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Commentary

COVID-19 Vaccination: Forging a Path Through the Pandemic

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The COVID-19 pandemic has presented a unique set of challenges to the medical community and amplified preexisting issues in this new context. VHA's response to the pandemic provides foundational experience on which to build future public health efforts and offers an opportunity to examine lingering questions as we work toward both slowing the pandemic and finding new norms of service and care.

VHA's success in COVID-19 vaccination is a result of comprehensive efforts of leadership and staff at every level, as depicted in the figure below.

An Effective Communications Network

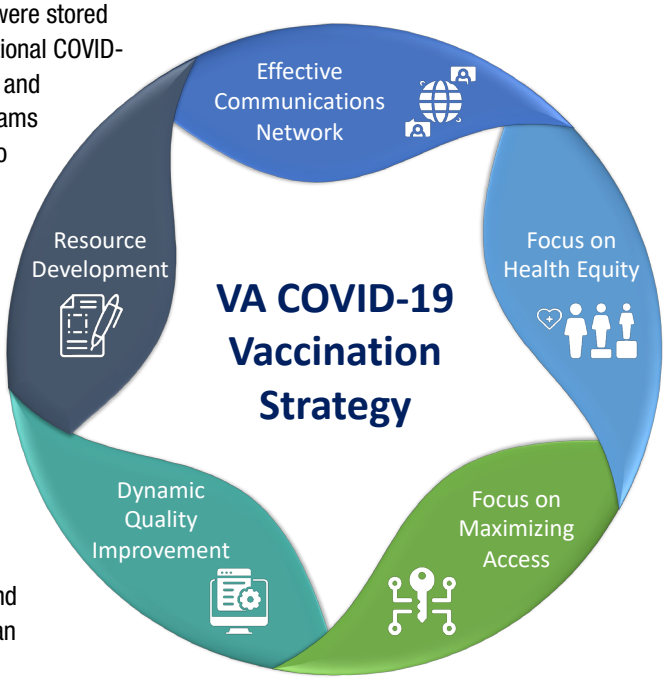
The efficiency of VHA's COVID-19 vaccination efforts relied in large part upon its communication channels. External and internal communications between all levels of leadership and staff focused on transparency, with daily national VHA leadership briefings regarding vaccine administration. VHA held mandatory vaccine administration tabletop exercises across all sites to ensure that information on vaccines, including anticipated challenges, was accessible, and to maximize strategic planning and collaboration. VHA leveraged its strengths as the largest integrated health care system in the nation via collaboration and frequent contact between vaccine coordinators across VHA and regular national presentations to broad audiences including operations, clinical leadership, and staff. These meetings and presentations promoted information sharing and dialogue.

Resource Development

VHA developed a vast catalogue of resources to effectively educate staff, Veterans, and other stakeholders about COVID-19 vaccination. These tools and documents were tailored to ensure accessibility and comprehensiveness and utilized both electronic and physical media. Notable resources include VA-specific facility guides for vaccine coordinators, toolkits tailored to African American, Latino, Asian, Pacific Islander, and American Indian Alaska Native populations, professionally designed template materials for internal and external distribution and weekly updates on federal partners such as the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA). Materials were stored and distributed digitally via a national COVID-19 Vaccine SharePoint database and supplemented by a Microsoft Teams venue for vaccine coordinators to engage with peers and share information.

Dynamic Quality Improvement

The scope of the COVID-19 vaccination effort required VHA to create new systems of information gathering and sharing. This included externally-facing resources, such as an online tool to track Veteran interest in vaccination, and operational resources, including an outreach tool for facilities to identify Veterans in accordance with risk stratification principles. VHA developed informatics solutions both to accurately capture and track data and to efficiently transmit information to the CDC. The vaccine planning team worked with the Office of Patient Safety to anticipate potential issues in vaccine administration, develop appropriate mitigation strategies, and promote open communication with the field to address and highlight challenges as they arose. VHA leveraged informatics to track its progress and to facilitate ongoing quality improvement while building its vaccination efforts across VA. VHA also shared its vaccination progress through external and internal channels to help inform leaders and stakeholders at all levels.



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Focus on Maximizing Access

The concept of maximizing access served as an underlying principle that drove VHA's vaccine planning. VHA developed transportation guidance to maximize the reach of available vaccines within strict cold-chain storage and handling requirements. Sites across VHA displayed both creativity and flexibility in reaching Veterans in remote and rural areas. Local leaders determined best approaches, with strategies including drive through vaccination clinics, use of Mobile Vet Centers, and even a fixed-wing plane to deliver vaccine to some rural sites. Vaccine coordinators also shared best practices with peers across VA. Beyond simply expanding geographic reach, VHA chose to also expand eligibility. VHA granted vaccine eligibility to Veteran Family Caregivers under the Program of Comprehensive Assistance for Family Caregivers to help Veterans maintain their health and standard of living during the COVID-19 pandemic. On March 24, 2021, the SAVE LIVES Act expanded legal authority for VHA to offer vaccine to additional Veterans, their spouses, and caregivers, and VA quickly moved to broaden vaccination further.

Focus on Health Equity

The COVID-19 pandemic amplified preexisting inequities in health care, with some racial and ethnic minority groups experiencing a disproportionate burden of morbidity and mortality, and with surveys revealing lower levels of vaccine acceptance among rural and minority populations. VHA focused on accounting for and correcting potential inequities within its scope of influence. Outreach, communications, and risk stratification considered needs of populations historically underserved in health care and most at risk from COVID-19 infection. Along with established relationships and trust between Veterans and VA, this approach contributed to the lack of racial and ethnic disparities in COVID-19 vaccination rates within VA. Throughout COVID-19 vaccination, VA tracked vaccination progress among key populations and addressed evolving barriers to vaccination quickly. For example, VA noted higher refusal rates and lower vaccination rates among rural Veterans and is currently working to address potential contributors such as ease of access, particularly as recent authorization of vaccines with more favorable transportation options allows more flexible distribution.

Looking Forward

As we continue forward with COVID-19 vaccination, we face additional challenges beyond physical access to vaccine. The next step in stemming the tide of the COVID-19 pandemic via vaccination is more complex than supply and demand. Having provided access to vaccine, we now must continue to help Veterans reach the decision to be vaccinated.

Even before COVID-19, many of us in VHA worked to address barriers to vaccine acceptance, which have become an increasingly important public health threat over the past several years. This mission has become more critical as the COVID-19 vaccine is an intervention with rapid returns in saving lives of Veterans, colleagues, and neighbors as well as in changing the way we live our daily lives. Newer virus variants with ability to spread COVID-19 more efficiently not only raise the threshold for community (herd) immunity but also place us in a race between speed of vaccination and speed of spread of variant virus.

