



MILLION VETERAN PROGRAM

ISSUE 5 | WINTER 2017-2018

MVP Insider

A Newsletter for Million Veteran Program Participants

Over 600,000 partners and growing!

It's been an exciting year for MVP enrollment milestones thanks to all of our Veteran partners. In September 2017, the 600,000th Veteran partner joined the program! Below are some highlights from this past year:

MVP Site Expansion

We've continued to expand our MVP footprint across the country. This year we welcomed the following new MVP sites: Boston (who re-opened their doors!), Fayetteville (Arkansas, not North Carolina), Honolulu (Aloha!), Sioux Falls (hello Great Plains!), Syracuse (Go Orange!). Las Vegas and New Orleans VAMCs are also in the process of opening.

As you can imagine, we're excited to have these sites open to provide more opportunities for our partners to contribute to the program. In addition to the new MVP sites, we also opened the doors at 8 satellite sites in 2017 (also known as Community-Based Outpatient Clinics, Outpatient Clinics, etc.) across the country. If you happen to be at one of

our MVP sites, stop in and say hello - We love to see all of you, and may even ask if you'd like to pose for a photo op!



Putting together the puzzle: Health, lifestyle, and genetics

A goal of MVP is to collect as much information about our Veteran partners as possible. Our health is like a puzzle.

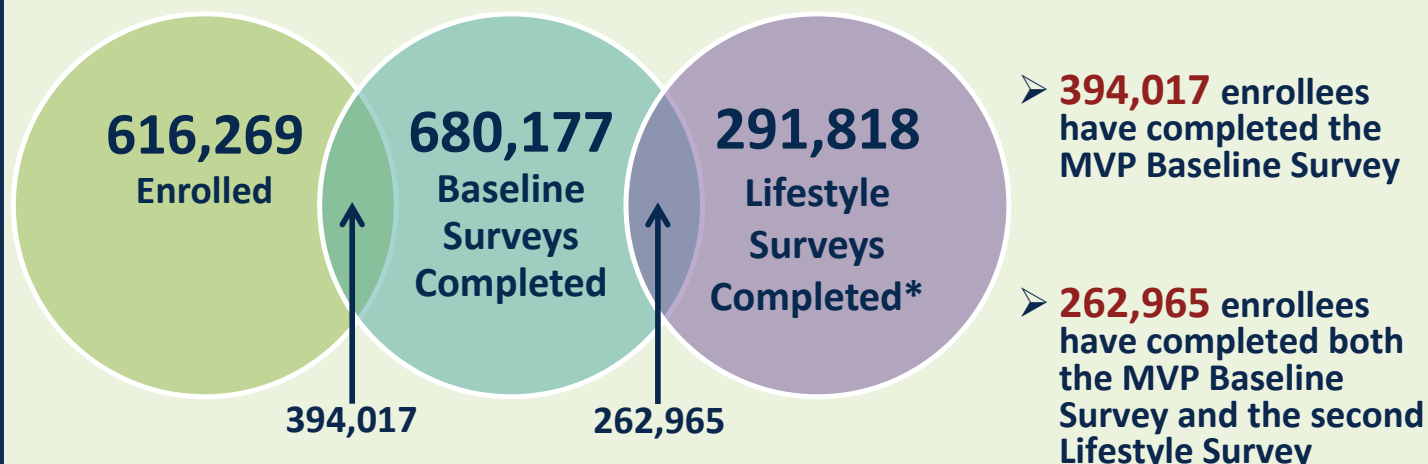
There are many unique pieces that come together to create the full picture. With information from your medical records, blood specimens, and survey information, researchers can put more pieces of the puzzle together.

Information from the MVP Baseline and Lifestyle Surveys provide critical pieces of the puzzle for researchers to understand more about you that we cannot learn from your medical record or DNA. By answering questions about what you eat, how much you exercise, how you feel physically and emotionally, and many other topics, researchers can look at not only the medical and genetic aspect of health and disease, but also how all these other factors can contribute to your health.

