Veterans Health Administration (VHA)

Coronavirus Disease 2019 (COVID-19)

Response Report - Annex C

December 5, 2022

VA
U.S. Department of Veterans Affairs
Veterans Health Administration

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FOREWORD

As we continue to persevere through the third year of the pandemic, we sustain our commitment to learning from every aspect of our response to support Veterans and the Nation. I am honored to present the Annex C report on our COVID-19 response. The pandemic has impacted every person, every family and every community in the United States, including the Veterans Health Administration (VHA) and the Veterans we serve. Even as vaccination has proven to save many lives, waves of COVID-19 variants continue to impact the U.S. population.

Through it all, the dedicated people of VHA have sustained our commitment to Veterans and the Nation. From August 1, 2021, through March 31, 2022, we conducted and participated in clinical trials for new treatments and vaccines to combat COVID-19. We launched new efforts to fight the symptoms of Long COVID. We used ingenuity and interagency collaboration to address supply chain disruptions. We expanded our testing protocols to provide access for Veterans and the general populace. Our vaccination initiative expanded to incorporate booster shots, and our staff deployed across the country to make sure Veterans, Federal employees and many others received the full protection afforded by vaccination. VHA focused particular effort on rural Veterans, who might otherwise have missed out on access to much-needed health care. We also expanded our health equity programming across the diverse spectrum of America's Veterans.

During this period, VHA—like many health care systems across the country—experienced staffing shortages, caused by two main factors: a larger number of employees unable to work due to exposure to and infection by the more-contagious Omicron variant, and the aggregate impact of stress and burnout from 2 years of pandemic work. These shortages created major challenges for VHA facilities as they did for many other health care organizations. The Department of Veterans Affairs (VA) is working to address these challenges with better wages, better training and a host of ideas aimed at making our people feel connected, appreciated and valued. A recently signed law, The Sergeant First Class Heath Robinson Honoring our Promise to Address Comprehensive Toxics Act of 2022, or the PACT Act, will help us meet this challenge to attract individuals with critical skills and allow VA to adjust salaries to be more competitive, while speeding up the hiring process. It will also support the level of growth needed for VA to deliver the benefits and care laid out in the PACT Act.

This Annex C report captures our successes and our challenges in the battle against this virus. But as you read through these pages and take in the enormity of the work we have done, I hope you can also see the incredible commitment represented in this report. Each day, our people wake up with renewed dedication to the people who fought for our Nation. Each day, they choose to care for the people who have served our country. I am endlessly proud of the employees of VHA. From doctors and nurses to facility managers and janitorial staff, it is an honor to work alongside them.

Sincerely,

Shereef Elnahal, M.D., MBA
Under Secretary for Health

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Veterans Health Administration (VHA) COVID-19 Pandemic Response

"Our response to the pandemic has made us stronger. As we enter a new age, VA stands ready to forge a new way forward to care for Veterans and the Nation through our response to national public health emergencies."

Secretary of Veterans Affairs
Denis McDonough

VETERANS USING VHA SERVICES[1, A]

	Peak New Daily Cases	Peak New Daily Admissions	Total New Admissions	Admission Rate	Peak Daily COVID-19 Associated Deaths
Delta	1,275 Peak Date: 8/24/2021	171 Peak Date: 8/26/2021	13,973 8/1/2021 - 11/30/2021	13.7% 8/1/2021 - 11/30/2021	51 Peak Date: 9/9/2021
Omicron	5,497 Peak Date: 1/10/2022	337 Peak Date: 1/15/2022	21,184 12/1/2021 - 3/31/2022	9.9% 12/1/2021 - 3/31/2022	69 Peak Date: 1/31/2022

All figures above represent 7-day averages

VACCINATIONS[2, B, C]

Veteran Vaccination Rate

55%

23% have received booster

Employee Vaccination Rate

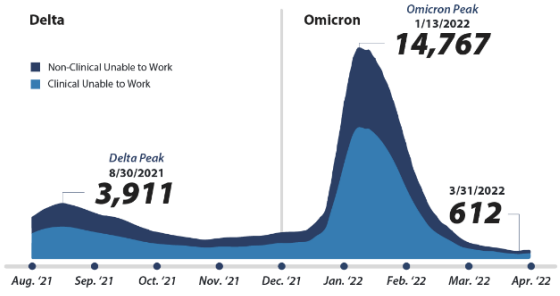
81%

36% have received booster

VHA Vaccinations Breakdown[3]

VHA WORKFORCE[E]

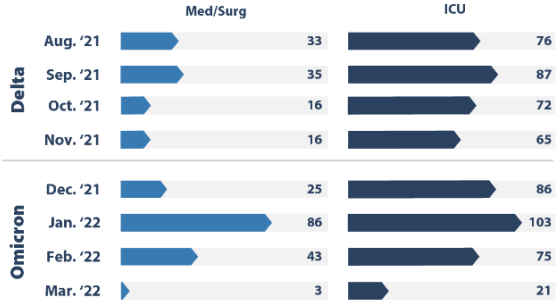
Total VHA Employees Unable to Work Due To COVID-19



All figures above represent 7-day averages

COVID-19 BED OCCUPANCY[4, D]

Facilities Experiencing High COVID-19 Bed Occupancy



FOURTH MISSION

197 responses to FEMA Mission Assignments in support of States and Tribal nations[5, 6, F, G]

6,386 VHA Staff deployments to CLCs, SVHs, Tribal Nations and other communities[H]

1,670 SVH Veterans admitted to VAMCs[I]

697 patients admitted to VA Medical Centers to relieve community hospitals[J]

All numbers listed above are cumulative and include data from 3/1/2020 – 3/31/2022, unless broken into Delta and Omicron periods.[1]

[1]For Annex C: Delta predominant period covers 8/1/2021 - 11/30/2021; Omicron predominant period covers 12/1/2021 - 3/31/2022. [2]Includes VHA-administered vaccinations and vaccinations administered outside of VHA. Completed initial vaccination series is defined as 2 weeks after receiving the 2nd dose of either the Moderna or Pfizer COVID-19 vaccine or 2 weeks after receiving the 1st dose of the J&J COVID-19 vaccine. Received Booster is defined as 2 weeks after an additional shot of Moderna, Pfizer or J&J (in addition to a completed series). [3] Total COVID-19 vaccine doses administered by VHA. [4]High COVID-19 bed occupancy is defined as a VAMC reaching 20% or more active beds occupied by COVID patients. [5]The SAVE LIVES Act authorized VA to administer COVID-19 vaccinations to all Veterans, regardless of VA health care enrollment status, as well as their spouses and caregivers by expanding eligibility requirements. [6]See Fourth Mission section for more information.

SOURCES:

[A]*VHA, NST Database, COVID-19 cases, hospitalizations, and deaths data, 4/1/2022.* [B]*VHA, CDW Database, vaccination data, 4/4/2022.* [C]*VHA HOC, response to call, 4/12/2022.* [D]*VHA, BMS Database, response to data call, 4/11/2022.* [E]*VHA HOC, response to data call, 4/8/2022.* [F]*VHA OEM, "FEMA Mission Assignments Tracker," 3/29/2022. Ref. D47.* [G]*VHA OEM, "VHA Interagency Agreements Roll Up," 3/29/2022. Ref. D48.* [H]*VHA OEM, response to data call, 4/11/2022. Ref. D110.* [I]*VHA Office of Analytics and Performance Integration, BASIC Program & VHA GEC, response to data call, 4/11/2022. Ref. D111.* [J]*VHA, HOC, response to data call, 4/202022. Ref. D231.*

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EXECUTIVE SUMMARY

Annex C covers the period from August 1, 2021, through March 31, 2022. This time period took the United States through the rise of self-testing, vaccine mandates for Federal workers and two waves of COVID-19. The Delta and Omicron waves placed some of the greatest demands yet on VHA, including hospitalization surges and staffing shortages. Through it all, VHA was there, serving Veterans and communities to the best of its ability.

Annex C is the third addendum to the Initial Report, which VHA released in November 2020. Like the Initial Report, Annex A and Annex B, this report details VHA efforts related to COVID-19. Unless otherwise stated, data points relate to the time period from August 1, 2021, through March 31, 2022 (the Annex C reporting period).

Guiding Principles

The VHA Steering Committee for this Annex established the following guiding principles. They are identical to those in Annex A and B, and they continue to be followed throughout Annex C:

- Working as a collaborative health care system is critical to the success of VHA. Our facilities and networks work as a team, focused on a common goal: quality care for our Veterans.
- Reporting and assessment of the COVID-19 response is essential to VHA as a learning organization and can be applied to agencies outside VHA, as well as private health care systems.
- Accurate documentation of the evolution of the pandemic and essential elements of the response is imperative to informing future VHA readiness and planning for VHA emergency responses.
- Readiness and planning will be essential to effective future responses because VHA's role in the Fourth Mission requires close coordination and collaboration with multiple components of government.
- Data, observations and experiences in response to a crisis are all important to identifying issues key to learning from the response.
- Identification of root causes for complex process problems is essential to improvement and often requires a focused analysis by subject matter experts.
- Questions identified in the response for which answers require new knowledge will be approached via research, applying the scientific method.

- A systems-oriented approach to process solutions is important to identifying reliable solutions.

Method

The information in the Annex C report primarily came from VHA leadership and subject matter experts through interviews and responses to information requests, as well as data collected from centralized VHA databases. Public information was also obtained from the White House, Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), medical journals and other sources. Endnote references at the end of each sentence reflect the sources of the information provided, including hyperlinks to online source materials.

After approval by VHA leadership, each report is posted publicly as part of VHA's commitment to forthright assessment and shared learning. Public reporting is an important component of VHA's efforts to enhance preparedness for response to national public health emergencies. This series of reports can be found at https://www.publichealth.va.gov/n-coronavirus/COVID_19_Response_Reports.asp.

Summary of Events during the Annex C Period

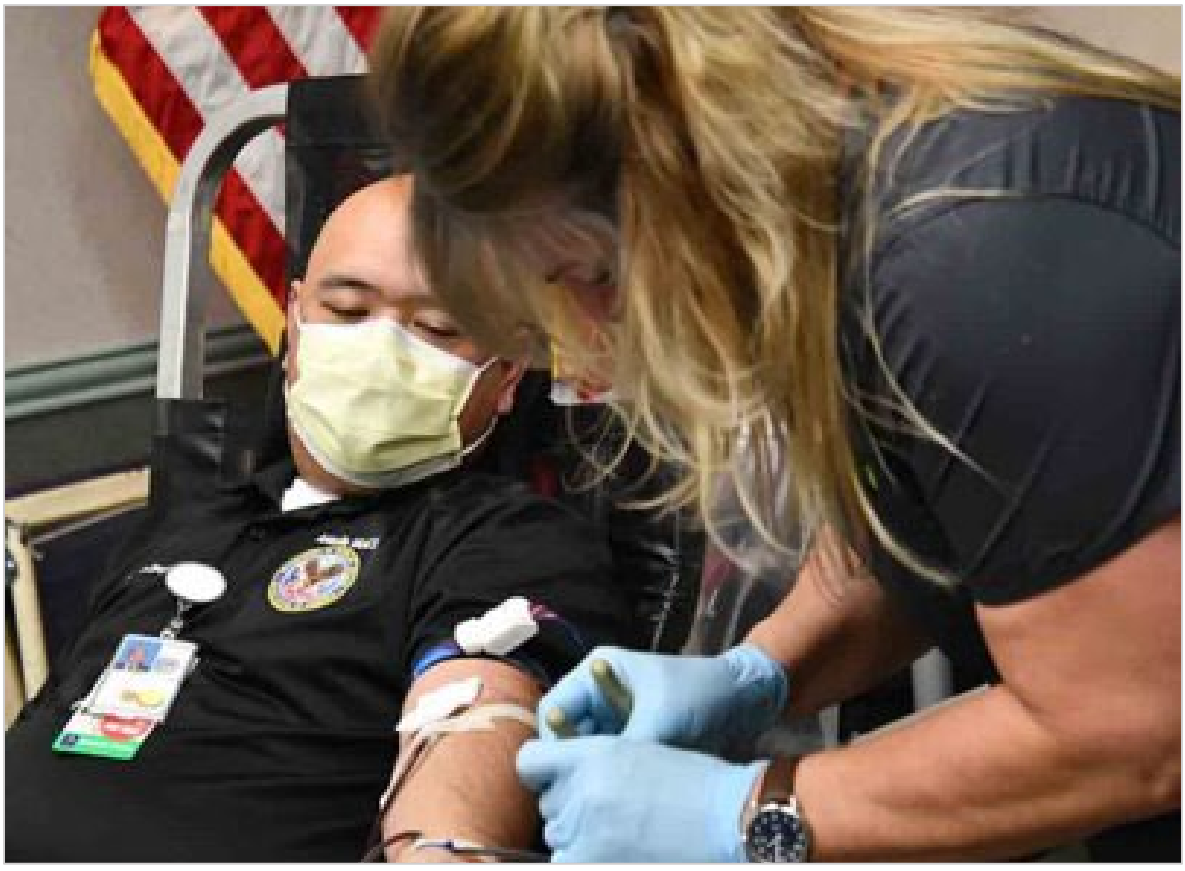
From August 1, 2021, through March 31, 2022, two waves of COVID-19 passed through the U.S. population. Both were triggered by variants of the original SARS-CoV-2 virus. The Delta variant caused the first wave, which began in August 2021. The Omicron wave started in December 2021 and crested in spring 2022. Delta resulted in a higher rate of severe illness, but Omicron spread so extensively that it generated the most U.S. hospitalizations and deaths of any variant.[1]

The Omicron wave infected more people in the United States than any previous variant. Although the illness caused by Omicron was relatively mild compared with previous iterations of the virus, the sheer number of cases led to a surge of hospitalizations. Hospitals struggled to manage the increased demand for beds during a major staff shortage, primarily driven by the high number of staff who could not work due to COVID-19 infection/exposure. The shortage was also impacted in part by higher attrition rates and burnout from two years of the pandemic.[2]

The newfound availability and use of self-testing—also called at-home testing or over-the-counter testing—gave the U.S. population more access to information about their COVID-19 status, but it also reduced the degree to which laboratories were involved in the diagnosis of COVID-19. Self-testing meant that many mild cases of COVID-19 likely were not reported to VHA and other public health organizations that were tracking SARS-CoV-2 data.

Accumulated evidence showed that the three vaccines approved for use in the United States—Pfizer-BioNTech (Pfizer), Moderna and Johnson & Johnson's Janssen (J&J)—significantly reduced rates of hospitalization, severe illness and death from COVID-19; however, the effectiveness of the vaccines in preventing infection proved to wane beyond six months. In September 2021, FDA began authorizing booster doses of COVID-19 vaccines. At first, boosters were recommended only for select populations, but by November 2021, the authorization was extended to include almost all individuals 16 years and older who had completed their initial vaccine series at least six months prior.[3] In late March 2022, a second booster was recommended for select populations.[4]

These events impacted VHA, its people and Veterans. The next section will focus on VHA actions and efforts to care for Veterans and the broader U.S. population, including the pivots needed to adjust to new challenges.



A VA associate director donates blood at a blood drive in the Texas panhandle. More than 130 employees, Veterans and community members participated in this event to combat a national blood shortage. (VHA photo)

Updates to Strategic Challenges & Actions

Throughout the Annex C time period, VHA continued to serve the Veterans and communities of the United States. As part of that effort, VHA began to shift focus, working with an emphasis on helping Veterans catch up on care that was deferred during the pandemic.

These were some of the new initiatives that VHA started during this period:

- Analysis of COVID-19 health disparities among Veterans of different races
- Administration of vaccine booster doses for eligible Veterans and employees
- Initiation of six new research studies
- Distribution of self-tests to Veterans, employees and visitors

VHA continued to support a number of other efforts, including the following:

- Vaccination efforts across the full geographic, racial and ethnic spectrum of Veterans, including doses for individuals eligible through the SAVE LIVES Act
- Expansion of testing and genomic sequencing capacity, including polymerase chain reaction (PCR) testing, molecular testing, rapid antigen testing and SARS-CoV-2 genomic sequencing
- Use of central procurement and distribution of scarce supplies to fill gaps in availability from prime vendors and sustain care in the facilities
- Support of clinical trials and other forms of COVID-19 research to inform the pandemic response and improve outcomes for Veterans
- Testing for employees, Veterans and Federal workers, and providing self-tests to Veterans and others in need

As a learning organization, VHA sees every experience as an opportunity to grow. As such, this report not only chronicles the work VHA has done, it also identifies areas of improvement for the organization.

During the Annex C reporting period, the U.S. health care system faced a range of national and international challenges; these challenges affected VHA along with the rest of the Nation. Although some of these issues—like supply chain disruptions and national staffing shortages—could not be resolved by VHA alone, the organization can still learn from the experiences and grow its support for its people and the Veterans it serves.

<u>The Overall Finding for This Period of the Pandemic Response</u>:
VHA performed as an integrated, coordinated, learning health system during the Annex C reporting period. VHA balanced its clinical, operational, research and support services effectively to meet the needs of Veterans and conduct Fourth Mission activities. The extended pandemic, coupled with the impacts of the Delta and Omicron variants, highlighted workforce challenges that will require a multifaceted response.

Testing & Genomic Sequencing

Testing demand tripled from November 2021 through January 2022 as Omicron swept through the Nation. Despite staffing shortages, VHA worked hard to process tests quickly, in response to the high demand. Through preparation, monitoring and increased staff, VHA was able to process 95% of PCR tests within two days.

Through collaboration with other Federal agencies, VHA obtained approximately 10 million self-tests and worked to distribute them to populations that might otherwise be missed, including Veterans experiencing homelessness.

VHA performed sequencing on more than 20,000 samples of SARS-CoV-2, the virus responsible for COVID-19. During the Annex C reporting period, VHA's genomic sequencing labs identified one of the first samples of the Omicron variant, collected from an employee who had traveled overseas and became sick on return to the United States.

Finding: During this period of the pandemic, VHA was successful in significantly expanding its capacity for COVID-19 testing and genetic sequencing of the SARS-CoV-2 virus.

Finding: VHA was effective in meeting the surge in demand for testing during the Omicron wave—the greatest demand for VHA testing to date in the pandemic.

Finding: VHA procured and distributed approximately 10 million antigen self-test kits for COVID-19 to staff, Veterans and visitors alike. These kits enabled diagnosis and evidence-based therapeutic treatment early in the course of infection to reduce the probability of serious illness.

Vaccinations

Throughout the Annex C period, VHA continued to vaccinate Veterans, VHA employees and other Federal workers. As of March 31, 2022, more than four million Veterans Using VHA Services had completed an initial vaccine series. Vaccination rates by race and ethnicity ranked from highest to lowest were: Asian Veterans, Black Veterans, Hispanic or Latino Veterans, White Veterans, then American Indian/Alaska Native Veterans (AIAN).

A total of 54.7% of Veterans Using VHA Services since October 1, 2019, completed an initial vaccination series, as of March 31, 2022. Of the Veterans who used VHA services in the last year, 63.3% are known to have completed an initial vaccination series.

Upon FDA authorization, VHA also began to administer booster doses to eligible populations. As of March 31, 2022, approximately one quarter of Veterans had received a booster dose of the COVID-19 vaccine (23% of Veterans who used VHA services since October 2019, and 26.9% of Veterans who used VHA services in the last year).[5] By the end of the Annex C reporting period, almost 36% of VHA employees also received a booster dose although the booster is not required under the VHA vaccine mandate.[6] Many Veterans were vaccinated in their communities. Because state vaccination data was largely inaccessible to VHA, actual Veteran vaccination rates were likely higher than those captured in VHA data.

Finding: VHA’s management of vaccination supply, distribution and administration, coupled with outreach to Veterans, was highly effective during this period.

Finding: VHA’s communications and outreach to minority Veterans yielded a significant increase in vaccination rates among Black and Hispanic Veterans. Vaccination rates are lagging among rural Veterans and AIAN Veterans.

Finding: VHA's access to state vaccination data is incomplete, which limits the organization’s visibility of the vaccination status of the Veteran population.

Finding: Managing the vaccine mandate for health care personnel in the midst of considerable staffing shortfalls was complex and time-intensive.

Recommendation: Conduct a review that collects and analyzes information on lessons learned during the application of vaccination requirement policy in the VHA health care workforce during the pandemic. This review should aim to inform future approaches, balancing factors including patient safety, staff protection, bioethics, administrative complexity and impact to pandemic staffing.

Research

During the Annex C reporting period, VHA contributed to 735 published studies related to COVID-19. VHA also was part of three clinical trials for COVID-19 vaccines, organized by Janssen, Moderna and Novavax.

VHA participated in 6 new studies during this period, including 2 led by VHA. Partners in these studies included FDA and the National Institutes of Health (NIH).

Finding: VHA's performance and publication of clinical research on COVID-19 provided significant contributions that informed the pandemic response nationally and internationally.

Finding: Through successful research partnerships and programs that made VHA data available to external researchers, VHA was able to conduct and participate in studies that published important information about the prevention and treatment of COVID-19.

Health Equity

From August 1, 2021, through March 31, 2022, VHA's Office of Health Equity (OHE) continued to work to reduce health disparities among Veterans. VHA provided rural and highly rural Veterans with access to the internet and telehealth support. The organization also worked to enhance its support for Veterans who are members of the Lesbian, Gay, Bisexual, Transgender, Queer Plus (LGBTQ+) community by making progress toward its process for collecting sexual orientation and self-identified gender identity (SIGI) data.

During the Annex C period, VHA conducted an analysis of COVID-19 health disparities among Veterans. The analysis was designed to examine potential disparities in infection rates and population mortality, as well as changes in health

disparities over the course of the pandemic. This population-level analysis differs from previous research studies of Veterans receiving COVID-19 care because the analysis also includes COVID-19 infections and associated deaths not managed by VHA.

After adjusting for age, gender and rurality, the analysis found that AIAN Veterans had a 11.5% increased risk of infection and a 73.1% increased risk of death from COVID-19 compared to their non-Hispanic White Veteran counterparts. Hispanic or Latino Veterans were 32.5% more likely to test positive for COVID-19 than non-Hispanic White Veterans; Black or African American Veterans were 14.5% more likely to test positive for the virus than non-Hispanic White Veterans.

This analysis, which is described in more detail in the Health Equity section, indicated that disparities changed between different phases of the pandemic, with the largest disparities in the earlier phases.

Finding: COVID-19 health disparities among Veterans have proven to be dynamic and multi-factorial, requiring sustained monitoring and analysis of data to inform actions.

Recommendation: Conduct further studies to identify and quantify root causes of COVID-19 health disparities, including those experienced by AIAN and rural Veterans. Data analysis should inform actions, interagency collaboration, partnerships and outreach.

Clinical Operations

Although still behind pre-pandemic volume, VHA has been working to address care that was deferred because of COVID-19. VHA facilities increased their routine and non-emergency care, including mammography and other breast cancer screenings, dentistry, colon cancer screenings and eye exams. Non-emergency surgery—including knee, hip and shoulder replacements—increased as well.

Despite VHA's work to move past the pandemic, COVID-19 continued to impact VHA facilities across the Nation. The number of COVID-19 cases continued to grow during the period, including the condition known as Long COVID, in which patients experience COVID-19 symptoms far longer than expected. VHA established an interdisciplinary team tasked with studying Long COVID and providing guidance on diagnostic criteria for the condition. By the end of the Annex C period, 17 VHA facilities had Long COVID programs in place to treat Long COVID patients.

Although VHA had been working to establish telehealth programs before COVID-19 struck the Nation, the pandemic called attention to the importance of virtual health care access. VHA has continued to work to increase the accessibility of telehealth for Veterans by providing tablets and resources to rural Veterans, prioritizing electronic health records (EHRs) and modernizing its virtual triage and treatment systems.

During the Annex C period, four VHA health care facilities experienced staffing shortages to such a degree that they needed to use crisis capacity strategies. To address these urgent staffing shortages, facilities executed operational changes in two primary ways:

- Allowing asymptomatic staff to immediately return to work after a high-risk COVID-19 exposure without testing (for staff who were not up to date on vaccination)
- Increasing the number of patients assigned to each nurse

Finding: VHA clinical and operational leaders have observed that health services to Veterans through a prolonged pandemic require a measured approach to deferral of preventive care, management of chronic conditions and restrictions on visitation to long-term care residents in order to balance pandemic protection with overall health outcomes.

Recommendation: Revise pandemic response plans to moderate actions that may impact the long-term health of Veterans. Consider an approach featuring judicious management of actions, such as deferral of preventive screening, deferral of disease management examinations and restriction of family visitation to CLC residents. Consider establishing a principle that balances risk from the pandemic pathogen with medium- and long-term health of the Veteran.

Finding: VHA's actions to employ telehealth, self-testing at home and express delivery of therapeutics for early intervention effectively mitigated the limitations Test-to-Treat encountered in U.S. health care.

Finding: VHA used a range of contingency staffing strategies to mitigate the impacts of staff attrition and unavailability during this period of the pandemic. Only a few facilities had to employ crisis staffing strategies.

Finding: Experience during the Omicron wave illustrated the importance of smooth transitions for personnel who are moving from ambulatory to inpatient care. Agility and flexibility will be important to meeting demand for inpatient care in future pandemic response, particularly during hospitalization surges.

Recommendation: Establish processes to enhance the agility of training staff in ambulatory units for inpatient care, such as anticipatory training and pre-certification as pandemic conditions are developing.

Finding: Experiences at facilities that employed crisis staffing strategies yielded additional measures that may help health care facilities mitigate the risk to patient safety and quality of care.

Recommendation: Capture the experiences of VHA facilities that applied crisis capacity staffing strategies during the Omicron wave and analyze the collected information to inform pandemic staffing guidance. Consider actions to mitigate risk to patient safety and quality of care under crisis staffing ratios. Examples may include the following:

- Focused application of crisis staffing ratios to lower-acuity patients
- Acuity-based distribution of inpatients
- Limitations on the percentage of nursing staff under supervision (cross-trained from other units) on each shift

VISN 19 staff members pose in their PPE. VISN 19, the VA Rocky Mountain Network, spans 10 states, encompassing the largest geographic area in the continental United States. (VHA photo)

Workforce

Staffing shortages affected many facilities, not just the ones that moved to crisis strategies. At its worst point, an unprecedented number of staff were unable to work due to COVID-19 illness or exposure—approximately 15,000 employees in a single week. The shortages coincided with the Omicron wave, which resulted in high hospitalizations. As of March 31, 2022, the impact of these staffing shortages was still tangible in many VHA facilities.

To address these shortages, VHA took steps to provide extra support for employees, such as implementing well-being programs and developing a more versatile working environment.

VHA also used its Disaster Emergency Medical Personnel System (DEMPS) and its Travel Nurse Corps (TNC) to supplement staff for health care centers.

Finding: A balanced, multifaceted approach to recruitment, retention and wellness of health care personnel will be important to the future resilience of the VHA workforce.

Recommendation: Develop a long-term, multifaceted strategy for sustained resilience, recruitment and retention of the VHA workforce. Consider long-term career track options that will afford VHA staff with opportunities and flexibility over long periods of service.

Staff Deployment

During emergency situations, VHA uses staff deployment to provide various levels of staff support. These deployments can support under-staffed facilities or areas recovering from emergencies or disasters. More than 2,000 requests for staff support were made during the Annex C period, but because of the speed and reach of Omicron across many parts of the country, nearly all of the requests were only partially filled. A total of 914 employees were deployed on these missions.

In response to this issue with staff deployment, VHA plans to use Clinical Deployment Teams (CDTs), which are designed to complement the DEMPS program. Each Veterans Integrated Services Network (VISN) will be provided with 20 new full-time employees (FTEs), all of whom are designed for emergency deployment as a primary task. Across 18 VISNs, CDTs will add 360 FTEs for VHA deployment.

Supply Chain

VHA's central procurement and distribution processes for scarce supplies addressed the shortfalls seen early in the pandemic, but new challenges evolved during this period. Worker strikes, raw material shortages and shipping port backups all contributed to difficulties obtaining antigen test kits, dialysis fluids, blood specimen tubes and other products.

VHA addressed its supply chain issues through interagency collaboration, innovative use of resources—including making its own saline solution syringes—and sourcing from Regional Readiness Centers (RRCs). VHA adjusted the dialysis procedure system-wide in response to a national shortage of dialysis fluid, applying an evidence-based process for effective kidney replacement therapy while consuming a lower quantity of dialysis fluid.

As of March 31, 2022, VHA was reviewing the RRCs through a business case analysis. The analysis will help VHA determine the number of RRCs that will remain permanent and provide recommendations for operations, implementation and stock rotation.

Finding: RRCs remained an essential source of support for VHA facilities. When scarce supplies could not be reliably procured through prime vendors, these centers were able to procure and store scarce supplies.

Finding: VHA was able to use interim processes and tools to sustain health care operations throughout this period of the pandemic. In the future, interim strategies should give way to a more formal process, as dictated by the pending supply chain modernization strategy.

Fourth Mission

VA provides Fourth Mission support during emergencies and at the request of the Federal Emergency Management Agency (FEMA). Fourth mission efforts aim to support the broader community beyond Veterans.

Fourth Mission activities from August 1, 2021, through March 31, 2022, included staff deployment, equipment, testing and vaccinations. Since the start of the pandemic, VHA has responded to 197 FEMA mission assignments, 38 of which were completed in the Annex C reporting period.

Under the Strengthening and Amplifying Vaccination Efforts to Locally Immunize All Veterans and Every Spouse Act (SAVE LIVES Act), VHA was authorized to vaccinate individuals outside its usual purview of Veterans Using VHA Services. During the Annex C reporting period, VHA vaccinated approximately 51,000 people, including additional Veterans, their spouses, dependents and caregivers.

Finding: VHA responded to all FEMA Mission Assignments during this period, even as it supported Veterans through the Delta and Omicron waves and sustained vaccination support to Federal agencies and beneficiaries of the SAVE LIVES Act.

ACKNOWLEDGMENTS

The COVID-19 Response Reporting Team would like to thank the VA Secretary and Deputy Secretary for their support in creating the team's fourth COVID-19 report, Annex C. The completion of this document was made possible with guidance from the Steering Group: Dr. Carolyn Clancy and Mr. James Tranoris. Dr. Steven Lieberman, who served as the Acting Under Secretary for Health during the Annex C review period, contributed to Annex C, as did VHA senior leaders, VISN Directors and VHA personnel. The Annex C team is greatly appreciative to VA for its ongoing work to protect and care for America's Veterans through the pandemic and beyond.

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OVERVIEW

The Annex C review period is from August 1, 2021, through March 31, 2022. During that time, the Veterans Health Administration (VHA) took the following actions:

- Cared for Veterans through two variant surges of coronavirus disease 2019 (COVID-19)
- Vaccinated Veterans, VHA employees and other Federal workers
- Supported the general U.S. population through its Fourth Mission efforts across the United States

Annex C is the fourth report commissioned by VHA to review its work related to COVID-19, following these three previous reports:

- The Initial Report: March 1, 2020, through June 30, 2020
- Annex A: July 1, 2020, through January 1, 2021
- Annex B: January 1, 2021, through July 31, 2021

All the reports are available at the VA website under Public Health.

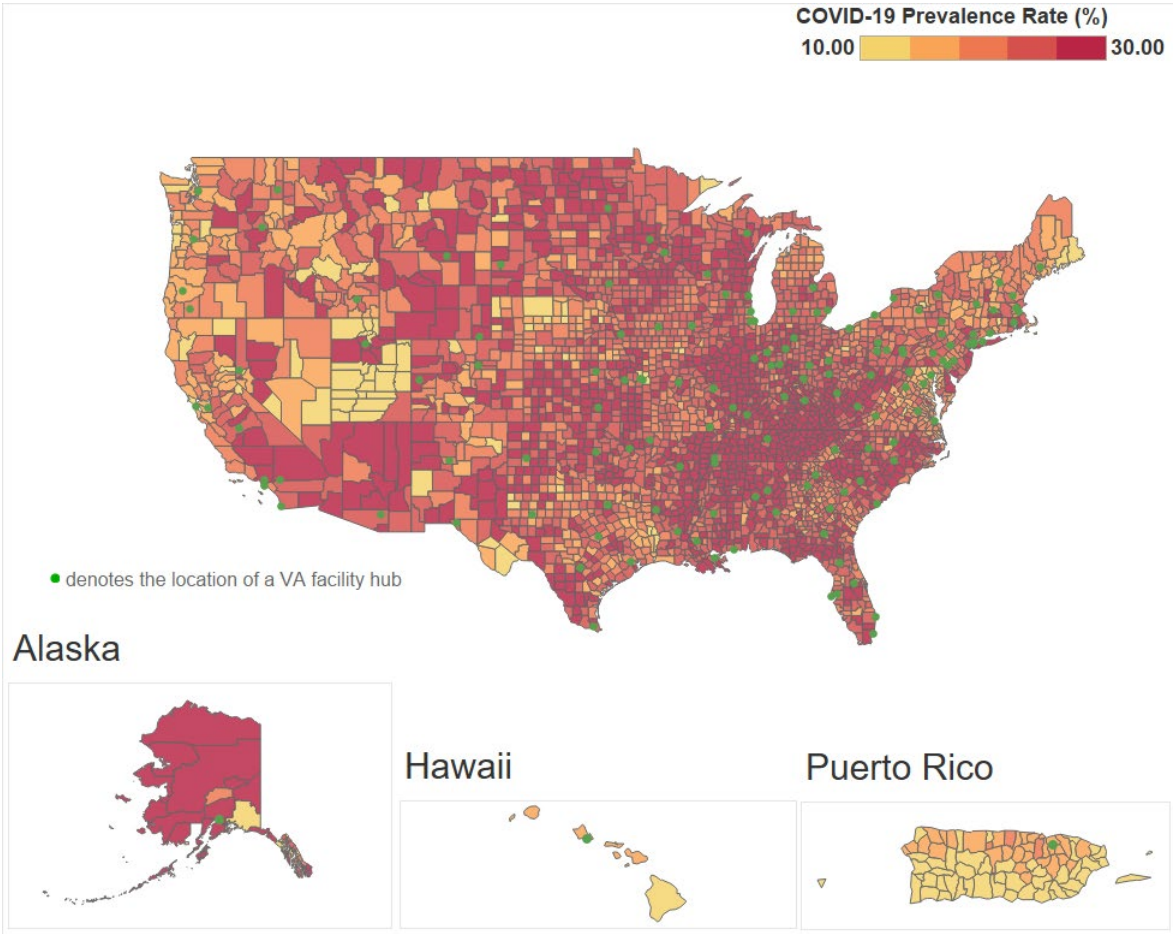
A Veteran of World War II celebrates his 105th birthday in Alabama, where he was presented with the French Legion of Honor. He survived COVID-19 last year. (VHA photo)

Progression of the Pandemic

As of March 31, 2022, the Centers for Disease Control and Prevention (CDC) estimates that nearly 80 million people in the United States have been infected with COVID-19 and that more than 961,000 people have died.[7] Approximately 45 million U.S. cases—more than half the total case count since the start of the pandemic—took place during the Annex C reporting period, along with approximately 348,000 of the deaths.[8]

Figure 1.1 provides a snapshot of confirmed COVID-19 case prevalence in U.S. counties, as of March 31, 2022. In Annex B, this map—which reported data as of July 31, 2021—tracked prevalence up to 15%; but for Annex C, the tracking changed to 30% because of the increase in prevalence rates.[9] If the map tracked only up to 15% prevalence for Annex C, the entire map would have been red.

Figure 1.1: *Prevalence of Confirmed COVID-19 Cases in the U.S. Population by County, as of 3/31/2022*



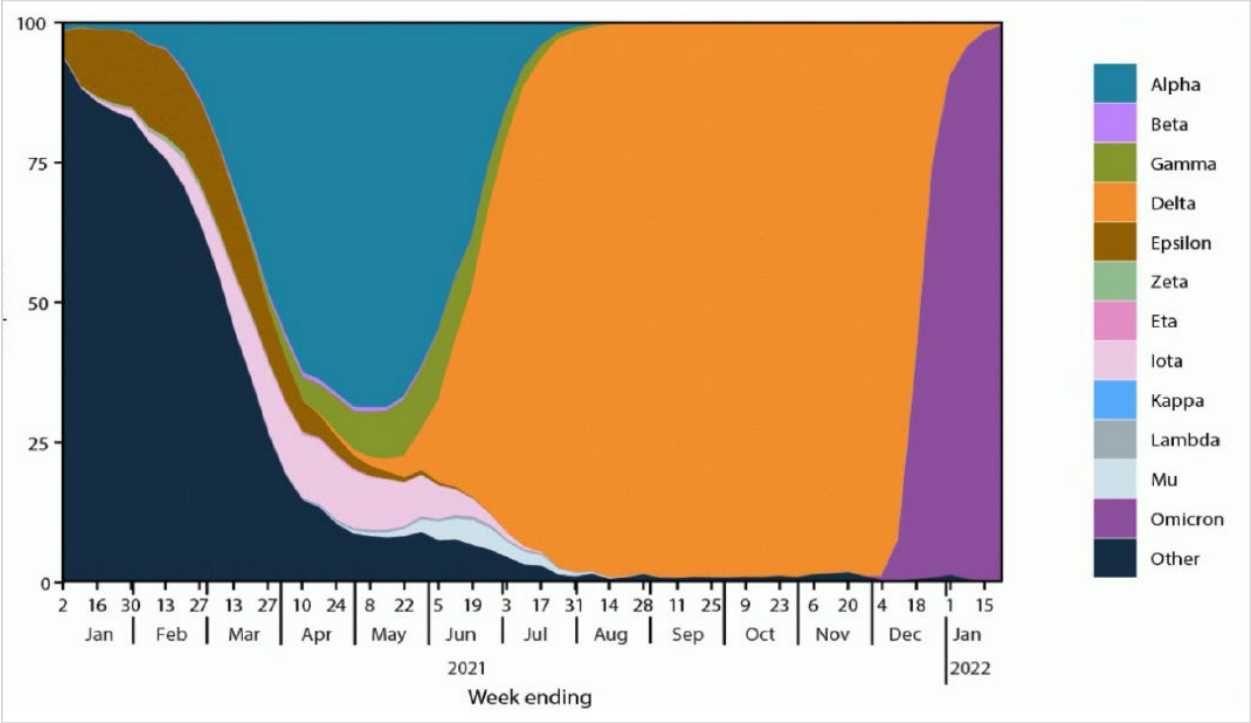
Note: The counties shown on this graphic are based on the alignment of County FIPS codes to VISN locations as per "VISN, Markets, Submarkets, Sectors and Counties by Geographic Location," VA, last updated on 3/31/2022. Not shown on map: Philippines, Guam, American Samoa and Virgin Islands.

Source: Johns Hopkins University COVID-19 GitHub Repository, accessed 4/5/2022; US Census 2020 Estimate, accessed 3/25/2022; US Department of Veterans Affairs, VA Facility Hub Locations. Refs. D268, D280

New Variants

During the Annex C period, several new variants of the SARS-CoV-2 virus rose to prominence.[10] **Figure 1.2** shows the variants that were active in the U.S. population from January 2021 through January 2022.

Figure 1.2: *Changing Landscape of Circulating Variants (1/2/2021 – 1/15/2022)*



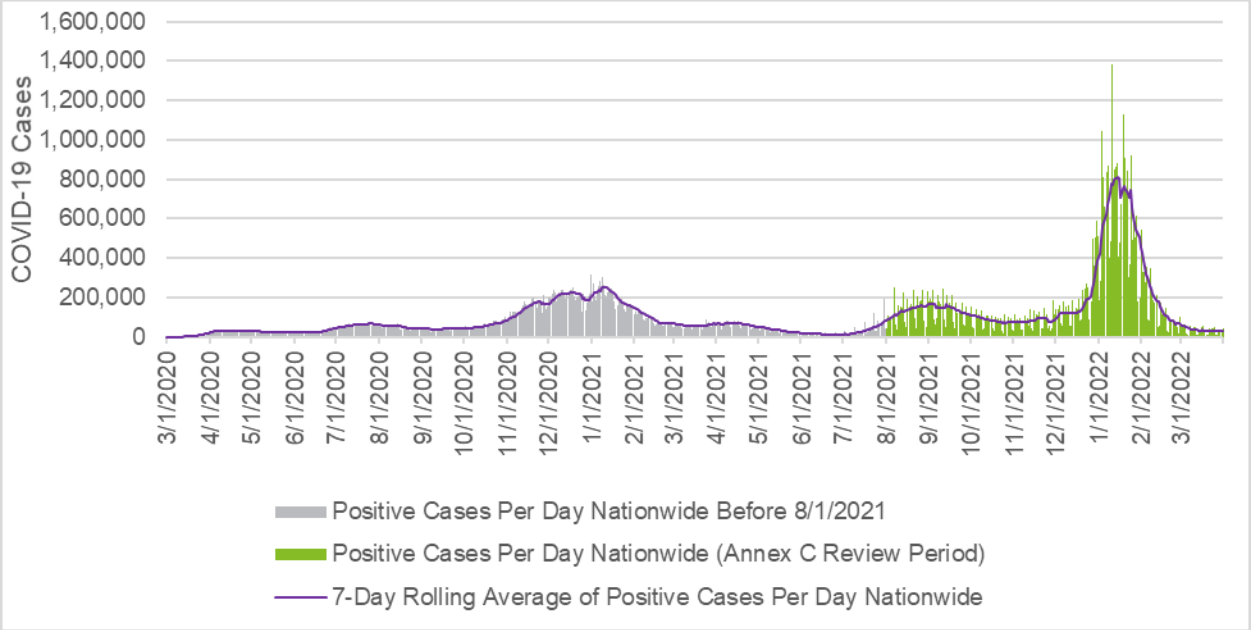
Source: CDC, "Update on the Epidemiology of SARS-CoV-2 Strains," 4/6/2022, slide 12. Ref. D72

The Delta and Omicron variants each caused a surge in cases in the United States—the Delta wave from July 2021 through December 2021, and the Omicron wave from December 2021 through March 2022.[11] To see how surges affected daily case counts, see **Figure 1.3**, which provides a picture of U.S. cases, including the 7-day rolling average since March 2020. The area in green demarcates the Annex C reporting period.

The availability and use of self-testing kits increased substantially during the Annex C reporting period.[12] According to a CDC report, this may have resulted in under-representation in case counting.[13]

For more information on the Delta and Omicron variants, including factors relating to the sharp increase in cases during the Omicron wave, see the Epidemiology section of this report.