Scientists continue to work to anticipate and defend against the virus as it changes, and the remarkable advances of the past year allow us a path through the COVID-19 pandemic to our new normal. VA is working hard to build on the trust that we have developed with the Veterans we serve, and to maximize transparency and sharing of information, so that Veterans have the information they need to understand how COVID-19 vaccine can protect them, their families, and their communities. We are grateful for the tireless work of our teams across VA in bringing vaccine to our Veterans and staff, answering questions and hearing concerns. We are also grateful to those Veterans, staff, and civilians who have come forward to be vaccinated. Their choice to receive the vaccine will help us fight our way through the COVID-19 pandemic together.

Response to Commentary

Ten Accomplishments from VA Research on COVID-19

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As the United States emerges from the pandemic with hopes of a return to a more normal life, it is an opportune time to reflect on the challenges and successes of the past year. VA has performed admirably during the COVID-19 pandemic, demonstrating the value of an integrated system and a coordinated, national response: we closed our community living centers to visitors early and instituted universal screening, avoiding the dramatic spread seen in private nursing homes; we surged staff where needed, preventing our hospitals from being overwhelmed and allowing VA to take in non-Veterans in hot spots; we pivoted quickly to telehealth; and as documented in this issue, we distributed vaccine quickly and efficiently to our staff and patients while maintaining high levels of trust in VA.

For the VA research enterprise, which spans more than 100 medical centers, the pandemic delivered a trio of challenges: local shutdowns interrupted access to labs and participant recruitment; clinician researchers were pulled into patient care; and researchers dove into solving COVID-19 questions without supplemental COVID-19 funds flowing to research. Despite these challenges, research teams across VA pivoted to address the numerous questions surrounding this novel pathogen. Below we outline just a few of our major efforts and accomplishments.

1. **Clinical Trials of Vaccines and COVID-19 Therapies:** Early in the pandemic, VA entered into partnerships with the National Institutes of Health (NIH), the Food and Drug Administration (FDA) and the Centers for Disease Control (CDC). Under NIH's Accelerating COVID-19 Therapeutics and Vaccines (ACTIV) initiative, VA continues to participate in both outpatient (ACTIV-2) and inpatient (ACTIV-3) platform trials. Under what was then called Operation Warp Speed, VA enrolled more than 1,500 Veterans in trials of five different vaccines and VA sites are continuing to participate in ongoing therapy trials. VA also funded intramural **clinical trials** of potential new therapeutics such as degarelix, a testosterone suppressant. Facilitating these trials required a substantial effort by the Office of Research & Development (ORD) as we devised new and streamlined processes for Central Institutional Review Board (IRB) review, and processed multiple new agreements with participating agencies and industry partners. ORD was able to accelerate these steps because of efforts we had undertaken to make the clinical trial start-up process more efficient, including establishing a Partnered Research Program Office to assist external partners and obtaining approval to rely upon commercial IRBs. We also tapped into the existing research infrastructure within VA: our 59 enrollment sites for the **Million Veteran Program** and the network of 5 coordinating centers and 10 enrollment sites for the VA **Cooperative Studies Program**.

2. **Real World Evidence:** As part of an FDA Evidence Accelerator collaboration involving multiple health systems, VA researchers worked with the Pharmacy Benefits Management office to use national EHR data to examine the real-world effectiveness of potential COVID-19 therapies in use in VA. Efforts began with hydroxychloroquine (soon shown to not be effective) but proceeded to compare real-world findings to treatments that had been examined in treatment trials: prophylactic anticoagulation (lowers risk of death in hospitalized patients);[1] remdesivir (of limited value) and steroids (analysis underway). Other studies by independent teams have examined effects of aspirin and alpha-blockers.

3. **Risk Modeling and Risk Prediction:** As illustrated in accompanying articles, VA's EHR data on 9 million Veterans and nearly 250,000 cases across the United States provided one of the richest databases to examine factors associated with getting infected or developing severe COVID-19. Such analyses helped clarify the role of race, ethnicity and comorbidity in risk of infection with COVID-19 and of developing severe disease among Veterans.

4. **Rapid Evidence Synthesis:** Our Evidence Synthesis Program produces rapid reviews of emerging COVID literature to assist our clinical partners and created a website, **VA-ESP | COVID-19 Reviews**, compiling an average of 500 similar reviews from around the world per month.

5. **Genomic Insights into COVID:** The Million Veterans Program platform, with genomic information on more than 800,000 enrolled subjects, 33,000 of whom were infected with COVID-19, provides a laboratory to identify possible targets for new therapies. A recent paper using Mendelian randomization examined over 1,000 potential protein targets for COVID-19 therapies and highlighted one that is most promising.[2]

6. **COVID-19 and Community Living Centers:** Research in VA community living centers identified the need for a lower temperature threshold to detect COVID-19 among older patients,[3] and more recently has documented the steep decline in infections post vaccination.

7. **COVID-19 and Mental Health:** Given the high prevalence of mental health conditions in Veterans and the stresses imposed by the pandemic, ORD launched multiple "rapid response" studies aimed at detecting early signals of how patients with PTSD, SUD, and other conditions have fared. Some results were counterintuitive. Patients with serious mental illness or recent homelessness recovered more quickly than healthier controls from the early stress of the pandemic;[4] patients with PTSD fared relatively well during the quarantine period.

8. **Long-term Outcomes of COVID-19:** As we pass one year since the first wave, evidence is increasing about long-term consequences

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Research Highlight

Initial Interview and Survey Results Reveal Vaccine Hesitancy among Veterans and VA Employees

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We thank the many members of our RRT-3 for their help with these projects. This work could not be done without them.

As of April 25, 2021, approximately 2.17 million Veterans and 282,000 VA employees have been vaccinated in the Veterans Health Administration (VHA) with one of the three COVID-19 vaccines available in the United States through Emergency Use Authorization.[1] While definitely a time for optimism, the vaccine rollout has prompted concerns about widespread vaccine acceptance, across the country and also within VHA. Although COVID-19 is one of the leading causes of death in the United States,[2] the percentage of Americans who stated they were somewhat or very likely to get vaccinated declined from 74 percent in April 2020 to 56 percent in December 2020. These declines were observed for both women and men and in all age, racial/ethnic, and educational subgroups.[3] As part of the National Center for Health Promotion and Disease Prevention's (NCP) overall implementation plan, rapid quality improvement projects to identify sources of vaccine hesitancy among VA employees and Veterans, and strategies to overcome these challenges, are greatly needed.

When QUERI released its request for applications in 2019 for the renewal of existing QUERI programs, and establishment of new programs, an innovative requirement was that the larger programs propose a readily available Rapid Response Team (RRT) that could, quite literally, respond to time-sensitive VHA program office needs for national priorities. Each RRT is expected to have a team comprised of experts in implementation and evaluation to participate in two projects per year, each requiring several months of time and effort. Funding for these projects is built into the QUERI program's core budget.