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MVP Snapshot

Data through October 31, 2017 unless otherwise noted



*All participants with completed Lifestyle Surveys are enrolled

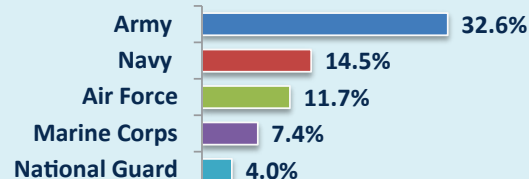
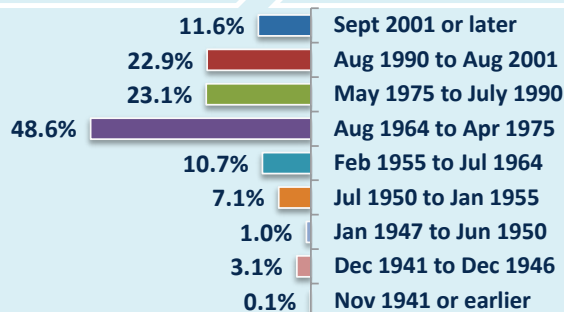
Data from MVP Baseline Surveys and electronic medical records

55 Active Sites
Service Era

66 sites Ever

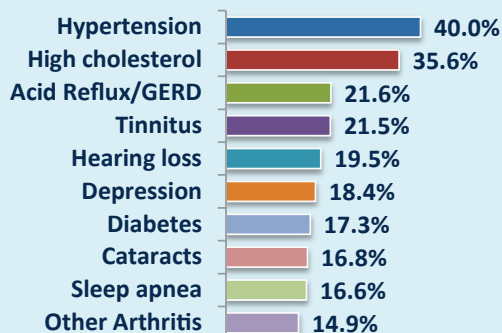
10,583,270 Total
Top 5 Service Branches

4,405,824 Individuals
Contacted



5.9% OEF/OIF **4.6% Gulf War**

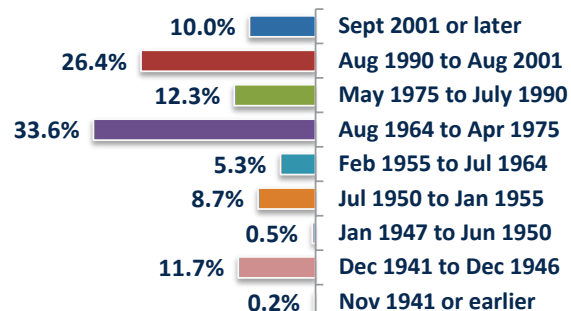
Top 10 Reported Diseases on the Baseline Survey



Data from electronic medical records as of 10/31/2017

VA Patients (N=11,454,787)

Service Era



10% OEF/OIF

DEMOGRAPHIC DATA

Letter to MVP Participants: You are helping to change the world

Dear MVP participants,

As a part of MVP, you are part of a very special group of people, and together we are making history! MVP is on the forefront of a scientific revolution made possible by new ways to analyze our genes, a rapid expansion in availability of health care data, and the development of ever-more powerful computers to analyze these rich data. In many ways, MVP represents a new way of doing research. Never before have we tried to combine information that comes from our genes with large amounts of health-related data.

As our efforts progress, it has become clear that the VA is one of the best places to do this type of work. The Veterans Health Administration (VHA) is the largest integrated national health system in the country, and it has an electronic medical record that goes back almost 30 years. The VA also has a robust research infrastructure, with over 150 medical centers ready for research projects. The MVP program would not succeed, however, without the help of Veterans like YOU, who contribute their time, information, and permission to use their data.

But succeed it has! MVP now has over 625,000 Veteran partners, making it the largest research operation of its kind (called a

genomic biobank) in the world. In the fall of 2017, MVP also reached a milestone in terms of producing results. Over 40 presentations on research using MVP data were given at several national scientific meetings, and several of the presentations received awards. MVP researchers are making contributions to our understanding of how genes affect disorders like obesity, high blood pressure, heart disease, cardiometabolic disorder, age-related macular degeneration, and kidney disease. In the coming years, MVP data will help researchers understand more about diseases like stroke, diabetes and cancer, and military-related illnesses, including post-traumatic stress disorder.

Research findings based on MVP—while protecting Veterans' privacy—may lead to new ways of preventing and treating illnesses in Veterans and all Americans, and may help answer questions like “Why does a treatment work well for some but not for others?”; “Why are some Veterans at a greater risk for developing an illness?”; and “How can we prevent these illnesses in the first place?”

Thank you very much again for your participation and continued support of this important program.

Mike Gaziano & John Concato, Principal Investigators

MVP Partner Spotlights: Serving for Life

Col. Shelia Varnado, US Army Ret. (26 years!)