Figure 1.3: *Daily U.S. COVID-19 Cases (3/1/2020 – 3/31/2022)*



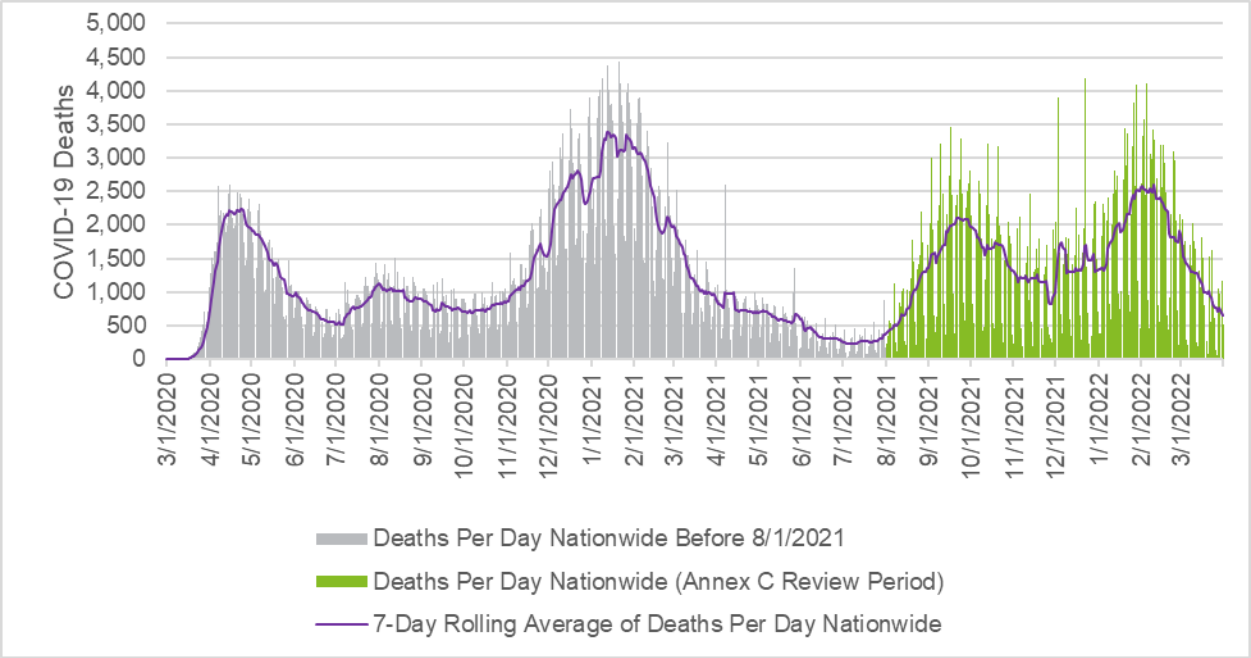
Note: COVID-19 reported positive cases represent general community confirmed positive COVID-19 tests. Nationwide total case estimates were aggregated by individual state reported cases from 3/1/2020, through 3/31/2022.

Source: Johns Hopkins COVID-19 GitHub Repository, accessed 4/5/2022. Ref. D270

The Delta and Omicron surges increased the number of deaths associated with COVID-19.[14] **Figure 1.4** shows the daily death counts from COVID-19 in the United States. The green section demarcates the Annex C reporting period.

Although the absolute number of Omicron deaths exceeded the number of Delta deaths, the Delta wave was proportionally more deadly.[15] Omicron's 7-day rolling average case count peaked at 807,677 cases, but its highest death count was 2,596.[16] By comparison, Delta's 7-day rolling average case count peaked at 166,236; however, its death count was not all that different from Omicron's—2,108 deaths.[17]

Figure 1.4: *Daily U.S. COVID-19-associated Deaths (3/1/2020 – 3/31/2022)*



Note: COVID-19 reported deaths represent general community confirmed deaths. Nationwide total death estimates were aggregated by individual state reported deaths from 3/1/2020 through 3/31/2022.

Source: Johns Hopkins COVID-19 GitHub Repository, accessed 4/15/2022. Ref. D270

Summary of Adjustments to VHA Approach

During the Annex C reporting period, VHA refocused its pandemic efforts to plan for endemic care. VHA recalibrated its efforts to consider future emergencies and help Veterans mitigate the health impacts of reduced in-person care brought on by the pandemic. VHA's adjustments during this period included the following:

- Continued to expand testing and genomic sequencing capacity to track and understand the impact of new variants, including polymerase chain reaction (PCR) testing, molecular testing, rapid antigen testing and SARS-CoV-2 genomic sequencing
- Shifted the vaccination program to providing booster shots
- Applied access to care for deferred treatments and overdue preventative screenings while continuing to address staffing shortfalls that required some ongoing delays of non-urgent care
- Renewed focus on telehealth and remote health care as an ongoing enhancement to Veteran health care
- Addressed ongoing staffing shortages and burnout by providing new programming and expanding part-time worker positions, including the creation of the REBOOT Task Force

- Initiated adjustment of strategies and plans to streamline supply chain management and attain greater VHA supply chain resilience
- Participated in interagency collaboration for preparedness planning, including national supply chain resilience and readiness
- Rebalanced research studies to include more non-COVID-19 studies in addition to COVID-19 studies
- Helped national blood organizations address a critical blood shortfall during the Omicron wave

Updated Epidemiological Data for VHA Populations and Staff

As of March 31, 2022, nearly 75,000 Veterans had been hospitalized with COVID-19.[18] More than 21,000 Veterans Using VHA Services had died, along with 255 VHA employees, as shown in **Table 1.1**.

Table 1.1: *COVID-19 Summary Statistics, as of March 31, 2022*

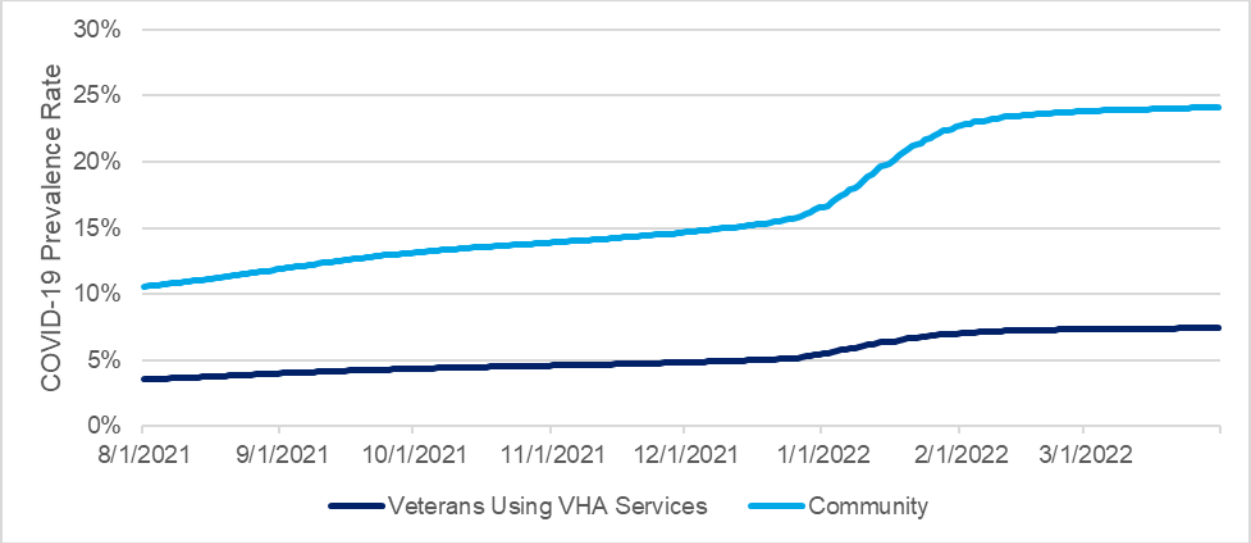
Category	Number
Veterans Using VHA Services	7,319,645
Veteran COVID-19 Cases	543,381
Veteran COVID-19 Inpatients	74,684
Veteran Deaths (COVID-19-associated)	21,411
VHA Employees	387,245
Employee COVID-19 Cases	60,667
Employee Deaths (COVID-19-associated)	255

Note: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Veterans Using VHA Services figures exclude VHA employees. Veteran COVID-19 cases include VHA conducted tests and Veteran self-reported test results to VHA. Veteran COVID-19 Cases are the cumulative total number of unique Veterans Using VHA Services who have tested positive for COVID-19 since the start of the pandemic. COVID-19-associated Veteran Deaths refers to Veterans Using VHA Services who died within 30 days of an established lifetime first COVID-19 case (the date of first case confirmed by VHA testing or date when the first positive test outside of VHA was reported to VHA). Employee numbers include only paid VHA employees and VHA Veteran-employees; VISN contractors and volunteers are not included.

Source: VHA, CDW, NST Dataset, Veteran Population accessed on 4/8/2022; VHA, CDW, NST Dataset, Cases accessed 4/5/2022; VHA, CDW, NST Dataset, Inpatients accessed 4/12/2022; VHA, CDW, NST Dataset, Deaths accessed 4/8/2022; VHA, HOC, Employee Population response to data call 4/26/2022; VHA, HOC, Employee Deaths response to data call 4/8/2022. Refs. D267, D277

During the Annex C reporting period, Veteran cases of COVID-19 followed a similar pattern to community cases, as shown in **Figure 1.5**. Starting in January 2022, cases increased substantially in Veteran and broader communities. Confirmed COVID-19 case rates for Veterans remained lower than the community at large. The Veteran case rate includes those who received a positive test from VHA, as well as those who reported their positive test to VHA. Not all cases performed by outside testing are included in this figure.

Figure 1.5: *COVID-19 Confirmed Case Count Statistics, Veterans Using VHA Services Compared with Community Prevalence (8/1/2021 – 3/31/2022)*



Source: VHA, CDW, NST Dataset, Veteran Population accessed 4/8/2022; Johns Hopkins University COVID-19 GitHub Repository, US Community Cases accessed 4/8/2022; 2021 US Census Population Estimate, US Census, accessed 3/7/2022; VHA, CDW, NST Dataset, Veteran Cases accessed 4/5/2022. Ref. D277

Approximately 7.4% of the Veterans Using VHA Services have been diagnosed with COVID-19 since the start of the pandemic.[19] Of the Veterans who tested positive, the highest percentage were females from 45 to 54 years old, as shown in **Table 1.2**.[20] Although this group also had the highest percentage of COVID-19 during Annex B, the number of cases of women ages 45 to 54 increased from 5% as of July 31, 2021, to 11.3% as of March 31, 2022.[21]

Table 1.2: *Number of Veterans Using VHA Services with COVID-19 Diagnosis, by Age and Gender, as of March 31, 2022*

Age Groups	Female	% of Female Veterans	Male	% of Male Veterans	Total by Age Group	% of Veterans Using VHA Services
34 and under	10,508	9.1%	35,498	7.4%	46,006	7.8%
35 - 44	15,898	11.0%	57,344	8.8%	73,242	9.2%
45 - 54	14,346	11.3%	65,450	9.6%	79,796	9.9%
55 - 64	14,117	9.6%	89,784	8.9%	103,901	9.0%
65 - 74	6,706	7.0%	126,498	7.0%	133,204	7.0%
75 - 84	1,282	5.5%	77,177	5.7%	78,459	5.7%
85 and over	505	4.5%	28,268	4.2%	28,773	4.2%
Total by Gender	**63,362**	**9.5%**	**480,019**	**7.2%**	**543,381**	**7.4%**

Note: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Veteran confirmed positives and COVID-19 Associated Deaths figures exclude Veteran-Employees. Veteran COVID-19 cases include VHA-conducted tests and Veteran self-reported test results to VHA.

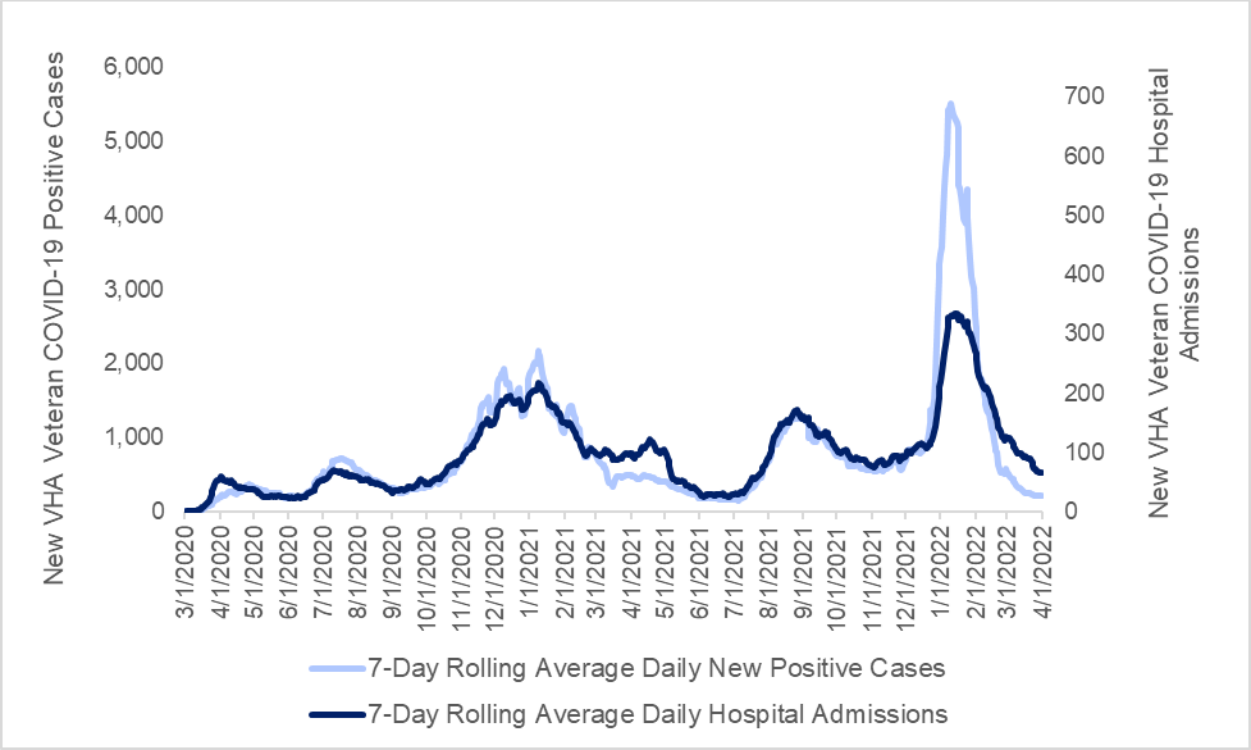
Source: VHA, CDW, NST Dataset, Veteran Cases accessed 4/8/22; VHA, CDW NST Dataset, Veteran Population accessed on 4/8/2022. Ref. D277

Veteran COVID-19-associated Illness and Death

In comparison to the case rate, Veteran hospitalization for COVID-19 remained relatively low during the Annex C reporting period, as shown in **Figure 1.6**.

The Omicron variant was more contagious than previous variants, and although it caused more deaths than previous variants, it was proportionally less severe.[22] In addition, those who were vaccinated experienced some protection against severe illness.[23] For more information on the Omicron variant and COVID-19 vaccination, see the Epidemiology and Vaccination sections of this report.

Figure 1.6: *Veterans Using VHA Services 7-Day Rolling Average COVID-19 Hospital Admissions and Positive Cases (March 1, 2020 – March 31, 2022)*



Note: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Veteran confirmed positives and COVID-19-associated Deaths figures exclude Veteran-Employees. Veteran COVID-19 cases include VHA-conducted tests and Veteran self-reported test results to the VHA. Veterans testing positive for COVID-19 and were admitted to a VA hospital by 3/31/2022 are included.

Source: VHA, CDW, NST Dataset, accessed 4/6/2022. Ref. D275

Overall, COVID-19-associated deaths in the Veteran population dropped from Annex B (5.0%) to Annex C (3.9%).[24] However, the high number of cases demonstrate that total COVID-19-associated deaths remained significant.[25]

Men 85 years or older had the highest percentage of COVID-19-associated deaths among Veterans; more than 5,200 men in that age group have died of COVID-19 since the start of the pandemic, including more than 1,700 in Annex C.[26] In each age category, female Veterans using VHA services experienced lower case fatality rates compared to male Veterans.[27] **Table 1.3** provides a breakdown of the case fatality rate among Veterans by age group and gender, as of March 31, 2022.

Table 1.3: *Case Fatality Rate Among Veterans Using VHA Services Following Diagnosis of COVID-19, by Age Group and Gender (3/1/2020 – 3/31/2022)*

Female Veterans			Male Veterans			Veterans Using VHA Services		
Age Groups	**Deaths**	**Case Fatality Rate**	**Age Groups**	**Deaths**	**Case Fatality Rate**	**Age Groups**	**Deaths**	**Case Fatality Rate**
34 and under	5	0.0%	**34 and under**	40	0.1%	**34 and under**	45	**0.1%**
35 - 44	9	0.1%	**35 - 44**	180	0.3%	**35 - 44**	189	**0.3%**
45 - 54	43	0.3%	**45 - 54**	486	0.7%	**45 - 54**	529	**0.7%**
55 - 64	124	0.9%	**55 - 64**	1,747	1.9%	**55 - 64**	1,871	**1.8%**
65 - 74	159	2.4%	**65 - 74**	7,014	5.5%	**65 - 74**	7,173	**5.4%**
75 - 84	69	5.4%	**75 - 84**	6,212	8.0%	**75 - 84**	6,281	**8.0%**
85 and over	65	12.9%	**85 and over**	5,247	18.6%	**85 and over**	5,312	**18.5%**
Total by Gender	**474**	**0.7%**	**Total by Gender**	**20,926**	**4.4%**	**Total by Gender**	**21,400**	**3.9%**

Note: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Veteran confirmed positives and COVID-19 Associated Deaths figures exclude Veteran-Employees. Veteran COVID-19 cases include VHA conducted tests and Veteran self-reported test results to VHA.

Source: VHA, CDW, NST Dataset, accessed 4/8/22. Ref. D277

Annex C Timeline[28]

Updated Summary of Fourth Mission Data

In the Annex C reporting period, VHA conducted 38 Mission Assignments issued by the Federal Emergency Management Agency (FEMA) in response to requests for Federal assistance.[29] Most were related to bed capacity in response to the surges in hospitalization during the Delta and Omicron waves.[30] Staffing shortages continued to be a challenge during the Annex C period, which led to VHA providing supplemental staff to support seven FEMA Mission Assignments.[31] **Table 1.4** provides a breakdown of activities by support type. For more information, see the Fourth Mission section of this report.

Table 1.4: *New FEMA Mission Assignments by Support Type (8/1/2021 – 3/31/2022)*

Support Type	Number of FEMA Mission Assignments
Bed Capacity	24
Personal Protective Equipment (PPE) / Equipment	4
Staffing Supplement	7
Subject Matter Expertise	1
Testing	2
Vaccinations	1
Grand Total	39

Notes: Only assignments with a start date from 8/1/2021 through 3/31/2022 are included.

Source: VHA, OEM, response to data call, 4/1/2022. Ref. D262

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U.S. EPIDEMIOLOGY

The Epidemiology section of the Annex C Report chronicles the changing nature of the SARS-CoV-2 virus and the COVID-19 pandemic from August 1, 2021, through March 31, 2022. This section does not contain specifics related to VHA's response; rather, it provides a high-level picture of the disease's spread, severity and changing nature over the reporting period.

Since COVID-19 appeared in December 2019, the World Health Organization (WHO) has tracked more than 490 million cases.[32] More than six million people have died worldwide.[33]

As of March 31, 2022, CDC estimates that nearly 80 million people in the United States contracted a COVID-19 infection, and more than 960,000 people died.[34] Approximately 460,500 of these deaths occurred in 2021.[35]

COVID-19 was the third-leading cause of death in 2021, surpassed only by heart disease and cancer.[36] According to provisional data provided by CDC, COVID-19 caused more U.S. deaths in 2021 than all other underlying causes, such as unintentional injuries (including drug overdoses), stroke, chronic lower respiratory disease, Alzheimer's disease, diabetes, kidney disease and suicide.[37]

According to CDC, deaths from COVID-19 in 2021 decreased for Asian, Hispanic and Black people in the United States, compared with 2020.[38] The number of deaths increased for American Indian/Alaska Native (AIAN), White and Native Hawaiian and Other Pacific Islander populations.[39] For more information on racial, age and gender breakdowns, see the Overview and Health Equity sections of this report.

According to a CDC study published in October 2021, more than 140,000 children in the United States lost a parent, custodial grandparent or grandparent caregiver to COVID-19.[40]

COVID-19 Viral Variants

Using a national genomic surveillance system, CDC has identified at least 10 viral variants of COVID-19, which it classifies into categories in order of increasing concern, including the following:[41]

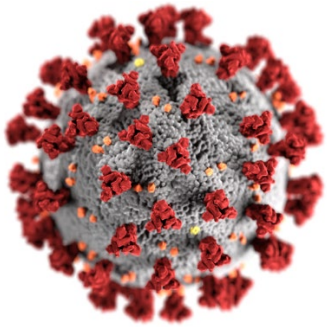
- Variant Being Monitored
- Variant of Interest
- Variant of Concern
- Variant of High Consequence

Significant COVID-19 viral variants are given names based on the letters of the Greek alphabet.[42] Some of the letters—Nu and Xi—were skipped; the first because it could be confused with the word New, and the second because it is a common last name.[43]

Mutations

As viruses evolve, they generate random mutations.[44] Most of these mutations do not impact viral spread, but some impart an infectious advantage to the virus.[45] These advantages can be anything from increased virus replication to improved viral binding to cells.[46] SARS-CoV-2 mutations occasionally change the spike protein on the outside of the virus—the red protuberances shown in **Figure 2.1**. These changes can affect the viruses binding to cells or allow it to evade natural or vaccine developed immunity.[47]

Figure 2.1: *Illustrated Ultrastructural Morphology of SARS-CoV-2*



Source: CDC, Image 23312, 2020, accessed 3/17/2022, https://www.cdc.gov/media/subtopic/images.htm.

CDC conducts genomic surveillance across the United States to detect new variants of SARS-CoV-2.[48] The organization estimates that if a variant has 0.1% frequency in the U.S. population, it has a 99% chance of being detected through the genomic surveillance.[49]

The Delta Variant

At the start of this reporting period, August 1, 2021, the Delta variant was the most common in the United States, causing approximately 97.4% of all cases.[50] Designated as B.1.617.2, the Delta variant was first detected in India in May 2021; it superseded all the previous variants in a matter of weeks.[51] CDC declared Delta a Variant of Concern on June 15, 2021.[52]

The Delta variant led to a surge in cases and hospitalizations throughout the United States, particularly in the Midwest and Southeast.[53] One study found that the Delta variant nearly doubled the risk of hospitalization for those infected, compared to the Alpha variant.[54]

The Delta wave began in summer 2021.[55] Even more highly vaccinated states saw an increase in the number of cases reported through the Delta surge.[56] Studies found that a single dose of the Pfizer-BioNTech (commonly known as Pfizer) vaccine reduced a person's risk of infection only by 33%, compared with 50% against the Alpha variant.[57] Two doses of Pfizer were 88% effective against Delta, compared with 93% against Alpha.[58]

Between December 1, 2021, and mid-January 2022, Delta went from 99% of U.S. cases to 1.7%, replaced by the more-contagious Omicron variant.[59]

The Omicron Variant

Omicron had far more mutations than the previous strains.[60] Scientists identified approximately 50 mutations in Omicron, including 26 that had not been identified in any other variant.[61] Studies found that Omicron's mutations imparted the following characteristics to the virus and its associated disease:[62]

- Increased transmission
- Decreased disease severity
- Reduced efficacy of some antibody treatments
- Reduced efficacy of antibodies from past infection or vaccination

Initial reports indicated that Omicron was discovered in Botswana and South Africa, but some evidence suggests that the Netherlands may have had the first cases.[63]

The first U.S. case of Omicron was reported on December 1, 2021; by mid-January 2022, this new variant made up 98.3% of cases in the United States.[64] Omicron also infected far more people than its predecessors.[65]

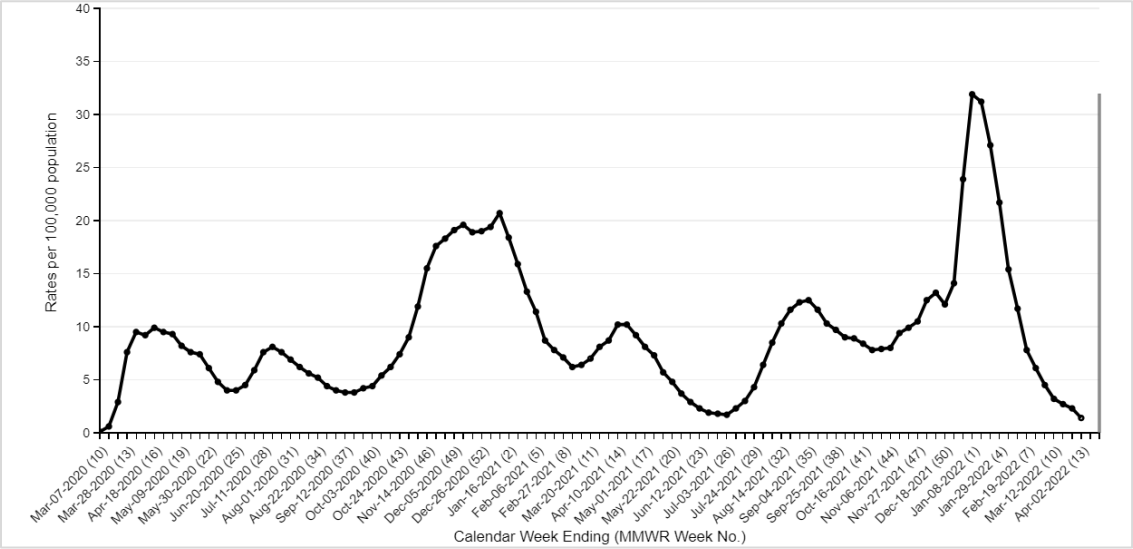
The Omicron wave caused a surge in cases.[66] Hospitalization rates were higher than they had been under Delta. Omicron hospitalizations peaked at 38.4 per 100,000 adults, compared with 15.5 per 100,000 adults during Delta.[67]

Although the number of people admitted to hospitals increased, most Omicron infections were less severe than the infections under Delta.[68] The surge in hospitalizations was driven by the exponential increase in COVID-19 infections.[69] The higher number of infections led to a higher hospitalization rate although the risk to most individuals remained relatively low.[70]

The people hospitalized with Omicron also stayed for shorter periods and died with lower frequency than those hospitalized with Delta.[71] **Figure 2.2** and **Figure 2.3** show that although U.S. hospitalization rates increased during the Omicron wave, the proportion of U.S. intensive care was not as high as it had been during the initial 2020 wave. The proportion of hospitalized U.S. patients requiring critical care was

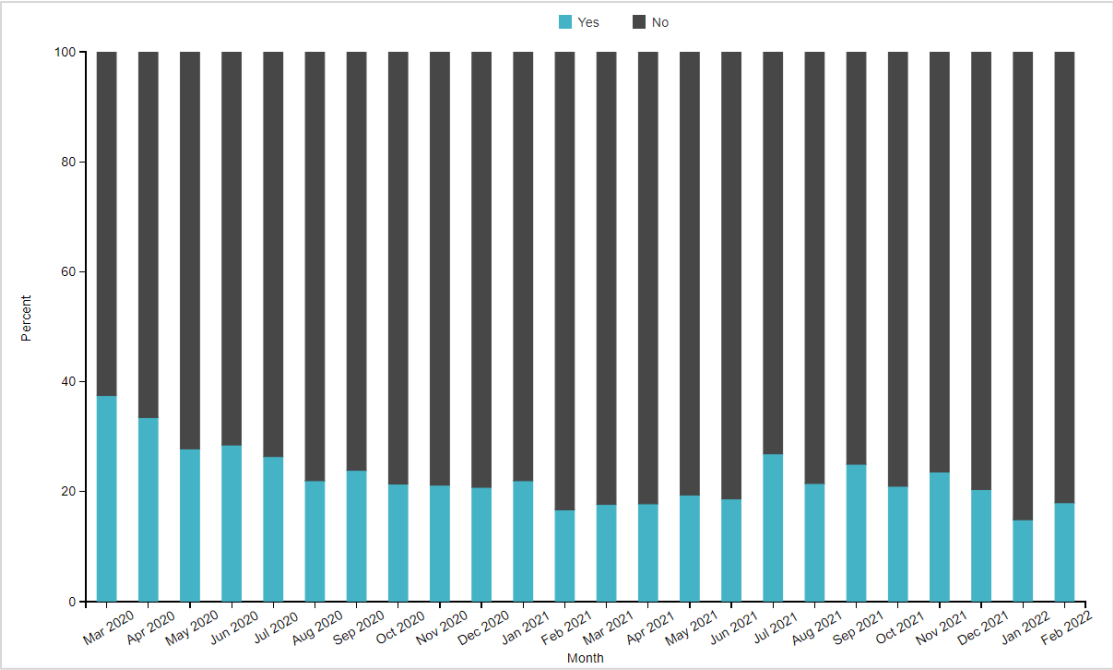
generally lower than 2020, but the proportions reflect some differences in critical care requirements between variant waves.

Figure 2.2: *Laboratory-confirmed COVID-19-associated Hospitalizations, March 7, 2020 – April 2, 2022*



Source: CDC, "Laboratory-confirmed COVID-19-associated hospitalizations," 4/2/2022, accessed 4/12/2022, https://gis.cdc.gov/grasp/COVIDNet/COVID19_3.html.

Figure 2.3: *Percentage of U.S. Hospitalizations in Intensive Care, March 2020 – February 2022*



Source: CDC, "Laboratory-confirmed COVID-19-associated hospitalizations," 4/2/2022, accessed 4/12/2022, https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html#virusTypeDiv

Note: Blue lines represent percentage of hospitalized COVID-19 patients who required ICU care.

CDC attributed the limited severity of the Omicron wave to the prevalence of vaccinations and boosters in the U.S. population.[72] Although rates of hospitalization for boosted adults increased during the Omicron wave, the rate was 12 times lower than it was for unvaccinated adults.[73]

The Subvariants

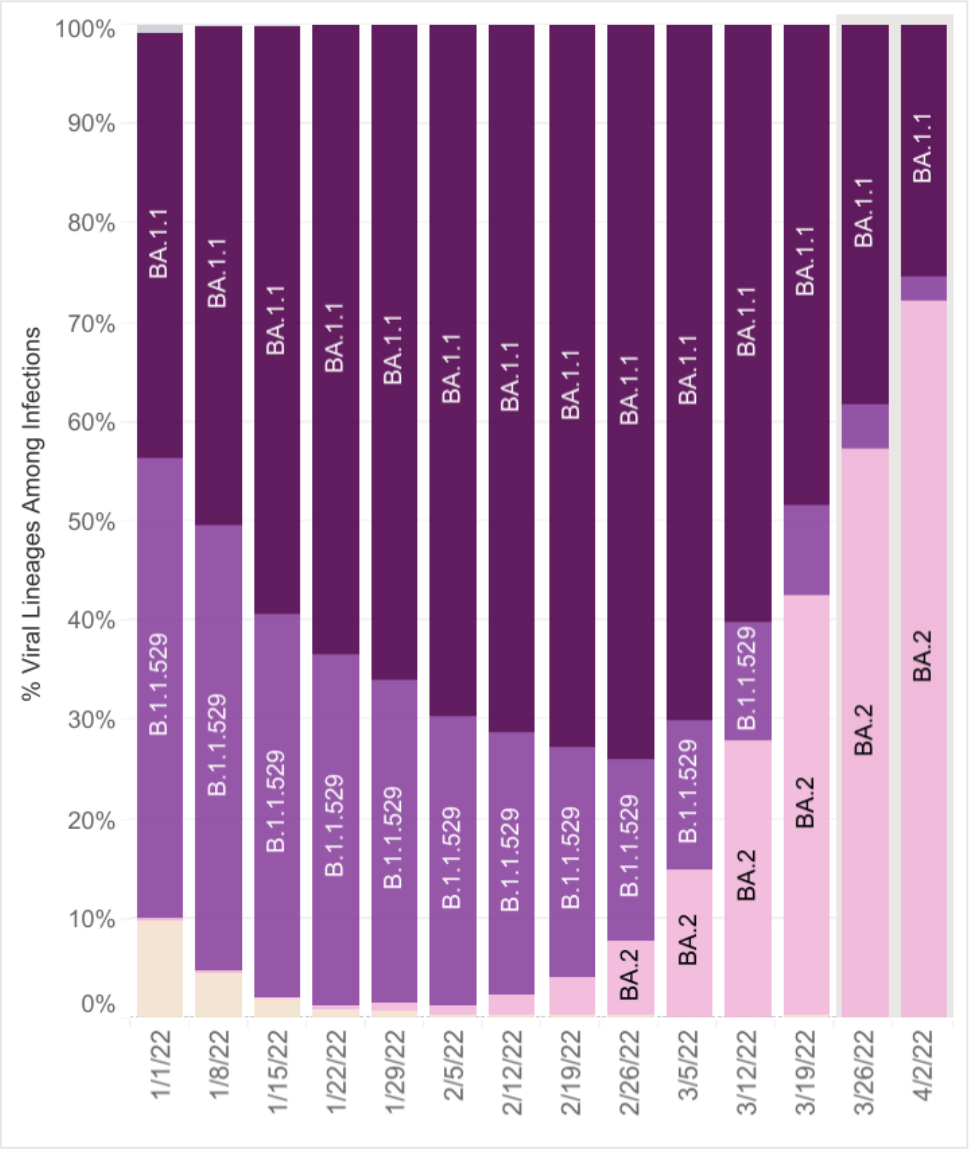
The original Omicron variant—B.1.1.529—has three subvariants: BA.1, BA.2 and BA.3.[74] As of the publication of this report, BA.3 had not gained much traction, but both BA.1 and BA.2 have spread rapidly across the globe.[75]

The B.1.1.529 strain and subvariant BA.1 drove the Omicron surge.[76] They spread faster than any other version of the virus to date.[77] Starting in March 2022, subvariant BA.2 became more dominant.[78] Research showed that this subvariant was 30% to 50% more contagious than BA.1.[79] The mutations in BA.2 led to its nickname, Stealth Omicron.[80]

Although it appeared at the same time as BA.1, the subvariant BA.2 took longer to appear in the broader population than its counterpart.[81] Scientists theorized that the subvariant may have been in a more isolated location initially, which delayed its spread; but once BA.2 reached a larger population, it spread quickly.[82] According to reports from South Africa, BA.2 was infecting 300 people a day in mid-November 2021; by the end of November, that number was closer to 3,000 a day.[83]

The first case of BA.2 in the United States was reported in January 2022.[84] As of April 2, 2022, BA.2 made up approximately 70% of U.S. COVID-19 cases.[85] To view the prevalence of each subvariant in the United States, see **Figure 2.4**. Some data for BA.1 and B.1.1.529 are aggregated because not all regions can provide reliable differentiation between the two.[86]

Figure 2.4: *Variant Prevalence in the United States (1/1/2022 – 4/22022)*



Source: CDC, "Variant Proportions," 4/2/2022, accessed 4/6/2022, https://covid.cdc.gov/covid-data-tracker/#variant-proportions.

Like B.1.1.529 and BA.1, the severity of BA.2 seemed to be tempered in populations with high vaccination rates.[87] Those who had the BA.1 strain of Omicron were also likely to have some protection against BA.2 although vaccines were far better protection than immunity after infection, as the next section explains.[88]

Immunity and Seroprevalence

Seroprevalence refers to the number of people in a population with antibodies for a given disease.[89] Studies of SARS-CoV-2 seroprevalence can provide an indication of how many people were infected with COVID-19 across the country and worldwide.[90]

The antibodies associated with SARS-CoV-2 can usually be detected in an individual's blood 1 to 3 weeks after infection.[91] However, CDC reported that some people took more than three weeks to develop antibodies, and some never developed any detectable antibodies.[92]

Despite potential unpredictability at the individual level, seroprevalence studies are important.[93] Reported cases of COVID-19 likely reflect only a small percentage of overall cases.[94] Actual cases may be under-counted for several reasons, including the following:

- The increased availability and use of self-testing: According to CDC, self-testing for individuals with COVID-19-like symptoms tripled from 5.7% during the Delta wave to 20.1% during Omicron.[95]
- The prevalence of mild symptoms: Many people infected with Omicron may experience less severe illness so they may not need to seek medical treatment, which would leave their cases unreported.[96]
- The untested: Many people, symptomatic or otherwise, do not get tested for COVID-19.[97]

According to a study that looked at blood samples of 1.4 million individuals in the United States, seroprevalence increased from 3.5% in July 2020 to 20.2% in May 2021.[98] This was before the Delta and Omicron waves, which most likely added a substantial number to the seroprevalence throughout the United States.[99] In addition, human immunity includes components other than antibodies—components that are not readily measured by seroprevalence testing.[100]

Immunity after Infection

Antibodies and other forms of immune response offered some protection against repeat infection for those who recovered from COVID-19.[101] However, CDC cautioned that previous illness was not a predictable guarantee of immunity.[102] This was particularly true for Omicron because its strong immune-evasive properties allowed it to avoid the antibodies created by previous infection.[103] Studies showed that unvaccinated individuals who were previously infected were unable to neutralize Omicron.[104]

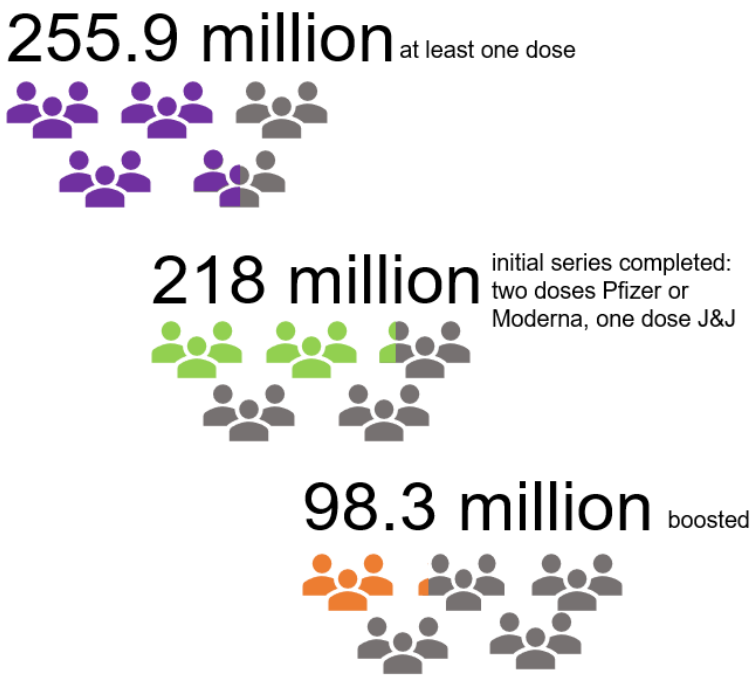
A study in England found that from December 2021 through February 2022, more than 650,000 people were re-infected with COVID-19. Re-infected people acquired one of the earlier strains of SARS-CoV-2, and then were infected again.[105] A separate study conducted in 2021 among previously infected individuals in Kentucky found that those who were not vaccinated were 2.34 times more likely to be re-infected than those who were vaccinated after their illness.[106]

National Vaccination Campaign

According to an analysis released in April 2022, approximately 234,000 people who died from COVID-19 could have survived if they had completed an initial vaccine series—one dose of Johnson & Johnson's Janssen (J&J) or two doses of Pfizer or Moderna.[107] The analysis was based on CDC data related to COVID-19-associated deaths and vaccine effectiveness in the United States. The analysis estimated that the people who could have survived accounts for 60% of adults who died of COVID-19 from June 2021 through March 2022 and 24% of all COVID-19-associated deaths since the start of the pandemic.[108]

As of April 1, 2022, more than 255.9 million people in the United States had received at least one vaccination dose.[109] Approximately 218 million people had received an initial complete series—two doses of an mRNA vaccine (Pfizer or Moderna) or one dose of J&J vaccination.[110] These numbers represent approximately 77.1% (Pfizer or Moderna) and 65.7% (J&J) of the eligible U.S. population, as shown in **Figure 2.5**.[111]

Figure 2.5: *COVID-19 Vaccinated Populations in the United States, as of 4/1/2022*



Source: CDC, "COVID Data Tracker Weekly Review," 4/1/2022, accessed 4/7/2022, https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html; CDC, "Update on Epidemiology of SARS-CoV-2 Strains," 4/6/2022, slide 16. Ref.s D93, D73

As of March 31, 2022, the highest U.S. vaccination rates were in ages 65 to 74: 91.6% of that age group had completed an initial vaccine series, and 99.9% had received at least one dose.[112] The lowest rate was for children ages 5 to 11; only 27.9% of this population had completed an initial vaccine series, and 34.6% had received at least one dose.[113]

Vaccination levels continue to vary by region. Most of the states with the highest rates of at-least-one-dose vaccination were in the Northeast. More than 90% of the eligible populations of Connecticut, Massachusetts, Rhode Island, Vermont and New Hampshire had received at least one dose of the COVID-19 vaccine.[114] With the exception of New Hampshire (69.8%), these states also had some of the highest rates of completed initial series, 80.9% or higher.[115]

Even in the states with the lowest rates of vaccination (Wyoming, Mississippi and Louisiana), more than half of the population had received at least one dose of the vaccine.[116] These 3 states also had the lowest rates of series completion—approximately 51% in each.[117]

The Vaccines

The three vaccines available in the United States are outlined in **Table 2.1**. The Pfizer, Moderna and J&J vaccines all received initial emergency use authorization (EUA) by the Food and Drug Administration (FDA) to combat the SARS-CoV-2 virus that causes COVID-19.[118] All three later received EUA approval for a third dose, commonly called a booster.[119]

Pfizer and Moderna vaccines have since received full FDA approval.[120]

Table 2.1: *COVID-19 Vaccines Available in the United States, as of March 31, 2022*