In late November 2020, with NCP leading the national vaccine distribution for VHA, QUERI requested support from RRTs to evaluate this implementation effort. The inaugural RRT projects at the Hines VA Carriage QUERI, Durham VA Function QUERI, and Bedford/Boston/Palo Alto VA's Bridge QUERI mobilized to design six-month projects that evaluate aspects of COVID-19 vaccine hesitancy in conjunction with the NCP vaccine program. Unique to this RRT work is the need for each of the RRTs to collaborate and coordinate efforts, to present a unified package of work products and deliverables to NCP, and to allow for iterative improvements to their six-month implementation plan.

The RRT-3, as the three groups are known, met with NCP in December 2020 to discuss how they could support NCP in their efforts. Launched in January 2021, these projects collectively aim to understand the extent of and reasons for vaccine hesitancy among Veterans and VA employees and to evaluate strategies for communicating with both groups about the COVID-19 vaccine. To answer these questions, the RRTs are leveraging a variety of available data sources, including the national ForeSee survey sent monthly to My HealtheVet users, SHEP VIP (VA Survey of Healthcare Experiences of Patients Program Veteran Insights Panel), and employee surveys administered by VA healthcare systems to plan their vaccine rollout. Each project is collecting additional qualitative data from VA employees or Veterans for a more in-depth understanding of factors contributing to COVID-19 vaccine hesitancy among VA stakeholders as the vaccination program progresses.

Initial Findings on Vaccine Hesitancy among VA Employees

Early RRT-3 results have identified target areas to address vaccine hesitancy among VA employees. Results from an employee survey at one VA healthcare system analyzed by our RRT-3 further revealed differences by demographic and work characteristics. For example, Black or multi-racial/ethnic employees were up to four times more likely to indicate hesitancy compared to other minority or White employees, and those who worked in outpatient settings were approximately twice as likely to indicate hesitancy compared to those who work in inpatient settings.

Key Points

- In November 2020, QUERI requested support from its Rapid Response Teams to evaluate the COVID-19 vaccine rollout undertaken by the National Center for Health Promotion and Disease Prevention (NCP), and to examine causes of vaccine hesitancy among Veterans and VA employees.
- Early results from three Rapid Response Teams identified target areas to address vaccine hesitancy among VA employees.
- These three Rapid Response Teams are continuing to engage with and support NCP-led operational activities.

Qualitative data collected by the RRT-3 through interviews with employees who were vaccine hesitant illustrate a range of issues related to the mistrust of information from federal sources during the COVID-19 pandemic, concerns about the impact of the vaccines on pre-existing health conditions, and worry about the speed with which the vaccines were developed. Reasons cited for overcoming vaccine hesitancy relate to altruism, such as wanting to receive the vaccine to protect their Veteran patients and elderly family members, as well as having conversations with trusted others, such as their own primary care providers, who are helping these employees understand the data on vaccine safety and effectiveness, and addressing their concerns in a non-judgmental way.

Initial Findings on Vaccine Hesitancy among Veterans

Other RRT-3 projects are focusing on Veterans' vaccine hesitancy. More recent survey data from Veterans across a broad geographic area of the United States showed that 52.6 percent of Veterans had already received a 2-dose vaccine and 29.4 percent 'probably would' or were 'very likely' to get a 2-dose vaccine. The most common reasons selected for getting a COVID-19 vaccine were to prevent the respondent from getting COVID-19, to

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contribute to ending the pandemic, and so that life could go back to the way it was before the pandemic. Concerns about (immediate and future) side effects and concerns about how quickly the vaccines were developed were the most commonly selected reasons against vaccinating. The top three trusted sources of information about COVID-19 reported by Veterans include their doctor or healthcare provider, the Veterans Health Administration, and science experts like Dr. Fauci. Through the SHEP VIP cross-sectional web-based survey of 1,178 Veterans (83 percent men, 81 percent non-Hispanic white) fielded between March 12 and 28, 2021, 71 percent of the respondents indicated that they were already COVID-19 vaccinated. Of the 29 percent (n=339) not yet vaccinated, those unsure of getting the vaccination were more likely to report fair or poor overall and mental health. Concern about the side effects from the COVID-19 vaccine was the topmost reason for not getting vaccinated among those not yet vaccinated.

RRT-3 Operational Engagement

Engagement with NCP-led operational activities has been integral to the RRT-3. A member of each RRT attends the COVID Vaccine Weekly Office Hours for Clinical Leaders, a briefing led by Dr. Jane Kim and Dr. Sophie Califano on the status of the vaccine program and any new information. These briefings also provide an opportunity for attendees to ask questions. The RRT-3 also participates in the VHA-wide Integrated Project Team meeting, which provides guidance to the COVID Vaccine sub-workgroups (distribution, policy, prioritization, education, measurement, communications, and vaccine safety) and information on the needs of Veterans, staff, and VHA with respect to COVID-19 vaccine. RRT-3 members are also engaged in individual workgroups such as the COVID vaccine education workgroup, led by Dr. Michael Goldstein, which provides guidance on education materials for Veterans and VA staff. These workgroups have also been a mechanism for sharing and receiving feedback from NCP. RRT-3 has received feedback on data collection tools and sampling strategies from workgroup participants that include NCP.

Lessons Learned for Rapid Response

There are several lessons to be learned for future RRTs based on our collective experience as the RRT-3. RRTs must be able to adapt quickly. VHA conducted a monumental task of rapidly deploying vaccine to all VA medical centers within one week of the Pfizer and Moderna vaccines emergency use authorization respectively. The RRT-3 had anticipated focusing on the initial five VA vaccine pilot sites for data collection; however with rapid deployment of vaccine, this shifted to a broader focus on the larger VA population and a broader set of VA medical facilities. Leveraging additional resources is key to achieving the goals of the RRT. Operational partners will likely be extremely busy and not able to meet separately on a weekly or bi-weekly basis. RRT teams can leverage established workgroup meetings or other teleconferences to obtain input quickly from operational partners and other stakeholders. Finally, collaboration amongst RRTs can bring efficiencies to the process. The RRT-3 share information and data collection tools, with a goal of aligning and triangulating efforts to ensure that the parts produced by each are greater than the whole.

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in patients who have recovered from COVID-19. A VA-DoD partnership has enrolled COVID-19-infected patients in a long-term follow-up study to examine how immunologic and serologic changes correlate with disease progression and recovery. VA EHR data have already provided compelling information on long-term outcomes; among recovered patients, mortality risk remains elevated up through six months as does incidence of conditions involving pulmonary, cardiac, and neurologic systems.[5] A recently launched 2-year follow-up study will expand on this work with symptom surveys and analyses in specific high-risk groups. Research is working closely with clinical partners as VA plans how to care for patients with "long COVID."