Col. Varnado joined the Army at age 25 after finishing school and feeling that she had lost focus in her life. The military provided the opportunity for her to expand her horizons past Syracuse, NY and with the intention of serving for 3 years then moving on, she decided to join the Women's Army Corps program with direct commission as a 2nd

Lt. Life had other plans for her. Army life suited her personality! She started her career at Ft. McClellan and spent time in Georgia, Washington DC., Hawaii, Germany and, the most memorable for her, Kuwait. She also met her husband in the Army who retired as a Lt. Col. — she is proud that she outranked him!

Col. Varnado joined the Million Veteran Program during the DAV's national convention in New Orleans this year along with a fellow female Veteran.

“I think it's important to understand and recognize that any advancements that come, come primarily from those who have been through an experience, to be willing to share it, and share whatever we need to — to include our blood — to advance technology for those who serve in the future. And so, I understand the importance of that. I believe that's just a part of our service, and so I'm happy to help out. And especially if you say that you don't get that many women Veterans coming through, then I think it's even more important for those of us who know about it to just participate. It's a small, small sacrifice, if it's even a sacrifice.” ★

MVP data leads to new finding on 'resistant hypertension'

Using MVP data, VA researchers found that a blood pressure condition called resistant hypertension can increase the risk of cardiovascular problems and kidney failure. Resistant hypertension is "a condition that increases cardiovascular risk in a tremendous way," says Dr. Adriana M. Hung, one of the study's lead investigators. Her team focuses on kidney disease and the impact of high blood pressure and diabetes on kidney function.

The team presented their findings at Kidney Week 2017, a conference hosted by the American Society of Nephrology.

The researchers relied on MVP data. They identified more than 27,000 Veterans with resistant hypertension. Resistant hypertension is high blood pressure that remains above 140 over 90 even when the patient is taking three blood pressure drugs. Patients whose blood pressure has been lowered below this threshold using four or more drugs are also considered to have the condition. The researchers compared these patients to a group of over 268,000 Veterans with high blood pressure but not resistant hypertension.

They found that those with resistant hypertension had a 23 percent higher risk of heart attack than those without. They also had a 31 percent higher risk of stroke. The resistant



Dr. Adriana M. Hung meets with patient Rodney Stewart at the Tennessee Valley Healthcare System.

hypertension group had a whopping 144 percent higher risk for end-stage renal disease, or kidney failure. The condition was not associated with higher risk of death, however.

According to the researchers, better blood pressure control could lower the risk of heart attack and stroke for those with resistant hypertension. More research is needed to explain how this condition is connected to kidney failure, they say.

The team is continuing this research by studying the genetic basis of resistant hypertension. They aim to use MVP data to identify genetic targets that can be treated with medication to better rein in high pressure. ★

600,000 enrollments

Continued from page 1

Currently, about 350,000 enrollees have completed the MVP Baseline Survey and about 200,000 have completed our second survey called the MVP Lifestyle Survey. *If you are not sure whether you have completed these, you can call the MVP Information Center at 866-441-6075 or stop by your local MVP office to check your status or request a survey.*

In addition, a new survey focused on our Gulf War Veterans will help us to better

understand health concerns of this group such as Gulf War Illness. If you served during the Gulf War Era, we ask your help in completing this survey when you receive it this year!

Reaching the 1 million partners goal

With the goal of welcoming our one millionth participant by 2021, we know that we can count on you to help spread the word about MVP. Talking with other Veterans about the program, providing feedback to us, taking information about

MVP to local VSO posts or other locations where Veterans may frequent, and invite MVP to speak about the program at Veteran events, or host outreach and enrollments events. To request information about MVP or to invite MVP to an event in your area, please contact us at MVPquestions@va.gov.

We thank you for your service to our country and for your continued service in MVP. ★

Phenotyping and How Data is Used

What is a Phenotype?

Phenotypes are observable traits such as your height and eye color or medical conditions such as high cholesterol and cancer. Your phenotypes are influenced by your genes and environmental factors. For example, your height is heavily determined by your genes.

In the Million Veteran Program (MVP), researchers are interested in phenotypes such as high blood pressure, diabetes and other health conditions.

What is “Phenotyping”?