Vaccine	Also Known As	Vaccine Type	Initial Dosage	Initial Booster	EUA Approval Date	Full Approval Date
Pfizer	Pfizer-BioNTech, COMIRNATY	mRNA	2 doses, 3-8 weeks apart	6 months after second dose	12/11/2020	8/23/2021 (16 years and older)
Moderna	Spikevax	mRNA	2 doses, 4-8 weeks apart	6 months after second dose	12/18/2020	1/31/2022 (18 years and older)
J&J	Johnson & Johnson's Janssen	Viral Vector	1 dose	2 months after receiving the single dose	2/27/2021	--

Source: CDC, "Pfizer-BioNTech COVID-19 Vaccine (also known as COMIRNATY): Overview and Safety," updated 4/1/2022, accessed 4/5/2022, https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/Pfizer-BioNTech.html; CDC, "Moderna COVID-19 Vaccine (also known as Spikevax): Overview and Safety," updated 4/1/2022, accessed 4/5/2022, https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/Moderna.html; CDC, "Johnson & Johnson's Janssen COVID-19 Vaccine: Overview and Safety," updated 4/4/2022, accessed 4/5/2022, https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/janssen.html; FDA, "Emergency Use Authorization," 3/31/2022, accessed 4/5/2022, https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-Sense over 700 framework/emergency-use-authorization#covid19euas; FDA, "Janssen COVID-19 Vaccine," updated 3/10/2022, accessed 4/5/2022, https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/janssen-covid-19-vaccine FDA, "Coronavirus (COVID-19) Update: FDA Takes Additional Actions on the Use of a Booster Dose for COVID-19 Vaccines," 10/20/2021. Ref.s D97, D98, D101, D136

Full approval will require more extensive study of clinical patients, as well as inspections of processes and facilities.[121] The Pfizer vaccine received full FDA approval for people over 16 years old in August 2021; however, the Pfizer vaccine for children ages 5 to 15 years of age remained under EUA.[122] The Moderna vaccine received full FDA approval in January 2022 for people over 18 years of age.[123]

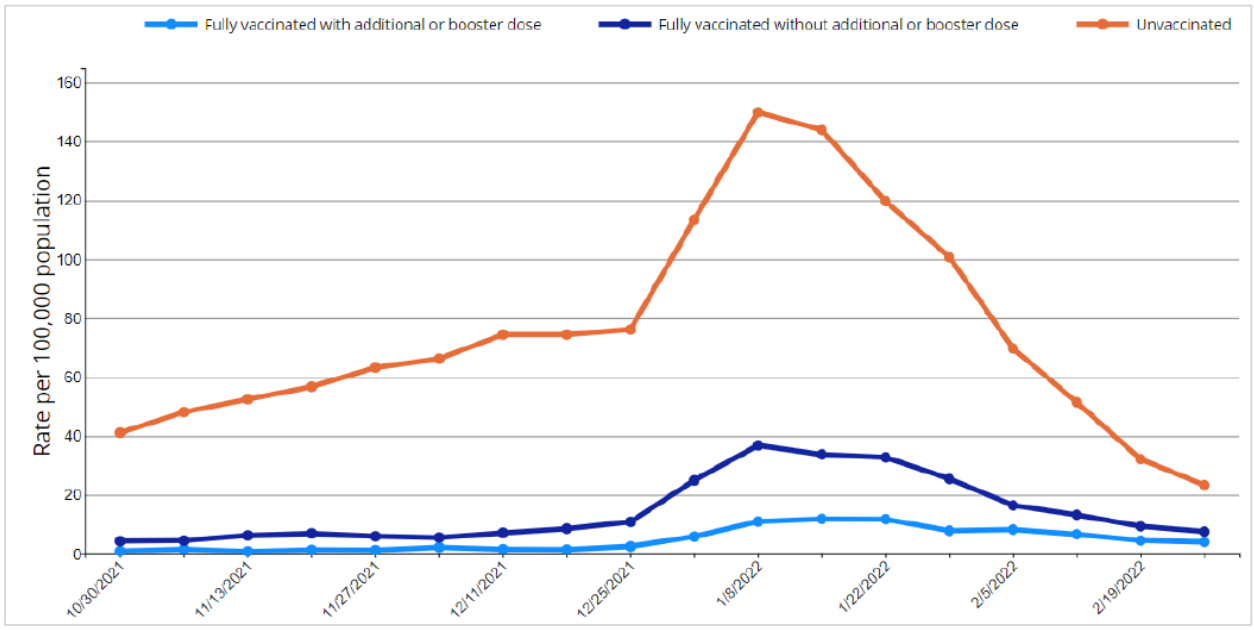
Although J&J had lower initial vaccine effectiveness than Pfizer or Moderna, its durability in protecting against post-vaccination infections and hospitalizations did not wane as quickly as its two predecessors.[124] A study of more than 17 million vaccinated individuals found that Pfizer and Moderna's protection against infection began to wane in month 2, and protection against hospitalization started to wane in month 2 (Pfizer) and month 3 (Moderna).[125] In comparison, J&J's protection against infection began to wane in month 4, and its protection against hospitalization did not deteriorate at all.[126] As of March 31, 2022, this study had not yet been peer-reviewed.[127]

Efficacy of Vaccines

The body's production of antibodies in response to vaccination can wane over time.[128] Repeated doses of vaccinations can increase the human body's immune response to the targeted threat.[129] This holds true for the COVID-19 vaccines and others, including pertussis, diptheria and tetanus.[130] Booster shots against SARS-CoV-2 can trigger revitalized production of antibodies, which prolongs the protection against disease.[131]

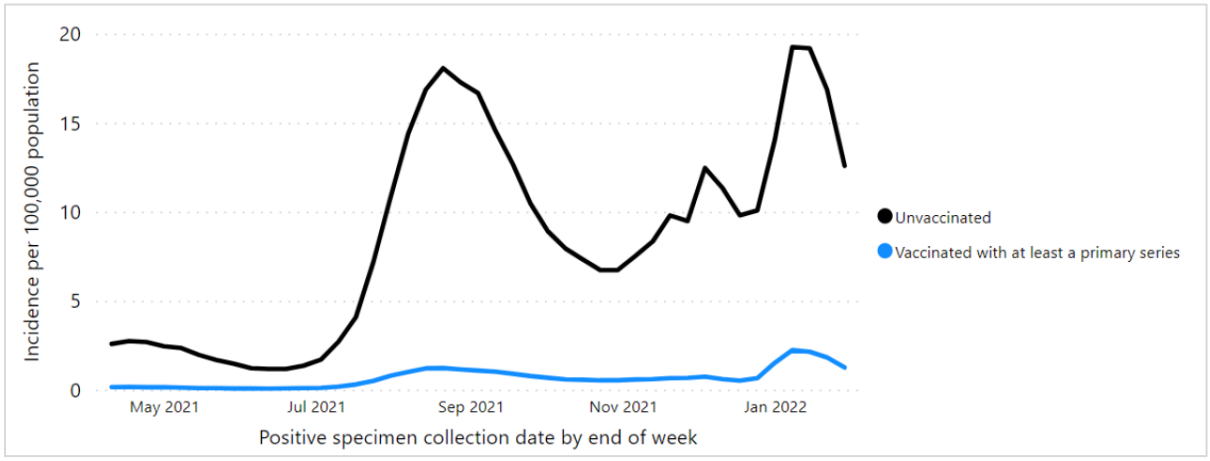
The vaccines were proven to decrease the rate of severe illness, hospitalization and death among vaccinated people, as shown in **Figure 2.6** and **Figure 2.7**.

Figure 2.6: *Age-adjusted Rates of COVID-19-associated Hospitalizations by Vaccination Status in Adults over 18 Years Old (10/2021 – 2/2022)*



Source: CDC, "Update on the Epidemiology of SARS-CoV-2 Strains," 4/6/2022, slide 24. Ref. D72

Figure 2.7: *COVID-19-associated Deaths by Vaccination Status, April 4, 2021 – February 19, 2022*



Source: CDC, "Update on the Epidemiology of SARS-CoV-2 Strains," 4/6/2022, slide 20. Ref. D72

However, the sustained efficacy of the vaccine against infection remained difficult to quantify for the following reasons:[132]

- 2021 mutations of the SARS-CoV-2 virus made it more resistant to the antibodies generated by the vaccines.[133] The vaccines targeted the spike protein of the SARS-CoV-2 virus, which was particularly mutated in the Omicron variant, making it more capable of evading detection and neutralization by antibodies.[134]

- As a result of self-testing, laboratories did not receive as many samples from the general population, which meant less information to use in studies.[135]
- The protection against infection for all three vaccines deteriorated over time.[136]

Antibodies are only one part of COVID-19 immunity; vaccination and natural immunity also produce cellular immunity (B- and T-cells).[137] Studies indicate that T-cells recognize all SARS-CoV-2 variants, which means that vaccinated people continued to have some protection against the newer strains.[138] This may also provide protection against more severe illness when infected with Omicron.[139]

Boosters

In August 2021, FDA approved a third dose of Pfizer or Moderna vaccines for immunocompromised people.[140] Since that time, the criteria was expanded to include eligible people who received their initial vaccine 6 months prior (Pfizer), 6 months prior (Moderna) or 2 months prior (J&J).[141] The booster shots contained the same ingredients as the first and second rounds of vaccination; for Moderna, the booster dose was half the amount provided in the original doses.[142]

On March 29, 2022, FDA authorized a second booster dose for both Pfizer and Moderna.[143] The boosters were recommended for elderly and immunocompromised individuals who received a booster at least four months prior.[144]

TESTING & GENOMIC SEQUENCING

Since the beginning of the pandemic, VHA has continued to expand its capacity for testing and genomic sequencing.[145] During the Annex C period, VHA provided high volumes of PCR tests and self-tests—also known as at-home tests or over-the-counter tests—and genomic sequencing of samples to identify COVID-19 variants.[146]

From the start of the pandemic through March 31, 2022, VHA administered 5,716,580 tests for Veterans for COVID-19.[147] This number includes lab-based PCR and antigen tests only and does not include self-tests.[148] Since December 2021, VHA has detected approximately 6,000 instances of Omicron and its subvariants through its genomic sequencing program.[149]

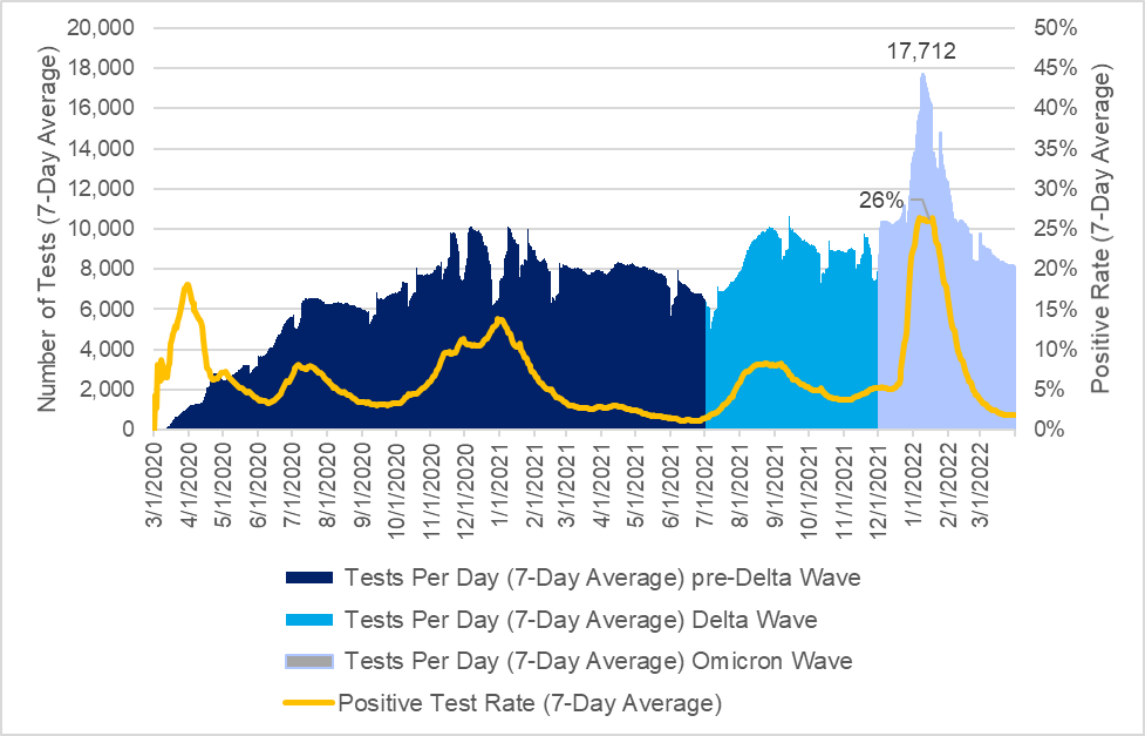
Testing

From August 1, 2021, through March 31, 2022, VHA administered 2,436,379 COVID-19 tests to Veterans Using VHA Services, of which 284,301 (11.67% of tests) were positive for COVID-19.[150]

Positivity rates peaked at 8.3% during Delta for the week of September 5, 2021, and 26.3% during Omicron for the week of January 2, 2022, as shown in **Figure 3.1.**

A Registered Nurse conducts a COVID-19 test at a VA outpatient clinic in Tulsa, Oklahoma. During the Annex C reporting period, VHA conducted more than 2.4 million COVID-19 tests for Veterans Using VHA Services. (VHA photo)

Figure 3.1: *VHA-administered COVID-19 Test Volume and Positive Rates for Veterans Using VHA Services, Daily (3/1/2020 – 3/31/2022)*



Note: This figure contains testing data for Veterans Using VHA Services compiled from VHA Lab-certified COVID-19 tests, including antigen tests. VA Veteran Employees are excluded from this data.

Source: VHA, CDW, NST Dataset, accessed 4/15/2022. Ref. D277

VHA leadership reported that testing demand tripled from November 2021 through January 2022, which overlapped with significant staffing shortages for VHA facilities.[151] In anticipation of high demand for testing, especially during surges, VHA took the following steps:[152]

- Monitored testing supply stock closely
- Tracked national and international testing supply trends in collaboration with VA Logistics and the Department of Health and Human Services (HHS)
- Hired additional testing staff to meet the demand

This preparation allowed VHA to return 95% of PCR test results in two days or less during the Omicron surge.[153] To reduce the pressure on clinical testing, VHA also provided self-test kits to VA staff, Veterans and visitors.[154]

Testing for Clinical and Surveillance Purposes

In August 2021, VHA issued a mandate requiring all of its health care workers to be vaccinated.[155] In addition, a White House expansion to Executive Order (EO) 13991 required all Federal workers to attest to their vaccination status.[156] Those who were

not vaccinated were subject to additional safety measures, such as masking and testing, which increased the testing volume for organizations like VHA.[157]

By early December 2021, the Omicron surge had begun to cause staffing shortages.[158] In response, VHA changed its policies, emphasizing test-to-stay-at-work and return-to-work programs to maintain critical operations.[159] This strategy helped minimize staffing shortages by bringing back staff earlier or allowing them to stay at work even if they had sustained high-risk exposure.[160] For more information on staffing shortages, see the Clinical Operations section of this report.

Early in the pandemic, VHA set up routine surveillance testing for all residents and staff in Community Living Centers (CLCs) and Spinal Cord Injury (SCI) units.[161] Surveillance tests were designed to mitigate the risk to elderly and immunocompromised residents in these facilities.[162] During the Annex C reporting period, CLCs and SCI units continued screening VHA staff and residents based on a set of algorithms, incorporating risk factors such as community COVID-19 case rates.[163] Approximately 90% of CLC and SCI facility residents had completed an initial vaccination series as of the end of the Annex C review period.[164]

VHA plans to collaborate with Population Health Services (PHS) to develop a new dashboard, tracking vaccination data including each person's dates of vaccination.[165] Tracking these dates is critical because vaccine efficacy diminishes over time, and boosters may be needed to sustain protection against the virus.[166] The dates of vaccination will be factored into testing timelines when screening individual workers.[167]

Self-testing

During the Omicron wave, self-tests became more widely available.[168] In January 2022, the White House purchased one billion COVID-19 self-test kits to be distributed to U.S. residents on request.[169] By February 2022, VHA provided guidance describing when and how (proctored and not proctored) self-test results would be accepted although follow-up testing and treatment were required at times.[170]

Self-testing for VHA Staff

VHA leadership reported that self-testing helped mitigate some health care staffing challenges.[171] With the increase in self-tests, the pressure on testing staff lessened, as did the number of Veterans coming in for testing.[172]

VHA procured approximately 10 million self-test kits from HHS and made them available to staff, Veterans and visitors alike.[173] This strategy reduced staffing

shortfalls by bringing back staff earlier or allowing them to stay at work even if they had sustained high-risk exposure if self-tests were negative.[174]

During a pilot in Veterans Integrated Services Network (VISN) 1, VHA provided employees with self-test kits and asked staff to take a test before entering facilities.[175] At least 60 employees who had planned to visit a VA Medical Center (VAMC) self-tested positive before their arrival and as a result did not enter facilities, thus preventing the potential spread of the virus.[176] Given the program's success, VHA leadership reported plans to make self-testing a VHA-wide program in April 2022.[177]

Self-testing for Veterans

Self-test kits were given out to Veterans who came to VA clinics.[178] These tests were used as an initial screening for Veterans who had COVID-19-like symptoms or were exposed to COVID-19.[179] Those who tested negative were encouraged to confirm negative self-test results with a PCR test.[180]

Self-testing also supported Veterans who might have otherwise experienced challenges obtaining testing.[181] The White House program required home addresses to receive self-test kits, which limited access for people experiencing homelessness.[182] To increase access, VHA provided self-test kits to homeless shelters, health fairs and other venues.[183] VHA also reached out to rural and minority Veterans to inform them of ways to obtain self-test kits.[184] This outreach was conducted through targeted media, including postcards, posters and social media posts, providing information in English, Spanish and Tagalog.[185]

Test-to-Treat

The Test-to-Treat program is a VHA standard of care in clinical settings.[186] It aims to provide patients with oral anti-viral treatment soon after testing, which can mitigate possible hospitalization.[187] Oral anti-viral treatment must be administered within five days of a patient's first COVID-19 symptoms, which can prove challenging.[188]

Test-to-Treat for Veterans at Home

On January 20, 2022, VHA released updated Test-to-Treat guidance to allow Veterans to use self-testing.[189] This allowed patients to perform a self-test in front of a clinician over video (often called a proctored test), or the patient could share a photo of a positive test result.[190]

Based on the patient's symptoms and level of risk according to an automated form in VHA's Pharmacy Benefit Management (PBM) Services platform, a clinician would

prescribe oral anti-viral medication if clinically appropriate.[191] For patients who did not qualify initially, PBM staff reviewed their applications, and a clinician followed up with a course of treatment that aligned with the patient's needs.[192]

The preferred oral antivirals for home treatment were Paxlovid and Molnupiravir, which received EUA from FDA in December 2021.[193] As of March 31, 2022, a total of 326 patients had received Paxlovid, and 119 had received Molnupiravir based on self-test results, according to VHA.[194]

Once a treatment plan was determined, patients could choose to pick up medication from a pharmacy or have treatments mailed overnight from their local VAMC.[195] According to VHA leadership, although mailed treatment sometimes meant delays, overnighting treatments was still a timely and durable solution for treatment delivery.[196]

VHA also offered COVID-19 medication for patients who were not candidates for an oral treatment, and for those who clinicians believed would be better treated in-person.[197] These patients were triaged for in-person care and possible receipt of monoclonal antibodies (mAbs), administered through infusions.[198] For more on mAb treatments, see the Clinical Operations section of this report.

Enhancing Test-to-Treat

During this reporting period, the White House invited VHA to pilot a Test-to-Treat program to capture more concrete results from Test-to-Treat and refine documentation pertaining to procedures such as call-center scripts.[199] Because VHA is an integrated health system with a mail order pharmacy system already in place, the organization was well-positioned to implement Test-to-Treat.[200] To support this request, VHA leadership reported that a facility in White River Junction, Vermont, (VISN 1) would participate in the Test-to-Treat pilot in April 2022.[201] This location was chosen because it supports a rural Veteran population and can leverage an existing call center to triage sick patients.[202]

The pilot will feature standardized language and documentation so it can be used throughout VHA medical facilities.[203] In each case, a licensed independent practitioner will work through a clinical call center to triage positive cases.[204] After assessing the patient, the practitioner will provide a telehealth visit if needed, document the case and provide treatment.[205]

VHA leadership noted that Test-to-Treat care could be expedited if FDA authorized VHA pharmacists to prescribe oral anti-virals for COVID-19 treatment.[206] As an integrated health system, VHA has access to patient records that allow it to identify

potential drug interactions and make informed decisions when prescribing medications.[207]

Genomic Sequencing

Genomic sequencing allows scientists to gain a detailed understanding of the genetic makeup of a virus or organism.[208] Comparing different specimens of the SARS-CoV-2 virus can assist researchers in tracking the virus, learning more about how it mutates and changes, and determining how those changes may impact the health of people infected with COVID-19.[209]

Since December 2021, VHA has sequenced more than 20,000 tests, including approximately 6,000 instances of Omicron and its subvariants.[210] By August 2022, VHA's genomic sequencing labs, Sequencing for Research Clinical and Epidemiology (SeqFORCE), plans to identify all known Delta variants and subvariants categorized by CDC.[211]

Genomic sequencing is a time-consuming and labor-intensive process.[212] Sequencing a sample takes 3 to 4 days, on average, plus several more days for recording and cataloging findings.[213] To process samples faster, VHA has started batch-testing multiple samples at a time, automating informatic systems with certain variant software in several sequencers.[214] Because of the time it takes to complete, sequencing results are not usually used for an individual patient's treatment; instead, the purpose of sequencing is to monitor case spread and outbreak clusters.[215]

Given limited resources and time, SeqFORCE chooses samples for sequencing by identifying cases of interest, similar to the process outlined in Annex B.[216] In November 2021, SeqFORCE added an additional criteria in hopes of identifying new variants.[217] Samples were genetically sequenced from people with COVID-19 infections who had recently traveled to a foreign country or employees who felt sick after any type of exposure from a foreign country.[218] As a result, SeqFORCE identified one of the first Omicron samples in the United States, obtained from an employee who traveled abroad and became sick after their return to the United States.[219] CDC validated this finding, highlighting VHA's efforts at the forefront of sequencing.[220] VHA leadership reported an ongoing shortage of experienced sequence technicians and molecular technologists to complete this work.[221]

Since December 2021, almost all of the samples being processed were Omicron.[222] Newer and more transmissible subvariants of Omicron have begun to appear, including BA.2; all known subvariants are identified and tracked by SeqFORCE.[223] SeqFORCE reports variant updates every two weeks internally within VHA, monitoring all variants, including those flagged by CDC.[224] VHA supports the national

surveillance and research efforts by sharing findings and raw data with the National Institutes of Health (NIH), CDC, local public health agencies and the Global Initiative on Sharing All Influenza Data (GISAID), an international database.[225]

From August 1, 2021, through March 31, 2022, VHA set up 2 additional labs certified by the Clinical Laboratory Improvement Amendment (CLIA) for genomic sequencing: 1 in Eastern Colorado and 1 in Indianapolis, Indiana.[226] This raises the total count of VHA's CLIA-certified genomic sequencing laboratories to eight nationally.[227]

In addition to results sent back to the patient, the laboratories anonymize the data and add it to population health data to track variant spread.[228] When data is compiled by geography, providers can predict likely variant surges and prepare appropriate treatments ahead of outbreaks.[229]

Research

VHA tracks variant mutations through three programs:[230]

- VHA SeqFORCE
- VA Science and Health Initiative to Combat Infectious and Emerging Life-Threatening Diseases (VA SHIELD), a biorepository of specimens and data
- VA Sequencing Collaborations United for Research and Epidemiology (SeqCURE), a research effort for genomic sequencing

Leftover samples from SeqFORCE are sent to the VA SHIELD biorepository for current and future research.[231] SeqCURE receives samples from SeqFORCE that have lower levels of viral particles in order to conduct genomic sequencing, based on current capabilities.[232]

During this period, SeqCURE and SeqFORCE began pursuing the capability to develop variant-specific PCR probes to more quickly identify future infections caused by variants of concern as flagged by CDC.[233] These capabilities could help VHA prioritize and triage genomic sampling to help optimize resources and accelerate results.[234]

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VACCINATION

During the Annex C period, three vaccines were administered to protect against COVID-19: Pfizer, Moderna and J&J.[235] The terminology for COVID-19 vaccinations has expanded to include initial booster doses, as shown in **Table 4.1**.

Table 4.1: *Vaccination Terminology*

Terminology	Meaning
Not Vaccinated	No vaccinations have been administered
At Least One Dose	1 dose of Pfizer, Moderna or J&J
Initial Series Completed	2 weeks after 2 doses of Pfizer, 2 doses of Moderna or 1 dose of J&J
Received Initial Booster	2 weeks after an additional dose of Pfizer, Moderna or J&J (in addition to a completed initial series) – FDA has approved mix-and-matching, which means the booster can be a different vaccine product than the initial completed series.
Source: VHA leadership, response to data questions, 4/11/2022.	

As of March 31, 2022, more than 4 million Veterans Using VHA Services (55%) had completed an initial vaccination series.[236] Of that number, more than 2.4 million Veterans Using VHA Services were administered vaccines by VHA, and the remainder were administrated outside VHA but reported to VHA.[237] From May 1, 2021, (when vaccines became widely available) through March 31, 2022, a total of 9,297 Veterans Using VHA Services suffered from a COVID-19-associated death.[238] This number represents 43% of all COVID-19-associated deaths since vaccines became widely available.[239]

Of the Veterans Using VHA Services since October 1, 2019, a total of 54.7% are known to have completed an initial vaccination series, as of March 31, 2022; but of the Veterans who used VHA services in the last year, 63.3% are known to have completed an initial vaccination series.[240] For more details on VHA employee and Veteran vaccinations, see Appendix B. **Table 4.2** shows vaccination rates for Veteran and VHA employees.[241]

Table 4.2: *Veterans Using VHA Services and VHA Employee Vaccinations, December 14, 2020 – March 31, 2022*

		Initial Series Completed		Received Initial Booster	
		Number of Veterans	% of Population	Number of Veterans	% of Population
Veterans Using VHA Services	Administered by VHA and Outside VHA	4,005,135	54.72%	1,706,106	23.31%
	Administered by VHA	2,462,886	33.65%	1,190,092	16.26%

		Initial Series Completed		Received Initial Booster	
		Number of Veterans	% of Population	Number of Veterans	% of Population
VHA Employees	Administered by VHA and Outside VHA	333,476	86.11%	138,052	35.65%
	Administered by VHA	246,460	63.64%	132,112	34.12%

Note: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Vaccinations include those administered by VHA, self-reported vaccinations administered outside of VHA and states who signed agreements with VHA to share their COVID-19 vaccination information. Veteran vaccination counts are for Veterans Using VHA Services who have completed the initial COVID-19 vaccination series as of 3/31/2022. Completed initial vaccination series is defined as 2 weeks after receiving the second dose of either the Moderna or Pfizer COVID-19 vaccine or 2 weeks after receiving the first dose of the J&J COVID-19 vaccine. Received Initial Booster refers to people who received an initial vaccination series and an additional dose of Moderna, Pfizer or J&J COVID-19 vaccine at least 2 weeks prior to 3/31/2021. The total number of vaccinations and boosters administered to Veterans Using VHA Services does not include vaccinations for individuals vaccinated by sources outside VHA in which records were not provided to VHA. Booster may be a different COVID-19 vaccine than the initial series. Vaccination numbers may change depending on when the data is accessed because VHA may retroactively update Veterans' vaccination status.

VHA employee numbers are as of 3/31/2022, which is after VHA implemented the vaccine mandate. The VHA vaccine mandate, VHA Directive 1193.01, applies only to Title 38 and Title 5 VHA health care personnel, not all VHA employees. This data is inclusive for all VHA employees. Only paid VHA employees are included in these numbers; VISN contractors and volunteers are not included. The population data includes VHA health care personnel who have requested a reasonable accommodation vaccination exemption for religious or medical reasons. The data also includes VHA employees in a deferred status due to long-term leave or those on FMLA leave. VHA health care personnel who receive the vaccine and/or booster outside of a VHA facility are required to provide this documentation to VHA.

Source: VHA, CDW, VSSC, Veteran Vaccinations accessed on 4/5/2022; VHA, HOC, response to data call, 4/26/2022. Ref. D278

Vaccine Acceptance Among Veterans

In June 2021, the VA Veteran Experience Office (VEO) began sending two surveys to Veterans Using VHA Services to assess their experiences with the COVID-19 vaccine.[242] The first survey, COVID-19 Post Vaccination, collected feedback from vaccinated Veterans; the second survey, the COVID-19 Vaccine Acceptance Survey, collected feedback from unvaccinated Veterans.[243]

VEO captured responses for the COVID-19 Post Vaccination survey of vaccinated Veterans from June 1, 2021, through March 31, 2022.[244] In the responses from those who participated in the survey, 93.5% of Veterans responded "Agree" or "Strongly agree" to the statement: "I trust VA to deliver the COVID-19 vaccine."[245]

The survey also provided the option to select the three primary reasons why they received the vaccine.[246] Through March 31, 2022, the top three responses have remained the same:[247]

- “It’s the best way to prevent me from getting sick from COVID-19.” (82.4%)
- “It’s the best way to prevent others from getting COVID-19.” (58.9%)
- “It will contribute to ending the COVID-19 pandemic.” (42.7%)

In the COVID-19 Vaccine Acceptance Survey, which captured responses from unvaccinated Veterans from June 22, 2021, through March 31, 2022, fewer than half (40.1%) responded “Agree” or “Strongly agree” that they trusted both VA and non-VA facilities to deliver the COVID-19 vaccine.[248]

The survey also provided the option to select the three primary reasons why they may choose to get vaccinated.[249] Through March 31, 2022, the top reasons have remained the same:[250]

- “Other” (54.6%)
- “It’s the best way to prevent me from getting sick from COVID-19.” (22.4%)
- “I am required to get it.” (19.7%)

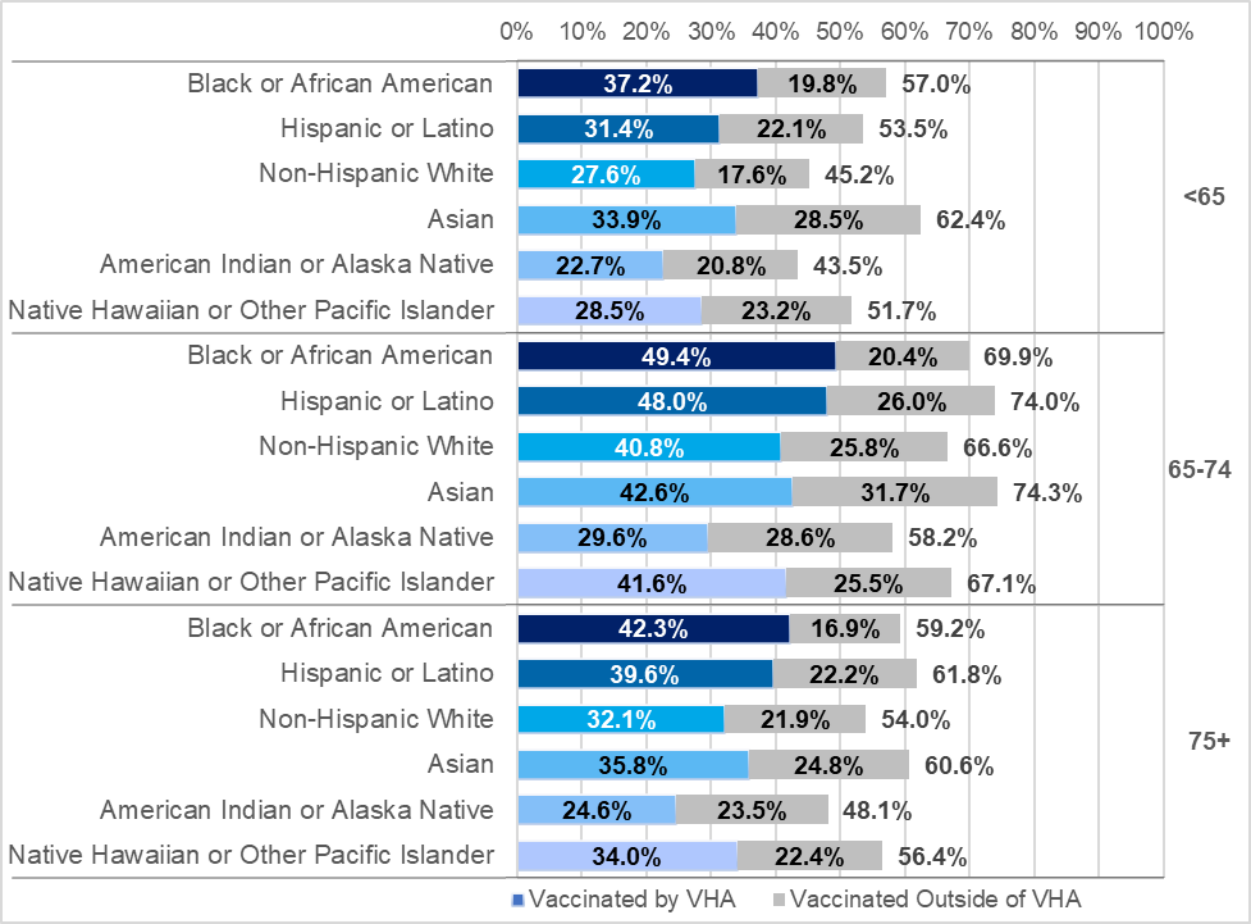
VHA leadership noted the difficulty in increasing vaccine acceptance in certain individuals and groups but continued to advise VHA clinicians to communicate with Veterans during their regularly scheduled appointments, encouraging them to receive the vaccine and alleviate any concerns they may have.[251]

Vaccination Acceptance by Race and Ethnicity

As of March 31, 2022, among Veterans Using VHA Services since October 1, 2019, Asian Veterans had the highest vaccination rates (64.1%), followed by Black or African American Veterans and Hispanic or Latino Veterans (60.6% and 59.0, respectively).[252]

Non-Hispanic White Veterans and AIAN Veterans had lower vaccination rates (53.9% and 48.3%, respectively) compared to the other racial/ethnic groups shown in **Figure 4.1**; this pattern holds for each age group.[253] Some AIAN Veterans Using VHA Services may have received vaccinations through Indian Health Service (IHS) rather than VHA, and these vaccinations were known to VHA only if they were reported to VHA.[254]

Figure 4.1: *Veteran Vaccination Rate by Age Groups and Race and Ethnicity, December 14, 2020 - March 31, 2022*



Note: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Vaccinations include those administered by VHA, self-reported vaccinations administered outside of VHA and states who signed agreements with VHA to share their COVID-19 vaccination information. Veteran vaccination counts are for Veterans Using VHA Services who have completed the initial COVID-19 vaccination series as of 3/31/2022. Completed initial vaccination series is defined as 2 weeks after receiving the second dose of either the Moderna or Pfizer COVID-19 vaccine or 2 weeks after receiving the first dose of the J&J COVID-19 vaccine. Vaccination numbers may change depending on when the data is accessed because VHA may retroactively update Veterans' vaccination status. Totals may not add due to rounding.

Source: VHA, CDW, VSSC, accessed 4/5/2022. Ref. D278

Like Veterans Using VHA Services, Asian U.S. residents had the highest vaccination rates (60.6%) across racial/ethnic groups, as of March 31, 2022.[255] However, the pattern is different between other racial/ethnic groups when comparing the Veterans Using VHA Services population to the general U.S. population.[256] In the general U.S. population, AIAN U.S. residents have the second-highest vaccination rate (59.6%), and Black or African American U.S. residents have the lowest vaccination rate (41.5%).[257]

Throughout the Annex C period, VHA continued its efforts to increase vaccination acceptance among Veterans of color through a series of targeted communications that included various videos, FAQs, posters and brochures, as shown in **Figure 4.2.**[258]

Figure 4.2: *Sample VHA Communication to Veterans of Color*

Source: VHA, VA Minority Outreach for COVID-19 Working Group, "Results and Participation Feedback," 9/24/2021.

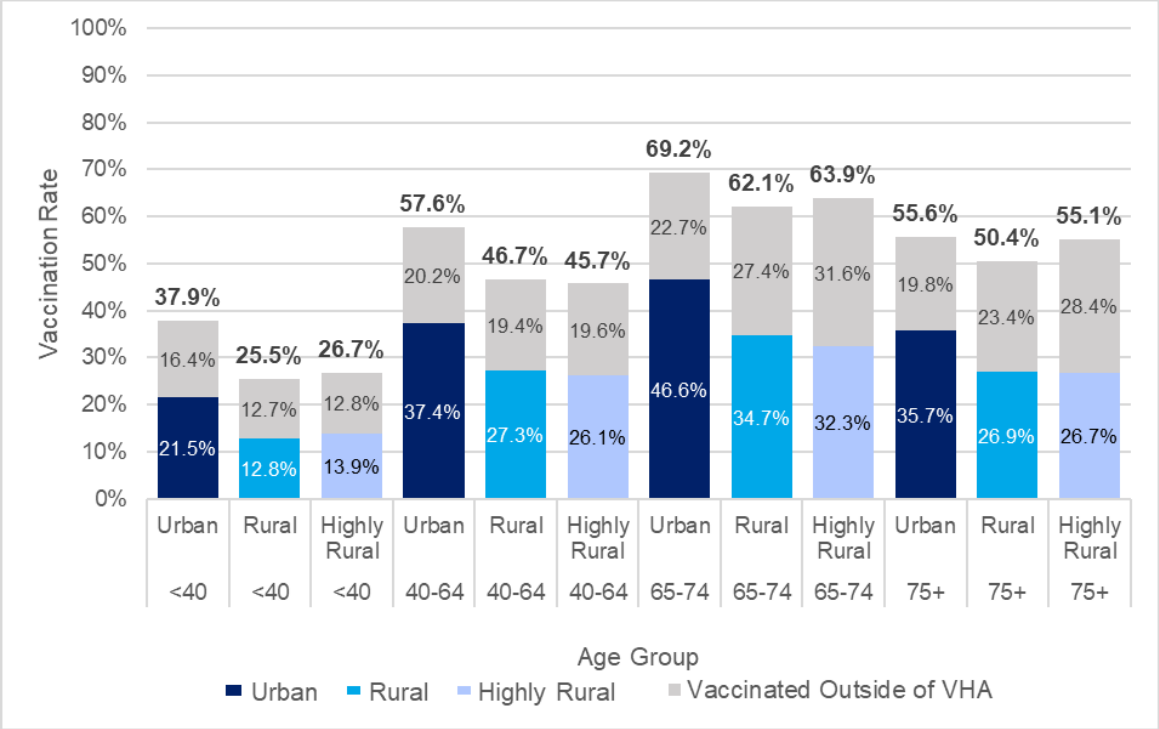
Rural Veteran Vaccination

In the Annex C review period, as in the Annex B review period, the vaccination rate for rural Veterans Using VHA Services was lower than urban Veterans Using VHA Services.[259] VHA classifies geographic areas using the Rural Urban Commuting Area (RUCA) system, which consists of 33 tiers.[260] VHA consolidates these tiers into Urban, Rural, Highly Rural, Insular Island and Unknown.[261]

A total of 33.6% of Veterans Using VHA Services since October 1, 2019, live in rural or highly rural areas, according to VHA data.[262] As of March 31, 2022, 49.9% of rural Veterans Using VHA Services and 53.7% of highly rural Veterans Using VHA Services had completed their initial vaccination series, compared to 56.8% of urban Veterans Using VHA Services.[263] During the Annex C period, the number of rural and highly rural Veterans Using VHA Services who completed their initial vaccination series increased by 6.0% and 3.9%, respectively.[264] For urban Veterans Using VHA Services, initial vaccination rates increased by 7.6%.[265]

Vaccination rates for Veterans Using VHA Services have a smaller disparity between rural/non-metropolitan and urban/metropolitan residents than the general U.S. population.[266] CDC classifies metropolitan and non-metropolitan areas using the National Center for Health Statistics (NCHS) urban-rural classification.[267] According to CDC metropolitan and non-metropolitan data, COVID-19 vaccination rates (completed initial series) in non-metropolitan areas was 10% lower than in metropolitan areas (52.7% and 62.7%, respectively).[268] Among Veterans Using VHA Services, the difference in vaccination rates between rural and urban Veterans is closer than the general population; rural Veterans lag urban Veterans by 6.9%, and highly rural Veterans lag urban Veterans by 3.1%.[269] The pattern of lower vaccination rates for rural and highly rural Veterans compared to urban Veterans holds for each of four primary age groups, as seen in **Figure 4.3**.[270]

Figure 4.3: *Veterans Using VHA Services, Vaccinations by Rurality and Age Group December 14, 2020 – March 31, 2022*



Notes: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Vaccinations include those administered by VHA, self-reported vaccinations administered outside VHA and states who signed agreements with VHA to share their COVID-19 vaccination information. Veteran vaccination counts are for Veterans Using VHA Services who have completed the initial COVID-19 vaccination series as of 3/31/2022. Completed initial vaccination series is defined as 2 weeks after receiving the second dose of either the Moderna or Pfizer vaccine or 2 weeks after receiving the first dose of the J&J COVID-19 vaccine. Vaccination numbers may change depending on when the data is accessed because VHA may retroactively update Veterans' vaccination status. Rurality is based on the RUCA system, which consists of 33 tiers. VHA further consolidates the tiers into Urban, Rural, Insular Islands, Highly Rural and Unknown. Highly Rural is defined as a sparsely populated census tract with less than 10% of the working population commuting to an urbanized cluster community. Urban is defined as at least 30% of the population residing in an urbanized area

as defined by the Census Bureau. Insular Islands include the U.S. Virgin Islands, Guam, American Samoa and the Northern Mariana Islands. Rural is defined as all other land areas.