9. **Deferred and Disrupted Care:** Not all effects of the pandemic are directly due to the virus. The massive economic dislocations, social isolation, and disrupted health care of the pandemic affected nearly everyone and proved especially hard on the most vulnerable. National and VA analyses suggest the excess total mortality in 2020 compared to previous years exceeds that attributed directly to COVID-19.[6] While some may be late effects of COVID-19 or undetected infection, at least one cause of death – overdoses – seems clearly to have increased outside VA. In contrast, despite dire predictions, the rate of suicides does not seem to have risen. With patients deferring a variety of acute and elective care, HSR&D has launched several research opportunities to examine outcomes in greater detail, including a national study comparing VA mortality to national benchmarks during the pandemic.
10. **Assessing Vaccine Acceptance and Vaccine Effectiveness:** Despite success in vaccination efforts, up to one-third of Veterans have not yet received or decided to get the vaccine. QUERI and HSR&D are supporting efforts to examine the causes of vaccine hesitancy and develop interventions. At the same time, researchers at White River Junction are conducting an FDA-funded study to assess vaccine effectiveness in the VA population.

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Research Highlight

Working in COVID-19 Recovery: Importance of Alternative Evidence-Based Practice Strategies

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The COVID-19 public health emergency has disrupted access to face-to-face healthcare visits in unprecedented ways. Diagnostic and procedural services (e.g., radiology, interventional procedures, surgery) have been particularly susceptible to disruptions in care. This is primarily due to the challenge in shifting to virtual care for these services. Moreover, these services have frequently had to reduce their capacity as a result of staff redeployments, repurposing and reductions of space and equipment, and laborious protocols to screen and prevent transmission of the SARS-CoV-2 virus, which causes COVID-19.[1] As a result, many procedural services in VA now have substantial backlogs that will likely take many months, if not years, to work down without strategic actions by VA to mitigate these backlogs.

As part of an HSR&D-funded Rapid Response Project (RRP), we sought to understand whether the implementation of several evidence-based practice (EBP) strategies, which involve applying the best available research evidence in the appropriate clinical context, could improve access to gastrointestinal (GI) endoscopy. Our approach and findings can serve as a model for other clinical services during the COVID-19 system recovery phase.

Opportunities to Improve Access in Endoscopy

GI endoscopy is one of the most commonly performed ambulatory procedures in VA, with almost 400,000 procedures annually. Lower endoscopy (i.e., colonoscopy) is a mainstay of VHA's colorectal cancer (CRC) prevention efforts, playing a role in both screening for cancer and surveillance to ensure that patients with previous CRC or pre-cancerous growths (i.e., polyps) do not have recurrence. Access to timely colonoscopy is essential because delays in diagnostic colonoscopy after an abnormal stool-based CRC screening test or in patients with previous high-risk polyps are associated with a higher risk of advanced CRC.[2]

Using discrete event simulation, an analytic method that models the behavior and performance of a real-life process, we evaluated the impact of two EBP strategies to reduce demand, and increase access, for colonoscopy during and after the first wave of the COVID-19 pandemic.

1. An "Extend" strategy (applicable to nearly one in six colonoscopies): Multi-society guidelines from 2020 specify that patients with 1 to 2 low-risk colon polyps can have their follow-up exam at 7 to 10 years (instead of 5 to 10 years, as specified in the 2012 recommendation) without increasing CRC morbidity or mortality.[3] Given VA data showing that many patients with low-risk polyps undergo surveillance at a 5-year interval (or sooner), an "Extend" strategy shifts the workload for patients with low-risk polyps two or more years into the future.

2. An "Exchange" strategy (applicable to nearly one in five colonoscopies): A Fecal Immunochemical Test (FIT) is a home-based stool test that is a guideline-recommended strategy for annual CRC screening. FIT is as effective for preventing mortality from CRC as screening colonoscopy. With an "Exchange" strategy, all referrals for average risk screening colonoscopy are changed to FIT testing.

Results of Simulation Exercise

The simulation model examined a hypothetical endoscopy unit that had a pre-COVID capacity of 110 procedures weekly, which is similar to many endoscopy units in VA. The unit was part of an integrated healthcare system without external referrals to community care. We made the following assumptions: 1) during the early pandemic, capacity was reduced to 5 percent of pre-COVID levels for 10 weeks; 2) capacity incrementally increased back to 100 percent by 30 weeks; 3) the number of referrals each week was 113; and 4) patients with the highest priority were always seen first, as recommended by VA GI National Program guidance, with all others joining a waiting line (i.e., queue).

Using published VA data, referrals included (in descending order of priority) 23 percent for diagnostic colonoscopy, 28 percent for upper endoscopy, 10 percent for high-risk polyp surveillance, 17 percent for low-risk polyp surveillance, and 22 percent for screening colonoscopy. (The Extend strategy would be appropriate for low-risk polyp surveillance and the Exchange strategy would be appropriate for screening colonoscopy.) We compared the Extend and Exchange strategies to a scenario of 20 percent Overtime, which is equivalent to running the endoscopy unit one extra day per week, and to usual care. The model length was approximately three years (150 weeks).

Key Points

- In the wake of the COVID-19 public health emergency, many procedural services in VA are experiencing substantial backlogs.
- An HSR&D-funded Rapid Response Project examined approaches for improving access to gastrointestinal endoscopy.
- Findings from this work can serve as a model for other services as we emerge from the COVID-19 pandemic.