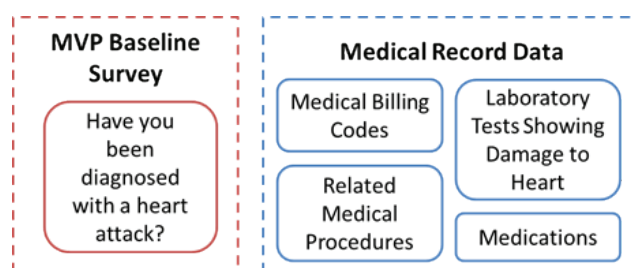
An MVP researcher is interested in studying which genes are related to heart attacks. But how will the researcher determine which Veterans had a heart attack? “Phenotyping” is the process of defining a phenotype of interest, in this case a heart attack. Researchers use the data available in MVP and apply their clinical knowledge to determine which Veterans have had a heart attack.

Phenotyping Example: Heart Attack

It can be difficult to determine which Veterans had a heart attack. Sometimes Veterans come to the hospital with chest pain and are evaluated for a heart attack, but in reality they had

acid reflux. The goal of the researcher is to create a set of rules that can be applied to the available data from MVP and assign a “phenotype status” to each Veteran – “Heart Attack” or “No Heart Attack”.

Assigning a “phenotype status” can be difficult depending on the disease of interest, which is why clinical knowledge is an important part of the phenotyping process. The example below shows the types of data that a researcher might use to assign a phenotype status in MVP.



The Role of Phenotyping in MVP

The first step of all MVP research projects is to perform phenotyping. Researchers must be able to accurately identify Veterans who had a heart attack, so that they can look at differences in the genes of Veterans with and without the disease. High quality phenotyping is a critical component of genetic research in MVP. ★

MVP's first studies generate excitement in the scientific community

MVP's initial projects have made incredible progress this past year. This progress was highlighted at the MVP Science Conference with the project leads held September 7-8, 2017 in Washington, D.C. MVP researchers came together to present their findings and learn from the breakthrough work their fellow colleagues are conducting with MVP data.

The MVP researchers also began to share their findings with the broader research community at large international scientific conferences, including:

- American Society of Nephrology 2017 Kidney Week
- American Society of Human Genetics 2017
- American Heart Association Scientific Sessions 2017
- EPI | Lifestyle 2017 Scientific Sessions

The work generated enthusiasm from the communities about the potential for meaningful findings from MVP and projects

using the information from it. Check out the article in the newsletter about findings from the renal project presented at one of the meetings!

The genetic analyses done with MVP samples right now are for research purposes. It's important to remember that these studies are the first step of impacting clinical care. It is a discovery phase and results from research need be verified or replicated and maybe even additional studies conducted before they will have the ability to impact clinical care. Speeding up the process from discovery to implementation of findings in the clinic is an important goal of MVP.

Want to be included in these studies? As MVP participants, you already are! Your information will be used in the studies that are looking at people like you. In the future, we may be contacting you to provide additional information or to participate in other studies that may be of interest to you! ★

VA and Department of Energy: Expanding the computing ability for MVP



VA has partnered with the Department of Energy to leverage some of the state of the art computing power and scientific minds of their scientists at the National Laboratories. This federal collaboration, endorsed by both Secretaries Shulkin and Perry, will allow VA and DOE to combine the best of their departments to facilitate MVP research. The collaboration is beginning with three pilot projects that will help with developing the infrastructure for computing as well as contribute to important issues Veterans face.

- One project will help VA improve computer algorithms being used to identify Veterans at high risk for suicide.
- A second project, on prostate cancer, will seek new ways to tell which tumors are deadly and require treatment, and which are slow-growing and not life-threatening.
- A third project will explore which sets of risk factors are the best predictors of certain forms of heart disease. It will help providers tailor treatment based on patients' individual genetic profiles.

"The Department of Energy as a whole has extraordinary computing capability," DOE Secretary Rick Perry said.

The plan is to use high-performing data analytics on the VA and MVP health databases that include veterans from all over the

nation. Together, the VA and DOE hope to better serve the men and women who serve us. These initial projects will contribute to not only creating a scalable infrastructure for computing, but have the potential to impact a large number of Veterans healthcare.

One of our priorities is to make MVP more broadly available to VA investigators, other federal partners, and university affiliates to facilitate their endeavors as they answer questions about the role of genetics in health and disease. These research efforts will continue to lead to discoveries which will improve the health care of Veterans, both near and long term.