Source: VHA, CDW, VSSC, accessed 4/5/2022. Ref. D278

The Data Challenge

VHA leadership reported that many Veterans may have been vaccinated at their local pharmacy, doctor's office or other local facility, but that data was not shared with VHA.[271] If a Veteran is vaccinated outside of a VHA facility, and the vaccination information is not shared with VHA, VHA cannot have clarity as to the true extent of the vaccination rates in the Veteran population.[272]

Some VISNs entered into agreements with state agencies that allowed their COVID-19 vaccination data to be shared, but these agreements were not wide-spread.[273] In most cases, the primary way VHA captured a Veteran's outside vaccination status was from the Veterans themselves.[274] As a result, VHA has an incomplete dataset of vaccinated Veterans throughout the United States, which made it challenging to assess the effectiveness of VHA's vaccination campaign.[275]

This nurse, once a refugee from Kosovo, works at the New York Harbor VAMC. Recently, she vaccinated a Veteran who served in former Yugoslavia. As she said, "I really felt like I was giving back to the soldiers who saved my life, my family's life, 23 years ago." (VHA photo)

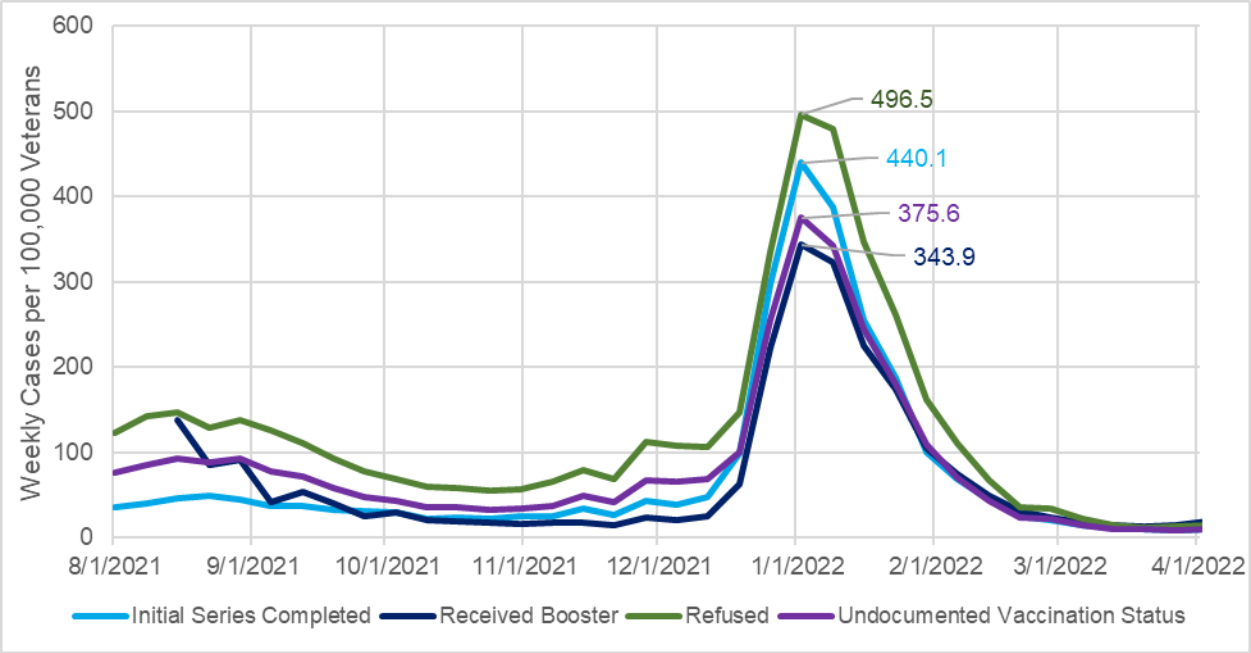
HHS is currently developing a system called the Immunization Gateway—a data exchange hub that will share immunization information between state Immunization Information Systems (IIS) and the Federal government.[276] Once operational, this system will allow VA and other Federal agencies to obtain an individual's full vaccination history.[277]

Post-vaccination Infection

During the Delta and Omicron waves, Veterans Using VHA Services who refused vaccinations were infected with COVID-19 at higher rates than those who completed an initial vaccination series, as shown in **Figure 4.4**.[278] Veterans Using VHA Services who had received a booster had lower rates of confirmed COVID-19 compared to Veterans with other vaccination statuses.[279]

Because vaccines do not offer 100% protection from infection, there will always be instances when someone will become infected with COVID-19 even though they have completed an initial vaccination series and received an initial booster dose.[280] These post-vaccination infections—also called breakthrough infections—occur when an individual who has completed their initial vaccination series becomes infected 14 or more days after receiving all recommended doses of 1 of the 3 authorized vaccines.[281]

Figure 4.4: *New Weekly Confirmed COVID-19 Cases in Veterans by Vaccination Status (August 1, 2021 – April 1, 2022)*



Notes: Veterans Receiving Care: Veterans who have received care through a VA facility in the past 12 months plus all Veterans who had received a vaccination since December 2020. A total of 79.6% of this cohort has a record of vaccination or documentation of refusal. Incident Infection: the first documented infection in the VA

record. Note that this may not always be the first infection and that the VA record may not contain all infections. Refusal: The refused designation is captured by facilities based on encounters with and outreach to Veterans. If a Veteran refused, but also has a vaccination recorded, they are not counted as refused. Rates are calculated based on the population of 6.3 million Veterans Receiving Care, for which 20.4% do not have either a vaccination record or refusal documented. The booster dose begins on August 15, 2021, which reflects the date when more than 1,000 Veterans had received a booster or additional dose. Caveats for this data include the following: (1) increasing frequency of unreported self-diagnosis late in the Annex C review period as home testing kits became more available and (2) waning immunity to infection as the period progressed among predominantly high-risk individuals after six months post-vaccination.

Source: VHA, Office of Analytics and Performance Integration, BASIC Program, response to data call, 4/25/2022. Ref. D278

During the Annex C period, VHA was conducting an analysis of post-vaccination infections, hospitalizations and deaths from COVID-19; the analysis was still ongoing as of the end of the period.[282] VHA leaders explained that since self-testing became more prominent during the Omicron wave, it is likely that more COVID-19 cases were self-diagnosed.[283] The increase in self-diagnosed cases may have increased as the availability of self-test kits improved during the Omicron wave, which would increase the gap between total cases and confirmed cases.[284] This gap almost certainly expanded during the Omicron wave, impeding the ability to calculate and compare the actual rate of post-vaccination infections to the infection rate of unvaccinated Veterans and to track those changes over time.[285]

Even with these data challenges, CDC has continued to emphasize that vaccines provide strong protection against severe illness, hospitalization and death.[286]

Vaccine Boosters

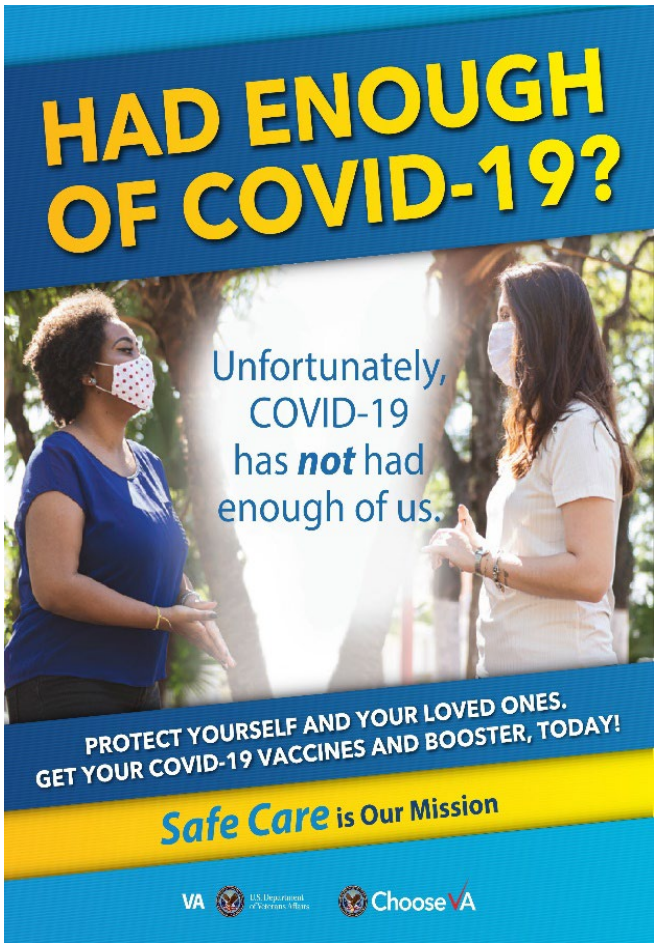
VHA leaders stated that, as with previous FDA authorizations, they were made aware ahead of time that booster doses were being considered for authorization.[287] This advance notice enabled VHA to prepare the necessary guidance and operational response to administer booster doses prior to the booster authorization going into effect.[288]

Within hours of booster doses receiving FDA authorization, VHA had communicated this change in guidance to VHA facility Vaccine Coordinators. [289] At the same time, VHA was also working on various communications products, including press releases, social media posts and flyers—like the one in **Figure 4.5**—for VHA facilities to distribute, informing them of the new FDA and CDC recommendation for booster doses.[290]

VHA engaged with multiple external stakeholder groups, including Veteran service organizations, informing them of the recommendation for booster doses and

requesting their help in disseminating relevant booster information and messaging to Veterans in their organizations.[291]

Figure 4.5: *Sample VHA Communication about Booster Doses*



Source: VHA, Veteran Booster Toolkit, "COVID Hasn't Had Enough of Us."

VHA was able to draw from a series of best practices and processes developed from previous phases of the pandemic to streamline the administration of booster doses throughout the network.[292]

At the end of the Annex C reporting period, more than 23% of Veterans Using VHA Services had received an initial booster dose.[293] Although booster doses were not required by the VHA vaccine mandate, nearly 36% of the VHA workforce received boosters.[294]

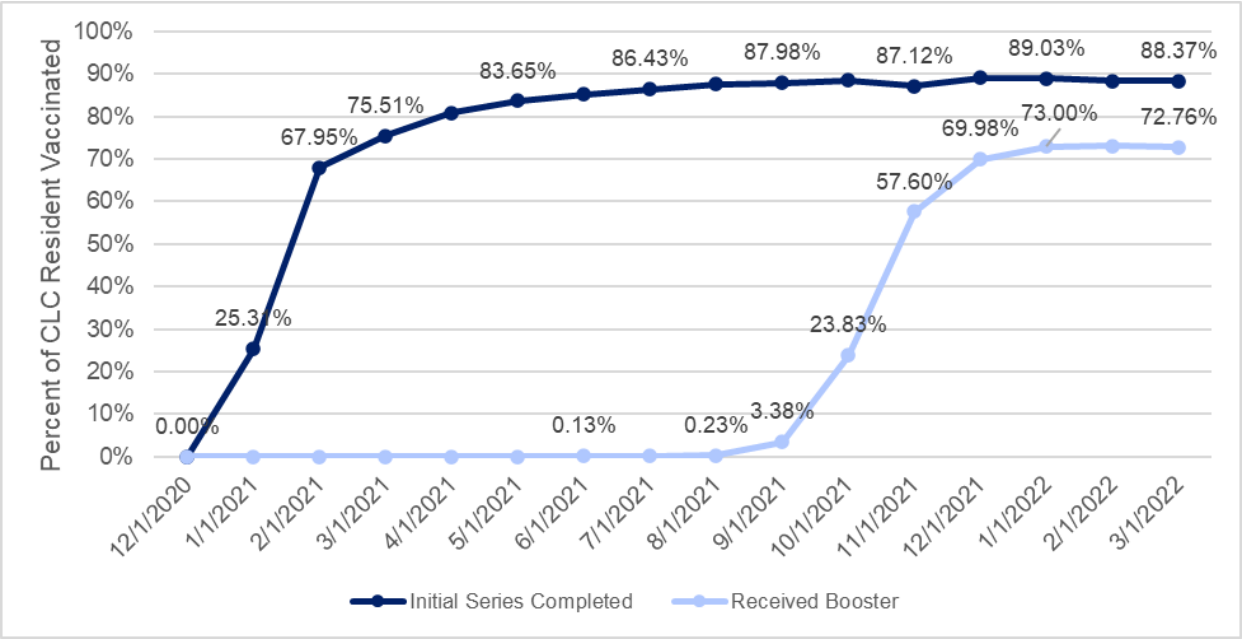
Community Living Centers

CLCs are VA nursing homes that provide residential health care and services for eligible Veterans.[295] VHA's effectiveness in vaccinating CLC residents was

recognized by the White House, which subsequently reached out to VHA to obtain a series of best practices, which the White House shared with privately run nursing homes and State Veterans Homes (SVHs).[296]

By March 2022, VHA had administered initial booster doses to nearly 73% of CLC residents, as shown in **Figure 4.6**.[297]

Figure 4.6: *Vaccinated and Boosted Residents of CLCs (12/1/2020 – 3/1/2022)*



Note: Each datapoint is the period's snapshot of the current CLC residents and the percentage vaccinated.

Source: VHA, CDW, NST Dataset, accessed 4/6/2022. Ref. D261

VHA Vaccine Mandate

On September 9, 2021, the President of the United States signed EO 14043, requiring all Federal employees to be vaccinated for COVID-19 by November 22, 2021.[298] This EO expanded VHA Directive 1193, which required vaccinations for VHA health care employees (first released in July 2021).[299]

On October 4, 2021, as required by EO 14043, VA issued VA Notice 22-01, ordering all VA employees to be vaccinated or seek medical or religious exemptions.[300] The notice also outlined the procedures and processes for relevant staff to implement the mandate and adjudicate reasonable accommodation requests for exemptions.[301]

Data from the VHA Office of Workforce Management and Consulting (WMC) show that as of April 8, 2022, a total of 355,438 of the 370,661 VHA health care workers (95.9%) had submitted their vaccination status to VHA, and 10,566 were granted

Deferred status (2.9%) and had not submitted their vaccination status due to long-term leave or Family and Medical Leave Act (FMLA) leave.[302]

Of the 355,438 VHA health care personnel who had submitted their vaccination status, 34,687 (10%) requested a reasonable accommodation vaccine exemption, 27,847 of which were Under Supervisor Review, and 5,690 were approved.[303] WMC data also showed that 1,077 VHA employees received written counseling about their vaccination status, 10 were suspended, and 5 were terminated from Federal service due to non-compliance with the vaccination policy.[304]

When comparing overall reasonable accommodation request rates for the COVID-19 vaccine with the influenza vaccine, VHA leadership stated that 54% of the VHA personnel who requested a COVID-19 reasonable accommodation did not request one for their last annual influenza vaccine.[305]

This difference was driven primarily by requests for religious accommodation.[306] For medical reasonable accommodation requests, approximately 1% of employees requested an accommodation for both COVID-19 and the influenza vaccine.[307] However, when comparing the data for religious reasonable accommodation requests for the COVID-19 vaccine and influenza vaccine, those requests more than doubled, from 5.0% for the influenza vaccine to 10.8% for the COVID-19 vaccine.[308]

Communicating the Mandate

To communicate the vaccine mandate to VHA personnel, VHA consulted with numerous VHA stakeholder groups to develop messaging, communications plans and frequently asked questions to distribute to their staffs.[309]

WMC communicated guidance to VHA facility leadership and VHA human resource offices on the processes and expectations for enforcement of the VHA vaccine mandate, along with how to appropriately record and document enforcement action.[310]

In addressing non-compliant personnel, supervisors were instructed to first issue standard counseling, followed by suspension and then separation from Federal service.[311] However, VHA supervisors were granted flexibility to take into account specific circumstances as they determined the appropriate level of disciplinary action due to non-compliance.[312]

Tracking the Mandate

VHA supervisors were charged with documenting enforcement actions due to non-compliance in the VHA Automated Labor and Employee Relations Tracker

(ALERT-HR) system, a centralized database that tracks enforcement mechanisms and disciplinary action due to non-compliance with the VHA vaccine mandate.[313]

During the holiday season of 2021, VHA paused enforcement of the vaccine mandate through early January 2022 when enforcement resumed.[314] A court issued a nationwide injunction on EO 14043 on January 21, 2022, that effectively paused the vaccination mandate for all Federal employees.[315]

The following Monday, January 27, 2021, the VA Secretary released an update to VHA Directive 1193 (VHA Directive 1193.01), stating that although the court's injunction paused the vaccine mandate for non-VHA Federal employees, it did not affect the VA Secretary's order for VHA health care personnel.[316]

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RESEARCH AND INNOVATION

Throughout the Annex C review period, VHA offices, including the Office of Research and Development (ORD) and the Office of Healthcare Innovation and Learning (OHIL), continued efforts to lead and advance the medical field through research and innovative scholarship.[317] VHA also participated in and produced new research through national and international studies, published articles and clinical and therapeutic trials.[318] VHA maintained partnerships with Federal organizations—including CDC, FDA, NIH and DoD—to support the advancement of research related to COVID-19.[319]

This section describes COVID-19-related efforts and advancements in research and innovation conducted at VAMCs and research sites during the Annex C review period from August 1, 2021, through March 31, 2022.

Research Advances

From August 1, 2021, through March 31, 2022, VHA conducted the following research activities:[320]

- Collaborated on 735 published studies related to COVID-19
- Initiated 6 new COVID-19 research studies across 16 VHA sites (including 2 led by VHA and 4 in which VHA participated and provided support)
- Continued participation in clinical vaccine trials and therapeutic trials
- Submitted one new trial to the International Review Board (IRB)

Active Clinical Trials

As of April 15, 2021—approximately a year ago—more than 57,800 Veterans had volunteered to participate in VHA clinical trials.[321] Of that number, 23% were members of racial and ethnic minority groups, and 18% were female.[322] VHA encourages diversity in its volunteers because diversity in trials makes the findings relevant to more people.[323] In general, clinical research indicates that disease patterns and responses to medical treatment can differ among racial and ethnic ancestral groups.[324] As the medical and scientific community are informed by research, a diverse representation of participants in medical research studies and trials is necessary to develop a complete understanding of health and disease.[325]

VHA continued its participation in three clinical trials of COVID-19 vaccines, as shown in **Table 5.1**.[326] These trials, their phases and their estimated primary completion dates are detailed below.

Table 5.1: *Ongoing Clinical Trials for COVID-19 Vaccines, August 1, 2021 - March 31, 2022*

Name of Product	Trial Phase	Partner Organization	Description and Trial Status	Estimated Primary Completion Date
Ad26.COV2.S	III	Janssen	Prevention of COVID-19 in adults 18 and older **Status**: Active	1/2/2023
mRNA-1273 (Moderna)	III	Moderna	Prevention of COVID-19 in adults 18 and older, up to two years after the second dose **Status**: Active	10/27/2022
SARS-CoV 2rS with Matrix-M1 Adjuvant	III	Novavax	Prevention of COVID-19 **Status**: Active	6/30/2023
Source: VHA ORD, response to questionnaire, 3/24/2022.				

During the Annex C review period, VHA initiated 2 new therapeutic trials, and continued progress on 8 previously initiated trials.[327] **Table 5.2** displays selected therapeutic trials focused on COVID-19 that were active during the Annex C review period.

Table 5.2: *Summary of Selected COVID-19 Therapeutic Trials, August 1, 2021 – March 31, 2022*

Name of Product	Trial Phase	Sponsor/ Funding Type	Description and Trial Status
Nitrazoxanide (NTZ)	III	Romark Medical Institute/ Private	Post-exposure prophylaxis in patients with COVID-19 and other respiratory illnesses in elderly residents of long-term-care facilities. **Status**: Study completed – analyzing data
Nitrazoxanide (NTZ) 2	III	Romark Medical Institute/ Private	Post-exposure prophylaxis in patients with COVID-19 and other respiratory illnesses in health care workers. **Status**: Study completed – analyzing data
Ramipril	III	UC San Diego/ Academic	Prevention of ICU admission, mechanical ventilation or death in persons with COVID-19 **Status**: Study completed – analyzing data
hIVIG	III	NIH/Agency Collaboration	Treatment of hospitalized adult patients at onset of clinical progression of COVID-19 **Status**: Active – recruiting volunteers for the trial

Name of Product	Trial Phase	Sponsor/ Funding Type	Description and Trial Status
Baricitinib Tocilizumab (TCZ)	III	Genentech/ Private	Treatment of hospitalized patients with COVID-19 pneumonia. **Status**: Complete
Leronlimab (PRO 140)	III	CytoDyn/ Private	Treatment of patients with severe or critical COVID-19 **Status**: Active – Enrollment Complete
ACTIV-2 (multiple)	III	NIH/Agency Collaboration	Treatment of COVID-19 in outpatients looking at the safety and effectiveness of different drugs under a master protocol. **Status:** Active – recruiting volunteers for the trial
ACTIV-3 (multiple)	III	NIH/Agency Collaboration	Study on safety and effectiveness of different drugs in treating COVID-19 in people who have been hospitalized with the infection. Treatments involve study drug plus current standard of care (SOC), or with placebo plus current SOC. **Status**: Active – recruiting volunteers for the trial.
ACTIV-4a (multiple)	III	NIH/Agency Collaboration	A Multicenter, Adaptive, Randomized Controlled Platform Trial of the Safety and Efficacy of Antithrombotic and Additional Strategies in Hospitalized Adults With COVID-19 **Status:** In submission: WCG IRB
OTAC	III	University of Minnesota/ NIH/Agency Collaboration	Treatment of adult outpatients in early stages of COVID-19 **Status:** Active – recruiting volunteers for the trial

Note: ACTIV-4a is not shown in an active trial phase because it was in IRB review for approval during the reporting period.
Source: VHA ORD, response to questionnaire, 3/24/2022; VHA, ORD, response to questionnaire, 8/19/2021; ClinicalTrials.gov, "ACTIV-4a" https://clinicaltrials.gov/ct2/results?cond=&term=ACTIV-4a&cntry=&state=&city=&dist= accessed 5/3/2022; VHA, data response, 6/2/2022; ClinicalTrials.gov, "OTAC," https://clinicaltrials.gov/ct2/show/NCT04910269?term=OTAC&draw=2&rank=1, accessed 6/2/2022; VHA, vetting response, 5/16/2022. Ref. D408

Select VHA COVID-19 research papers are listed in **Table 5.3**. The papers are organized by topic: disruptions to care, Long COVID, health equity and vaccinations.

Table 5.3: *Select VA Research Papers related to COVID-19, August 1, 2021 - March 31, 2022*

Topic: Disruptions to Care

Research Article Title	Publication Information
Type 2 Diabetes Management, Control and Outcomes During the COVID-19 Pandemic in Older US Veterans: An Observational Study	J Gen Intern Med. 2022;37(4):870-877. doi:10.1007/s11606-021-07301-7
Patient and Provider Predictors of Telemental Health Use Prior to and during the COVID-19 Pandemic within the Department of Veterans Affairs	The American Psychologist. 2021 Dec 23.
Implementation of Telehealth Services at the US Department of Veterans Affairs During the COVID-19 Pandemic: Mixed Methods Study	JMIR formative research. 2021 Sep 23; 5(9):e29429.
Impact of the COVID-19 pandemic on diagnosis of new cancers: A national multicenter study of the Veterans Affairs Healthcare System	Cancer. 2022;128(5):1048-1056. doi:10.1002/cncr.34011
County-Level Impact of the COVID-19 Pandemic on Excess Mortality Among U.S. Veterans: A Population-Based Study	Lancet Reg Health Am. 2022;5:100093. doi:10.1016/j.lana.2021.100093
Barriers and Facilitators to Buprenorphine Prescribing for Opioid Use Disorder in the Veterans Health Administration During COVID-19	Journal of Addiction Medicine. 2021 Sep 1; 15(5):439-440.
Assessment of Changes in US Veterans Health Administration Care Delivery Methods During the COVID-19 Pandemic	JAMA Network Open. 2021 Oct 1; 4(10):e2129139.
Source: VHA ORD, response to vetting, 5/27/2022. Ref. D407	

Topic: Long COVID

Research Article Title	Publication Information
Long-Term Cardiovascular Outcomes of COVID-19	Nat Med 28, 583–590 (2022). https://doi.org/10.1038/s41591-022-01689-3
Risks of Mental Health Outcomes in People with COVID-19: Cohort Study	BMJ 2022; 376 :e068993 doi:10.1136/bmj-2021-068993
Risks and Burdens of Incident Diabetes in Long COVID: A Cohort Study	Lancet Diabetes Endocrinol. 2022 May;10(5):311-321. doi: 10.1016/S2213-8587(22)00044-4. Epub 2022 Mar 21. PMID: 35325624; PMCID: PMC8937253.
Burdens of Post-Acute Sequelae of COVID-19 by Severity of Acute Infection, Demographics and Health Status	Nat Commun. 2021 Nov 12;12(1):6571. doi: 10.1038/s41467-021-26513-3. PMID: 34772922; PMCID: PMC8589966.

Research Article Title	Publication Information
Kidney Outcomes in Long COVID	J Am Soc Nephrol. 2021 Nov;32(11):2851-2862. doi: 10.1681/ASN.2021060734. Epub 2021 Sep 1. PMID: 34470828.
High-Dimensional Characterization of Post-Acute Sequelae of COVID-19	Nature. 2021 Jun;594(7862):259-264. doi: 10.1038/s41586-021-03553-9. Epub 2021 Apr 22.
Source: VHA ORD, response to vetting, 5/27/2022. Ref. D407	

Topic: Health Equity

Research Article Title	Publication Information
Researchers Should Consider How Disparities Change Over Time and Space: Lessons from the COVID-19 Pandemic	NAM perspectives. 2021 Sep 8; 2021.
Changes in the Associations of Race and Rurality with SARS-CoV-2 Infection, Mortality, and Case Fatality in the United States from February 2020 to March 2021: A Population-based Cohort Study	PLoS Med. 2021 Oct 21;18(10):e1003807. doi: 10.1371/journal.pmed.1003807. PMID: 34673772
Source: VHA ORD, response to vetting, 5/27/2022. Ref. D407	

Topic: Vaccination

Research Article Title	Publication Information
Comparison of Moderna versus Pfizer-BioNTech COVID-19 Vaccine Outcomes: A Target Trial Emulation Study in the U.S. Veterans Affairs Healthcare System.	EClinicalMedicine. 2022 Mar 5;45:101326. doi: 10.1016/j.eclinm.2022.101326. PMID: 35261970; PMCID: PMC8896984.
Source: VHA ORD, response to vetting, 5/27/2022. Ref. D407	

Emerging Research Interests

VHA leadership reported that during the Annex C review period, an interdisciplinary team (which included a Presidential Innovation Fellow) engaged in research about Long COVID.[328] The team interviewed Veterans and medical facility personnel to better understand Long COVID.[329] As of March 31, 2022, 18 of 170 VAMCs were providing clinical services focused on Long COVID.[330]

VHA leadership reported that during the Annex C period, VHA increased its research on staff burnout.[331] In partnership with the National Academy of Medicine, VHA is preparing to study the effects of the pandemic on health care workers.[332] Some of the driving forces behind VHA's interest in this topic included the highly competitive health care job market and VHA's increased turnover rate in nursing.[333]

Research Partnerships

VHA leadership emphasized the importance of collaboration between health care organizations and public health organizations, including the sharing of data.[334] Through these partnerships, organizations will be better able to remain up to date in operations standards, identify authorities and enhance preparedness to face the unique challenges of an extended public health emergency.[335]

VHA leadership reported that its COVID-19 research response has been a coordinated effort in which research teams were organized and assembled based on areas of expertise.[336] The six new studies related to COVID-19 initiated during the Annex C review period were conducted in partnership with national and Federal public health organizations, including FDA and NIH.[337] VHA also continued its partnership with CDC to maintain progress on ongoing studies reported in the Annex B period.[338]

VHA also continued its collaboration with DoD, maintaining an observational study called Epidemiology, Immunology and Clinical Characteristics of COVID-19 (EPIC^3).[339] This study is focused on the treatment, prevention, clinical outcomes and development of immunity by observing Veterans who received the COVID-19 vaccine.[340] VHA leadership reported that this study is still in progress and that it saw an increase in participants during the Omicron wave.[341]

Additionally, VHA leadership introduced a new research partnership with the Biomedical Advanced Research and Development Authority (BARDA) to examine COVID-19 treatment effectiveness over time—for example, between the Delta and Omicron variant stages of the virus.[342]

Interagency Partnerships

As of March 31, 2022, VHA was working to establish a newer approach to interagency partnership and collaboration, placing a greater emphasis on acknowledging and collaborating with other relevant groups, stakeholders and partners when integrating VHA research and clinical services.[343]

VHA developed and supported interagency partnerships during the Annex C period, including a new task force called the Pandemic Innovations Task (PIT) Force.[344] PIT Force efforts identify and discuss lessons learned from the COVID-19 pandemic, along with possible research and clinical topics.[345] VHA leadership stated that this new practice and approach to communication and partnership will be a good model for operations to handle other disease areas and potential crises.[346]

Looking to the Future

Innovations

During the Annex C period, VHA leadership began to shift its innovation focus away from individual products and technology and toward VHA capabilities and capacity, especially regarding market disruption challenges.[347] For example, VHA invested in 3D-printing technology to build VHA capacity and capabilities.[348] During the Annex C period, 3D printing of medical products lessened the impact of supply shortages for VHA.[349]

Onsite manufacturing of medical products through 3D printing may allow faster access to medical products, decreasing the need for traditional supply chain mobilization.[350] VHA leadership reported that the innovation team also made progress in point-of-care (hospital-based) manufacturing.[351]

Point-of-care Manufacturing

During the Annex C review period, VHA's three FDA-registered sites completed training under Good Manufacturing Practice (GMP) certification standards.[352] All three sites fully implemented the quality record and management system under that certification for medical device manufacturing.[353] Additionally, VHA leadership reported that four more VHA sites were becoming medical device manufacturing sites through the same process.[354]

Also during the Annex C period, VHA registered a 3D-printed diagnostic swab with FDA.[355] The swab is the first class-one medical device created by VHA, and the first to produce revenue for VHA.[356] As of March 31, 2022, VHA had produced up to 1,500 of these diagnostic swabs, which were distributed across the country.[357]

To register this diagnostic swab, VHA filed its first 510(k) clearance application, which was approximately 1,600 pages long.[358] Section 510(k) of the Food, Drug, and Cosmetic Act requires a 90-day advance notification from medical device manufacturers that they intend to commercially distribute a new device for the first time.[359] The 501(k) premarketing submission is made to FDA to demonstrate the safety and efficacy of the proposed device for market, and to demonstrate that it is Substantially Equivalent to a device that is already legally marketed.[360] Having a 510(k) clearance means that the new device can be marketed.[361]

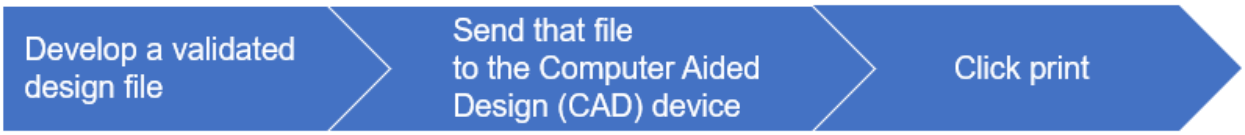
VHA also patented the design file for a 3D-printable paper hood—a type of PPE.[362] VHA filed a non-provisional patent for this device and then sourced a commercial partner to produce them at scale.[363] These paper hoods were freely distributed across the world, including a large quantity shipped to India.[364]

VHA leadership reported that other medical device cases are in progress.[365] The organization plans to submit 5 to 10 cases by June 2022.[366]

Digital Stockpiling

Point-of-care 3D manufacturing can advance VHA's supply chain resilience and curb costs by building a digital stockpile of medical supplies.[367] A digital stockpile of usable, non-expiring medical supplies would have a low cost for VHA.[368] The process of creating digital material is a simple one.[369] VHA leadership reported that medical devices could be printed in a few steps, as shown in **Figure 5.1**.[370]

Figure 5.1: *3D Printing Process for Medical Devices*



Source: VHA leadership, Interview #8, timestamp: 35:53, 3/22/2022.

VHA leadership reported that digital stockpiling is valuable for emergency preparedness and response for COVID-19, as well as other potential disasters.[371] In an emergency, VHA could connect with or move 3D printers to a disaster site to print needed supplies.[372]

VHA plans to continue working closely with FDA to advance the ability to create usable medical products from raw materials.[373] VHA is developing a plan and process to create a stand-alone office for advanced manufacturing.[374]

Shifting Focus

Since the start of the pandemic, much of VHA's research resources have been devoted to COVID-19.[375] As of March 31, 2022, VHA was starting to shift its focus back to previous pre-pandemic research efforts.[376]

VHA leadership identified a number of topics, including the following:[377]

- Precision oncology
- Traumatic brain injury and brain health research

The White House identified additional topics of importance, including rare cancers and military exposure, which VHA is working on.[378] VHA leadership emphasized the importance of maintaining telehealth and virtual care advances, even as focuses shift.[379]

HEALTH EQUITY

Many of the health equity issues VHA discussed in Annex B continued to be relevant from August 1, 2021, through March 31, 2022.[380] VHA worked to address these challenges throughout the period.[381] In addition, VHA began to return more of its attention to pre-pandemic health equity priorities while also maintaining pandemic services to Veterans.[382]

VA Health Equity Statistics

During the Annex C period, VHA conducted a new COVID-19 health equities analysis. The purpose of the analysis was to understand whether Veterans Using VHA Services have experienced COVID-19 disparities—in terms of COVID-19 infection and COVID-19 population mortality risk—across racial and ethnic groups and how those disparities have changed over the course of the pandemic after adjusting for age, gender and rurality.

Methodology

The population and variable data points for Veterans Using VHA Services were captured from the Corporate Data Warehouse (CDW) and included Veterans who used VHA services pre-pandemic from January 1, 2018, through December 31, 2019, and were alive as of January 1, 2020. Data was collected for both COVID-19 and non-COVID-19 services. The test results included VHA-lab COVID-19 testing inside VHA, VHA-ordered outside testing and verified test results reported to VHA. Veterans with multiple positive case records were counted only once.

The analysis excluded the following:

- VA Veteran Employees
- Veterans who only had records for workload that are not encounters, but rather are administrative and not related directly to delivery of care
- Veterans whose rurality was unknown or who resided on one of the Insular Islands
- Veterans whose age was identified as 0 to 17 years old
- Veteran records missing age, gender or race and ethnicity values

Models were run to understand the effect of race and ethnicity and rurality on the likelihood of risk of infection and COVID-19-associated death among Veterans Using VHA Services. Models analyzed the age group, rurality, gender and race/ethnicity of patients who tested positive for COVID-19 and had a COVID-19-associated death. Each variable of interest was tested to identify significant differences.

The analysis included changes in risk over the course of the pandemic, stratified by key U.S. pandemic phases. The phases included:

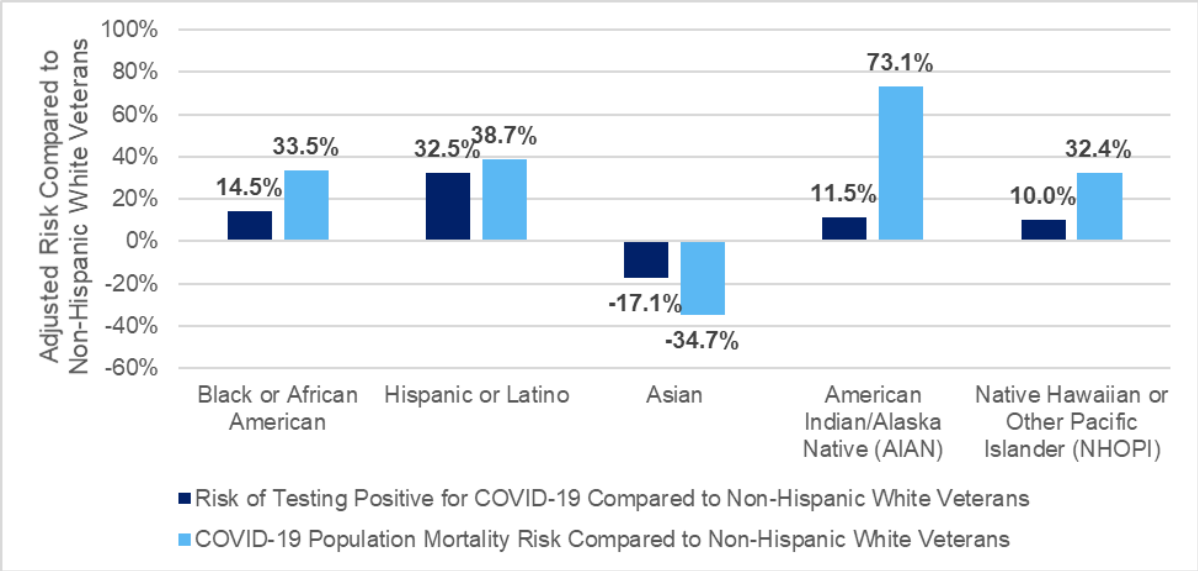
- March – May 2020 (early pandemic)
- June – August 2020 (summer 2020 wave)
- September 2020 – February 2021 (fall 2020 – winter 2021 wave)
- March – June 2021 (spring 2021 wave)
- July – November 2021 (Delta wave)
- December 2021 – March 2022 (Omicron wave)

Studies conducted earlier in the pandemic found that disparities in infection, population mortality and case fatality risks across racial and ethnic groups fluctuated.[383] For example, one study looking at changes in disparities over time found that in the first year of the pandemic (March 2020 through March 2021), Black Veterans had four times the risk of population mortality compared to White Veterans; however, the difference was no longer statistically significant by November 2020.[384]

Analysis Results

Results of the analysis showed that Veterans of several minority racial and ethnic groups had increased risk for COVID-19 infection and population mortality in comparison to non-Hispanic White Veterans over the course of the pandemic, as shown in **Figure 6.1**.

Figure 6.1: *Adjusted Relative Risk for Testing Positive and COVID-19-associated Death Among Veterans Using VHA Services, by Race and Ethnicity, March 1, 2020 – March 31, 2022*



Note: Adjusted and unadjusted multivariable Poisson regressions were used to assess the risk of testing positive and mortality among different race and ethnicity groups during the pandemic. The variables in the model included age group, rurality, gender and race/ethnicity. The results are reported with Relative Risk calculated from the regression coefficients and the test statistics for significance (Chi-Square and p-values). The population of Veterans Using VHA Services was captured from the CDW database included Veterans who used VHA Services pre-pandemic between January 1, 2018, through December 31, 2019, and were alive as of January 1, 2020. Data was collected for both COVID-19 and non-COVID-19 services. The test results include VHA-lab COVID-19 testing inside VHA, VHA-ordered outside testing, and verified test results reported to VHA. The analysis excluded the following: VA Veteran Employees; Veterans who only had records for workload that are not encounters, but rather are administrative and not related directly to delivery of care; Veterans whose rurality was unknown or one of the Insular Islands; records in which age was grouped as 0-17; and records missing age, visit codes, gender or race and ethnicity values.

Source: VHA, CDW, NST Dataset, accessed 6/13/2022. Ref. D266

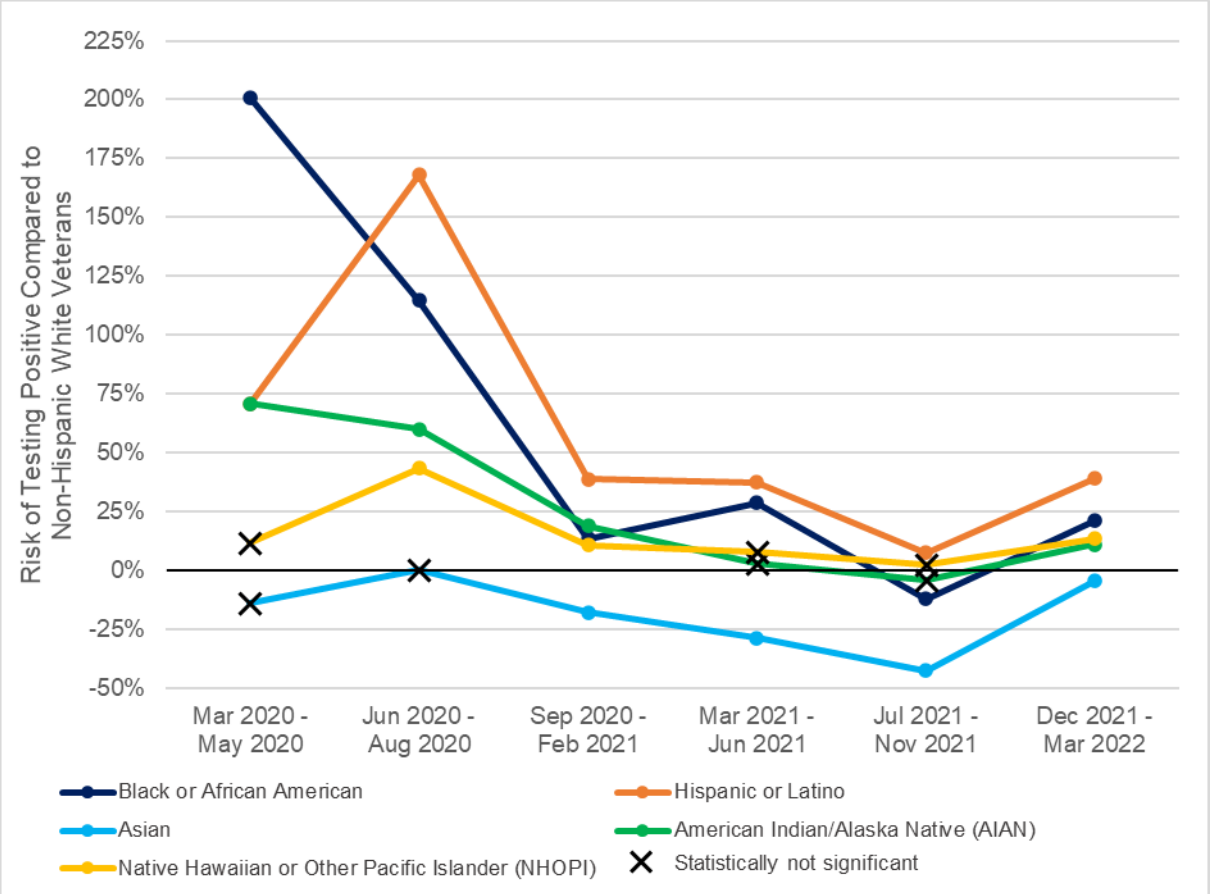
The early pandemic phase saw the largest racial and ethnicity disparities in risk of infection and COVID-19-associated death. These disparities decreased during the Delta and Omicron waves, as seen in **Figure 6.2** and **Figure 6.3**. Differences that were not statistically significant are identified in the tables with an asterisk (*) and in the figures with an “X.”

Over the course of the pandemic, Black and African American Veterans had a 14.5% increased risk of testing positive for COVID-19 compared to non-Hispanic White Veterans, and a 33.5% increased risk of COVID-19-associated death after controlling for age group, gender and rurality, as seen in **Figure 6.1**.