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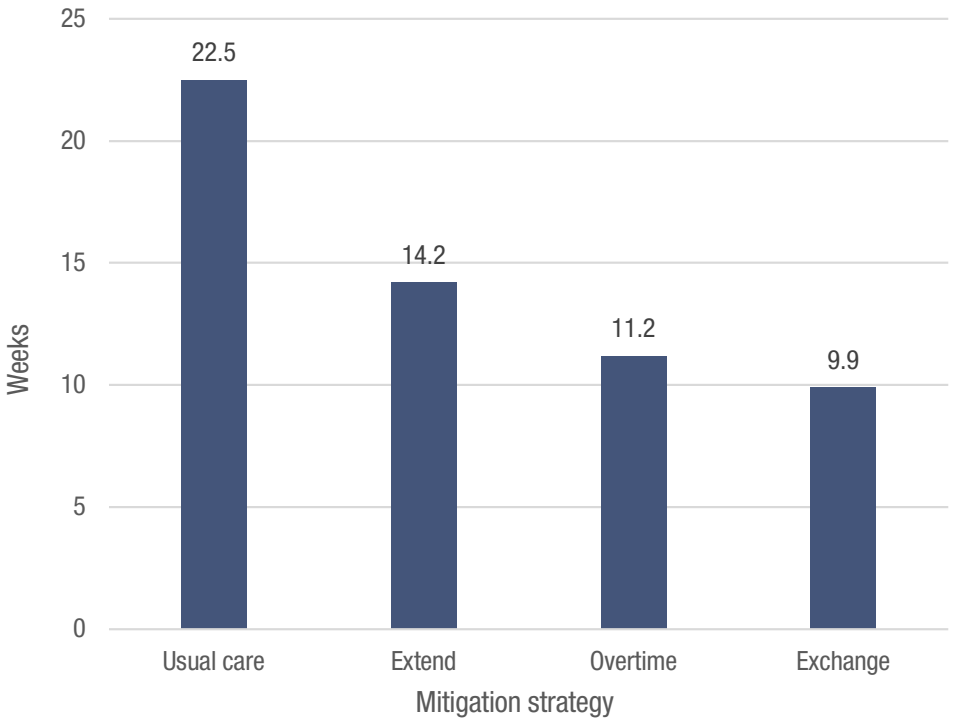
With usual care, the average wait time across all procedural indications was nearly six months, driven predominantly by wait times for screening colonoscopy, which exceeded one year; more than 3,000 patients remained in the queue at the end of the three-year period. The Exchange strategy reduced average wait times to the greatest degree (56 percent), followed by Overtime (50 percent) and Extend (37 percent; see Figure 1). Notably, with Exchange the wait time for screening colonoscopy was reduced to zero since all CRC screening was done using FIT, while with Overtime and Extend, average wait times for screening still exceeded 8 months. Both Exchange and Overtime reduced the queue to zero by three years, while over 1,000 patients remained in queue at three years with Extend. With all four strategies, nearly equivalent numbers of patients were seen for high-risk polyp surveillance, diagnostic colonoscopy and upper endoscopy, with similar wait times.

Figure 1. Average wait time for endoscopy procedures under different mitigation strategies



Results are based on a discrete event simulation of a single hypothetical VA endoscopy unit. "Extend" is an evidence-based strategy that entails changing the follow-up interval for patients with low-risk polyps from 5 to 7 years. "Exchange" is an evidence-based strategy that entails performing stool-based colorectal cancer screening instead of screening colonoscopy. "Overtime" entails a 20 percent increase in capacity (i.e., 1 additional day per week). The time period for all simulations was 150 weeks.

Conclusions

The COVID-19 pandemic has created an opportunity and urgency to maximize the value of care provided by VA, and in the process increase Veteran access. Simulation modeling can help VA clinical leaders evaluate and select evidence-based strategies to maximize access to critical services when it is limited by external or internal events. In the setting of gastrointestinal endoscopy, we found that wait times for the lowest priority endoscopy indications, particularly screening colonoscopy, will be unacceptable without the use of mitigation strategies, and that an evidence-based Exchange strategy has the greatest potential to mitigate the problem. Instead of simply working harder (e.g., employing overtime), working smarter (e.g., using FIT, instead of colonoscopy, for screening) may do more to improve access.

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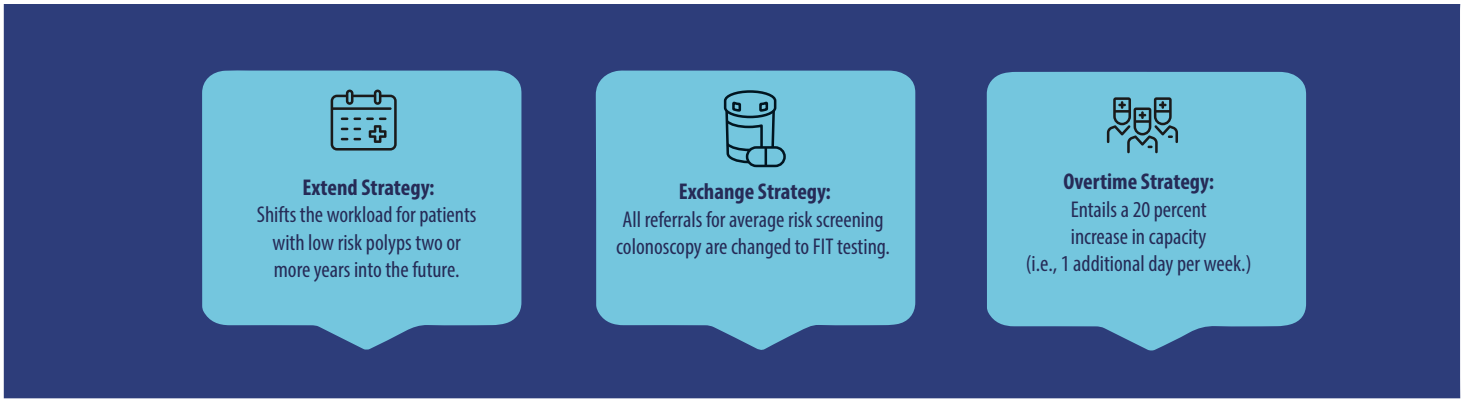


Research Highlight

Eight Research Projects Examine Relationship Between COVID-19 and Mental Health

Emily Evans, PhD, MPH, Robert O'Brien, PhD, and Naomi Tomoyasu, PhD, all with HSR&D Central Office, Washington, DC

Past experience and emerging evidence portend significant mental health impacts from the COVID-19 pandemic, including elevated levels of anxiety, depression, psychological distress, substance use, and suicidal ideation.[1] These mental health impacts (new cases and/or worsening of existing conditions) are hypothesized to result (directly or indirectly) from the public health measures needed to mitigate the spread of the virus (e.g., physical distancing, lockdowns, school closures) (Figure 1). Veterans with existing mental health conditions, as well as those from vulnerable subgroups (e.g., aging, homeless, residential rehab, rural), may be particularly at risk for adverse mental health outcomes during the COVID-19 pandemic.