In November 2017, access to the DOE environment for MVP was opened up to a small number of researchers to begin preparing for these projects. Testing of the system and procedures for accessing the data from this phase will inform the expansion of access to a broader community of researchers.

As a Veteran, Secretary Perry is also invested in MVP as a participant! Check out a message from him here: <https://www.click2houston.com/news/rick-perry-volunteers-for-million-veteran-program-aiming-to-identify-ptsd-trends>

"It's the continuation of volunteering, of their giving back to their country by being a part of a substantial program that's going to be able to give the next generation of servicemen and women some good intelligence, so it's a good program," he said. ★

New MVP projects funded in 2017

MVP is pleased to announce seven new projects that were funded this year. These seven projects are joining eight ongoing studies as MVP continues to expand access for science. All the projects are helping the MVP team refine the data access process for future researchers. Before MVP is opened more broadly to researchers, we need to ensure our application and data access process is sound to protect the integrity of our research program and the data from our Veteran partners.

The new projects are tackling topics of importance such as suicide prevention, mental health, tinnitus and women's health.

Genetic risk factors for suicide

This research project is studying genetic variants that increase Veterans' risk for suicidal behavior. Past studies have suggested that some people are at higher risk of suicide because of their genes. The researchers hope that this study will lead to improved approaches to suicide prevention by finding new ways to identify Veterans at high risk for suicide. On average, 20 Veterans die by suicide in the U.S. each day.

Predicting breast cancer risk for women Veterans

Researchers are using MVP data to build a new screening strategy for breast cancer. The team is studying genetic and clinical markers to predict breast cancer risk. They will use this information to develop more personalized screening strategies for individual women, rather than relying, say, on age alone to plan screening. They are also looking at how military experience and race might affect breast cancer risk. Most current screening plans are based on studies of civilian, Caucasian women.

New computer algorithm to search database

Researchers are testing how efficiently a new computer algorithm can automatically find data on people with specific diseases within the

MVP database. The algorithm, called APHRODITE, will be used to link diseases to inherited DNA changes within participants. If the algorithm proves successful, it will allow researchers to quickly match data on diseases with related DNA characteristics. APHRODITE should be able to identify individuals with a condition in a fraction of the time it takes to search the database using current methods.

How gene variation relates to diseases

This project is examining how differences in people's genes affect gene expression (how the information in DNA is translated into actual physiological changes within the body). Studying changes in gene expression will help researchers understand the genetic risk factors of different diseases. The researchers are looking at numerous health conditions, such as PTSD, depression, diabetes, and heart disease. They will use the results to improve treatments and develop precision medicine—treatment customized to individual patients.

Genetics of osteoarthritis

Researchers are exploring how genetics affect the prevalence and progression of osteoarthritis. They are looking for genetic predictors of the disease. The researchers believe that understanding

how gene variance is related to knee and hip arthritis could lead to new treatments both before and after surgery. The study is also looking at how genetics affect the success of hip or knee joint replacement.

Genetics of diabetes

This study is identifying the genes that underlie the differences in risk for diabetic patients by combining gene information with the clinical experience of MVP participants. The team is studying eye disease, kidney disease, heart failure, and hypoglycemia in diabetic patients. They are also looking at how gene variants, glucose levels, and different diabetes drugs affect diabetes risk. The work may lead to a better understanding of diabetes and improve individualized care.

Genes related to tinnitus

Researchers are studying how genes relate to tinnitus. Tinnitus is ringing in the ears with no external source. It has been the number-one disability for Veterans for more than a decade, being reported in more than 30 percent of the population. The study aims to identify genes associated with tinnitus from different causes, such as noise, blast, traumatic brain injury, and age. Identifying these genes will direct research into ways to measure tinnitus and new drug treatments. ★

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MILLION VETERAN PROGRAM

Connecticut Healthcare System

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West Haven, CT 06516



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A Partnership with Veterans

Have questions?

If you have any questions or would like to request MVP materials for distribution, please contact the MVP Information Center at **866-441-6075** or email us at **MVPquestions@va.gov**.

Like hearing from us?

Make sure we have your email address so we can send you newsletters and information electronically! The Information Center staff or your local MVP teams are happy to assist with updating this information.

You can also visit us at www.research.va.gov/MVP for updated information.

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