Early in the pandemic (March 2020 through May 2020), Black or African American Veterans were 200.8% more likely to test positive and at 213.6% higher risk of

COVID-19-associated death compared to non-Hispanic White Veterans, as seen in **Figure 6.2** and **Figure 6.3**, respectively. By the summer wave (June to August 2020), the relative risk of infection for Black or African American Veterans decreased to 114.3%, and then to 13.3% by the fall and winter wave (September 2020 to February 2021). By the Omicron wave (December 2021 to March 2022), the relative risk of COVID-19-associated death was 20.1% for Black and African American Veterans, as seen in **Figure 6.2**.

Figure 6.2: *Adjusted Relative Risk for Testing Positive for COVID-19 for Veterans Using VHA Services, by Race and Ethnicity, Compared to Non-Hispanic White Veterans (3/1/2020 – 3/31/2022)*



Race/ Ethnicity	Mar 2020 - May 2020	Jun 2020 - Aug 2020	Sep 2020 - Feb 2021	Mar 2021 - Jun 2021	Jul 2021 - Nov 2021	Dec 2021 - Mar 2022
Black or African American	200.8%	114.6%	13.3%	28.6%	-12.1%	21.1%
Hispanic or Latino	70.6%	168.0%	38.8%	37.5%	7.4%	38.9%
Asian	-14.1%*	0.3%*	-17.9%	-28.8%	-42.7%	-4.5%
AIAN	70.8%	59.9%	18.9%	2.9%*	-4.0%*	10.8%
NHOPI	11.7%*	43.4%	10.6%	7.8%*	2.4%*	13.4%

* *Indicates differences not statistically significant (P > 0.05)*

Note: Adjusted and unadjusted multivariable Poisson regressions were used to assess the risk of testing positive and mortality among different race and ethnicity groups over 6 phases during the pandemic. The variables in the model included age group, rurality, gender, race/ethnicity and pandemic phase (the exception is pandemic phase June 2020 to August 2020 where gender was not found to be significant to the adjusted model and was therefore removed to ensure goodness of fit for the model. A well-fitted model produces more accurate outcomes.). The results are reported with Relative Risk calculated from the regression coefficients and the test statistics for significance (Chi-Square and p-values). The population of Veterans Using VHA Services was captured from the CDW database included Veterans who used VHA Services pre-pandemic between January 1, 2018, through December 31, 2019, and were alive as of January 1, 2020. Data was collected for both COVID-19 and non-COVID-19 services. The test results include VHA-lab COVID-19 testing inside VHA, VHA-ordered outside testing, and verified test results reported to VHA. The analysis excluded the following: VA Veteran Employees; Veterans who only had records for workload that are not encounters, but rather are administrative and not related directly to delivery of care; Veterans whose rurality was unknown or one of the Insular Islands; records in which age was grouped as 0-17; and records missing age, visit codes, gender or race and ethnicity values.

Source: VHA, CDW, NST Dataset, accessed 6/13/2022. Ref. D266

Hispanic Veterans have had a 32.6% increased risk of infection, and a 38.7% increased risk of COVID-19-associated death over the course of the pandemic compared to non-Hispanic White Veterans, as shown in **Figure 6.1**.[385] The risk of infection and COVID-19-associated death compared to non-Hispanic White Veterans was highest during the summer wave of 2020 (June to August 2020), 168.0% and 189.6%, respectively (**Figure 6.2** and **Figure 6.3**). By the Omicron wave (December 2021 to March 2022), Hispanic Veterans' relative risk of infection and COVID-19-associated death was still higher than non-Hispanic White Veterans, but less so than it had been earlier in the pandemic: 38.9% and 29.1%, respectively.

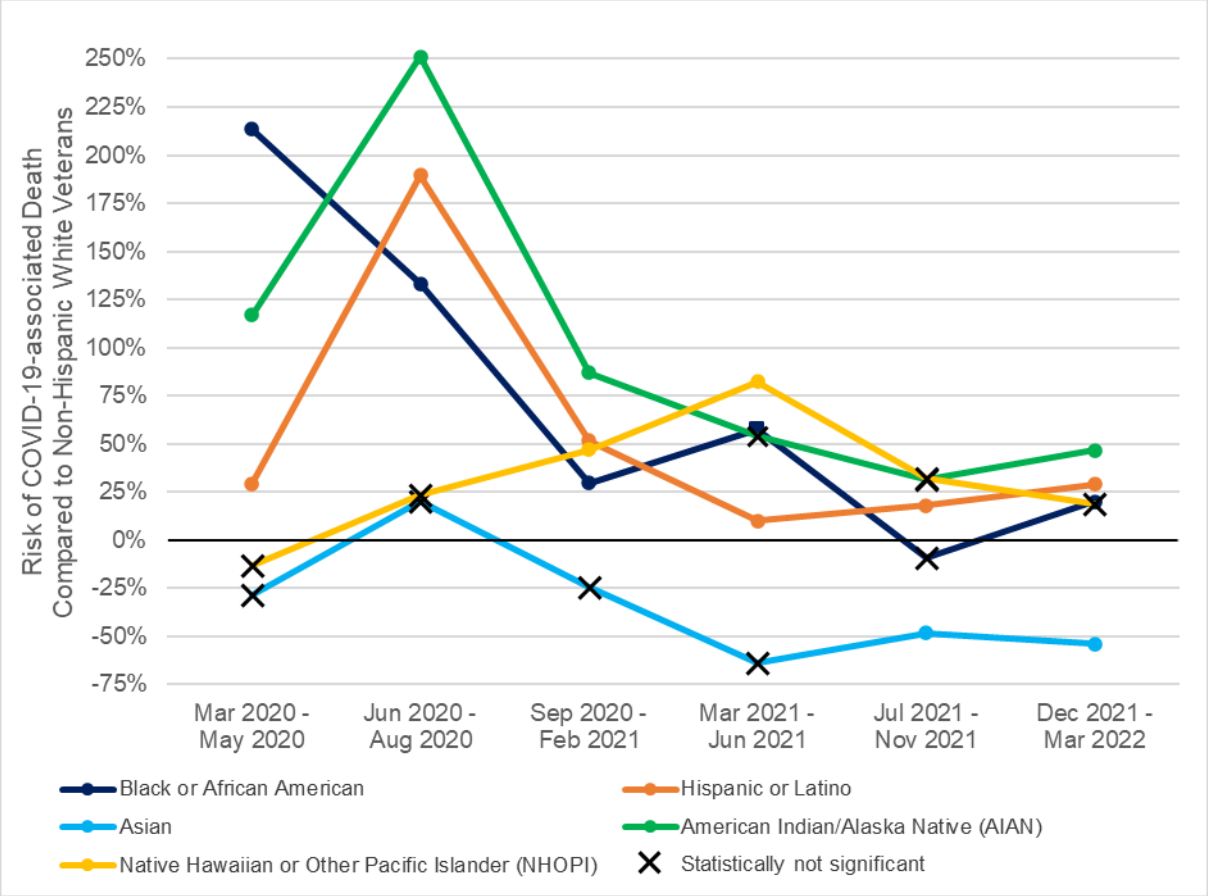
Over the course of the pandemic, AIAN Veterans had a 11.5% increased risk of infection and a 73.1% increased risk of COVID-19-associated death compared to non-Hispanic White Veterans. Relative to non-Hispanic White Veterans during the beginning of the pandemic (March 2020 to May 2020), AIAN Veterans were 70.8% more likely to testing positive for COVID-19, but by the fall 2020 and winter 2021 wave (September 2020 to February 2021), this likelihood decreased to 18.9% higher than non-Hispanic White Veterans.

A separate study of COVID-19 infection from the first six months of the pandemic found that some social determinants of health (for example, living in a community with higher percentages of overcrowded households or kitchens without plumbing) explained part of the disparity in COVID-19 infection between AIAN Veterans and non-Hispanic White Veterans.[386] These disparities were exacerbated for AIAN Veterans living near Indian reservations.[387]

By the summer 2020 wave (June to August 2020), AIAN Veterans were 251.2% more likely to die from a COVID-19-associated death than non-Hispanic White

Veterans. As of the Omicron wave (December 2021 – March 2022), the increased risk of COVID-19 population mortality of AIAN Veterans was 46.6%, as shown in **Figure 6.3**.

Figure 6.3: *Adjusted Relative Risk for COVID-19-associated Death for Veterans Using VHA Services, by Race and Ethnicity, Compared to Non-Hispanic White Veterans (3/1/2020 – 3/31/2022)*



Race/ Ethnicity	Mar 2020 - May 2020	Jun 2020 - Aug 2020	Sep 2020 - Feb 2021	Mar 2021 - Jun 2021	Jul 2021 - Nov 2021	Dec 2021 - Mar 2022
Black or African American	213.6%	133.4%	29.8%	57.7%	-8.8%*	20.1%
Hispanic or Latino	29.5%	189.6%	51.8%	10.1%	18.2%	29.1%
Asian	-28.3%*	20.4%*	-24.4%*	-64.0%*	-48.1%	-53.9%
AIAN	117.1%	251.2%	86.9%	54.2%*	31.3%*	46.6%
NHOPI	-13.2%*	23.5%*	47.1%	82.3%	32.3%*	18.6%*

* *Indicates differences not statistically significant (P > 0.05)*

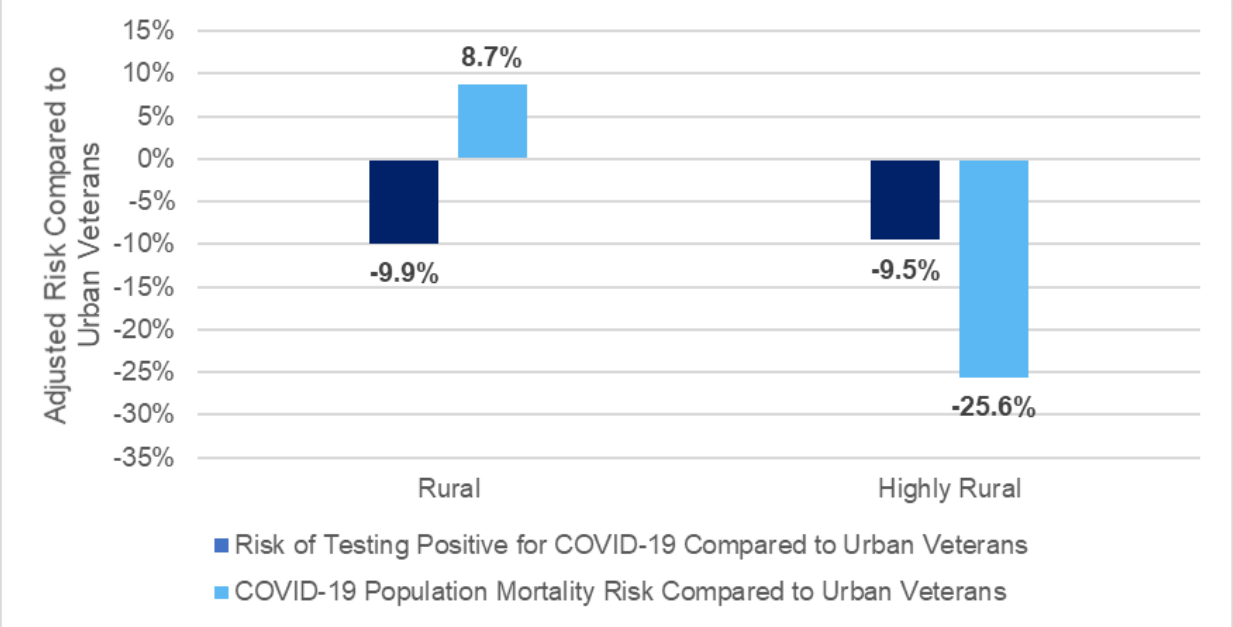
Note: Adjusted and unadjusted multivariable Poisson regressions were used to assess the risk of testing positive and mortality among different race and ethnicity groups over 6 phases during the pandemic. The variables in the model included age group, rurality, gender, race/ethnicity and pandemic phase (the exception is pandemic phase December 2021 to March 2022 where rurality was not found to be significant to the adjusted

model and was therefore removed to ensure goodness of fit for the model. A well-fitted model produces more accurate outcomes.). The results are reported with Relative Risk calculated from the regression coefficients and the test statistics for significance (Chi-Square and p-values). The population of Veterans Using VHA Services was captured from the CDW database included Veterans who used VHA Services pre-pandemic between January 1, 2018, through December 31, 2019, and were alive as of January 1, 2020. Data was collected for both COVID-19 and non-COVID-19 services. The test results include VHA-lab COVID-19 testing inside VHA, VHA-ordered outside testing, and verified test results reported to VHA. The analysis excluded the following: VA Veteran Employees; Veterans who only had records for workload that are not encounters, but rather are administrative and not related directly to delivery of care; Veterans whose rurality was unknown or one of the Insular Islands; records in which age was grouped as 0-17; and records missing age, visit codes, gender or race and ethnicity values

Source: VHA, CDW, NST Dataset, accessed 6/13/2022. Ref. D266

As of March 31, 2022, rural and highly rural Veterans Using VHA Services over the course of the pandemic were less likely to test positive for COVID-19 than urban Veterans (9.9% and 9.5%, respectively) when adjusting for gender, age, and race and ethnicity, as seen in **Figure 6.4**.

Figure 6.4: *Adjusted Relative Risk for Testing Positive and COVID-19-associated Death Among Rural and Highly Rural Veterans Using VHA Services, Compared to Urban Veterans (3/1/2020 - 3/31/2022)*



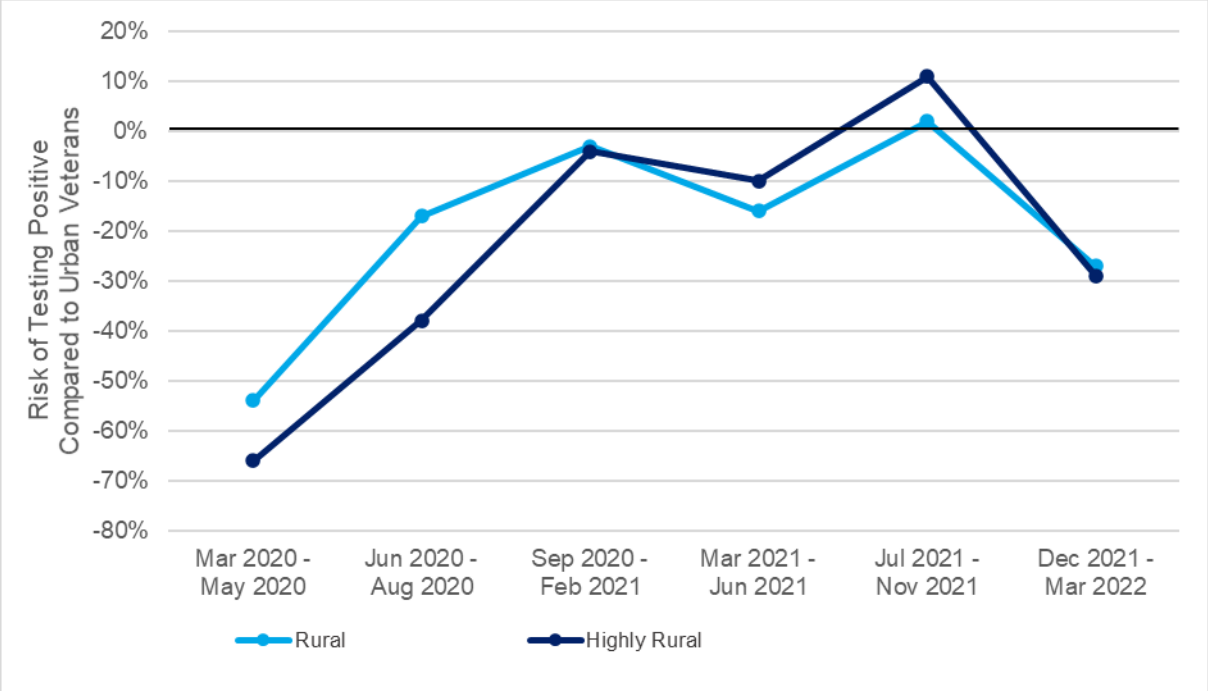
Note: Adjusted and unadjusted multivariable Poisson regressions were used to assess the risk of testing positive and mortality among different race and ethnicity groups during the pandemic. The variables in the model included age group, rurality, gender and race/ethnicity. The results are reported with Relative Risk calculated from the regression coefficients and the test statistics for significance (Chi-Square and p-values). The population of Veterans Using VHA Services was captured from the CDW database included Veterans who used VHA Services pre-pandemic between January 1, 2018, through December 31, 2019, and were alive as of January 1, 2020. Data was collected for both COVID-19 and non-COVID-19 services. The test results include VHA-lab COVID-19 testing inside VHA, VHA-ordered outside testing, and verified test results reported to VHA. The analysis excluded the following: VA Veteran Employees; Veterans who only had records for workload that are not encounters, but rather are administrative and not related directly to delivery of care; Veterans whose

rurality was unknown or one of the Insular Islands; records in which age was grouped as 0-17; and records missing age, visit codes, gender or race and ethnicity values

Source: VHA, CDW, NST Dataset, accessed 6/13/2022. Ref. D266

Figure 6.5 depicts changes in risk over time; data indicate that reduced risk for rural and highly rural Veterans was most prominent early in the pandemic—from March 2020 through May 2022, rural and highly rural Veterans were 54.0% and 66.0% less likely to test positive compared to urban Veterans, respectively. However, by the Delta wave (July 2021 to November 2021), the relative risk had reversed, and rural and highly rural Veterans experienced an increased risk to test positive compared to urban Veterans (2.0% and 11.0%, respectively). During the Omicron wave (December 2021 to March 2022), risk for rural and highly rural Veterans reversed again, and these Veterans experienced a decreased risk of infection compared to urban Veterans, at 27.0% and 29.0%, respectively.

Figure 6.5: *Adjusted Relative Risk for Testing Positive Among Rural and Highly Rural Veterans Using VHA Services over the Course of the Pandemic, Compared to Urban Veterans (3/1/2020 – 3/31/2022)*



Rurality	Mar 2020 - May 2020	Jun 2020 - Aug 2020	Sep 2020 - Feb 2021	Mar 2021 - Jun 2021	Jul 2021 - Nov 2021	Dec 2021 - Mar 2022
Rural	-54.0%	-17.0%	-3.0%	-16.0%	2.0%	-27.0%
Highly Rural	-66.0%	-38.0%	-4.0%	-10.0%	11.0%	-29.0%

Note: Adjusted and unadjusted multivariable Poisson regressions were used to assess the risk of testing positive and mortality among different race and ethnicity groups during the pandemic. The variables in the model included age group, rurality, gender, race/ethnicity, and pandemic phase (the exception is pandemic phase June 2020 to August 2020 where gender was not found to be significant to the adjusted model and was therefore removed to ensure goodness of fit for the model. A well-fitted model produces more accurate

outcomes.). The results are reported with Relative Risk calculated from the regression coefficients and the test statistics for significance (Chi-Square and p-values). The population of Veterans Using VHA Services was captured from the CDW database included Veterans who used VHA Services pre-pandemic between January 1, 2018, through December 31, 2019, and were alive as of January 1, 2020. Data was collected for both COVID-19 and non-COVID-19 services. The test results include VHA-lab COVID-19 testing inside VHA, VHA-ordered outside testing, and verified test results reported to VHA. The analysis excluded the following: VA Veteran Employees; Veterans who only had records for workload that are not encounters, but rather are administrative and not related directly to delivery of care; Veterans whose rurality was unknown or one of the Insular Islands; records in which age was grouped as 0-17; and records missing age, visit codes, gender or race and ethnicity values

Source: VHA, CDW, NST Dataset, accessed 6/13/2022. Ref. D266

The population mortality model was not broken down by pandemic phase and rurality. This is because rurality did not contribute to the model during the Omicron wave.

Additional Research

Also during the Annex C period, VHA partnered with FDA to conduct a separate study on health disparities among Veterans. The study included approximately 550,000 Veteran inpatients and focused on disparities of COVID-19 treatments among minority groups.[388]

As of the publication of this report, results were expected later in 2022.[389] VHA and FDA intended to share preliminary findings and submit for publication, pending peer review.[390]

Support for Veterans in Rural Locations

According to VHA data, 33.6% of Veterans Using VHA services live in rural and highly rural areas.[391] VA's Office of Rural Health (ORH) reports that 27% of rural Veterans do not have access to home internet, and 58% of rural enrolled Veterans have at least one service-related health condition.[392] Rural Veterans are also older than their urban counterparts.[393] Veterans in rural environments may not have ready access to health services or medical clinics.[394]

Throughout the COVID-19 pandemic, VHA worked to sustain access for rural Veterans to quality health care.[395] Outreach to rural Veterans continued to include the use of the Digital Divide Consult and Connected Tablet Program, providing affordable broadband to rural Veterans.[396] Social workers assessed needs, helping Veterans apply for affordable technology subsidies.[397] For more information on the Digital Divide Consult, see the Clinical Operations section of this report.

Targeted efforts were also designed to provide self-testing for the rural Veteran population to mitigate the impact of distance on ready access to testing.[398] For more information on self-testing and Test-to-Treat programs, see the Testing and Genomic Sequencing section of this report.

VHA also sponsored awareness campaigns for COVID-19 testing among Veterans of color and Veterans experiencing homelessness.[399] COVID-19 testing awareness was supported by VHA's Minority Outreach Communications Group.[400] The campaign focused on customized advocacy language, visuals and products to promote self-testing kits, lab tests and what to do with test results.[401] Some of the items produced included brochures, newsletters, flyers and postcards.[402] Although outcomes were not tracked in detail, VHA leadership reported that this campaign was successful in assisting Veterans with testing.[403]

A VA Health Care System Director and Supervisor walk through a homeless encampment during a 2022 Point-In-Time Count in San Antonio, Texas. The count is typically conducted each year, but the 2021 count was delayed by COVID-19, which reduced information about the needs of people experiencing homelessness in the area. (VHA photo)

LGBTQ+ Sexual Orientation and Gender Identity

Veterans who are members of the LGBTQ+ community face increased health risks and challenges in accessing health care, in part because of the stigma and discrimination against their sexual orientation and gender identities.[404] The lack of sexual orientation and SIGI data has made assessing COVID-19 disparities for LGBTQ+ Veterans and access to care difficult.[405]

VA estimates that at least one million LGBTQ+ Veterans are served by VHA.[406] VHA provides online fact sheets about health risks that focus on issues relevant to specific subsets of the LGBTQ+ community, including transgender, gender-diverse, gay, bisexual, queer and nonbinary.[407]

It is important for LGBTQ+ Veterans to share their SIGI data with VHA providers so they can receive the highest quality of care.[408] In an ongoing effort to promote an inclusive LGBTQ+ environment, VHA has started to provide information to Veterans and providers on the importance of sharing SIGI information with VHA providers.[409]

VHA has been working to improve its understanding of the LGBTQ+ Veteran population—both its size and its needs—but during the Annex C review period, SIGI data and trained staff resources were limited.[410]

VHA received approval to expand its LGBTQ+ programming; but hiring has been slow.[411] As of March 31, 2022, the program had only one official employee, and open leadership positions were part-time.[412] With little staff capacity, tracking LGTBQ+ Veterans' health care needs remained stalled.[413]

Integrating SIGI into Electronic Health Record Systems

VHA leadership reported that it hopes to bring SIGI information into routine data collection during clinical visits, but this will require building trust with LGBTQ+ Veterans.[414] VHA leadership recognized that this may take time.[415]

Lack of LGTBQ+ data at VHA is largely due to missing SIGI data infrastructure in VHA health record systems.[416] As a result, VHA has been working to add SIGI data fields to health care systems and has been training staff on SIGI data entry.[417]

Once SIGI data is improved, VHA plans to better serve this population through data-informed barriers to access to care.[418] To date, VHA has relied on national surveys from the National Center for Health Statistics to serve LGBTQ+ Veterans.[419]

Health Equity Terminology

Sexual Orientation: Refers to the way a person defines their sexual attraction; for instance, lesbian, gay, bisexual, queer or straight.

Gender Identity: An inner sense of self and understanding related to an individual's gender.

Gender Expression: The behavior and outward appearance of a person and how they choose to exhibit their gender identity through clothes and physical attributes.

Source: VHA, "Get the Facts… LGBTQ+ Veteran Health Care," accessed 4/25/2022, https://www.patientcare.va.gov/LGBT/docs/LGBTQ-factsheet-nonbinary-Veterans.pdf#. Ref. D319

VHA developed gender identity training products to support accurate and sensitive collection with staff data entry trainings to start later in 2022.[420]

As of the Annex C reporting period, of the approximately 9 million enrolled Veterans, VHA has gender identity data for 1.3 million Veterans; however, this field became visible to clinicians on VHA's Computerize Patient Record System (CPRS) only in December 2021.[421] Clinicians cannot update this data field in CPRS themselves, but clinicians reported to VHA that if the data is populated, they use it to inform treatment.[422]

Although CPRS is used in VAMCs nationwide, VHA has begun transitioning to a commercial electronic health record system, Cerner Millennium.[423] As of March 31, 2022, Cerner Millennium was in use at only one VA facility.[424] This shift in systems will support a seamless transition of medical files from DoD—which uses Cerner—to VHA's compatible Cerner system, allowing for integrated care.[425] Cerner already contains SIGI data fields; therefore, shifting from CPRS to Cerner will advance VHA's collection of this data.[426]

In May 2022, VHA plans to update the VA.gov website to allow Veterans to enter their own names and gender identities.[427] VHA also plans to add a reminder prompt for clinical staff to ask Veterans to share their sexual orientation when they come to the clinic.[428]

VHA has also requested permission from VA's central database manager system, Out of Band Manager (OBM), to add pronouns and sexual orientation to enrollment forms.[429] As of March 31, 2022, leadership was waiting for approval.[430]

Transitioning Back to Pre-COVID-19 Priorities

The VHA Office of Health Equity (OHE) reported that during the Annex C review period, it shifted more of its focus back to pre-pandemic health equity work to further address needs outside of COVID-19 while continuing COVID-19 programming.[431] During the Annex C reporting period, OHE funded 19 pilot field projects.[432] One of these projects focused on the diagnosis of pressure ulcers in darker-skinned individuals.[433] Another provided education and training on delivery of new services for the LGBTQ+ community.[434] According to VHA leadership, VHA plans to track the success of these projects; impactful ones will be expanded to support more locations.[435]

OHE has developed an equity-focused community of practice to recommend data tracking for program quality improvement standards.[436] The goal of this group is to ensure that VHA quality improvement recommendations address equity issues.[437]

Learning extends to primary care, mental health, specialty care and inpatient settings by developing equity-curriculum to guide quality improvement.[438] This curriculum is especially relevant with the increased needs in health care settings after COVID-19.[439]

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CLINICAL OPERATIONS

Throughout the global COVID-19 pandemic, VHA has served the ongoing health care needs of Veterans. This section describes VHA's adjustments to clinical services, new health initiatives and evolving solutions to required health care adaptations from August 1, 2021, through March 31, 2022.

Adjustments to Clinical Services

During the Annex C reporting period, VHA continued to adjust clinical services that were impacted by the COVID-19 pandemic.[440] VHA leadership and staff engaged in continued efforts to address a number of critical issues, including managing treatment for COVID-19, staff shortages compelling facilities to use Crisis Staffing Strategies, deferred care, resumption of health care services and the protective care of elderly Veterans living in CLCs and SVHs.[441]

An emergency department nurse in Ann Arbor delivers an infusion of monoclonal antibodies to fight COVID-19. The Ann Arbor VA has administered more of these infusions than any other VA hospital. (VHA photo)

COVID-19 Treatments

As the pandemic progressed, FDA revised EUAs and authorized new treatments to keep up with COVID-19 variant resistance and drug efficacy.[442] Oral anti-viral treatments were effective against Omicron variants, but some mAbs were not.[443]

FDA changed EUAs for some mAb treatments to respond to the lower efficacy against the Omicron variant.[444] VHA considered several data points when selecting treatments, including the following:[445]

- Resistance patterns
- Prioritization between treatment types based on availability
- Special supplies needed to administer treatment

In collaboration with ORD, VHA has begun developing studies to evaluate the effectiveness of mAbs in preventing hospitalization.[446] Bi-weekly surveillance for these studies will include tracking the types of mAbs used and patient demographics, including age, race, gender and region.[447]

VHA leadership reported certain treatment challenges faced during the Omicron wave, including EUA changes, managing field requests and equitably distributing limited treatment supplies to the field.[448]

Crisis Staffing Strategies

During the peak week of Omicron, nearly 15,000 VHA employees were unable to work due to COVID-19, compared to nearly 4,000 in the peak week during Delta.[449]

Also during the Omicron wave, VHA's HOC conducted daily calls with VISNs, during which they collected information to identify which facilities were operating with contingency and crisis strategies for staffing.[450]

Crisis capacity strategies reflect the third stage in CDC's continuum of options to mitigate resource shortages, as shown in **Figure 7.1**.[451] As stated in VHA's Moving Forward Plan Surge Staffing Framework (referred to in this document as the Surge Staffing Framework), these strategies are intended to be implemented in order of increasing severity if needed and are defined below:[452]

1) Conventional: sufficient staffing, preparedness and planning
2) Contingency: insufficient staff in critical/essential roles
3) Crisis: no longer enough staff to provide safe patient care

Figure 7.1: *CDC Guidance for Health Care Professionals Returning to Work After COVID-19 Exposure or Infection*

Work Restrictions for HCP With SARS-CoV-2 Infection

Vaccination Status	Conventional	Contingency	Crisis
Up to Date and Not Up to Date	10 days OR 7 days with negative test†, if asymptomatic or mild to moderate illness (with improving symptoms)	5 days with/without negative test, if asymptomatic or mild to moderate illness (with improving symptoms)	No work restriction, with prioritization considerations (e.g., types of patients they care for)

Work Restrictions for Asymptomatic HCP with SARS-CoV-2 Exposures

Vaccination Status	Conventional	Contingency	Crisis
Up to Date	No work restrictions, with negative test on days 1‡ and 5–7	No work restriction	No work restriction
Not Up to Date	10 days OR 7 days with negative test†	No work restriction with negative tests on days 1‡, 2, 3, & 5–7 (if shortage of tests prioritize Day 1 to 2 and 5-7)	No work restrictions (test if possible)

†Negative test result within 48 hours before returning to work
‡For calculating day of test: 1) for those with infection consider day of symptom onset (or first positive test if asymptomatic) as day 0; 2) for those with exposure consider day of exposure as day 0

Source: CDC, Strategies to Mitigate Healthcare Personnel Staffing Shortages, https://www.cdc.gov/coronavirus/2019-ncov/hcp/mitigating-staff-shortages.html#previous, 1/21/2022, accessed 5/4/2022. Ref. D386

Mitigation Options

In January 2022, four VHA health care centers experienced such significant staffing shortages that they moved to crisis capacity strategies.[453] This was the first time crisis capacity strategies were necessary for VHA facilities during the pandemic. The timeframe operating in crisis strategy varied based on facility: one facility operated in crisis strategy for a week and a half, and another facility moved back and forth between contingency and crisis strategies several times over nearly six weeks.[454]

Before a facility moves to crisis strategies, it is expected to implement the contingency strategies laid out in the Surge Staffing Framework.[455] The Surge Staffing Framework's mitigation plans encourage VISNs and facilities to tailor guidance to local circumstances.[456]

Due to the speed with which Omicron spread, employing mitigations was more challenging; the virus impacted many parts of the Nation at the same time.[457] Facilities had to use a variety of mitigation steps. VHA's size was helpful; the ability to share staff across facilities played an important role in mitigating staff shortages.[458] Some facilities relied on augmenting resources through contract staff.[459] However, given how quickly staff became unable to work due to COVID-19 infection and exposure, it became difficult to find contract staff.[460]

Facilities sought volunteers to work overtime or cover beyond their shifts, retraining staff to deploy to acute areas and using the concept of extender nurses to move high-level med-surg nurses to high-critical areas.[461] One facility supported nurses by

adopting a runner program for administrative assistants to pick up items at the pharmacy and the supply room.[462]

Because many procedures had been cancelled earlier in the pandemic, facilities tried hard to keep as many services running as possible to maintain access to care, but some elective or non-urgent procedures were still canceled or delayed.[463] One facility decided which surgeries and elective procedures to cancel based on what would require an inpatient bed.[464]

One facility noted that it was not aware of any published guidance about the percentage of staff providing care independently versus under supervised in-service orientation during crisis capacity strategies. But even so, the facility added a safety measure target to address changes occurring while moving between contingency and crisis operations.[465] The target stated that no more than 25% of nurses for a particular unit could be under supervision.[466] This involved monitoring (for each pay period) the nurses who were shifted temporarily from ambulatory care to inpatient care.[467]

Facilities moved to crisis capacity strategies in two main ways:[468]

- **Return to work.** How long after an illness/exposure could the staff return to work; requirements differ based on vaccination status and describe when testing after illness/exposure is required.
- **Staffing metrics such as nurse ratios.** Nurse ratios refer to the number of patients cared for by a single nurse. (A 1:3 ratio means one nurse for every three patients; usually it refers to registered nurses.)

Some VHA facilities needed to allow health care personnel to return to work following COVID-19 exposure without testing, but this was limited to personnel without symptoms.[469]

Guidance specific to staffing metrics, such as nurse ratios, is not part of the Surge Staffing Framework; rather, facilities establish staffing standards in accordance with the scope of services and characteristics of the population served.[470] One facility reported that when it moved to crisis capacity strategies, the nurse ratio was held at 1:1 for some patients, but for intensive care units (ICUs) in general, the nurse ratio for RNs increased from 1:3 in contingency to 1:4 in crisis-level staffing, and for the med-surg unit, it increased from 1:5 to 1:7.[471] The facility recognized indications of escalated patient safety risk while under crisis capacity strategies.[472] Another facility explained the impact of crisis staffing in terms of another staffing metric: nurse hours per patient day (NHPPD).[473] NHPPD is calculated by dividing productive direct patient care nursing hours by patient days and multiplying by 24.[474] This facility

reported that it reduced its ideal target NHPPD by more than 10-15%; for one unit, the reduction was approximately 25%.[475]

Facilities communicated the shift to crisis staffing strategies through regular updates to staff, explaining the approach, providing guidance on an intranet site and directly notifying staff about the clearance process to return to work. [476] One facility described the importance of copying supervisors on direct email notifications to staff if an employee missed an email.[477]

Facilities noted that staff expressed relatively low concern about the return-to-work practices while operating in crisis capacity strategies.[478] Their greater frustrations related to being detailed away from their regular work to surge areas.[479] One facility's leadership observed that a regular cadence of clear and consistent communications had a calming effect on staff. [480] Similarly, the presence of a consistent incident commander (instead of switching week to week) gave staff a clear leader to whom they could turn with questions. [481]

Multiple facilities seemed unclear about the difference between contingency and crisis-level capacity staffing strategies, particularly related to return to work. For example, several facilities reported entering crisis-capacity strategies for staffing; however, when addressing follow-up questions, they confirmed that they did not in fact enter crisis capacity strategies.[482] One VISN leader suggested that clearer, simpler guidance to delineate between the contingency and crisis strategies could have helped mitigate the confusion and enable consistency across facilities.[483]

Deferred Care and Resumption of Health Services

During the Annex C review period, VHA worked to improve access to routine and non-emergency services that were deferred earlier in the pandemic.[484] Mammography imaging examinations conducted by VHA had returned to pre-pandemic volumes as of March 2022.[485]

VA leadership also reported progress in accomplishing deferred dental care as the response to the pandemic improved.[486] In March 2021, 33% of eligible Veterans were up to date on their annual dental cleaning within the last 18 months of data collection.[487] By February 2022, that number had increased to 72%.[488] VHA improved these statistics by extending hours, conducting weekend clinics and using community providers.[489] Similarly, periodic oral evaluations climbed from 55% in March 2021 to 66% in February 2022.[490]

Breast Cancer Screenings

During the Annex C Period, VHA launched communications outreach intended to encourage women to schedule regular preventive procedures, including mammograms.[491] MyHealtheVet newsletters reached many female Veterans with information about breast screenings.[492]

VHA used Health Effectiveness Data and Information Set (HEDIS) metrics to measure the use of preventive screenings.[493] HEDIS metrics measure the percentage of a population that is up to date on preventive screening procedures based on a representative sample of a VHA patient cohort.[494] HEDIS metrics use an External Peer Review Process (EPRP) to gather the data from large samples of Veteran health records, including all facilities where Veterans are enrolled.[495]

According to VHA HEDIS metrics, approximately 82% of women Veterans from 50 to 74 years old were up to date with breast cancer screenings from January through March 2022.[496] This percentage dropped from the quarter preceding the pandemic (approximately 84%) but has rebounded from a low of approximately 80% during the pandemic.[497]

Colon Cancer Screenings

During this review period, HEDIS metrics indicated that 79.29% of Veterans from 50 to 75 years old were up to date on colorectal screenings. [498] This number is close to the pre-pandemic percentage (79.39%).[499]

As part of its initiative to encourage preventive care, VHA increased its focus on mitigating and addressing the fears and difficulties related to attending in-person appointments.[500] For instance, VHA expanded its colorectal screening program to include at-home Fecal Immunochemical Tests (FIT).[501] FIT tests are preventive screening tests for colon cancer, which are sent to Veterans through the mail.[502] They are one means of improving accessibility to (and engagement in) preventive care.[503]

VHA leadership shared that the at-home FIT pilot program received promising engagement data and may offer an alternative to lagging colonoscopy screenings.[504]

Eye Examinations

VHA leadership reported that the shut-down of various Community-Based Outpatient Clinics (CBOCs) had an impact on specialty eye care services in the early pandemic.[505] To better serve rural Veterans, VHA applied innovative technology to

conduct preventive eye screenings through Technology-Based Eye Care Services (TECS).[506]

TECS allowed rural Veterans to gain access to screening and monitoring diabetic eye disease, age-related macular degeneration and glaucoma without traveling to a specialist provider who might be located far away.[507] Because rural Veterans are less likely to engage in ophthalmology care if they must travel long distances, VHA set up TECS programs in community-based facilities that provide advanced eye care through the facilitation of an ophthalmology technician on site.[508]

Upon completion of their visit with the technician, Veteran data was sent to specialty care providers located off-site.[509] VHA leadership reported that VHA's use of TECS technology had increased and was expanding across VHA facilities.[510]

As of March 31, 2022, all CBOCs have reopened to resume services, and TECS was put into action at 12 new VHA facilities.[511] Additionally, several VHA sites have increased their accessibility to advanced eye care by adding additional equipment and examination rooms to enable the provision of direct services on site.[512]

Blood Shortage

During the Annex C reporting period, the Nation faced a critical blood supply shortage.[513] The American Red Cross reported that it was the worst blood supply shortage in more than a decade—a 10% overall decline in blood donation since August 2021.[514] Root causes for this shortage, influenced by the COVID-19 pandemic, included the following:[515]

- A 62% drop in blood drives from colleges and high schools
- Cancellation of blood drives due to staffing limitations, illness or weather-related closures
- Active flu season
- COVID-19 surges

VHA leadership reported that due to this nationwide shortage, VHA faced delays in routine blood transfusions for oncology and hematology patients, and cancellations of some routine elective surgeries.[516] VHA responded to the Nation's shortage and the ongoing demand for blood with the Roll Up Your Sleeve Campaign (#RollupyoursleeveVA), which launched in December 2021 and concluded in March 2022.[517]

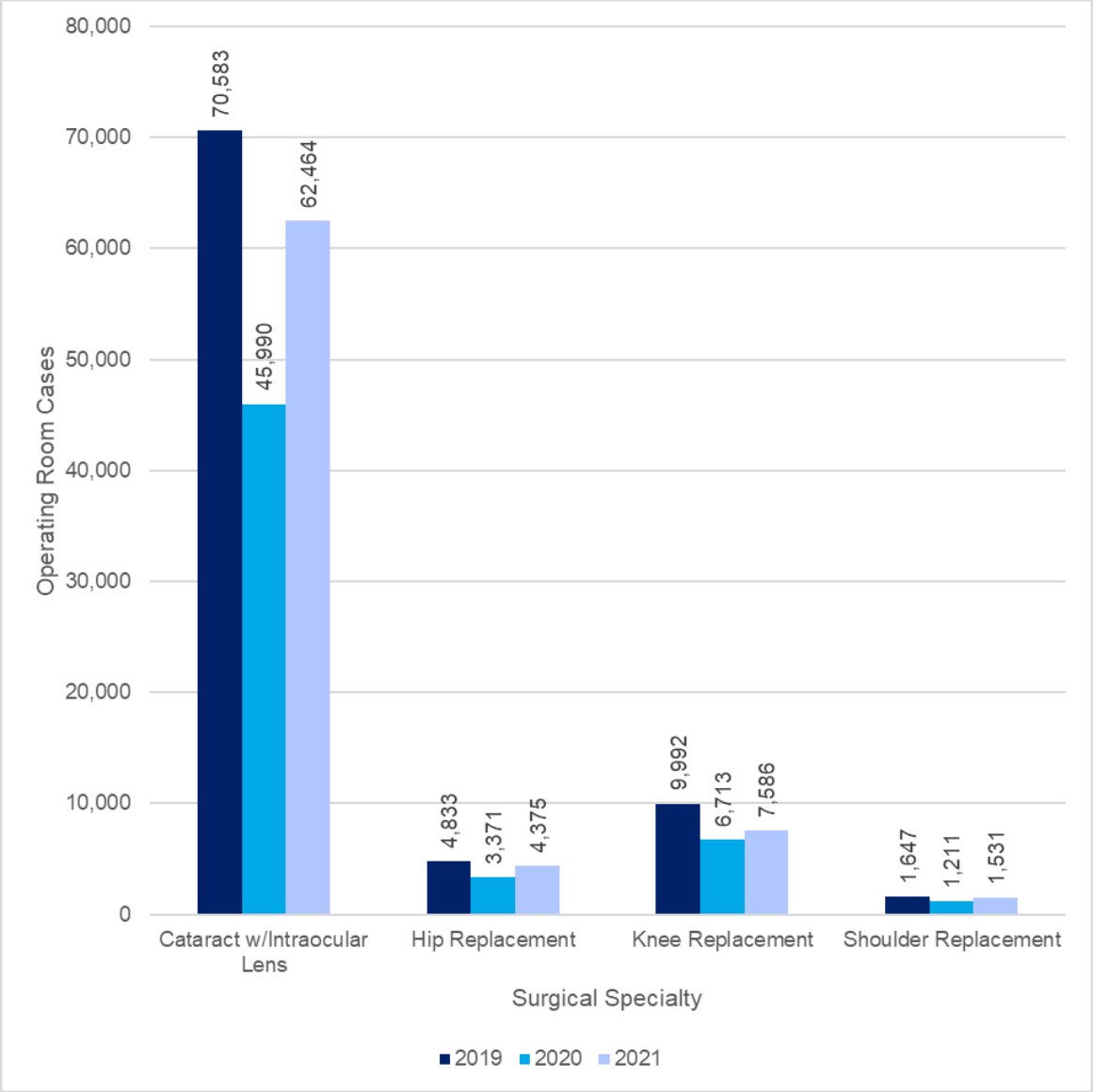
VHA partnered with blood collection agencies to host blood drives.[518] This campaign encouraged VA facilities to partner with either the American Red Cross or American Blood Centers to host a minimum of one blood drive at each VAMC or health care

system.[519] VHA facilities incorporated safety precautions at their drives, including mask requirements, enhanced disinfection protocols and social distancing rules as recommended by CDC.[520] VHA reported that it collected more than 3,900 units of blood and conducted 288 blood drives through February 2022.[521]