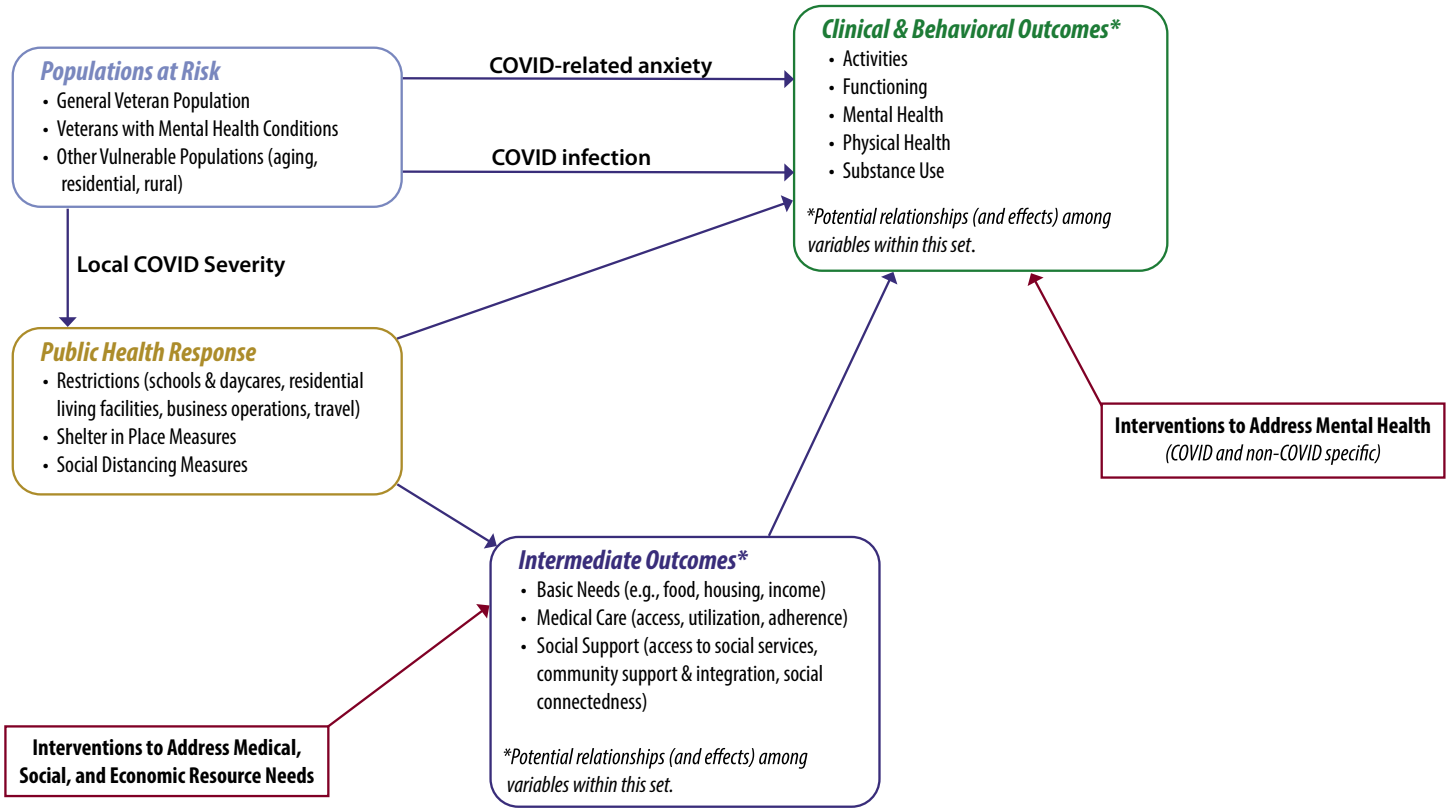
Rapid Response Mechanism

Addressing the mental health impacts of the COVID-19 pandemic in a robust, effective manner requires strategies that can support a research agenda that includes analyses to inform decision-making on a relatively short timeline; studies that guide long-term planning; and projects to understand the unique conditions of the pandemic (and what works under these conditions).[2] HSR&D released a Rapid Response RFA (Spring 2020) to jumpstart research efforts in these domains, including data analysis projects; planning projects ("preparatory to research"); and short-term pilots. This funding mechanism allowed for timely, targeted, and coordinated work to build partnerships, develop capacity, and conduct foundational research and operations work necessary to address critical questions surrounding the COVID-19 pandemic. HSR&D received and reviewed over 200 proposals under this RFA, and within three months of submission, funded 21 new studies and 5 supplements to existing awards, 8 of which addressed mental and behavioral health and care delivery issues.

Key Points

- Veterans with existing mental health conditions as well as Veterans from vulnerable subgroups may be at heightened risk for adverse mental health outcomes during the COVID-19 pandemic.
- With release of a Rapid Response RFA in Spring 2020, HSR&D sought to accelerate research efforts that would inform short-term decision-making and long-term planning for a research agenda focused on the mental health impacts of the pandemic.
- This article provides an overview of eight HSR&D-funded Rapid Response studies that address mental health and care delivery in the wake of the pandemic.

Figure 1: General Causal Framework for Understanding Impacts of the COVID-19 Pandemic on Mental Health



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Rapid Response Projects

As outlined below, the COVID-19 mental health research projects funded by HSR&D address a broad range of Veteran-centric topics, from social distancing to access to care to an after-action review of the COVID-19 response.

- **Bryann DeBeer (Aurora, Colorado): Impact of COVID-19 and Social Distancing on Mental Health and Suicide Risk in Veterans.** This cross-sectional study uses social network analyses to examine pandemic-related changes to Veterans' social support systems and subsequent impacts on mental health symptoms and suicide risk.

- **Johanna Eliacin (Indianapolis, Indiana): Expanding VA Peer Support Workforce Capacity to Facilitate Increased Access to VHA Mental Health Services and Continuity of Care for Veterans with Mental Illness During the COVID-19 Pandemic.** Leveraging the Principal Investigator's ongoing Career Development Award project, this qualitative study seeks to understand impacts of the COVID-19 pandemic on delivery and adaptations for peer support programs in mental health, including successful strategies for enhancing peer support to improve Veterans' access to care.

- **Angela Fagerlin (Salt Lake City, Utah): Veterans' Experiences During the COVID-19 Pandemic.** This short-term longitudinal study leverages the existing infrastructure of an ongoing COVID-19 study to identify challenges and facilitators to physical distancing; understand access to VA and non-VA medical care; and assess impacts of social isolation on loneliness and emotional coping.

- **Jennifer Funderburk and Robyn Shepardson (Syracuse, New York): Piloting a Self-Help Intervention to Improve Veteran Mental Health During the COVID-19 Pandemic.** This mixed methods study assesses the effects of the Managing Emotions in Disaster and Crisis (MEDIC) intervention on psychological distress, depressive symptoms, anxiety symptoms, social connectedness, and overall well-being, along with implementation strategies and outcomes.

- **Bo Kim (Boston, Massachusetts): Applying the After Action Review Methodology to Examine Mental Health Residential Rehabilitation and Treatment Programs' (RRTP) Response to the COVID-19 Crisis.** Using qualitative methods, this study explores challenges, adaptations, and performance of RRTPs in their initial response to the pandemic, and how that might inform subsequent response strategies.

- **Diana Mendez (Orlando, Florida): Changes in the Delivery of Evidence-Based Psychotherapies for Depression and PTSD as a Result of the COVID-19 Pandemic.** Using secondary analyses of data from ongoing research, the study team is assessing impacts of the sudden shift to telehealth strategies on treatment utilization (frequency and duration) and mental health outcomes (prescription changes, Veterans Crisis Line calls, chart flagging for suicide).

- **Lisa Silbert (Portland, Oregon): Impact of Social Distancing During the COVID-19 Pandemic on Cognitive, Physical, and Mental Health in Urban and Rural Veterans in the Pacific Northwest.** Leveraging data and infrastructure from an ongoing study of the VA Clinical Assessment, Reporting and Tracking Program, investigators are assessing the impact of COVID-19 pandemic distancing restrictions on social activities (overnight visitors and travel), digital biomarkers (step counts, sleep duration, time in/out of the house), psychological distress, and physical illness.