Deferred Surgical Cases

Non-emergency surgery cases—such as knee, hip and shoulder replacements—increased gradually during 2021, as shown in **Figure 7.2**. The same was true for cataract surgery with intraocular lens implants.[522]

Figure 7.2: *Completed Surgical Cases Across Select Medical Specialties, 2019 – 2021*



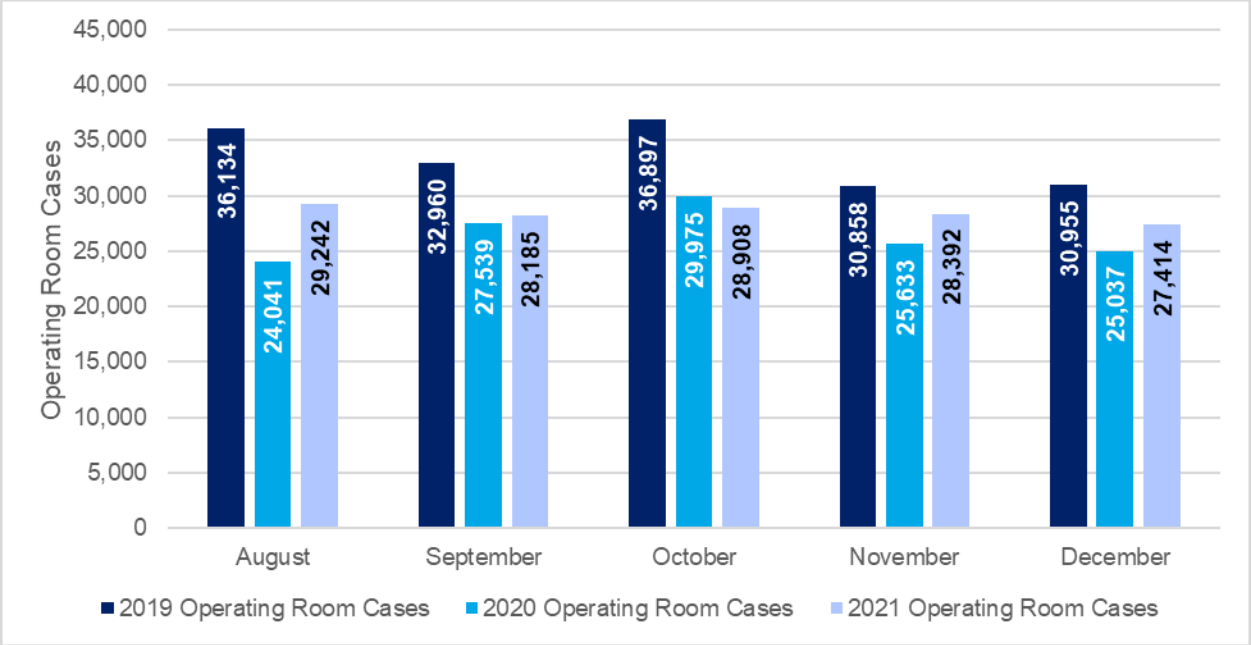
Source: VHA, National Surgery Office, response to data call, 4/29/2022. Ref. D265

Operating Room Cases

By March 31, 2022, operating room cases still lagged behind pre-pandemic levels, as shown in **Figure 7.3**.[523] Resumption of care has been maintained through the guidance of VHA Moving Forward Plans.[524]

Operating room cases increased to 29,242 cases in August 2021 from a low of 24,041 in August 2020.[525] As of December 2021, operating room cases had increased to 27,414, compared with 25,037 cases in December 2020, as shown in **Figure 7.4**.[526]

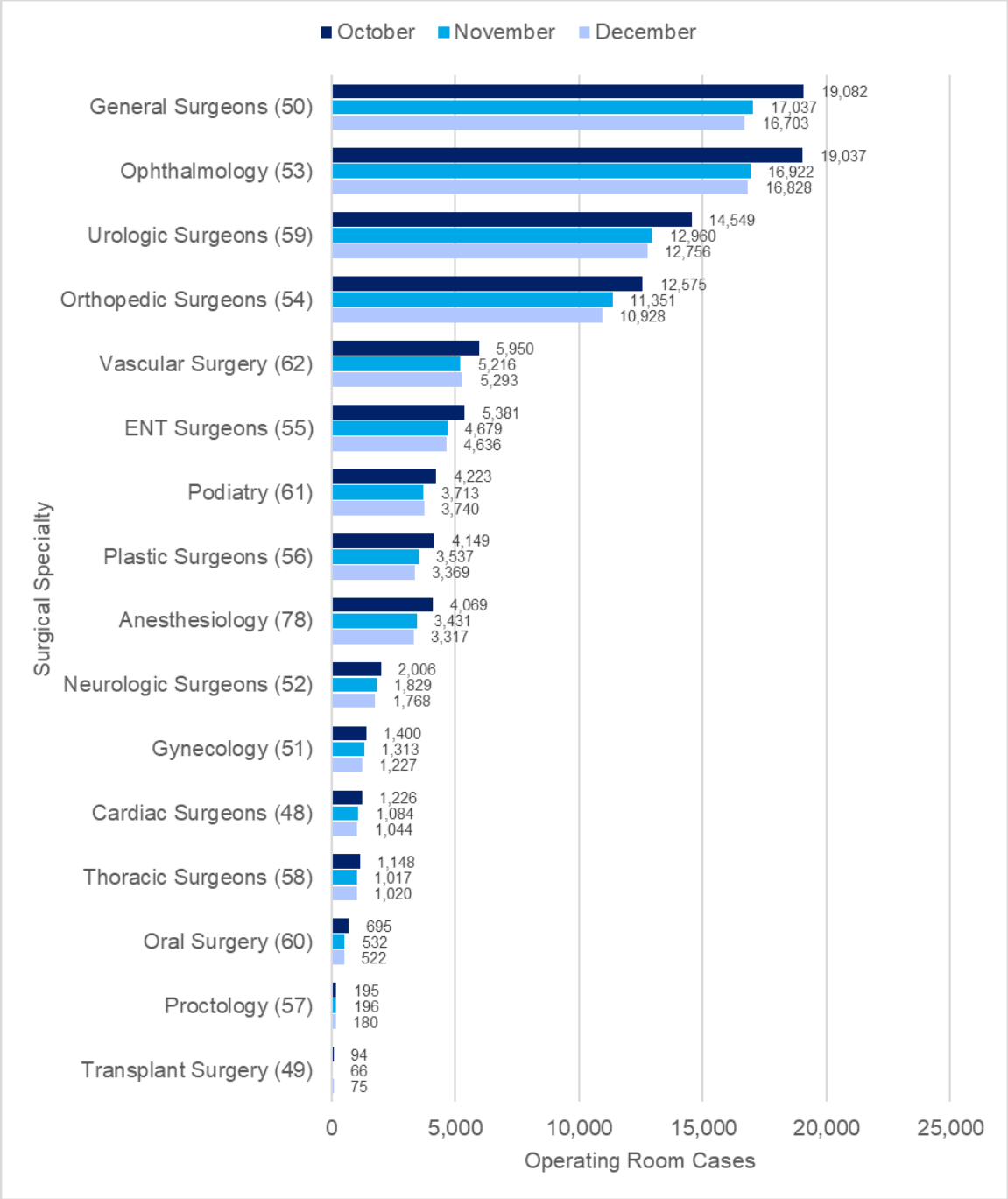
Figure 7.3: *Total Operating Room Cases (August - December 2019, 2020 and 2021)*



Note: Operating Room cases data are processed and reported quarterly. At the time of this report, Operating Room cases data for January through March 2022 were not published.

Source: VHA National Surgery Office, response to data call, 4/22/2022. Ref. D265

Figure 7.4: *Completed Operating Room Cases Across all Medical Specialties, October - December 2021*



Note: Operating Room cases data are processed and reported quarterly. At the time of this report, Operating Room cases data for January – March 2022 were not published.

Source: VHA, National Surgery Office, response to data call, 4/22/2022. Ref. D265

Mental Health Rehabilitation

The Office of Mental Health and Suicide Prevention (OMHSP) remains committed to sustaining access to care for Veterans, particularly in its Mental Health Residential Rehab Treatment Programs (MH RRTP).[527] MH RRTPs faced emerging staffing shortages during the Omicron wave.[528] VHA leadership also reported low MH RRTP enrollment, partly driven by concerns about congregate settings.[529]

Starting in January 2022, OMHSP implemented new MH RRTP Moving Forward Guidance, focused on addressing staffing challenges and providing mitigation strategies for sustained residential operations.[530] VHA leadership reported that the mitigation strategies outlined in MH RRTP Moving Forward FAQs have improved OMHSP's ability to provide mental health residential treatment.[531] Mitigation strategies included the following:[532]

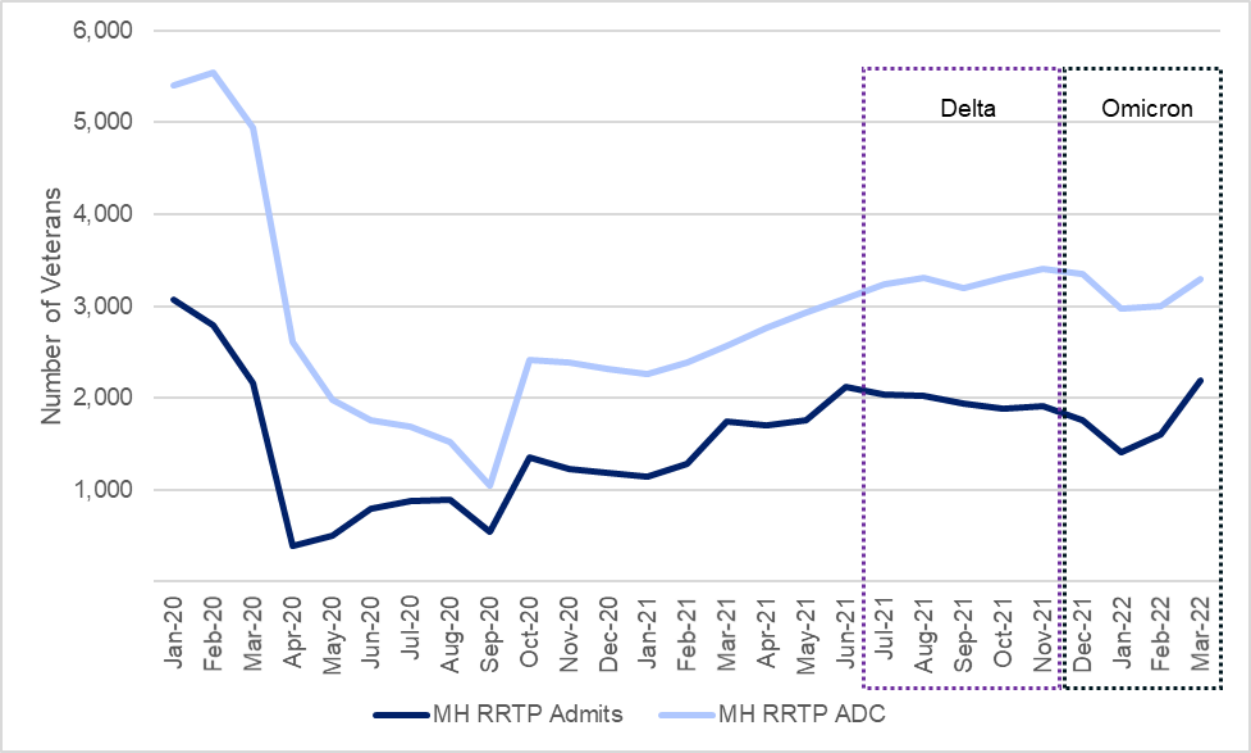
- Flexibility with the method of provision for supervision
- Relocation of clinical staff offices
- Cross-training of staff to increase comprehensive capabilities
- Use of telehealth for necessary support with mental health or medical evaluation
- Safe consolidation of residential spaces

MH RRTPs have three primary areas of responsibility:[533]

- Care for homeless Veterans
- Programs for substance use disorders
- Programs for specialized treatment of PTSD

The MH RRTP average daily population remained below pre-pandemic levels.[534] This utilization experienced a slight rise from September to November 2021, then began dropping again after November 2021.[535] Utilization rates began to rise again between February and March 2022, as shown in **Figure 7.5**.[536]

Figure 7.5: *Mental Health Residential Rehabilitation Treatment Program Admissions and Average Daily Census by Month (1/1/2020 – 3/31/2022)*



Source: OMHSP, response to data call, 4/20/2022. Ref. D263

Veterans are overrepresented in the U.S. homeless population, making up nearly 13% of the total homeless adult population although they make up only 7% of the total general U.S. population.[537] Combat Veterans are at greater risk for developing Post-Traumatic Stress Disorder (PTSD) although their rates of documented PTSD diagnoses vary by era of service.[538] Discharge from military service for mental disorders is one of the predictors for Veteran homelessness.[539] Evidence suggests that individuals diagnosed with PTSD are 4 to 5 times more likely to experience a substance use disorder in their lifetimes than people without a diagnosis of PTSD.[540]

VHA leadership reported proactive efforts to increase Veteran participation in MH RRTPs and other mental health programs, such as resource allocation to VISNs, for greater communication outreach.[541]

Wait times in VHA facilities for an initial routine mental health appointment can be 20 days or more in some locations.[542] Under the Mission Act, Veterans can be referred to community facilities when wait times exceed the standard, but there is no guarantee that community wait times will be better.[543] The Mission Act also implemented same-day services at VHA facilities for primary care or mental health

concerns that need to be addressed before the Veteran's next scheduled appointment.[544]

In November 2021, the White House issued a strategy aimed at reducing military and Veteran suicide.[545] The White House acknowledged that multiple Federal agencies are executing plans for the prevention of Veteran suicide, including VA, HHS and DoD, and identified a series of priority goals to be achieved through a series of executive actions, including the following:[546]

- Limiting access to lethal means and improving safety
- Enhancing crisis care and improving transitions of care
- Increasing access to effective services
- Acknowledging and prioritizing efforts to mitigate suicide risk factors and capitalizing on protective factors
- Improving coordination in research, data sharing and evaluations

Universal Access Deployment

VHA has worked to improve Veterans' timely access to health care through the VHA Universal Access Deployment (UAD) effort.[547] VHA leadership reported that UAD efforts aim to improve the timeliness of access to mental health care—a foundational aspect of VA care.[548]

VHA leadership shared that although UAD began with mental health, the effort has expanded to promote better access across all health care services.[549]

Through data analysis, UAD aims to improve and standardize the process of appointment scheduling, reporting and monitoring.[550] The reported outcome of this effort for Veterans will be the following:[551]

- Provision of uniform information on access to care to Veterans
- Improved access to care
- Consistent wait time experiences
- Reliable and easy appointment interactions, regardless of Veteran and provider location

Primary Care Resumption of Services

According to VHA leadership, communications outreach has had a positive impact on primary care service visits.[552] VHA primary care services use the Preventive

Health Inventory (PHI) to help track preventive health measures, mental health screenings, vaccinations and scheduling appointments.[553]

From August 2021 through March 2022, VHA documented approximately 14.1 million primary care encounters in VHA facilities.[554] This total was a decrease from the previous period (August 2020 to March 2021), in which approximately 15.9 million encounters took place.[555]

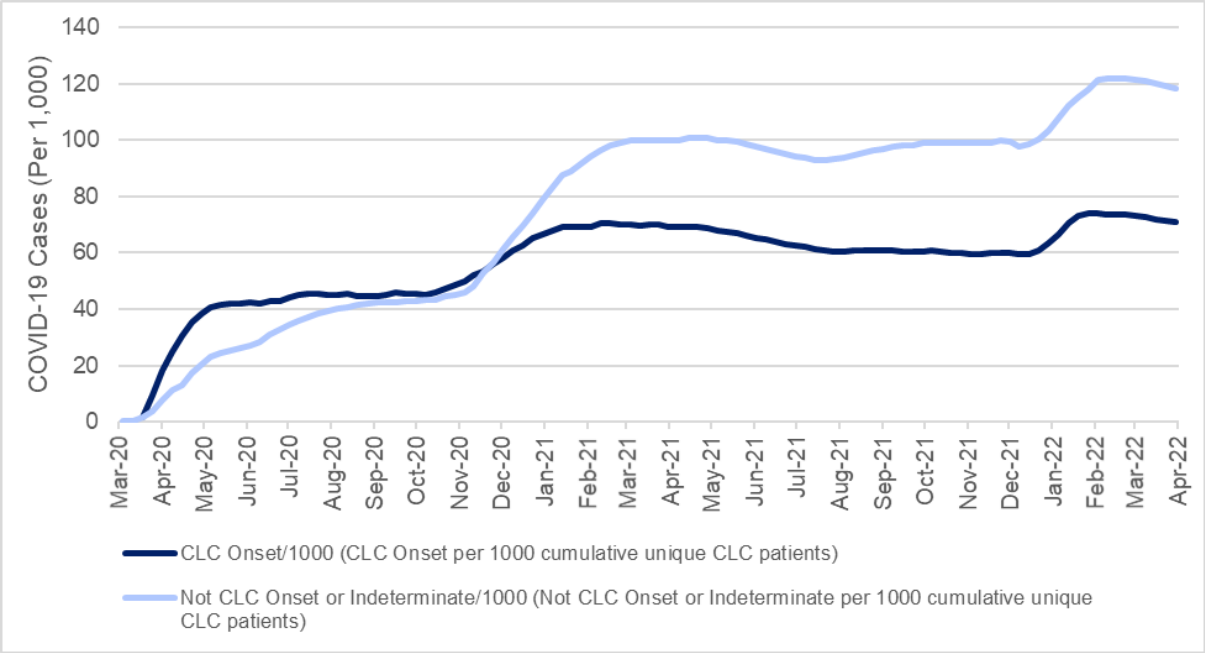
Despite the ongoing impact of the pandemic, both periods surpassed the approximate total encounters of the comparable pre-pandemic year (August 2019 to March 2020), in which VHA documented approximately 13.9 million encounters.[556]

In-person primary care appointments increased by about 1.5 million from August 2021 to March 2022 when compared to the previous year.[557] Primary care video encounters decreased from August 2021 to March 2022 when compared to the previous period, but the number of telephone encounters increased when compared to pre-pandemic encounters.[558]

Community Living Centers and State Veteran Homes

Figure 7.6 shows that since December 2020, most CLC residents who became infected with COVID-19 caught it outside CLC settings.[559] As of March 31, 2022, VHA recorded 8,461 positive cases among CLC residents whose point of infection was indeterminate or outside the CLC (62.8%).[560] CLC resident cases with a point of infection at the CLC totaled 3,147 (37.2%).[561]

Figure 7.6: *CLC Onset COVID-19 Cases vs. Outside CLC or Indeterminate Onset, per 1,000 (March 4, 2020 – March 30, 2022)*



Notes: VHA determined that CLC COVID-19 Onset Cases were likely acquired at a CLC, based on the timing of the positive test in relation to the Veteran's residence in the CLC. Cases are considered indeterminate when COVID-19 case data occurred with some contact in the CLC and some contact elsewhere within the 14-day exposure window.

Source: VHA, CDW, NST Database, accessed 4/7/2022. Ref. D265.

VHA offered and encouraged booster vaccinations through educational communications to CLC residents.[562] Approximately 88.4% of CLC residents completed an initial series of vaccination, and 72.8% of CLC residents received booster vaccinations by March 2022.[563] According to VHA leadership, outreach about boosters was conducted across CLCs, including education and discussions with clinical staff.[564] VHA leadership reported that efforts to boost CLC residents are ongoing.[565] For more information on VHA vaccination efforts, see the Vaccination section of this report.

In November 2021, VHA updated its CLC visitation guidance to reflect the changing characteristics of the pandemic.[566] Visitation guidelines became less restrictive, allowing all residents to receive more visitation.[567] The guidelines included continued visitation allowances for CLC residents in need of compassionate care, as well as day passes for family and friends of all CLC residents.[568]

Despite the relaxed restrictions, CLC leadership continued to take precautions to limit the spread of COVID-19.[569] Private rooms were used for social distancing, and observation periods remained in effect although quarantines were decreased from

14 to 10 days.[570] VHA received positive feedback from CLC residents regarding these changes.[571]

CLC leadership reported that they equipped all CLCs to be telehealth-capable and that they can provide specialty appointments to all eligible Veterans.[572] CLCs now have access to telehealth-equipped emergency departments that provide urgent care and after-hours care.[573]

VHA leadership reported that CLCs and SVHs have experienced staffing shortages during the pandemic.[574] VHA adjusted testing strategies based on the data from its new assessment tool.[575] The tool employs data including vaccination statuses and rates of positive tests.[576]

The COVID-19 pandemic has strengthened communication and partnership between SVH administrators and medical center directors.[577] In July 2021, VHA Geriatrics and Extended Care (GEC) enacted protocols for SVH directors and local VAMC directors, instructing them to meet at least twice a month to discuss infection control and best practices.[578]

During the review period, VHA introduced regular team meetings called Infection Prevention and Control Office Hours to support SVHs.[579] Coordination also included an email chain that frequently sent educational content and responded to questions about infection control and other medical inquiries.[580]

In addition to sharing educational resources, SVH leadership reported that during the Annex C reporting period, VHA donated approximately 117 iPads to 86 SVHs and had the capacity to respond to additional iPad requests.[581] Loaned iPads provided Veterans with access to virtual family visits and other social interactions that might otherwise be impeded by quarantine safety policies.[582]

Long COVID

After contracting COVID-19, some people develop Post-Acute Sequelae of SARS-CoV-2 (PASC) infection, also known as Long COVID.[583] Long COVID is a general term for health problems that can linger long after the expected recovery period for COVID-19.[584] The condition can affect the heart, lungs, brain, liver, kidneys and other systems.[585]

Staff members at the Long COVID clinic within the Pittsburgh VA. The team includes physicians, psychologists, nurses, physical therapists, social workers, researchers and hearing and speech specialists. (VHA photo)

Estimates on the number of Long COVID cases in the United States range from 7.7 to 23 million.[586] The full weight of the economic and health impacts of Long COVID is unknown, but is expected to be significant.[587] The research community is still working to develop diagnostic criteria and codes to uniformly diagnose and treat Long COVID.[588]

During the Annex C review period, VHA established an interdisciplinary team to address Long COVID.[589] The Integrated Project Team (IPT) includes members from clinical services and the National Institute for Discovery and Science (NIDS).[590] This team consists of representatives from various medical subspecialties, including cardiology, pulmonary, infectious disease, endocrinology and neurology.[591]

Long COVID Care programs used a combination of data from CDC guidelines, health care system criteria and insights from interviews and an environmental scan to inform the development of these programs.[592] The program includes clinical and administrative staff, treatment and referral processes, evaluation and reporting of patient status, diagnostic processes and involvement of clinical peers or intra-facility leadership.[593] As of March 31, 2022, VHA has established Long COVID programs in 17 facilities, and the organization plans to add more.[594]

VHA leadership reported that Long COVID teams are working to provide guidance on diagnostic criteria and diagnostic codes for Long COVID. VHA identified the need for a standardized set of criteria.[595]

Virtual Care Solutions

During the Annex C period, VHA focused its attention on enhancing virtual care tools, including the experience of care and satisfaction with the tools.[596] Virtual care allows patients to access information—and sometimes clinical care—remotely through their computer or phone.[597] The pandemic led to a significant increase in VHA's use of virtual care and telehealth.[598]

Although some health care systems have seen virtual care decrease in 2022, that has not been the case for VHA.[599] Leaders believe that the flexibility of telehealth will continue to improve care for Veterans after the pandemic, not just in emergency situations—such as snowstorms, hurricanes, and tornadoes—but also as a preferred form of care.[600] Just as Veterans may choose community health care or in-person health care, they can also choose virtual health care.[601]

Virtual care was in a foundational stage at the start of the pandemic, focused on expanding access for Veterans.[602] As of March 2022, VHA leadership aims to continue enhancing virtual care services and their quality while improving user experience and satisfaction.[603] Part of that improvement will be to include the integration of MyHealtheVet with the VA.gov website.[604] The flagship mobile app currently provides appointment management and secure messaging.[605] Additional services will include prescription refill ordering and full medication management.[606]

Clinical Resource Hubs

During the pandemic, VHA has worked to build more robust telehealth services.[607] The goals for this effort included helping rural Veterans connect for health care.[608]

VHA's Clinical Resource Hubs (CRHs) launched in 2019 before the pandemic started.[609] CRHs are a network of in-person and telehealth care sites that provide rural Veterans with access to medical care despite great distances from clinical facilities.[610] Operated out of all 18 VISNs and serving nearly 5 million rural Veterans, CRHs house primary care, mental health, clinical pharmacists, specialty care and rehabilitation providers.[611]

VHA uses CRH performance metrics to monitor the number of encounters, appointments and specialties used by rural Veterans.[612] VHA leadership reported that the dramatic increase in telehealth use during the pandemic was made possible by having the CRH structure in place before the pandemic began.[613]

Although CRHs have been highly effective in providing care to rural Veterans, hiring medical professionals to staff the CRHs is an ongoing challenge, according to ORH.[614]

Virtual Care Support

During the Annex C review period, the Office of Connected Care (OCC) focused on enhancing the efficacy of virtual care through efforts to improve digital literacy for Veterans and providers.[615] During the Annex C reporting period, OCC worked to formalize a system of training processes, as detailed in the subsections below.[616]

VHA leadership continues to prioritize access to effective medical services that Veterans can use comfortably.[617]

Virtual Care Resource Centers

In January 2022, VHA began to establish centers to train and support clinicians and Veterans as they learn to use virtual health care.[618] As of March 31, 2022, 3 medical centers and 1 VISN had developed virtual care resource centers.[619] VHA will continue to open virtual health resource centers and work with cohorts from April through July 2022.[620] VHA leadership reported that they hope to open virtual health resource centers in all facilities and VISNs.[621]

VHA leadership anticipates providing upcoming centers with tools, materials, training, video content and other resources to support the improvement of digital literacy for Veterans and clinicians.[622]

Assistance with Technology

As reported in Annex B, VHA has been working to provide Veterans with tablets through the Digital Divide Consult and Connected Tablet Program to support access to telehealth.[623] During the Annex C period, VHA expanded this effort to include technical support in setting up the tablet, along with video test calls with a technician.[624] When Veterans receive a tablet, they are contacted by a helpdesk, which provides support and helps the Veteran develop confidence and comfort using the technology.[625]

Additionally, VHA leadership reported that all VHA facilities are expected to offer technical support services and provide a designated individual or team to assist with tablet set up and test calls for Veterans who have their own devices.[626] Individual VHA facilities will be equipped with tools such as formalized scripts to help Veterans when they call for aid.[627] Once providers determine that telehealth is an appropriate form of care, schedulers will use these resources to discuss virtual care with Veterans and then connect them to appropriate technology assistance resources as needed.[628] VHA continues to formalize this training process.[629]

The National Help Desk is also available to support a variety of Veteran needs, especially for virtual care engagement.[630] As of March 31, 2022, the National Help Desk was not yet able to cover the whole country; therefore, additional support provided by individual VHA facilities remained necessary.[631]

Atlas Pilot Program

As reported in Annex B, VHA launched the Atlas Program to support rural Veteran's access to reliable internet.[632] This program continued in the Annex C period, providing telehealth access points for rural Veterans in centers in their communities (including stores like Walmart).[633]

Access to Care Modernizations

Community Care and Direct Care System Merger

Veterans have the following options for accessing care:[634]

- Face-to-face care in the community
- VAMC care
- Virtual care

From April through June 2022, VHA plans to complete the first phase of a merger combining OCC with the VHA direct care system; both organizations are responsible for access and integration of Veteran care.[635] This reorganization is a strategic change with a focus on improving the integration of care as VHA works to modernize Clinical Contact Centers (CCCs).[636] The merger will support the continued care of Veterans who receive care from multiple settings more efficiently by combining and organizing their resources.[637]

Clinical Contact Centers

VHA currently uses telephone-based software to connect Veterans to schedulers and nurses.[638] These systems allow VHA personnel to triage incoming calls and allocate resources efficiently.[639] VHA leadership reported that about 60% of calls answered by nurses are resolved over the phone, which means the Veterans do not have to visit emergency rooms or attend in-person follow-up.[640] VHA leadership reported that CCCs receive up to 700,000 calls each week.[641]

VHA is still working to connect this service more effectively with electronic health records (EHRs).[642] VHA leadership predicts that using EHRs will be valuable for the provision of medical services in natural disasters or health emergencies.[643]

Tele-Emergency Care Programs

During the Annex C reporting period, VHA emergency departments (EDs) and urgent care centers expanded the use of tele-consultation technologies, linking ED clinicians with specialists for rapid consultation.[644]

Three VISNs and several facilities increased virtual access to emergency medical care providers by establishing Tele-Emergency Care Programs.[645] Through these programs, Veterans can receive a rapid virtual assessment by an emergency care clinician, which often leads to a resolution that does not require an in-person ED visit by the Veteran.[646] An update has been posted to the VA urgent care website that encourages Veterans to call before visiting to ask about virtual help by phone or video.[647]

Tele-Ophthalmology

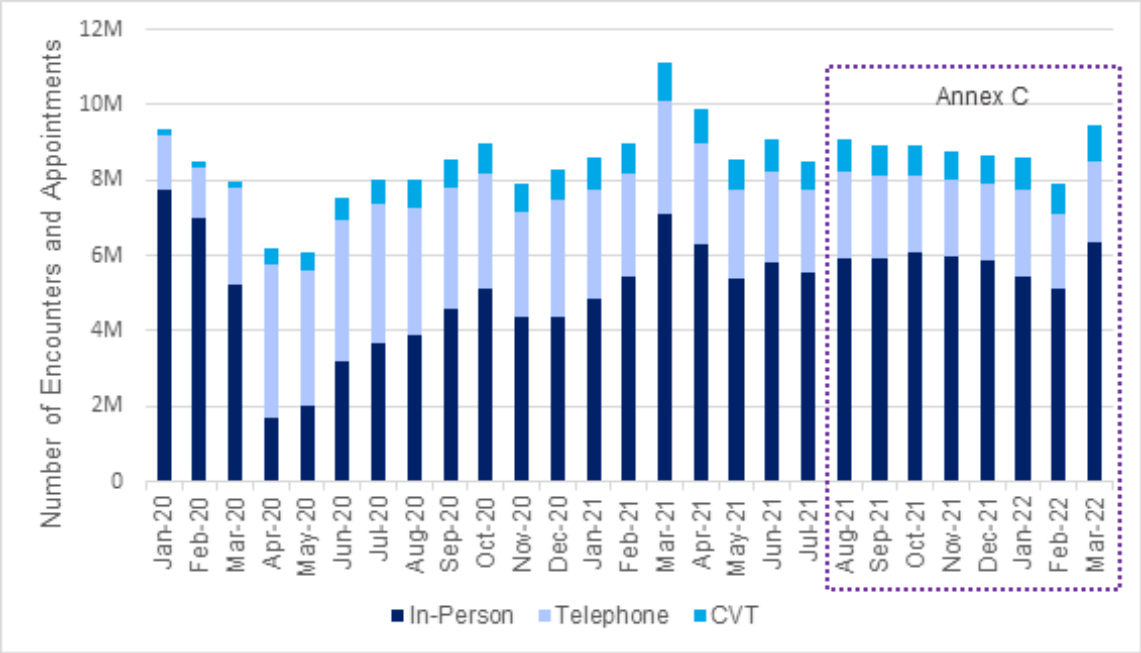
The National Ophthalmology Program Office continues efforts in the potential advancement of telehealth for eyecare services.[648] This office hopes to expand its VA video connect capabilities to add fundus and slit lamp photography, visual fields and optical coherence topography for advanced eyecare, facilitated by a general provider or specialist at a VAMC.[649] Another expansion that the ophthalmology offices hope to introduce is in-home optical coherence scanning to help Veterans who may have suspected or confirmed glaucoma.[650]

Telehealth Usage

The use of virtual encounters remained relatively steady during the Annex C review period, as shown in **Figure 7.7**.[651] In February 2022, virtual encounters dropped slightly, but they increased again in March 2022, along with a greater rise in in-person appointments.[652] Telehealth encounters and in-person appointments are higher in this review period than in much of the pandemic period, marking positive progress for resumption of services with continued use of telehealth encounters.[653]

VHA leadership reported that legal prescription of controlled substances is a major concern for the future of telemedicine.[654] Under the law, the definition of telehealth is very narrow, restricting the prescription of controlled substances through telehealth under many circumstances.[655] During the pandemic, governing authorities declared a public health emergency, which temporarily allowed medical prescribers to legally prescribe controlled substances through telemedicine.[656] This permitted the initiation of prescription therapy for substance abuse via telehealth during the pandemic, which has proven important as the national opioid crisis continues.[657]

Figure 7.7: *Virtual Encounters vs. In-Person Appointments Across all VISNs, January 2020 - March 2022*



Note: CVT refers to unique encounters attributed to clinical video telehealth. Telephone refers to unique encounters attributed to clinical telephone telehealth. In-person data represents the count of confirmed in-person appointments attended.

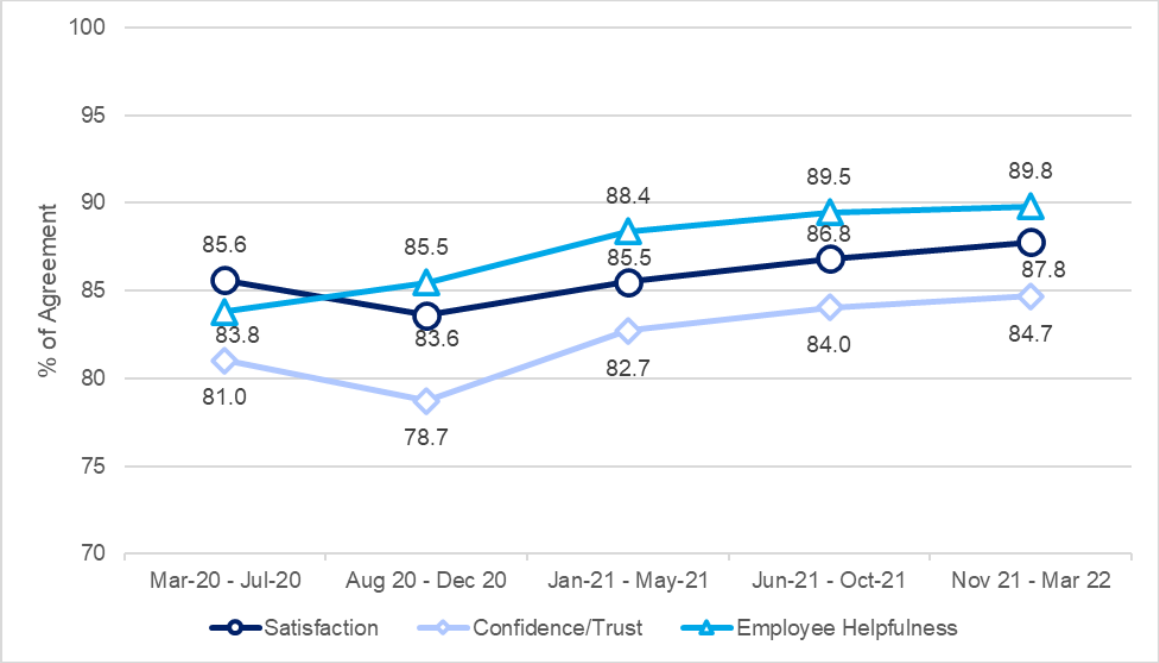
Source: VHA, VSSC, Telehealth Cube, response to data call, 4/7/2022; VHA, VSSC, Encounters Cube, response to data call, 4/7/2022; VHA, VSSC, Appointments Cube, response to data call 4/7/2022. Ref. D269

Looking forward to the end of the pandemic public health emergency, VHA telemedicine prescribers see value in sustaining the legal latitude to provide comprehensive treatment through telemedicine for patients who have not been seen in-person.[658] VHA leadership emphasized the hope that governing authorities will develop a permanent regulation that would legally and ethically allow medical prescribers the ability to prescribe controlled substances through telemedicine.[659]

Veteran Response

Through the Annex C reporting period, Veteran satisfaction, confidence/trust and endorsement of employee helpfulness from telehealth encounters remained at a steady level, as shown in **Figure 7.8**.[660] This rating has been increasing since December 2020.[661]

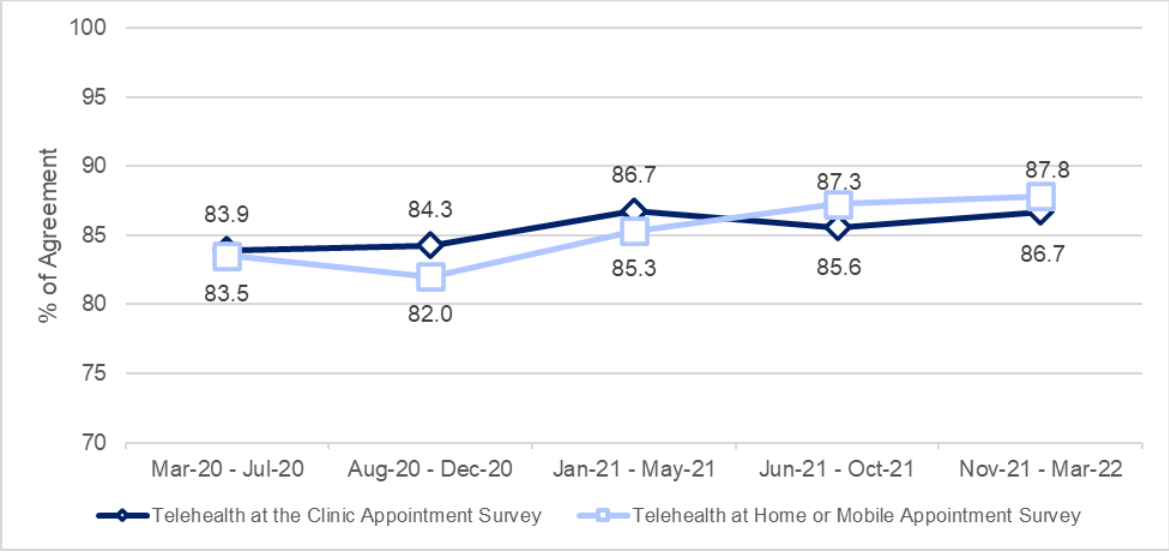
Figure 7.8: *Telehealth Satisfaction, Confidence/Trust and Employee Helpfulness Scores (March 2020 - March 2022)*



Source: VHA, OCC, Veteran Satisfaction Survey, response to data call, 4/14/2022. Ref. D269

As shown in **Figure 7.9**, during this review period, there was a general improvement in confidence/trust scores with telehealth at home and at clinic locations.[662]

Figure 7.9: *Telehealth Appointment Confidence/Trust Scores at Clinic vs. Mobile, March 2020 - March 2022*



Source: VHA, OCC, Veteran Satisfaction Survey, response to data call, 4/14/2022. Ref. D269

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WORKFORCE IMPACTS

During the Annex C Period, VHA faced staffing shortages and high turnover rates, including highly impactful nursing staff shortages.[663] During the Omicron surge (December 2021 to March 2022), the total number of VHA staff who were unable to work due to COVID-19 reached a peak of 14,767, based on a 7-day average.[664] This included 9,221 clinical employees.[665] In comparison, during the Delta surge (August to December 2021), the total number of staff unable to work reached a peak of 3,911, including 2,275 clinical employees.[666]

COVID-19 infection and burnout triggered by the ongoing COVID-19 pandemic were at least partly responsible for high staff shortages and turnover rates.[667] During the Annex C Period, some VAMCs entered crisis-level operation status for the first time in the COVID-19 pandemic.[668] VHA leadership reported that during this time, staffing shortages within their nursing workforce were a driving factor in these shifts.[669] For more on crisis staffing, see the Clinical Operations section of this report.

During the Annex C reporting period, VHA took a number of steps to address the needs of its employees by improving the working climate at VHA,[670] including the following:[671]

- Increasing wages
- Implementing employee wellbeing programs
- Developing a more versatile working environment

As VA leadership stated before Congress, by investing in the VHA workforce, VA is investing in Veterans.[672]

Continuous Operations

During Omicron, facilities encountered challenges clearing staff to return to work after COVID-19 infection or exposure while simultaneously, a high number of staff were unable to work.[673] Clearing staff was labor-intensive for employee occupational health professionals; it required that they call staff on the phone and access information in data systems.[674] Facilities experienced a range of delays processing the backlog of callbacks; one had a delay of 1 to 2 days, and others had a delay of 1 to 2 weeks.[675]

To expedite return to work, one facility developed a list of occupations considered critical who were automatically cleared to return to work.[676]

VHA is actively working to employ and deploy more nurses to support these staffing shortages.[677] VHA leadership reported that 4,500 to 4,600 individual nursing deployments were made in the past two years.[678] This number excluded internal redeployments, which occurred when VHA nurses moved from ambulatory and less care-intensive positions after receiving refresher trainings and were transferred into COVID-19 units and vaccination roles.[679]

A VA employee poses in front of the Birmingham VAMC, where he recently performed CPR on an unresponsive patient until first responders arrived. A father of three, he lost his wife to COVID-19 in 2020. (VHA photo)

Burnout & the Psychological Impact of COVID-19 on Workforce

VHA leadership reported that the pandemic increased frustration and psychological challenges among clinical staff.[680] Some of this distress was triggered by patients' and co-working staff's rejection of vaccines and boosters.[681]

VHA leadership reported that clinical staff faced a unique psychological challenge when managing and caring for patients who were ill but rejected their own COVID-19 diagnosis.[682]

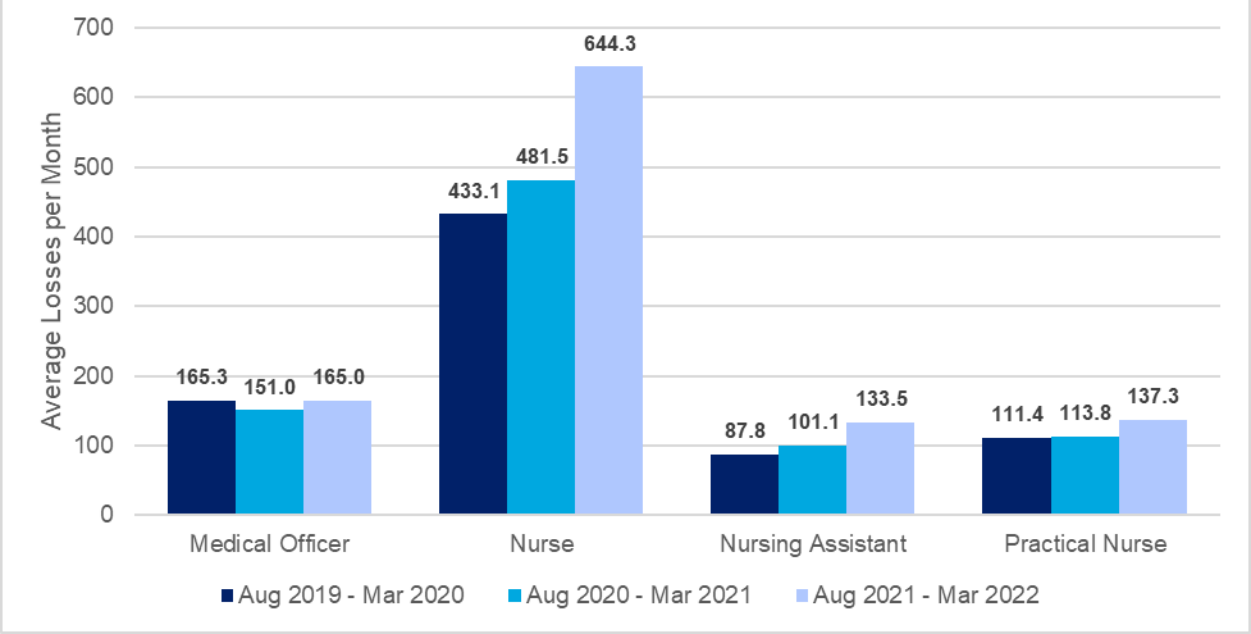
A study published in June 2021 examined the experiences of nurses taking care of critical care patients in the United States.[683] The study found that nurses experienced emotional and physical responses to the stress of caring for these patients, including anxiety, fear, helplessness, sleep disturbances, headaches and breathlessness.[684]

Even under normal conditions, some roles have higher-than-average burnout rates.[685] Nursing research identifies a vast number of predictors of burnout.[686] These predictors include high workload and low control over the job, limited job rewards, understaffing, limited flexibility with schedule, shifts longer than 12 hours, high psychological demands and difficult team relationships.[687]

VHA health care workers also faced challenges at home, just like non–health care workers.[688] Staff experienced family deaths from the virus, had children at home who were unable to return to school and cared for sick family members in addition to their full-time jobs.[689] Staff shortages and surges of hospitalization meant that many front-line staff did not get much time off.[690] The delivery of care continued; but clinicians in patient-facing roles had an extremely challenging working environment and social climate.[691]

VHA reached the highest levels of resignation and retirement during the Annex C period (represented by the lightest blue color), as shown in **Figure 8.1**.[692]

Figure 8.1: *Average Workforce Losses per Month – Retirements and Resignations (August – March 2019, 2020, 2021, 2022)*



Note: The average monthly losses cover August through March on an annualized basis. Losses include Retire and Resignation categories only. February and March 2022 data may be underreported because it can take time for HR data to be fully processed.

Source: VHA, WMC, response to data call 4/15/2022. Ref. D276

Clinical staff were not the only personnel who experienced burnout; non-clinical staff—including food service, janitorial and technical staff—were also burdened.[693] VHA leadership identified these roles as critical components of the health care team; they also impacted operating capacities.[694]

Table 8.1 shows HR statistics of employee gains and losses from August 1, 2021, through March 31, 2022.[695] During that time, 955 total employees were added (net of attrition). VHA experienced greater losses than net gains in three occupations: Practical Nurse, Nursing Assistant and Custodial Worker.[696]

Table 8.1: *Key HR Statistics Across VACO and VISNs*

Occupation	Total Staff Onboard, as of July 2021	External New Hires	Total Losses	Total Staff Onboard, as of March 2022	Net Gain (Onboard March 2022 minus Onboard July 2021)
Custodial Worker	11,966	1,926	1,757	11,533	-433
Medical Officer	27,365	2,079	1,723	27,517	152
Medical Support Assistance	31,388	4,795	3,044	31,748	360
Nurse	78,632	5,863	6,089	78,675	43
Nursing Assistant	14,330	1,715	1,468	13,833	-497
Pharmacist	9,635	425	290	9,855	220
Practical Nurse	15,628	1,308	1,360	15,187	-441
Psychology	6,245	392	370	6,405	160
Social Work	16,784	1,579	990	17,242	458
All Other Occupations	158,432	12,361	12,523	159,365	933
Totals	**370,405**	**32,443**	**29,614**	**371,360**	**955**

Notes: External New Hires represents unique external hires, which excludes transfers from other VA entities; Total Losses represents all employees who have been removed from, or departed, VA for any reason; and Total Staff Onboard represents total positions filled as of the date identified in the respective column header. Net Gain is calculated as the variance between the Total Staff Onboard as of March 2022 and Total Staff Onboard as of July 2021. Net Gain includes transfers within VA to another administration or occupational position. All Other Occupations includes all administrative, clinical and other occupations not independently identified in the table above. Numbers reported exclude trainees, medical residents, employees in non-pay status and intermittent employees.

Source: VHA, WMC, response to data call, 4/15/2022. Ref. D.276

Staffing Relief

During the Annex C period, VHA used multiple programs to provide relief assistance during emergencies, including the Disaster Emergency Medical Personnel System (DEMPS) and the Travel Nurse Corps (TNC).[697] VHA leadership reported that TNC deployed staff nurses to provide relief and support for the VHA nursing workforce.[698]

From August 1, 2021, through March 31, 2022, the volume of TNC staff decreased in comparison to the early stages of the pandemic.[699] In 2020, TNC had as many as 150 frontline workers working for VHA; as of March 2022, there were about 60 nurses in the corps,[700] They were spread among units that were not specific to COVID-19.[701]

According to VHA leadership, some access-to-care issues could be mitigated more efficiently through TNC provision and deployment of nurse providers and higher-level care providers such as Physician Assistants (PA), but that option was not available, as of March 31, 2022.[702] VHA leadership stated that adding advanced skilled roles to TNC could support the agility of the VHA workforce and accessibility to care because PAs would be able to provide a higher level of care.[703]

Building a Sustainable Workforce

As VHA staffing losses increased over the last year, leaders began to emphasize the importance of building a sustainable workforce.[704] VHA leadership acknowledged the weight and psychological impact of working conditions during the pandemic; for clinicians to return to work at full emotional capacity, sustainable workforce conditions will be critical.[705] VHA plans to support a healthy working environment by taking a number of actions, including the following:[706]

- Acknowledging the challenges and stresses of providing emotional support to staff
- Creating an environment conducive for learning and growth, which includes allowing nursing staff protected time to learn
- Incorporating support for psychological and emotional resilience into emergency response plans and drills with VHA facilities
- Increasing the volume of part-time staff to support agility in times of crisis

Human Infrastructure Plan

In February 2022, the Secretary of VA announced a human infrastructure plan to support a healthy and effective VHA workforce.[707] The Secretary announced ten steps that VHA is taking to enhance the working environment at VHA, including the following:[708]

- Increased wages, bonuses, retention incentives and opportunities for promotion
- Expanded benefits, including childcare, scholarships and student loan forgiveness

- Streamlined hiring, with an emphasis on inclusion/diversity
- Expanded flexibility and wellbeing opportunities

In the Annex C reporting period, VHA leadership reported the following progress:[709]

- Implemented a virtual Aspiring Supervisors Program to offer VA-wide leadership development
- Developed the VHA Reduce Employee Burnout and Optimize Organizational Thriving (REBOOT) task force
- Hired a Chief Diversity Officer

Raise Act

In March 2022, Congress enacted the RAISE Act to fund the Federal government through the end of the 2022 fiscal year. The RAISE Act was designed to make Federal health care jobs more competitive in the broader health care industry.[710]

The RAISE Act increased the former VHA pay cap for advanced medical professionals employed by VHA, including PAs, Advanced Registered Nurse Practitioners (ARNP) and Registered Nurses (RN).[711]

The REBOOT Task Force

In late summer 2021, concerns about employee burnout prompted the Acting Under Secretary for Health (Acting USH) to establish the REBOOT Task Force.[712]

The task force was charged with gathering input directly from employees; it began its work in fall 2021.[713] Through more than 700 messages and a series of focus groups, the task force received input on persistent staffing shortages, employee retention, scheduling flexibility, workload management and burdensome administrative tasks.[714] The task force expected to deliver its recommended actions to the Acting USH by June 2022.[715]

Pilot Projects

The VHA Office of Patient-Centered Care and Cultural Transformation initiated two pilot projects focused on resilience and wellness in the workforce, described in more detail below.[716]

CWO Pilot

The Chief Employee Wellbeing Officer (CWO) Pilot evaluated the impact of CWOs at select VHA facilities in eight VISNs.[717] A CWO is an executive position, charged with establishing an organizational strategy and leading systemic efforts to support professional fulfillment.[718] The CWO pilot used the Stanford Model of Professional

Fulfillment evidence-based framework, adapted to VHA's team-based structure.[719] This pilot applied interventions in three categories: culture of well-being, practice efficiency and professional resilience.[720]

The pilot will run for 18 months, after which the VA National Center for Organizational Development (NCOD) will evaluate its success.[721] To make its assessment, NCOD will use data gathered from the 2021-2023 annual All Employee Survey scores and from pre- and post-implementation interviews.[722]

Employee Whole Health Self-care Protected Time Pilot

As of March 31, 2022, Phase 1 of the Employee Whole Health Self-Care Protected Time Pilot was in progress at three VISN 17 facilities.[723] A total of 312 participating employees received up to 1 hour per week of protected time to conduct self-care and well-being activities.[724] The participants chose from a variety of options, including activities conducted on-demand, live, alone or in groups.[725]

The success of this pilot will be determined using evidence-based tools to assess the participants' resilience coping, perceived stress, perceived wellness, environmental support, goal setting and a flourishing index.[726] Phase I of this pilot was expected to end in May 2022, and results were expected to be presented to the VHA Governing Board in October 2022.[727]

Workforce Agility

VHA leadership identified that a major lesson learned from COVID-19 response was the importance of building and sustaining an agile workforce.[728] Workforce agility is the ability to move staff from one place to another to meet demand.[729] VHA leadership identified the following key factors in developing agility in the VHA workforce:[730]

- Increasing the number of part-time staff
- Conducting regular workforce data tracking
- Allocating resources appropriately

VHA leadership reported that VHA could benefit from an increase in its part-time staff.[731] In a surge-staffing framework, part-time staff would relieve full-time staff who would otherwise be responsible for putting in overtime hours during staffing shortages.[732] Part-time staff have more flexible working times and locations so they can fill in when and where they are needed.[733]

As VHA continued to see high turnover in nursing staff and across other medical professions, it became increasingly important to track staffing data and fill staffing vacancies quickly.[734] Leadership reported that they actively maintained a regular

cadence of staffing review, unmet care review and demand-for-care review so they could provide continuous service.[735]

Recruitment and Retention

According to VHA leadership, VHA struggles to stay competitive in the health care hiring market because necessary, timely changes in workforce policy have been difficult to pass.[736] In this review period, VHA took significant steps to evolve workforce policies such as passing the RAISE Act and incorporating the REBOOT Task Force.[737]

Additionally, the VHA Office of Nursing Services (ONS) worked closely with Workforce Management to address the hiring process.[738] They held weekly meetings over the past six months to evaluate statistics that inform decisions for speedier hiring.[739] Sharing data and hosting regular communication sessions with human resource officers and Chief Nursing Officers (CNOs) could be beneficial in appropriately evaluating and managing the nursing workforce.[740] To support this action, VHA reported that they were in the process of placing CNOs at every VISN.[741]

STAFF DEPLOYMENT

During the Annex C reporting period, VHA continued to deploy staff to support VHA internal requests and Fourth Mission operations.[742] From August 1, 2021, through March 31, 2022, VHA received 89 internal and external mission requests, as well as 2,191 staff requests.[743]

During the Omicron surge, VHA experienced challenges staffing the necessary number of people to respond to DEMPS mission requests while many staff were unable to work due to COVID-19 infection or exposure.[744]

Disaster Emergency Medical Personnel System

VHA's Office of Emergency Management (OEM) uses the DEMPS process to field requests to support emergency staffing needs.[745] The DEMPS process relies on a database of VHA staff who have volunteered to provide support in emergencies.[746]

VHA had an influx of volunteers during the pandemic.[747] Before COVID-19, approximately 9,180 volunteers were enrolled in DEMPS, and 3,689 were fully qualified to deploy.[748] As of April 2022, VHA had 18,540 DEMPS volunteers, and 6,907 were fully qualified to deploy.[749]

During the Annex C reporting period, VHA continued to use DEMPS to track mission requests and source volunteers.[750] OEM provided some level of staffing support for 96% of mission requests (80 of the 83 requested DEMPS missions).[751] However, due to the staff shortages created by the Delta and Omicron waves, DEMPS was unable to source the total number of volunteers requested for every mission.[752]

Table 9.1 shows the percentage of positions filled across DEMPS missions during the Annex C period. The table does not include reassignments that were executed without using DEMPS.[753]

Table 9.1: *DEMPS Missions (August 1, 2021 – March 31, 2022)*

	Number of DEMPS Missions	Number of DEMPS Staff Requested	Number of DEMPS Staff Deployed	Percentage of DEMPS Positions Filled
External Missions	6	48	26	54%
Internal VA Missions	77	2180	888	41%
Totals	**83**	**2,288**	**914**	**41%**
Source: VHA leadership, response to vetting, 5/17/2022. Ref. D217				

During this review period, a variety of factors impacted the number of volunteers available to meet the demand of mission requests.[754] Before DEMPS volunteers can

deploy, they must receive the approval of their supervisor and VAMC Director.[755] VAMC leadership were hesitant to approve and release VHA staff for DEMPS deployments due to the conflicting needs of facilities during the Delta and Omicron waves.[756] Many VAMCs also experienced staffing shortages.[757] Some of these staffing shortages, particularly nurse shortages, existed prior to the pandemic and were exacerbated when COVID-19 began.[758] In one week in January 2022 alone, nearly 15,000 VHA staff—mostly clinical staff—were unable to work.[759]

In earlier phases of the pandemic, VHA was able to encourage a larger number of volunteers to sign up for DEMPS deployments using Special Contribution Awards (SCA) and bonuses.[760] Initially, this led to a significant increase in the number of DEMPS volunteers.[761] But by 2022, VHA clinicians were fatigued by the duration of the pandemic and the demands associated with the large number of DEMPS mission requests.[762] VHA continued to provide SCAs, but even when the dollar amount of the SCAs was increased—particularly during the 2021-2022 holiday season—VHA was still unable to deploy the necessary number of staff to meet mission requests.[763]

VHA is currently conducting an assessment of DEMPS. The assessment will review whether systems need to be enhanced to better track mission requests and to provide adequate surge staffing support for emergencies and disasters at a national level.[764] The assessment will also include an analysis of the technology behind the platforms to determine opportunities for prioritizing missions and identifying qualified personnel.[765]

Clinical Deployment Teams

As a result of the stress put on DEMPS during the COVID-19 pandemic, VHA leadership approved the creation of Clinical Deployment Teams (CDTs).[766] CDTs are designed to complement—not replace—the DEMPS program, allowing VHA to standardize their response to emergency staffing requests.[767] As of the end of the Annex C reporting period, VHA was in the planning phase for CDTs, working to determine how best to implement the teams.

Using CDTs, VHA plans to provide each of the 18 VISNs with 20 new full-time employees (FTEs), whose primary responsibility will be emergency deployment.[768] This will provide VHA with an additional 360 FTEs, trained and ready to respond to internal deployment and Fourth Mission requests, as appropriate.[769]

When CDT staff are not deployed, they will work at VHA health care facilities.[770] OEM will maintain responsibility for determining DEMPS and CDT mission requests and staffing needs.[771] VHA hopes to have CDTs operational in the fourth quarter of fiscal year 2023.[772]

SUPPLY CHAIN

During the Annex C reporting period, the availability of previously scarce products improved, but supply scarcities shifted to new items.[773] The contingency plans VHA developed at the start of the pandemic were refined and used to address changing product scarcity.[774] VHA leaders engaged in a variety of interagency activities that focused on improving national supply chain resilience for preparedness and response to national public health emergencies.[775]

Also during the Annex C period, VA initiated development of an overarching supply chain strategy, including an analysis of alternatives for supply chain and support services, as well as enterprise information systems.[776] The enterprise information systems will consist of biomedical maintenance management, facility management, equipment accountability and assemblage management.[777]

Pandemic Response

During this reporting period, global and domestic supply chain disruptions continued to impact U.S. health care across the Nation, including VHA.[778] Shortages in glass, rubber, semiconductors, resin and paper constrained medical manufacturers' capability to meet demands.[779] Limited supplies of blood tubes and dialysis solution were top areas of concern for VA health care and U.S. health care overall.[780]

Relying on processes established early in the pandemic, VHA enabled facilities to order scarce medical supplies from central procurement operated by the VHA Procurement and Logistics Office (PLO).[781] For instance, when VAMCs were not able to procure sufficient quantities through VA medical-surgical prime vendors, VHA allowed VAMCs to order centrally procured blood tubes directly by using the National Contingency Response Tool (NCRT).[782] VHA worked with manufacturers to procure contingency blood tubes centrally and stocked them at Regional Readiness Centers (RRCs).[783]

VHA also adapted to mitigate supply chain issues.[784] For example, to address shortages in pre-filled saline-flush syringes, VHA purchased bags of saline and syringes separately and made its own saline syringes.[785]

Kidney Replacement Therapy (KRT) fluid was in short supply throughout the United States during the Annex C period.[786] KRT is required to treat chronically ill patients with kidney disease.[787] Access to KRT was disrupted due to supply chain issues stemming from COVID-19.[788] In light of the shortages, suppliers capped KRT fluid allocations to all U.S. customers, including VHA.[789]

In response, VHA, like many other health care systems, acted within evidence-based standards of care to adjust clinical guidelines and safely reduce the quantity of dialysis fluid used for each patient.[790] This allowed VHA to continue treatment for Veterans requiring dialysis.[791]

In addition to KRT fluid supply shortages, dialysis care was also impacted by nurse staffing shortages at community dialysis centers.[792] During the Annex C period, two large dialysis organizations closed community units due to staffing issues.[793] Community dialysis centers impacted Veterans Using VHA Services because the majority of Veterans requiring dialysis use community dialysis centers closer to their homes; access to close-by centers is important because dialysis treatment is typically needed three times per week.[794] With the closure of some community facilities, some Veterans went to VA facilities for dialysis care.[795]

During pandemic surges, production of medications authorized to treat COVID-19 could not meet patient demand globally.[796] Consistent with other jurisdictions and Federal entities in the United States, VHA had fewer doses of COVID-19 treatments than it needed to treat all eligible patients.[797] To provide the fairest treatment possible, VHA developed an interim system, supported by a team of ethics advisors and internal experts (including infectious disease, Pharmacy Benefits Management (PBM), emergency medicine and COVID-19 clinical experts).[798] The team created an algorithm to help sites determine which patients were at highest risk for progression of severe COVID-19 and would receive the most likely benefit from available doses at individual sites.[799]

Semiconductor shortages raised different challenges.[800] Medical device manufacturers represent only a fraction of the overall U.S. demand for semiconductors.[801] As a result, medical device manufacturers had difficulty obtaining enough of the semiconductors they require for medical device manufacturing.[802]

In light of the absence of available semiconductors, VHA received authority allowing VHA to purchase back-ordered, high-cost medical equipment from manufacturers beyond the year in which they were purchased.[803]

Drug Management & Supply

Increased demand for COVID-19 medications during the Omicron surge, coupled with inadequate production of product by the drug manufacturers, drove VHA to prioritize patient selection for its limited supplies, similar to other jurisdictions and Federal entities across the United States.[804]

Early in the pandemic, VHA developed an opt-in opt-out system for newly available COVID-19 treatments so sites could make decisions based on their needs.[805] VHA monitored usage by site.[806]

In collaboration with the VISN pharmacist executives who oversaw VISN administration and supplies, VHA monitored facilities on a PBM dashboard to determine which sites were running low on supplies and which had extra products on their shelves.[807] This allowed VHA to move scarce products to sites in need.[808] The process was so successful that DoD and other federal entities were referred to VHA for consultation on how to better manage their on-hand inventories and used it to improve their own processes.[809]

In February 2022, HHS asked VHA to be one of the first agencies to use a redesigned CDC-run system called the Health Partner Ordering Portal (HPOP) to deliver therapeutics across the country.[810] Instead of using VHA's own centrally located mail order pharmacy, VHA could order directly from the supplier, which shipped product directly to sites.[811] VHA leaders noted that although the system reduced stress on VHA's redistribution resources, it also decreased flexibility in dividing orders among sites, at least initially.[812]

Although this new system allowed products to be delivered directly to VA facilities from the HHS contracts distributor, it still required VHA PBM staff to centrally coordinate orders that were entered into the HPOP system.[813] This new system empowered sites to order their own products when they needed them, rather than going through a centralized process.[814] It also allowed facilities to opt in for new products once approved by FDA.[815] VHA was able to establish facility-level periodic automatic replenishment (PAR) for each of the medications. To keep sites stocked at all times, auto-shipments of product could be generated when initial allocations were provided to sites once facilities went below their PAR levels.[816] Additionally, VHA was now able to create auto-shipments of product once initial allocations were provided to sites; as products are used, VHA can auto-ship additional product to keep sites stocked.[817]

Interagency Engagement

To mitigate the challenges acquiring COVID-19 self-test kits, VHA leveraged existing interagency relationships with DoD and the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR).[818] With support from these organizations, VHA obtained approximately 10 million self-test kits for VA employees, Veterans and visitors.[819] For information on self-tests, see the Testing and Genomic Sequencing section of this report.

VHA continued its interagency collaboration, focusing on the implementation of the National Strategy for a Resilient Public Health Supply Chain (the Strategy) and the multiple actions that comprise the Strategy, including the following:[820]

- The COVID Supplies Interagency Policy Committee
- Multiple interagency working groups, each focused on a specific action required by the Strategy
- The Voluntary Agreement for the Manufacture and Distribution of Critical Healthcare Resources Necessary to Respond to a Pandemic (VARG) working group

During this period, the Acting AUSH for Support was selected as one of three co-chairs for the Government Coordinating Committee (GCC) Joint Supply Chain Resilience Working Group (JSCRWG). Along with fellow co-chairs from HHS ASPR and FDA, the JSCRWG operated under the Critical Infrastructure Partnership Advisory Council (CIPAC).[821] The JSCRWG is considered the "strategic guidance arm" of the Strategy's implementation plan.[822]

RRCs: Transitioning from Contingency to Readiness

As of March 2022, RRCs supported 562 organizations that ordered supplies through the NCRT. The RRC mission expanded to provide N95 non-surgical respirators to a broader range of VHA employees and to VA employees, including the Consolidated Patient Account Center, National Cemetery Administration (NCA), Office of Information and Technology (OIT), Veterans Benefits Administration (VBA) and VACO.[823]

Readiness Inventory

During the pandemic, VHA purchased approximately 30 million 1870-model respirators.[824] This type of respirator requires documented fit tests for users, ensuring that the respirators do not leak; the fitting process takes time.[825] VHA is working with manufacturers to exchange the 1870-type respirators with the preferred 1860-model respirators, which are already fit-test-documented.[826]

VHA experienced challenges securing N-95 masks during the Annex B period (January 1, 2021, to July 31, 2021); however, by the Annex C reporting period, VHA was able to meet demand, supplying 5.3 million generic and surgical N95 masks through RRCs for Veterans and VA staff.[827]

Supply Chain Resilience and Readiness

During the Annex C period, VHA began transitioning its supply chain strategy from contingency to long-term readiness for other emergencies outside of the

pandemic.[828] Part of this included assessing VHA's supply chain and the role of RRCs beyond the pandemic response.[829]

In October 2021, VHA completed various supply chain assessments, including the VA Chief Acquisitions Officer-led supply chain management assessment, which was followed by a gap analysis.[830] This work will culminate in the development of a comprehensive supply chain strategy that was in progress as of the release of Annex C.[831]

On November 18, 2021, VA's Principal Executive Director for Acquisition, Logistics and Construction (who is also the Chief Acquisition Officer) presented Congressional testimony to the subcommittees on Technology Modernization and Oversight and Investigations of the House Veterans Affairs Committee.[832] In their testimony, VA and VHA leaders shared the current state of VA's supply chain modernization efforts and strategies for improvement.[833]

During the Annex C reporting period, Congress halted VHA's plans to implement Defense Medical Logistics Standard Support (DMLSS), pending a business case analysis to inform VHA supply chain readiness.[834] While the analysis is performed, facilities will continue to order directly from vendors or through the DLA Electronic Catalog (ECAT).[835] As of the Annex C reporting period, DLA ECAT was used throughout VA, and DMLSS was approved to be piloted in VISN 20 and at the James A. Lovell Federal Health Care Center in VISN 12.[836]

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FOURTH MISSION

Under its Fourth Mission, VHA can be called to provide humanitarian and health care support for Veterans and non-Veterans during emergencies and natural disasters.[837] VA's Fourth Mission also supports and partners with other Federal, state, municipal, tribal and territorial government agencies.[838]

For example, VHA can admit non-Veteran patients to VAMCs in emergencies when appropriate requirements are met.[839] VHA can also deploy VHA staff to non-VHA facilities.[840]

Overview of Fourth Mission Support

During this review period, VHA Fourth Mission support included providing additional staff, equipment, testing, vaccinations and other types of community engagement and outreach.[841]

From the start of the pandemic through early April 2022, VHA provided more than 1 million pieces of PPE, deployed personnel to 50 states and multiple U.S. territories and admitted nearly 700 non-Veteran patients to VHA facilities throughout the country.[842]

VHA also provided various levels of support for multiple Federal agencies.[843] For a list of new VHA Fourth Mission activities during the Annex C reporting period, see Appendix C.

FEMA Mission Assignment Process

The National Response Framework (NRF) guides how FEMA and other Federal agencies respond to emergencies and other significant events. During responses to disasters with a formal declaration in place, FEMA coordinates the Federal response, receiving all requests for Federal assistance and identifying the appropriate Federal agencies that would best be able to provide the requested assets or capabilities. If the requests require health or medical support, FEMA connects with HHS.

HHS leads and coordinates the Federal response related to issues involving public health and medical support. HHS works with other organizations that have responsibilities under the Emergency Support Function (ESF) #8 annex to the NRF (including VA) to determine which partner agency can best supply the necessary resource or capability.

Sources: DHS, "National Response Framework: Fourth Edition," 10/28/2019, https://www.fema.gov/sites/default/files/2020-04/NRF_FINALApproved_2011028.pdf, accessed 5/20/22; HHS, "Emergency Support Function #8 – Public Health and Medical Services Annex," https://www.fema.gov/pdf/emergency/nrf/nrf-esf-08.pdf, 1/2008, accessed 5/20/2022. Ref.s D399, D398

FEMA Mission Assignments

When state or local governments need additional resources to manage emergencies, they can request Federal assistance from FEMA during federally declared disasters.[844]

Since the beginning of the pandemic, VHA has completed 197 FEMA Mission Assignments.[845] Of that number, 36 (18.3%) were completed during the Annex B review period, 38 (19.3%) were completed during the Annex C review period, and 1 is ongoing.[846] During this review period, 13 VISNs responded to new FEMA Mission Assignments.[847] The majority of these assignments were requests for PPE, staff augmentation and excess bed capacity for non-Veteran patients from the community.[848]

Interagency Support

VHA interagency support consisted mainly of IHS requests for bed capacity, staff augmentation and vaccination support for other Federal agencies.[849] VHA administered COVID-19 vaccinations for Federal employees at the Department of Homeland Security (DHS), Administrative Office of the United States Courts (AOUSC), General Services Administration (GSA), National Archives and Records Administration (NARA), HHS and FDA.[850] VHA also supported the Defense Logistics Agency (DLA) by shipping vaccines to the Philippines.[851]

In this review period, VHA's Fourth Mission supported these Federal agencies through interagency agreements: DHS, FDA, NARA, AOUSC, GSA, DLA and HHS (including IHS and the Administration for Children and Families).[852]

During the Annex C review period, VHA drew from a series of processes developed in previous phases of the pandemic to better support vaccinations of employees from other Federal agencies.[853] These new processes allowed VHA to register the employees of other Federal agencies into VA systems, schedule their vaccinations and then share that data with each Federal agency.[854]

SAVE LIVES Act

On March 24, 2021, the President of the United States signed the Strengthening and Amplifying Vaccination Efforts to Locally Immunize All Veterans and Every Spouse (SAVE LIVES) Act into law.[855] The act authorizes VHA to provide COVID-19 vaccines to all Veterans (even those who are not enrolled in VHA Services), along with their spouses, some beneficiaries and caregivers.[856] During the Annex C reporting period, VHA used the SAVE LIVES Act authority to vaccinate approximately 51,000 additional Veterans, spouses, dependents and caregivers.[857]

Vaccination Support for Deported Veterans

The SAVE LIVES Act also allowed VHA to vaccinate deported Veterans, their spouses and eligible dependents and caregivers.[858] As reported in Annex B, VHA, DHS and other partners previously collaborated to vaccinate deported Veterans along the U.S.-Mexico border near San Diego, California.[859] For more information on this initial vaccination event, see Annex B.

In November 2021, the same interagency collaboration reconvened to vaccinate deported Veterans along the U.S.-Mexico border near El Paso, Texas.[860] VA contacted deported Veterans living in close proximity to the area to provide information about receiving the vaccine, along with briefings from VBA about potential benefits they may be eligible to receive.[861]

More than 20 Veterans signed up to travel to the border with their families to receive vaccinations and information on Federal benefits and services.[862]

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CONCLUSIONS

The findings, conclusions and recommendations from the initial VHA COVID-19 Response Report, Annex A and Annex B remain valid. Examination of this period of the response, the Annex C reporting period, led to some additional findings, conclusions and recommendations.

Overall Response

The Overall Finding for This Period of the Pandemic Response:
VHA performed as an integrated, coordinated, learning health system during the Annex C reporting period. VHA balanced its clinical, operational, research and support services effectively to meet the needs of Veterans and conduct Fourth Mission activities. The extended pandemic, coupled with the impacts of the Delta and Omicron variants, highlighted workforce challenges that will require a multifaceted response.

During the Annex C reporting period, two successive waves of COVID-19 swept through the United States, caused by the Delta and then the Omicron variants. Both waves imposed considerable stress on health care systems throughout the Nation, including VHA. VHA case volumes and hospitalizations surged to their highest point since the pandemic began.

Throughout this period, VHA sustained its coordinated response across its 18 networks, which proved essential to balancing its ongoing emphasis on vaccination, COVID-19 care, research, the Fourth Mission and interagency support while still meeting a variety of clinical, operational and support challenges.

Sustaining the VHA workforce was a major challenge during this reporting period, requiring continuous focus and engagement by VHA leaders at all levels. The challenge resulted from a confluence of factors, including the following:

- Burnout from the prolonged pandemic response
- A surge in hospitalizations during the Omicron wave
- High levels of staff unavailability due to Omicron illness and exposure
- Attrition from the workforce through resignations and retirements

These issues impacted every VHA inpatient facility. In response, the facilities employed contingency staffing strategies, and a few applied crisis staffing strategies. VHA used recruiting, retention and wellness actions to provide some mitigation to the

shortfalls. Cross-leveling of staff—a response technique used early in the pandemic—was essentially unavailable as a tool because of the widespread national impact of the Omicron variant.

Although the staffing crisis abated as the Omicron wave waned, workforce shortages persist. These shortages will require a multifaceted strategy to enhance workforce resilience through wellness, compensation and agility in preparing staff to shift between units within VAMCs and other VHA facilities.

In reviewing the actions taken during the pandemic, VHA leaders noted the importance of a measured approach to restrictions and deferred care. Deferral of care and preventive screenings should be limited when possible to mitigate the health risk to Veterans. Leaders also noted the importance of permitting family interaction with CLC residents through a pandemic under safety controls and limitations. Visitation can have a strong impact on the mental health of CLC residents.

This period of the pandemic also highlighted the importance of agility as a learning health system. Pandemic waves caused by viral variants generated new questions for research that required rapid adaptation of clinical processes.

Testing

Finding: During this period of the pandemic, VHA was successful in significantly expanding its capacity for COVID-19 testing and genetic sequencing of the SARS-CoV-2 virus.

Finding: VHA was effective in meeting the surge in demand for testing during the Omicron wave—the greatest demand for VHA testing to date in the pandemic.

Finding: VHA procured and distributed antigen self-test kits for COVID-19 to a large number of Veterans. These kits enabled diagnosis and evidence-based therapeutic treatment early in the course of infection to reduce the probability of serious illness.

Context: During the Annex C reporting period, COVID-19 case volume increased substantially as a result of the Delta and Omicron variants. Both variants had mutations that allowed for enhanced transmission and diminished sensitivity to

immunity, which greatly increased the rate of infection. This produced surges in demand for testing, both in the clinical setting and in U.S. homes.

The Omicron variant produced the greatest number of confirmed U.S. cases to date in the COVID-19 pandemic. COVID-19 associated with Omicron included many cases with symptoms amenable to self-care, and epidemiologists estimated that many cases of COVID-19 during the Omicron wave went unreported. As antigen test kits for home use became more readily available, demand for the kits exceeded supply, and the American public found it difficult to find kits at retail stores. The Federal government initiated programs to enable free access to kits, but the Omicron wave moved past its peak as these efforts were implemented.

Conclusions: VHA mitigated the ongoing shortfall in testing supplies and staffing challenges and was able to meet demand among the Veteran population for COVID-19 testing. VHA testing attained a peak 7-day average volume of approximately 10,000 tests per day during the Delta wave and more than 17,000 tests per day during the Omicron wave. For 95% of the tests, VHA provided results for PCR tests within 2 days.

During the Omicron wave, VHA also procured antigen test kits for self-testing and shipped them to Veterans at no charge. Distributing self-testing kits to Veterans and communicating with Veterans about their availability and use were important to enabling VHA's Test-to-Treat program. Test-to-Treat allowed for the timely administration of therapeutics to reduce the risk of serious illness for those early in their COVID-19 infection.

VHA's network of genetic sequencing laboratories expanded to eight during this period. The increased volume of genetic sequencing performed by VA laboratories made important data-sharing contributions to national and international collaborative tracking of variants. VHA's genetic sequencing is also providing important support to clinical research pertaining to variants of the virus responsible for COVID-19.

Vaccination

Finding: VHA's management of vaccination supply, distribution and administration, coupled with outreach to Veterans, was highly effective during this period.

Finding: VHA’s communications and outreach to minority Veterans yielded a significant increase in vaccination rates among Black and Hispanic Veterans. Vaccination rates are lagging among rural Veterans and AIAN Veterans.

Finding: VHA's access to state vaccination data is incomplete, which limits the organization’s visibility of the vaccination status of the Veteran population.

Finding: Managing the vaccine mandate for health care personnel in the midst of considerable staffing shortfalls was complex and time-intensive.

Context: During this reporting period, a great deal of evidence was published from studies of the effectiveness of COVID-19 vaccines. Studies showed that vaccine effectiveness in preventing infection waned over a period of months although the vaccine’s effectiveness in preventing hospitalization and death stayed steady.

Upon examining a recommendation from FDA and evolving evidence from studies of vaccine efficacy, CDC issued a recommendation for a booster dose of COVID-19 vaccine. The booster dose was recommended for individuals who met specific eligibility criteria after the individuals had completed an initial vaccination series.

As the Delta variant and then the Omicron variants emerged and spread, studies revealed that the vaccines had diminished efficacy against these variants. However, evidence also revealed a high level of vaccine efficacy in preventing hospitalization and mortality from Delta and Omicron.

COVID-19 vaccination rates for the U.S. population lagged below rates of numerous nations with advanced economies. The number of people in the United States who obtained a booster dose remained well below the number who completed an initial vaccination series. Vaccination rates among rural U.S. residents were lower than rates among urban residents.

Some U.S. health care systems and a few state and local governments established requirements for COVID-19 vaccination for health care workers. In July 2021, VHA issued a requirement for COVID-19 vaccination for its health care personnel.

Conclusions: VHA provided access and availability to COVID-19 vaccines at its facilities. Outreach to Veterans included promotion of the initial vaccination series and booster doses.

Black and Hispanic Veterans completed their initial vaccination series at higher rates than Black and Hispanic people in the overall U.S. population. However, the rates of initial vaccination series among AIAN Veterans were below the AIAN rates in the general U.S. population. Vaccination rates among rural Veterans lagged behind rates for urban Veterans, similar to the pattern in the overall U.S. population.

During the Annex C reporting period, VHA became acutely aware of the need to improve the exchange of immunization data across all vaccination jurisdictions. VHA lacked access to state data that would have provided a more complete picture of the vaccination status of Veterans. During this reporting period, VHA launched an initiative to provide such a data exchange, the Immunization Gateway.

Workforce management was complicated by several factors, including the adjudication of requested exceptions to the vaccination mandate, as well as the staffing shortfalls during the Omicron wave.

Research

Finding: VHA's performance and publication of clinical research on COVID-19 provided significant contributions that informed the pandemic response nationally and internationally.

Finding: Through successful research partnerships and programs that made VHA data available to external researchers, VHA was able to conduct and participate in studies that published important information about the prevention and treatment of COVID-19.

Context: As the pandemic continued and viral variants produced serial waves of COVID-19 across the world, new scientific questions evolved—questions that could be answered only with well-designed clinical research. These questions pertained to issues like the following:

- Vaccine effectiveness over time
- Viral variant susceptibility to immunity from vaccination or prior infection
- Effectiveness of therapeutics against infection with viral variants
- Long-term health effects of COVID-19

Studies into these matters required evidence applicable across races, ethnicities, genders and ages. Access to health data from diverse populations remained critical to the design and conduct of research to effectively address the questions.

Conclusions: During this period, VHA conducted extensive clinical research across multiple sites focused on COVID-19, including clinical trials of vaccines and therapeutic agents. VHA's clinical research included studies related to health disparities, health effects of Long COVID, staff burn-out and aspects of vaccine effectiveness. VHA clinical research continued its rigorous pace, publishing reports of its studies across a broad array of journals. VHA also continued to provide access to VHA health data to external researchers under the VA Informatics and Computing Infrastructure (VINCI) program, employing controls to ensure the security and privacy of Veterans.

VHA expanded its research collaborative partnerships with Federal agencies and other organizations during this period. Together, the parties conducted pandemic-related research, such as the BARDA initiative, which studied the effectiveness of treatment modalities for COVID-19 across all variants.

The VHA Innovation Ecosystem continued its development of on-site medical device manufacturing capability. As of March 31, 2022, 3 sites had attained FDA certification, and 4 sites were preparing to seek certification. During this reporting period, VHA joined the PIT Force—an interagency group that reviews lessons learned and considers research and clinical initiatives.

Health Equity

Finding: COVID-19 health disparities among Veterans have proven to be dynamic and multi-factorial, requiring sustained monitoring and analysis of data to inform actions.

Context: The impact of COVID-19 has varied substantially by race and ethnicity. The disparities, which have been visible nationally throughout the pandemic, have changed with the different waves of the pandemic. During the Annex C review period, the Delta wave produced disproportionately high rates of infection and death among AIAN populations in the United States. The Omicron wave produced disproportionately high rates of infection and death among Hispanic and Black populations, with an associated rise in rates for infection and death among White members of the U.S. population.

As medications became available to reduce the risk of serious illness from COVID-19, concerns were raised about disparities in access to testing and clinical care.

Conclusions: VHA research into the epidemiology of the pandemic among subgroups of Veterans specific to race, ethnicity, age, gender and communities of residence yielded important insights during this period. Published VHA studies revealed significant changes as the pandemic progressed. Wide disparities among Veterans in infection rates and mortality rates across race and ethnicity early in the pandemic narrowed as the pandemic progressed and, in some cases, even reversed. Potential explanations for the changes in disparities include differences in vaccination rates by race and ethnicity, and changes in population exposure as the pandemic reached different geographic regions of the United States.

A published study from early periods of the pandemic examined factors associated with COVID-19 disparities among AIAN Veterans. The study yielded important insight into the contribution of community factors to disparities. The study quantified the contributions of social determinant and community factors to the disparities, including the prevalence of kitchen plumbing, socioeconomic indicators and proximity to a reservation.

Clinical Operations

Finding: A pandemic like COVID-19, which may feature successive waves of viral variants, requires a measured approach to deferral of preventive care, management of chronic conditions and restrictions on visitation to long-term care residents in order to balance pandemic protection with overall health outcomes.

Finding: VHA's actions to employ telehealth, self-testing at home and express delivery of therapeutics for early intervention effectively mitigated the limitations Test-to-Treat encountered in U.S. health care.

Finding: VHA used a range of contingency staffing strategies to mitigate the impacts of staff attrition and unavailability during this period of the pandemic. Only a few facilities had to employ crisis staffing strategies.