- **Alan Teo (Portland, Oregon): Adapting Caring Contacts to Counteract Adverse Effects of Social Distancing Among High-Risk Veterans During the COVID-19 Pandemic.** This project is planning for a large randomized clinical trial by involving an expert panel to (1) develop an adapted version of the Caring Contacts intervention ("Crisis Caring Contacts"), and (2) construct a cohort and develop data collection instruments and protocols.

Understanding and mitigating the adverse mental health impacts of the COVID-19 pandemic among Veterans is a priority for VA. The current research funded by HSR&D, including, but not limited to, the Rapid Response projects, as well as other studies supported by the Office of Research and Development (ORD), are addressing multiple aspects of the potential relationships between the COVID-19 pandemic and clinical and behavioral health outcomes. Still, much work remains to be done in addressing important evidence gaps, including identifying vulnerable groups most at risk for adverse mental health outcomes; understanding the underlying mechanisms (e.g., social, economic, and public health prevention factors); and examining facilitators and barriers to accessing effective and timely treatment for mental health conditions. HSR&D is working across ORD and with our program partners to address these challenges and to support continued, coordinated, and Veteran-centric studies that will improve the quality of mental healthcare for Veterans during and after the COVID-19 pandemic.

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Research Highlight

Disparities in COVID-19 Infections among Veterans Mirror General Public, but Survival Rates among Racially Diverse Veterans are Comparable

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COVID-19 has devastated populations and economies in the United States and around the world. In many places, people of color have borne a disproportionate burden of disease and death associated with COVID-19. Even though a national vaccination campaign is underway and new cases are in steep decline, concerns remain that people of color will continue to be hard hit by the pandemic due to uneven vaccine availability and uptake due to structural racism and vaccine hesitancy. Given national disparities in COVID-19 related outcomes, VHA's Office of Health Equity mobilized workgroups to allow for rapid analysis to determine how marginalized Veterans were impacted.

BLUF. Black and Hispanic Veterans have received care at VA for COVID-19 infection at higher rates than White Veterans. Contrary to patterns observed in the civilian population, among Veterans who test positive, Black, Hispanic, and White Veterans have comparable survival rates. Early data indicate that Black and Hispanic Veterans have accepted COVID-19 vaccination at similar rates as White Veterans.

Who Tests Positive? People of color are more likely to live in high-density residences and serve as essential workers, which increases exposure to COVID-19.[1] Veterans live and work in the same communities as their families and colleagues, so it should be no surprise that Veterans of color tested positive for COVID-19 at a higher rate than White Veterans.

Among those aged 18-74, Hispanic Veterans were 1.7 times more likely than White Veterans to test positive. Among those age 75 and over, Black Veterans were 1.7 times more likely to test positive. Disparities fell as the pandemic grew.

Who Dies? Treatment for severely ill COVID-19 patients improved over the course of the pandemic. As experience with antivirals, antibodies, steroids, and anticoagulation increased, mortality declined. Age and comorbidities remain the major determinants of survival.

Key Points

- The VHA Office of Health Equity recently conducted a rapid analysis to determine the impact of the COVID-19 pandemic on marginalized Veterans.
- While Black and Hispanic Veterans received care at VA for COVID-19 infection at higher rates than did White Veterans, Black, Hispanic and White Veterans had comparable survival rates.
- During the pandemic, VA accelerated the development of tools and communities to monitor disparities and reach out to Veterans at high risk for COVID-19 infection and death.

Veterans aged 75 and over were 6 times more likely to die than younger Veterans. Although Veterans of color were more likely to require hospitalization when they presented with COVID-19 for care at VA, differences in mortality among Black, Hispanic, and White Veterans receiving care at VA were small.

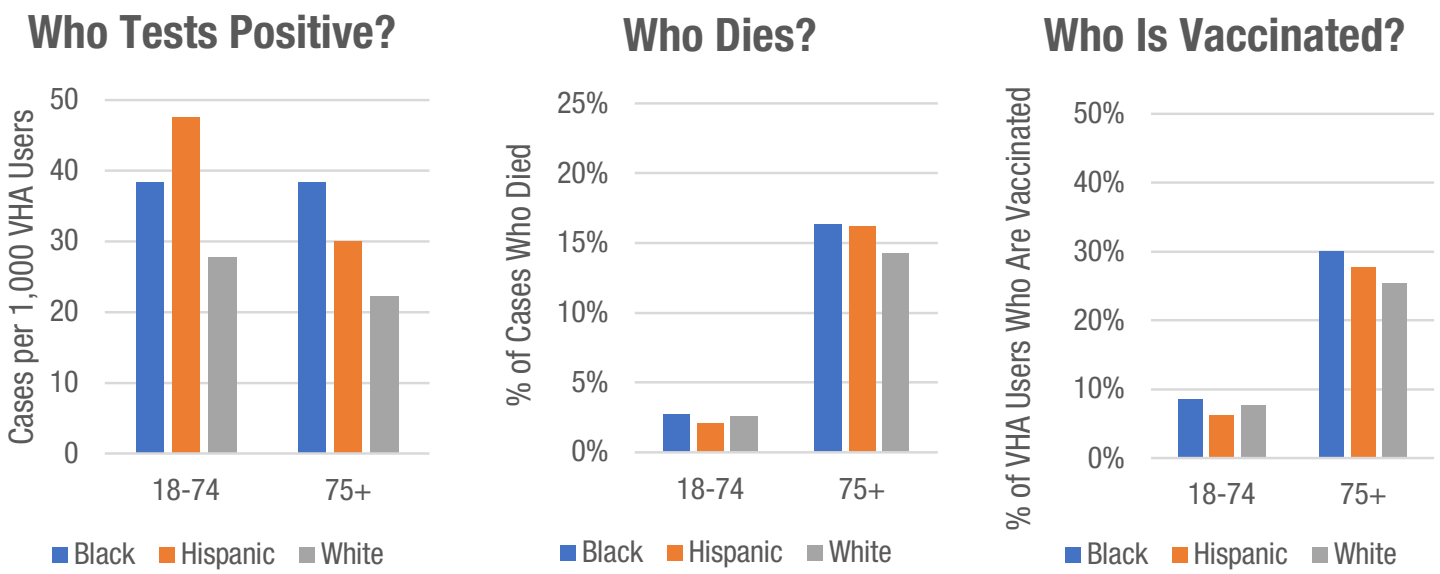

Figure Notes: Cases, deaths, and Veterans vaccinated reflect CDW data through February 10, 2021. VHA users represent Veterans with at least one service during fiscal year 2020.

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Who is Vaccinated? The CDC suggests that people aged 75 and over should be prioritized to be vaccinated for COVID-19.

As of June 3, 2021, 42 percent of VHA users aged 75 and over and 36 percent of younger Veterans have been vaccinated. Despite concerns that mistrust of the healthcare system might lead to lower vaccination uptake among Veterans of color, Black and Hispanic Veterans have thus far accepted vaccination at rates similar to White Veterans. Close monitoring will be needed to ensure that disparities in vaccination availability and uptake do not emerge as VA's vaccination campaign continues to unfold.

VA Interventions. VA success at mitigating the racial and ethnic disparities in COVID-19 mortality and vaccination that have been observed outside VA may relate to several VA features and interventions. First, VA has fairly complete clinical and demographic information on VHA users; race or ethnicity data are available for about 90 percent of Veterans seen in VA during fiscal year 2020. This allowed rapid identification of disparities and outreach to at-risk groups about infection risks and potential for severe COVID-19 illness. Second, VHA users face few financial barriers to care; COVID-19 testing, care, and vaccination are available to the majority of VHA users at no cost.

Perhaps most importantly, VHA users typically have established relationships with VHA providers. This allowed Veterans to be screened for COVID-19 symptoms and social risk factors, and to be counselled about masking and social distancing when they called or interacted with providers on VA Video Connect. For Veterans who were ill, providers had detailed knowledge of past medical history, comorbidities, and medications that enabled them to deliver more effective care. When COVID-19 vaccines became available, VA providers and staff could identify Veterans in specific priority groups eligible for vaccination and call them to discuss this option. This personal relationship with VA providers may have been particularly influential in helping Veterans of color receive sound advice about COVID-19 and overcome vaccine hesitancy.

In addition, VA greatly expanded telehealth services and the delivery of medications to Veterans' homes over the course of the

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Innovation Update

Development of a "COVIDVax" Model to Estimate Risk of COVID-19 Related Deaths among Veterans for Use in Prioritizing Vaccination

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There are no evidence-based strategies that offer guidance on how to best prioritize persons for COVID-19 vaccination. Explicitly prioritizing persons' vaccination according to their risk of COVID-19 related death would minimize the number of deaths that would occur in the time it takes to vaccinate a large enough proportion of the population to achieve herd immunity. Therefore, we sought to develop a model to estimate the risk of COVID-19 related death among VA enrollees to aid vaccination prioritization. We used electronic health record data from the Corporate Data Warehouse (CDW) supplemented by the COVID-19 Shared Data Resource (CSDR) developed by VINCI to identify Veterans in VA care (7.6 million) during the study observation period (May 21, 2020 to November 2, 2020). We then developed and internally validated in different time periods a logistic regression model – called COVIDVax – to predict the risk of COVID-19 related death. In estimating the risk, COVIDVax used the following 10 patient characteristics: sex, age, race, ethnicity, body mass index (BMI), Charlson Comorbidity Index (CCI), diabetes, chronic kidney disease, congestive heart failure, and the Care Assessment Need (CAN) score. We found that:

- COVIDVax had excellent discrimination.
- Prioritizing vaccination based on the COVIDVax model was estimated to prevent a large proportion of deaths expected to occur during vaccine rollout until sufficient herd immunity is achieved.
- Assuming vaccination is 90 percent effective at preventing COVID-19 related death, using COVIDVax to prioritize vaccination was estimated to prevent 64 percent of deaths that would occur once 50 percent of VA enrollees are vaccinated, which is significantly higher than prioritizing vaccination based on age (46 percent) or the CDC phases of vaccine allocation (41 percent).

Implications and Implementation

We demonstrated that we could ingest all necessary data streams and execute the model for all VA enrollees in real time to generate a "Dashboard" with risk scores. We also developed a web-based calculator that executes the COVIDVax model (https://COVIDVax.xyz). Although VA has already vaccinated many VA enrollees (2.26 million have received at least one shot as of April 6, 2021), our model may still be helpful to identify high-risk Veterans who remain unvaccinated and for if or when booster vaccinations are deemed necessary. Models such as ours would also be very helpful in countries or systems that are still lagging behind in vaccination.

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The pandemic will have both positive and negative enduring effects on VA research. Some pre-existing work suffered major disruptions, which will mean more money and time to complete the research. Absent supplemental funding for COVID-19 research, ORD funding for other projects was tighter than previous years. The urgency of the pandemic, however, accelerated the transformation of VA research from a collection of research centers into a more unified research enterprise with even tighter connections to VA care. COVID-19 also forced us to test more efficient processes for rigorous peer review of time-sensitive research proposals. Beginning this summer, VA research will launch an enterprise-building initiative to institutionalize lessons learned to ensure that the system emerges from the pandemic better able to meet Veterans' needs across the full range of health conditions.

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pandemic. This has helped Veterans maintain access to healthcare without exposure to COVID-19 in healthcare settings. VA has experienced no disparities in utilization of telehealth services by race or ethnicity. VA participation in clinical trials of new therapies also enhanced the expertise of providers and treatment options available to Veterans with COVID-19 cared for at VA.

VA Challenges. VA did face limitations in efforts to identify and eliminate disparities in COVID-19 care among Veterans. VA data, while accurate for identifying Black, Hispanic, and White Veterans, are less accurate for smaller groups such as American Indians, Pacific Islanders, and Veterans of more than one race. VA also lacks data on care delivered to Veterans outside of VA facilities unless a bill is submitted to VA. This is true even of care delivered by VA staff as they provided 4th Mission support outside VA facilities in State Veterans Homes, Indian Health, and other facilities. Hence, analyses of disparities are restricted to Veterans receiving care at VA.

VA outreach to Veterans of color about COVID-19 also came late. COVID-19 messaging was often not tailored for specific populations or coordinated with Veterans Service Organizations and other community groups. Earlier, focused outreach to Veterans of color may have helped reduce the impact of COVID-19 in minority communities.

As COVID-19 vaccination at VA continues and reaches lower risk priority groups, vaccine hesitancy and electronic sign-up for vaccination may pose a greater barrier for Veterans of color. VA will need to continue outreach efforts to ensure that all Veterans receive the evidence they need from trusted sources to make informed decisions for themselves and their families.

Despite these challenges, the strong collaboration and partnership of VA program officers and researchers and the unwavering dedication of VA staff to serve all Veterans allowed VA to be proactive in identifying and addressing disparities. While always committed to equity, VA accelerated the development of tools and communities to monitor disparities and reach out to Veterans at high risk for COVID-19 infection and death. Ongoing vigilance is critical in the face of this rapidly mutating pandemic that has disrupted nearly every aspect of our modern-day existence, but safer days are coming as vaccination escalates. VA is a leader in healthcare advancements. We should redirect the knowledge we gained and infrastructure we built to mitigate disparities in COVID-19 among Veterans to other health outcomes where disparities are seen.

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