Finding: Experience during the Omicron wave illustrated the importance of smooth transitions for personnel who are moving from ambulatory to inpatient care. Agility and flexibility will be important to meeting demand for inpatient care in future pandemic response, particularly during hospitalization surges.

Finding: Experiences at facilities that employed crisis staffing strategies yielded additional measures that may help health care facilities mitigate the risk to patient safety and quality of care.

Context: During this reporting period, the Delta and Omicron variants produced sizable waves of COVID-19. Nations around the world also experienced these waves, including nations with vaccination rates above 50%. In these countries, research indicated that a significant number of infections occurred among the vaccinated. Studies began to confirm that the variants were more transmissible than the ancestral SARS-CoV-2 virus and were less susceptible to immunity from vaccination or prior infection. Studies also began to confirm that hospitalization rates were lower with these variants although the high number of cases showed that the demand for hospitalization remained significant. Additionally, studies indicated that hospitalization and mortality among the vaccinated was quite low.

During the Annex C reporting period, research reinforced the effectiveness of mAb therapy, and several forms of mAb medication gained EUAs from FDA. New oral therapies gained FDA EUA for use early in the course of mild-to-moderate COVID-19 as a means of reducing the probability of serious infection.

Demand for self-testing antigen kits increased during this period, in part because of new medications that could treat mild-to-moderate COVID-19, and in part because of the high proportion of mild cases caused by Omicron. As the Omicron wave drove the largest number of U.S. COVID-19 cases to date, the supply of antigen testing kits in retail stores fell well short of demand. The Federal government initiated a program to distribute free antigen testing kits and managed distribution of the kits nationally. As the supply of antigen testing kits and oral therapeutics for early use in mild-to-moderate COVID-19 rose to meet demand, the Omicron wave was on the decline.

Staffing shortfalls in U.S. hospitals started to put stress on health care facilities during the Delta wave. These shortages became acute during the Omicron wave, requiring many U.S. hospitals to employ contingency and crisis staffing strategies, particularly among nursing staff for inpatient units.

Conclusions: VHA facilities experienced significant shortfalls in staffing during the Omicron wave as a result of the health care personnel who were not available to work and increased attrition from the workforce. VHA met the demand for inpatient care for COVID-19 during this period, but multiple facilities had to defer elective procedures during part of the Omicron wave. Although the circumstances were difficult, VHA facilities successfully employed a range of mitigating actions to operate under contingency staffing strategies.

A small number of facilities had to employ crisis staffing strategies for periods of time. These strategies were used only after facilities had exhausted all mitigating options, including transferring patients to community hospitals. One facility that had to employ crisis staffing strategies detected indicators of increased patient safety risk during the period. They also were able to admit all Veterans requiring admission and did not resort to inpatient boarding in the ED. Facilities that had to employ crisis staffing strategies for staffing ratios on inpatient units identified specific actions to mitigate risk to patient safety and quality of care, such as acuity-based staffing ratios, cross-leveling acuity between inpatient units and setting a limit for the percentage of new inpatient staff under supervised practice on each shift.

Given the limited options for augmentation of facility staff during this period, VHA found that training staff to shift from ambulatory to inpatient care was an essential tool to manage the shortfall. But to move personnel between roles, VHA needed agile processes for facilitating the transitions. VHA leaders also increased work hours for strategic part-time staff, which offset the shortages to some extent.

During this period, VHA effectively established clinical processes in response to the availability of new evidence-based therapeutics for COVID-19. As new variants emerged, VHA managed the distribution and availability of therapeutics such as monoclonal antibodies to match therapeutics with prevalent community variants.

VHA recognized the importance of making oral therapeutics available for Veterans early in the course of suspected COVID-19. To increase agile access to the medication, VHA procured and distributed antigen test kits for home use to Veterans. VHA also worked to make telehealth an approachable option for Veterans with suspected COVID-19—another important enabling action for early treatment in a VHA Test-To-Treat Program.

The effects of extensive deferral of non-urgent care early in the pandemic are not yet fully known. The impact will become clear over time as population outcomes are measured. National statistics show that a drop in preventive screening and preventive aspects of disease management can be an early indicator of potential outcomes, including increases in cancer diagnosis and higher rates of complications to chronic conditions. Aware of the potential impact on Veterans, VHA initiated an assertive effort to resume timely preventive screening.

Compared with commercial health systems, VHA’s resumption of clinical services has lagged in its return to pre-pandemic volume. However, such a comparison must note VHA’s ongoing Fourth Mission responsibility, through which it has provided multiple community health systems with relief during surges in pandemic demand for

hospitalization. Fourth Mission duties required that VHA hold some of its capacity in reserve during the pandemic.

At the start of the pandemic, VHA took steps to protect vulnerable populations, including eliminating family visitation to CLCs and deferring non-urgent care. Looking back on the last two years, leaders are concluding that a pandemic response should apply protective actions but must also permit some family visitation and sustain access to preventive care. These steps are feasible and in the best interests of Veteran health.

During the Annex C period, the Nation experienced medical supply shortages, including limited supplies of dialysis fluids that were important for kidney replacement therapy. In response, VHA conducted a system-wide adjustment of dialysis procedures for Veterans. This action is a good example of a health system deferring to expertise (one of the High Reliability Organization principles) and applying that advice as a new standard across the health system.

In addition to issues with medical supplies, the Nation experienced a widespread blood shortage. VHA responded with a nationwide blood drive, conducted in collaboration with the American Red Cross and American Blood Centers. The initiative—the Roll Up Your Sleeves campaign—encouraged Veterans to contribute to the national response.

Workforce

Finding: A balanced, multifaceted approach to recruitment, retention and wellness of health care personnel will be important to the future resilience of the VHA workforce.

Context: The nationwide surges associated with the Delta variant and then the Omicron variant generated escalating surges in hospitalizations across the United States. Simultaneously, the propensity for these variants to spread quickly and infect vaccinated people led to large numbers of health care staff who were unavailable to work due to infection or high-risk exposure to infection. The additive effects of staff who were unavailable to work and the increase in resignations and retirements led to a precipitous shrinkage in the health care workforce nationally, especially among nurses.

Hospitals nationwide struggled to sustain adequate staff for inpatient care during the Omicron surge. There were widespread reports of increasing numbers of nurses leaving the health care workforce due to fatigue and burnout.

Conclusions: Sustaining staffing in health care facilities was one of the most challenging issues for VHA during the Annex C reporting period. The high demand for inpatient care during the Omicron wave, increased retirements and resignations (primarily among nurses), staff burnout and the surge in the number of staff who were unavailable due to COVID-19 infection or exposure combined to exacerbate staff shortfalls across the network. Similar staffing shortfalls in community hospitals meant that in many locations, community care was not a viable option for Veterans who needed inpatient care. Omicron struck broadly across the country, which limited VHA's ability to shift staff from one location to another to manage the shortages. Similarly, the prevalence of Omicron constrained the availability of contracted temporary staff.

Through concerted efforts to enhance recruitment and retention, VHA has successfully sustained staffing of health care personnel, with the exceptions of medical assistants, licensed practical nurses and custodial staff. However, VHA was only able to make progress in filling vacant positions within certain skill sets.

Recognizing that recruitment and retention will be ongoing challenges, VA and VHA have embarked on a strategy to boost their staffing numbers. The strategy includes the use of initiatives like the Secretary's Human Infrastructure Plan, the VHA REBOOT initiative to mitigate burnout and the VHA Employee Whole Health pilot projects. These programs will be important to VHA's future success in meeting staffing requirements because competition for health care personnel is expected to remain high for years to come.

Staff Deployment

Context: During the Annex C reporting period, the demand for inpatient care for patients with COVID-19 increased significantly. The heightened transmission of the Delta and Omicron variants and the diminished efficacy of antibodies from vaccination or prior infection led to widespread outbreaks, particularly during the Omicron wave. These circumstances imposed high demand on health systems nationwide. High numbers of health care personnel were unavailable to work due to COVID-19 infection, and attrition increased from burnout and fatigue.

Conclusions: The staffing shortfalls VHA experienced during the Omicron wave had such widespread impact that the DEMPS process could not source enough deployable staff to meet all requests from VAMCs for support. Although the number of volunteers registered in DEMPS—the system VHA uses to source and deploy volunteer staff for internal support or the Fourth Mission—appeared to be sufficient, other factors such as local staffing shortfalls and fatigue among volunteers may have been root causes.

Recognizing the burden these shortfalls placed on health care facilities, VHA leadership initiated a review of DEMPS to develop recommendations for its future effectiveness. VHA leadership also established an initial cadre of CDTs—teams of clinical staff who will be trained for temporary placement in facilities with emergency staffing needs. CDTs will be available for rapid deployment on rotating schedules.

Supply Chain

Finding: RRCs remained an essential source of support for VHA facilities. When scarce supplies could not be reliably procured through prime vendors, these centers were able to procure and store scarce supplies.

Finding: VHA was able to use interim processes and tools to sustain health care operations throughout this period of the pandemic. In the future, interim strategies should give way to a more formal process, as dictated by the pending supply chain modernization strategy.

Context: International disruption of the medical supply chain remained a major factor in pandemic response for U.S. health care systems. The critical shortfall in PPE during the first year of the pandemic had abated, with the exception of nitrile gloves, which remained scarce. Although some of the supply chain issues eased, new scarcities arose, including blood tubes, dialysis fluids and medical equipment containing microprocessors.

The shortage of dialysis fluid stemmed from supply disruption outside the United States. The problem persisted through the end of this reporting period. This shortfall required adjustments of VHA clinical processes for treating patients on kidney replacement therapy, as described in the Clinical Operations section.

Conclusions: The scarcity of specific pandemic supplies remained a challenge during this period although the particular supplies had changed. The central procurement and distribution processes that VHA initiated early in the pandemic were more mature in this period, which allowed facilities to execute effective processes to procure scarce items that were unavailable from prime vendors.

VHA progressed toward a permanent end-state for the RRCs. In the long term, the RRCs that remain open will interface directly with VHA facilities to centrally procure and distribute supplies. The specific definition of that end-state, including the number and locations of the permanent RRCs, was pending decision at the end of this period.

VHA's strategy for modernization of supply chain management (as informed by the pandemic response and described in prior installments of this report) are now under reconsideration for potential revision. Decisions on revisions to the strategy are expected later in 2022.

Fourth Mission

Finding: VHA responded to all FEMA Mission Assignments during this period, even as it supported Veterans through the Delta and Omicron waves and sustained vaccination support to Federal agencies and beneficiaries of the SAVE LIVES Act.

Context: During the Delta and Omicron waves, U.S. hospitals were stressed nation-wide by staffing shortfalls. The demand for critical care for COVID-19 patients remained within available capacity, with rare exceptions. Those exceptions were primarily addressed by deployment of 1,000 clinicians from the Military Health System to various locations around the country for augmentation of hospital staff during the Omicron wave.

Conclusions: During this period of the pandemic, VHA responded to all FEMA Mission Assignments. The assignments focused primarily on interagency support, including bed capacity opened to the IHS, staff augmentation to the IHS and vaccination support to a variety of Federal agencies.

Additionally, under the SAVE LIVES Act, VHA administered COVID-19 vaccines to 51,000 Veterans, spouses, dependents and caregivers who gained eligibility for VA vaccination services under the act.

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RECOMMENDATIONS

The following recommendations are supplementary to those in the Initial Report, Annex A and Annex B.

1. Vaccination

Conduct a review that collects and analyzes information on lessons learned during the application of vaccination requirement policy in the VHA health care workforce during the pandemic. This review should aim to inform future approaches, balancing factors including patient safety, staff protection, bioethics, administrative complexity and impact to pandemic staffing.

2. Health Equity

Conduct further studies to identify and quantify root causes of COVID-19 health disparities experienced in AIAN Veteran and rural Veteran populations. Data analysis should inform actions, interagency collaboration, partnerships and outreach.

3. Clinical Operations

a. Capture the experiences of VHA facilities that applied crisis capacity staffing strategies during the Omicron wave and analyze the collected information to inform pandemic staffing guidance. Consider actions to mitigate risk to patient safety and quality of care under crisis staffing ratios. Examples may include the following:

- Focused application of crisis staffing ratios to lower-acuity patients
- Acuity-based distribution of inpatients
- Limitations on the percentage of nursing staff under supervision (cross-trained from other units) on each shift

b. Establish processes to enhance the agility of training staff in ambulatory units for inpatient care, such as anticipatory training and pre-certification as pandemic conditions are developing.

c. Revise pandemic response plans to moderate actions that may impact the long-term health of Veterans. Consider an approach featuring judicious management of actions, such as deferral of preventive screening, deferral of disease management examinations and restriction of family visitation to CLC residents. Consider establishing a principle that balances risk from the pandemic pathogen with medium- and long-term health of the Veteran.

4. Workforce

Develop a long-term, multifaceted strategy for sustained resilience, recruitment and retention of the VHA workforce. Consider long-term career track options that will afford VHA staff with opportunities and flexibility over long periods of service.

ACRONYMS

Acronym	Expansion
AIAN	American Indian or Alaska Native
ALERT-HR	Automated Labor and Employee Relations Tracker
AOUSC	Administrative Office of the United States Courts
ARNP	Advanced Registered Nurse Practitioners
ASPR	Office of the Assistant Secretary for Preparedness and Response
AUSH	Assistant Under Secretary for Health
BARDA	Biomedical Advanced Research and Development Authority
CAD	Computed Aided Design
CBOCs	Community-Based Outpatient Clinics
CCC	Clinical Contact Centers
CDC	Centers for Disease Control and Prevention
CDT	Clinical Deployment Team
CDW	Corporate Data Warehouse
CIPAC	Critical Infrastructure Partnership Advisory Council
CLC	Community Living Center
CLIA	Clinical Laboratory Improvement Amendment
CMOP	Consolidated Mail Outpatient Pharmacy
CNO	Chief Nursing Officer
COVID-19	coronavirus disease 2019
CPAC	Critical Infrastructure Partnership Advisory Council
CPRS	Computerize Patient Record System
CRH	Clinical Resource Hub
CWO	Chief Employee Wellbeing Officer
DEMPS	Disaster Emergency Medical Personnel System
DHS	Department of Homeland Security
DLA	Defense Logistics Agency
DMLSS	Defense Medical Logistics Standard Support

Acronym	Expansion
DoD	Department of Defense
ECAT	Electronic Catalogue
ED	emergency department
EHR	electronic health record
EO	Executive Order
EPIC3	Epidemiology, Immunology and Clinical Characteristics of COVID-19
EPRP	External Peer Review Process
ESF #8	Emergency Support Function #8
EUA	Emergency Use Authorization
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FIT	Fecal Immunochemical Tests
FMLA	Family and Medical Leave Act
FTE	full-time employee
FY	fiscal year
GCC	Government Coordinating Committee
GEC	Geriatrics and Extended Care
GISAID	Global Initiative on Sharing All Influenza Data
GMP	Good Manufacturing Practice
GSA	Government Services Administration
HEDIS	Health Effectiveness Data and Information Set
HHS	Department of Health and Human Services
HOC	Health Operations Center
HPOP	Health Partner Ordering Portal
ICU	intensive care unit
IHS	Indian Health Service
IIS	Immunization Information Systems
IPC	Initial Planning Conference
IPT	Integrated Project Team

Acronym	Expansion
IRB	International Review Board
J&J	Johnson & Johnson's Janssen
JSCRWG	Joint Supply Chain Resilience Working Group
KRT	Kidney Replacement Therapy
LEAF	Light Electronic Action Framework
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer Plus
LNO	Liaison Officer
LPN	Licensed Practical Nurses
mAb	monoclonal antibody treatments
MH RRTPs	Mental Health Residential Rehab Treatment Programs
MSPV	Medical Surgical Prime Vendor
NA	Nursing Assistant
NARA	National Archives and Records Administration
NCA	National Cemetery Administration
NCHS	National Center for Health Statistics
NCOD	National Center for Organizational Development
NCRT	National Contingency Response Tool
NHHPPD	nurse hours per patient day
NIDS	National Institute for Discovery and Science
NIH	National Institutes of Health
NIOSH	National Institute of Occupational Safety and Health
NRF	National Response Framework
NSC	National Security Council
OBM	Out of Band Manager
OCC	Office of Connected Care
OEM	Office of Emergency Management
OHE	Office of Health Equity
OHIL	Office of Healthcare Innovation and Learning
OIT	Office of Information and Technology

Acronym	Expansion
OMHSP	Office of Mental Health and Suicide Prevention
ONS	Office of Nursing Services
OPR	Operations, Plans & Readiness
ORD	Office of Research and Development
ORH	Office of Rural Health
PA	Physician Assistant
PAR	periodic automatic replenishment
PASC	Post-Acute Sequelae of SARS-CoV-2
PBM	Pharmacy Benefits Management
PCR	polymerase chain reaction
PHI	Preventive Health Inventory
PHS	Population Health Services
PIT Force	Pandemic Innovations Task Force
PLO	Procurement and Logistics Office
PPE	personal protective equipment
PTSD	Post-Traumatic Stress Disorder
REBOOT	Reduce Employee Burnout and Optimize Organizational Thriving
RN	Registered Nurse
RRC	Regional Readiness Center
RRCC	Regional Response Coordination Center
RUCA	Rural Urban Commuting Area
SAVE LIVES Act	Strengthening and Amplifying Vaccination Efforts to Locally Immunize All Veterans and Every Spouse Act
SCA	Special Contribution Awards
SCI	Spinal Cord Injury
SCRWG	Supply Chain Resiliency Working Group
SeqFORCE	Sequencing for Research Clinical and Epidemiology
SIGI	self-identified gender identity
SVH	State Veterans Home

Acronym	Expansion
TECS	Eye Telehealth and Technology-based Eye Care Screening
TNC	Travel Nurse Corps
UAD	Universal Access Deployment
USH	Under Secretary for Health
VA SHIELD	VA Science and Health Initiative to Combat Infectious and Emerging Life-Threatening Diseases
VACO	VA Central Office
VAMC	VA Medical Center
VARG	Voluntary Agreement for the Manufacture and Distribution of Critical Healthcare Resources Necessary to Respond to a Pandemic
VBA	Veterans Benefits Administration
VEO	Veteran Experience Office
VHA	Veterans Health Administration
VINCI	VA Informatics and Computing Infrastructure
VISN	Veterans Integrated Services Network
VMI	Vendor Managed Inventory
WHO	World Health Organization
WMC	Office of Workforce Management and Consulting

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APPENDICES

APPENDIX A: STAKEHOLDER INTERVIEWS

Table 14.1 below lists the interviews completed by the COVID-19 Response Reporting Team that contributed to the creation of Annex C. Interviewees' titles and positions were as of March 31, 2022.

Table 14.1: *Stakeholder Interviews for the Annex C Review Period*

Interview Date	Interviewee Name	Position
3/17/2022	Ms. Nancy Wilck	Director of Connected Health Implementation Strategies, Acting Executive Director of Connected Health, VHA Office of Connected Care
3/17/2022	Dr. Kevin Galpin	Executive Director for Telehealth Services, VHA Office of Connected Care
3/17/2022	Dr. Jacqueline Cook	Medical Advisor, VHA Office of Occupational Safety and Health
3/21/2022	Dr. Grant Huang	Deputy Chief Research & Development Officer for Enterprise Optimization, VHA Office of Research and Development
3/22/2022	Ms. Alexis Matza	Associate Director for Data and Analytics, VHA LGBTQ+ Health Program, Population Health
3/22/2022	Mr. Michael Kauth	Director, VHA LGBTQ+ Health Program
3/23/2022	Dr. Thomas Klobucar	Executive Director, VHA Office of Rural Health
3/23/2022	Dr. Jane Kim	Executive Director for Preventive Medicine, VA National Center for Health Promotion and Disease Prevention
3/24/2022	Dr. Ernest Moy	Executive Director, VHA Office of Health Equity
3/25/2022	Dr. Ryan Vega	Chief Officer, VHA Office of Healthcare Innovation and Learning
3/25/2022	Dr. Beth Taylor	Assistant Under Secretary for Health for Patient Care Services (Chief Nursing Officer)
3/25/2022	Dr. Jessica Wang-Rodriguez	Executive Director, VHA National Pathology and Laboratory Medicine Service
3/25/2022	Dr. Scotte Hartronft	Executive Director, VHA Office of Geriatrics & Extended Care
3/28/2022	Dr. Susan Kirsh	Executive Director, VHA Office of Veterans Access to Care
3/29/2022	Mr. Juan Cosme	Director of Operations, Plans and Readiness, Logistics, VHA Office of Procurement and Logistics
3/29/2022	Dr. Jennifer Martin	Deputy Chief Consultant, VA Pharmacy Benefits Management Services
3/30/2022	Dr. Thomas Emmendorfer	Acting Chief Officer for Population Health, VHA Patient Care Services
3/31/2022	Ms. Deb Kramer	Acting Assistant Under Secretary for Health for Support
3/31/2022	Ms. Tammy Czarnecki	Assistant Deputy Under Secretary for Health for Administrative Operations
1/1/2022	Dr. Carolyn Clancy	Assistant Under Secretary for Health for Discovery, Education and Affiliate Networks
4/1/2022	Ms. RimaAnn Nelson	Assistant Under Secretary for Health for Operations
4/4/2022	Dr. Erica Scavella	Acting Assistant Under Secretary for Health for Clinical Services

APPENDIX B: VHA EMPLOYEE AND VETERAN COVID-19 VACCINATION RATES BY VISN

Table 14.2 shows a VISN-by-VISN breakdown of COVID-19 vaccination data for VHA employees and Veterans Using VHA Services since October 1, 2019. This data includes vaccines administered by VHA, vaccines reported by individuals when received from sources other than VHA and vaccines administered by states that signed agreements with VHA to share their COVID-19 vaccination information.

The table breaks down vaccination rates by the following vaccination status:

- Individuals who received at least one dose of a COVID-19 vaccine
- Individuals who completed an initial COVID-19 vaccination series
- Individuals who received a booster dose of the COVID-19 vaccine

***Table 14.2** VHA Employee and Veteran Vaccinations by VISN, December 14, 2020 – March 31, 2022*

VISN	Employee Vaccinations		% of Total Employees	Veteran Vaccinations		% of Total Veterans
1	At Least One Dose:	14,664	89.59%	At Least One Dose:	177,285	61.84%
	Initial Series Completed:	14,637	89.43%	Initial Series Completed:	171,110	59.69%
	Received Initial Booster:	7,485	45.73%	Received Initial Booster:	83,884	29.26%
	Base Pop.:	16,367		*Base Pop.:*	286,673	
2	At Least One Dose:	16,771	88.30%	At Least One Dose:	185,672	60.14%
	Initial Series Completed:	16,693	87.89%	Initial Series Completed:	179,143	58.03%
	Received Initial Booster:	6,801	35.81%	Received Initial Booster:	87,440	28.32%
	Base Pop.:	18,993		*Base Pop.:*	308,731	
4	At Least One Dose:	13,865	86.34%	At Least One Dose:	194,201	59.17%
	Initial Series Completed:	13,825	86.09%	Initial Series Completed:	187,899	57.25%
	Received Initial Booster:	6,304	39.26%	Received Initial Booster:	90,891	27.69%
	Base Pop.:	16,059		*Base Pop.:*	328,197	
5	At Least One Dose:	10,608	85.03%	At Least One Dose:	129,314	55.40%
	Initial Series Completed:	10,545	84.52%	Initial Series Completed:	125,086	53.58%
	Received Initial Booster:	4,025	32.26%	Received Initial Booster:	49,094	21.03%
	Base Pop.:	12,476		*Base Pop.:*	233,438	

VISN	Employee Vaccinations		% of Total Employees	Veteran Vaccinations		% of Total Veterans
6	At Least One Dose:	17,746	86.64%	At Least One Dose:	243,648	53.73%
	Initial Series Completed:	17,701	86.42%	Initial Series Completed:	233,998	51.61%
	Received Initial Booster:	7,776	37.97%	Received Initial Booster:	94,545	20.85%
	Base Pop.:	20,482		*Base Pop.:*	453,432	
7	At Least One Dose:	18,603	85.85%	At Least One Dose:	323,647	62.37%
	Initial Series Completed:	18,490	85.33%	Initial Series Completed:	289,337	55.76%
	Received Initial Booster:	7,212	33.28%	Received Initial Booster:	98,514	18.98%
	Base Pop.:	21,669		*Base Pop.:*	518,936	
8	At Least One Dose:	27,546	85.12%	At Least One Dose:	417,302	61.44%
	Initial Series Completed:	27,420	84.73%	Initial Series Completed:	402,569	59.27%
	Received Initial Booster:	12,262	37.89%	Received Initial Booster:	180,850	26.63%
	Base Pop.:	32,362		*Base Pop.:*	679,188	
9	At Least One Dose:	12,405	85.15%	At Least One Dose:	159,814	51.36%
	Initial Series Completed:	12,371	84.91%	Initial Series Completed:	152,671	49.07%
	Received Initial Booster:	4,412	30.28%	Received Initial Booster:	62,412	20.06%
	Base Pop.:	14,569		*Base Pop.:*	311,149	
10	At Least One Dose:	23,041	83.63%	At Least One Dose:	291,549	52.71%
	Initial Series Completed:	22,914	83.17%	Initial Series Completed:	279,632	50.55%
	Received Initial Booster:	9,690	35.17%	Received Initial Booster:	132,824	24.01%
	Base Pop.:	27,550		*Base Pop.:*	553,130	
12	At Least One Dose:	17,655	86.63%	At Least One Dose:	182,451	60.27%
	Initial Series Completed:	17,599	86.35%	Initial Series Completed:	175,383	57.94%
	Received Initial Booster:	8,420	41.32%	Received Initial Booster:	93,596	30.92%
	Base Pop.:	20,380		*Base Pop.:*	302,705	
15	At Least One Dose:	11,603	84.50%	At Least One Dose:	139,782	50.19%
	Initial Series Completed:	11,558	84.17%	Initial Series Completed:	135,015	48.48%
	Received Initial Booster:	4,742	34.53%	Received Initial Booster:	56,942	20.45%
	Base Pop.:	13,732		*Base Pop.:*	278,480	

VISN	Employee Vaccinations		% of Total Employees	Veteran Vaccinations		% of Total Veterans
16	At Least One Dose:	18,912	87.18%	At Least One Dose:	253,874	51.35%
	Initial Series Completed:	18,824	86.78%	Initial Series Completed:	241,890	48.92%
	Received Initial Booster:	7,728	35.63%	Received Initial Booster:	98,850	19.99%
	Base Pop.:	21,692		*Base Pop.:*	494,414	
17	At Least One Dose:	17,953	86.00%	At Least One Dose:	283,572	57.74%
	Initial Series Completed:	17,860	85.55%	Initial Series Completed:	268,771	54.72%
	Received Initial Booster:	7,314	35.04%	Received Initial Booster:	91,670	18.66%
	Base Pop.:	20,876		*Base Pop.:*	491,141	
19	At Least One Dose:	13,671	85.03%	At Least One Dose:	188,961	51.24%
	Initial Series Completed:	13,607	84.64%	Initial Series Completed:	182,418	49.47%
	Received Initial Booster:	5,509	34.27%	Received Initial Booster:	70,973	19.25%
	Base Pop.:	16,077		*Base Pop.:*	368,762	
20	At Least One Dose:	13,892	87.53%	At Least One Dose:	199,828	53.78%
	Initial Series Completed:	13,838	87.18%	Initial Series Completed:	190,467	51.26%
	Received Initial Booster:	4,751	29.93%	Received Initial Booster:	56,707	15.26%
	Base Pop.:	15,872		*Base Pop.:*	371,545	
21	At Least One Dose:	19,878	88.26%	At Least One Dose:	223,644	58.27%
	Initial Series Completed:	19,825	88.03%	Initial Series Completed:	213,834	55.71%
	Received Initial Booster:	8,538	37.91%	Received Initial Booster:	95,363	24.85%
	Base Pop.:	22,522		*Base Pop.:*	383,826	
22	At Least One Dose:	23,783	87.34%	At Least One Dose:	371,462	63.17%
	Initial Series Completed:	23,706	87.06%	Initial Series Completed:	354,378	60.26%
	Received Initial Booster:	11,859	43.55%	Received Initial Booster:	152,531	25.94%
	Base Pop.:	27,229		*Base Pop.:*	588,038	
23	At Least One Dose:	14,729	87.39%	At Least One Dose:	229,105	62.28%
	Initial Series Completed:	14,693	87.17%	Initial Series Completed:	221,534	60.22%
	Received Initial Booster:	6,312	37.45%	Received Initial Booster:	109,020	29.64%
	Base Pop.:	16,855		*Base Pop.:*	367,860	

VISN	Employee Vaccinations		% of Total Employees	Veteran Vaccinations		% of Total Veterans
Other VHA	At Least One Dose:	27,426	87.11%	At Least One Dose:	-	-
	Initial Series Completed:	27,370	86.94%	Initial Series Completed:	-	-
	Received Initial Booster:	6,912	21.95%	Received Initial Booster:	-	-
	Base Pop.:	31,483		*Base Pop.:*	-	
Total	At Least One Dose:	**334,751**	**86.44%**	At Least One Dose:	**4,195,111**	**57.31%**
	Initial Series Completed:	**333,476**	**86.11%**	Initial Series Completed:	**4,005,135**	**54.72%**
	Received Initial Booster:	**138,052**	**35.65%**	Received Initial Booster:	**1,706,106**	**23.31%**
	Base Pop.:	**387,245**		*Base Pop.:*	**7,319,645**	

Note: Veterans Using VHA Services are Veterans who used VHA services from 10/1/2019 through 3/31/2022. Vaccinations include those administered by VHA, self-reported vaccinations administered outside of VHA and states who signed agreements with VHA to share their COVID-19 vaccination information. Veteran vaccination counts are for Veterans Using VHA Services who have completed the initial COVID-19 vaccination series as of 3/31/2022. Completed initial vaccination series is defined as 2 weeks after receiving the second dose of either the Moderna or Pfizer COVID-19 vaccine or 2 weeks after receiving the first dose of the J&J COVID-19 vaccine. Received Initial Booster refers to people who received an initial vaccination series and an additional dose of Moderna, Pfizer or J&J COVID-19 vaccine at least 2 weeks prior to 3/31/2021. The total number of vaccinations and boosters administered to Veterans Using VHA Services does not include vaccinations for individuals vaccinated by sources outside VHA and records were not provided to VHA. Booster may be a different COVID-19 vaccine than the initial series. Vaccination numbers may change depending on when the data is accessed because VHA may retroactively update Veterans' vaccination status.
VHA employee numbers are as of 3/31/2022, which is after VHA implemented the vaccine mandate. The VHA vaccine mandate, VHA Directive 1193.01, applies only to Title 38 and Title 5 VHA health care personnel, not all VHA employees. This data is inclusive for all VHA employees. Only paid VHA employees are included in these numbers; VISN contractors and volunteers are not included. Other VHA includes VACO employees and VHA employees not assigned to a particular VISN. The population data includes VHA health care personnel who have requested a reasonable accommodation vaccination exemption for religious or medical reasons. The data also includes VHA employees in a deferred status due to long-term leave or those on FMLA leave. VHA health care personnel who receive the vaccine and/or booster outside of a VHA facility are required to provide this documentation to VHA.
Source: VHA, CDW, VSSC, Veteran vaccinations accessed 4/5/2022; VHA, HOC, Employee vaccinations response to data call, 4/26/2022. Ref. D278

APPENDIX C: FOURTH MISSION ACTIVITIES

Table 14.3 shows FEMA Mission Assignments to VHA and support provided under Interagency Agreements (IAA) that began during the Annex C reporting period.

Table 14.3: *FEMA Mission Assignments and IAAs, August 1, 2021 – March 29, 2022*

VISN or Agency	MA Type	Support Type	Description	Location	Start Date	End Date
V01	COVID-19 Care	Staffing Supplement	1 Liaison Officer (LNO)	Maynard, RI	8/31/2021	3/31/2022
V01	COVID-19 Care	Bed Capacity	Up to 10 med/surg beds	White River Junction, VT	10/26/2021	12/23/2021
V02	COVID-19 Care	Staffing Supplement	FEMA Regional Response Coordination Center (RRCC)	Colts Neck, NJ	12/27/2021	3/31/2022
V02	COVID-19 Care	Bed Capacity	5 ICU beds and 36 med/surg beds	Multiple cities in New York	1/1/2022	3/2/2022
V04	COVID-19 Care	Staffing Supplement	LNO support for FEMA RRCC	Philadelphia, PA	8/24/2021	9/24/2021
V04	COVID-19 Care	Staffing Supplement	Provide staff to RRCC in support of COVID-19 ops	Philadelphia, PA	1/3/2022	3/4/2022
V05	Vaccination Support	Testing	Testing for SVHs	Sterling, VA	8/27/2021	10/1/2021
V08	COVID-19 Care	Bed Capacity	12 ICU beds and 30 med/surg beds	Florida	8/6/2021	12/5/2021
V08	COVID-19 Care	PPE/Equipment	Oxygen regulators	Christiansted, Saint Croix	9/4/2021	10/31/2021
V10	COVID-19 Care	Bed Capacity	Up to 5 ICU beds and up to 5 med/surg beds	Detroit, MI	11/22/2021	1/21/2022
V12	COVID-19 Care	Staffing Supplement	8 nurses and 8 Nursing Assistants (NAs) for SVH	Union Grove, WI	8/19/2021	9/17/2021
V12	COVID-19 Care	Bed Capacity	ICU beds and med/surg beds	Multiple locations in Illinois	9/7/2021	11/6/2021

VISN or Agency	MA Type	Support Type	Description	Location	Start Date	End Date
V15	COVID-19 Care	Bed Capacity	Up to 3 ICU beds and 10 med/surg beds	Topeka, KS	1/18/2022	3/19/2022
V15	COVID-19 Care	Bed Capacity	Up to 3 ICU beds and 10 med/surg beds	St. Louis, MO	2/18/2022	3/5/2022
V16	COVID-19 Care	Bed Capacity	5 ICU beds	New Orleans, LA	8/6/2021	9/6/2021
V16	COVID-19 Care	Bed Capacity	Up to 10 ICU beds for non-beneficiary patients	Jackson, MI	8/9/2021	9/22/2021
V16	COVID-19 Care	Staffing Supplement	3 RNs, 2 LPNs, and 5 NAs	Little Rock, AR	8/11/2021	9/10/2021
V16	COVID-19 Care	Bed Capacity	Beds for non-beneficiaries	Little Rock, AR	8/11/2021	9/10/2021
V16	COVID-19 Care	PPE/ Equipment	10 ventilators	Little Rock, AR	8/19/2021	10/15/2021
V16	COVID-19 Care	PPE/ Equipment	8 ventilators	Fayetteville, AR	9/1/2021	12/31/2021
V16	COVID-19 Care	Bed Capacity	Beds for non-beneficiaries	Little Rock, AR	9/10/2021	10/10/2021
V16	COVID-19 Care	Bed Capacity	Up to 5 ICU beds or up to 5 med/surg beds for patients not eligible for VA benefits	Little Rock, AR	1/28/2022	2/28/2022
V19	COVID-19 Care	Bed Capacity	20 med/surg beds for non-COVID-19 patients	Cheyenne, WY	9/12/2021	3/12/2022
V19	COVID-19 Care	Bed Capacity	Up to 2 ICU beds and 4 med/surg beds	Fort Harrison, MT	9/22/2021	12/20/2021
V20	COVID-19 Care	Bed Capacity	5 ICU beds and 10 med/surg beds	Portland, OR	8/23/2021	3/2/2022
V20	COVID-19 Care	Bed Capacity	4 ICU beds and 5 med/surg beds	Boise, ID VAMC	8/27/2021	10/3/2021
V20	COVID-19 Care	Bed Capacity	2 med/surg beds	Spokane, WA	8/27/2021	9/27/2021
V20	COVID-19 Care	Testing	Lab testing and sequencing	Boise, ID	8/31/2021	9/30/2021
V20	COVID-19 Care	Staffing Supplement	Staffing support	Spokane, WA	9/13/2021	12/12/2021

VISN or Agency	MA Type	Support Type	Description	Location	Start Date	End Date
V20	COVID-19 Care	Bed Capacity	12 med/surg beds to support SVHs	Spokane, WA	9/13/2021	3/13/2022
V20	COVID-19 Care	Bed Capacity	Up to 5 med/surg beds	Spokane, WA	9/13/2021	3/2/2022
V20	COVID-19 Care	PPE/ Equipment	7 ventilators	Boise, ID VAMC	9/28/2021	1/30/2022
V20	COVID-19 Care	Bed Capacity	ICU beds and/or med/surg beds	Boise, ID VAMC	10/4/2021	3/2/2022
V21	Vaccination Support	Vaccinations	Clinicians, RNs, LPNs, and other medical personnel to assist in vaccination	American Samoa	2/26/2022	4/30/2022
V22	COVID-19 Care	Bed Capacity	ICU beds and/or med/surg beds for patients not eligible for VA benefits	Tucson, AZ	10/30/2021	2/28/2022
V23	COVID-19 Care	Bed Capacity	Up to 6 med/surg and 2 ICU beds	Multiple cities in Iowa	9/24/2021	2/20/2022
V23	COVID-19 Care	Staffing Supplement	Up to 10 staffing support	Kearney, NE	10/13/2021	11/12/2021
V23	COVID-19 Care	Bed Capacity	Up to 5 ICU beds and up to 5 med/surg beds	Minneapolis, MN	11/17/2021	3/20/2022
V23	COVID-19 Care	Bed Capacity	Up to 5 ICU beds and/or up to 5 med/surg beds for SVH	Omaha, NE	12/10/2021	2/8/2022
HHS/IHS	COVID-19 Care	Bed Capacity	3 ICU beds	Denver, CO	9/27/2021	3/31/2022
HHS/IHS	COVID-19 Care	Bed Capacity	Up to 1 ICU beds and 2 med/surg beds	Fort Harrison, MT	9/27/2021	3/31/2022
HHS/IHS	COVID-19 Care	Staffing Supplement	6 RNs, 2 lab technicians, 2 x-ray technicians	Cass Lake, MN	10/4/2021	9/30/2022
HHS/IHS	COVID-19 Care	Staffing Supplement	3 RNs, 3 LPNs	Red Lake, MN	10/4/2021	9/30/2022

Note: This table includes only FEMA Mission Assignments and IAAs that began from 8/1/2021 through 3/29/2022. When relevant, descriptions have been adjusted for consistency. Other Fourth Mission activities are not included, such as support to vaccinate individuals under the SAVE LIVES Act, non-staff support to SVHs

VISN or Agency	MA Type	Support Type	Description	Location	Start Date	End Date
under the CARES Act, vaccination support to other Federal agencies through IAAs and humanitarian support provided by medical facilities at the discretion of facility directors. Source: VHA OEM, "FEMA Mission Assignments," response to data call, 3/29/2022; VHA OEM, "Interagency Agreements," response to data call, 3/29/2022. Ref. D262						

[1] Yale News, "Omicron variant caused more excess deaths in Massachusetts than Delta," 5/20/2022, accessed 6/14/2022, https://news.yale.edu/2022/05/20/omicron-variant-caused-more-excess-deaths-massachusetts-delta#:~:text=A%20new%20study%20by%20investigators,its%20entire%2023%2Dweek%20outbreak.
[2] American Nursing Association, "Nurses in the Workforce," accessed 5/10/2022, https://www.nursingworld.org/practice-policy/workforce/.
[3] FDA, "FDA Authorizes Booster Dose of Pfizer-BioNTech COVID-19 Vaccine for Certain Populations," 9/22/2022, accessed 5/11/2022, https://www.fda.gov/news-events/press-announcements/fda-authorizes-booster-dose-pfizer-biontech-covid-19-vaccine-certain-populations; FDA, "Coronavirus (COVID-19) Update: FDA Expands Eligibility for Pfizer-BioNTech COVID-19 Booster Dose to 16- and 17-Year-Olds," 12/9/2021, accessed 5/11/2022, https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-expands-eligibility-pfizer-biontech-covid-19-booster-dose-16-and-17. Ref.s D389, D390
[4] FDA, "Coronavirus (COVID-19) Update: FDA Authorizes Second Booster Dose of Two COVID-19 Vaccines for Older and Immunocompromised Individuals," 3/29/2022. Ref. D101
[5] VHA, CDW Database, vaccination data from VSSC, accessed on 4/5/2021. Ref. D278. NOTE: Veterans may receive care (including booster doses) outside of VHA, so this number may not reflect the total number of Veterans who received a booster dose of the COVID-19 vaccine.
[6] VHA, CDW Database, vaccination data from VSSC, accessed on 4/5/2021. Ref. D278
[7] CDC, "COVID-19 Data Tracker," accessed 3/11/2022, https://covid.cdc.gov/covid-data-tracker/#cases_casesper100klast7days. Ref. D67
[8] CDC, "COVID-19 Data Tracker," accessed 3/11/2022, https://covid.cdc.gov/covid-data-tracker/#cases_casesper100klast7days; VHA, "Coronavirus Disease 2019 (COVID-19) Response Report – Annex B," 12/15/2021, pages 23-24. Ref.s D67, D209
[9] VHA, "Coronavirus Disease 2019 (COVID-19) Response Report – Annex B," 12/15/2021, page 26. Ref. D200
[10] CDC, "Basics of COVID-19," 11/4/2021, accessed 4/26/2022, https://www.cdc.gov/coronavirus/2019-ncov/your-health/about-covid-19/basics-covid-19.html#:~:text=COVID%2D19%20is%20caused%20by,East%20respiratory%20syndrome%20(MERS); CDC, "Update on the Epidemiology of SARS-CoV-2 Strains," 4/6/2022, slide 12. Ref.s D72, D334
[11] CDC, "Update on the Epidemiology of SARS-CoV-2 Strains," 4/6/2022, slide 10. Ref. D72
[12] CDC, "Use of At-home COVID-19 Tests—United States, August 23, 2021-March 12, 2022," 4/1/2022. Ref. D132
[13] Ibid.
[14] CDC, "Update on the Epidemiology of SARS-CoV-2 Strains," 4/6/2022, slide 12. Ref. D72
[15] Yale News, "Omicron variant caused more excess deaths in Massachusetts than Delta," 5/20/2022, accessed 6/14/2022, https://news.yale.edu/2022/05/20/omicron-variant-caused-more-excess-deaths-massachusetts-delta#:~:text=A%20new%20study%20by%20investigators,its%20entire%2023%2Dweek%20outbreak; Johns Hopkins COVID-19 GitHub Repository, accessed 4/5/2022. Ref. D270

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