

INNOVATIONS IN CLINICAL PRACTICE

Addressing COVID-19 Vaccine Acceptance Within a Large Healthcare System: a Population Health Model



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BACKGROUND: The COVID-19 pandemic, and vaccine hesitancy, pose a significant public health threat. The Veterans Health Administration system is uniquely situated to provide insights into the implementation of a population health approach to vaccine acceptance.

AIM: We describe the VA Connecticut Healthcare System's (VACHS) quality improvement project to improve rates of vaccine uptake.

SETTING AND PARTICIPANTS: VACHS consists of eight primary care sites with 80 primary care providers delivering care to 47,000 enrolled veterans.

PROGRAM DESCRIPTION: Our program involved identification of a local champion, education sessions, development of vaccine acceptance tools (including the templated "COVID-19 Prevention Letter" and the "COVID-19 Prevention Telephone Note"), and application of a population health approach (use of a prioritization scheme and playbook) by primary care patient-aligned care (PACT) medical home teams.

PROGRAM EVALUATION: We found increased rates of vaccination at VACT compared to the surrounding region 6 months after implementation (65.16% vs 61.89%). Use of vaccine acceptance tools were associated with a statistically significant increase in vaccination (24.1% vs 13.6%, $P = 0.036$) in unvaccinated veterans.

DISCUSSION: A population health approach to vaccine acceptance using EHR-based tools can impact vaccination rates, and this approach may be of practical utility to other large healthcare systems with EHR.

authorization) have contributed to high rates of vaccine hesitancy in some parts of the world. A recent systematic review of vaccine acceptance surveys identified large global geographic regions with uptake rates of less than 70%, including the USA (56.9%).² As of September 1, 2021, only 61.4% of eligible Americans 12 years of age and older have been fully vaccinated.³ Combating vaccine hesitancy on a large scale will be pivotal to public health. General strategies have focused on messaging, and positioning voices of authority like healthcare workers, celebrities, and scientists to engage in large-scale educational or social media campaigns.⁴ Others have proposed more specific, evidence-based frameworks to augment policy and community campaigns with sound "social, behavioral, communication and implementation science" at the level of healthcare organizations.⁵ Given the size and scope of the Veterans Health Administration, as well as characteristics such as integration, unified electronic health record (EHR), primary care focus, population health focus, and record of high-quality outpatient and preventive care, this system is uniquely situated to provide insights into the implementation of an evidence-based framework to address vaccine hesitancy. We describe here the VA Connecticut Healthcare System's (VACHS) clinical and operational paradigm to improve rates of vaccine uptake.

Setting and Participants

VACHS consists of eight primary care sites, including a major tertiary care medical center with specialty, emergency, and hospital care; a smaller medical center with full ambulatory services; and six community-based outpatient clinics (CBOCs) with primary and mental health care only. There are 80 individual primary care providers delivering care to 47,000 enrolled veterans in VACHS. The VACHS COVID-19 initial vaccination campaign started in late December 2020 and involved several modalities of outreach including direct telephone calls, text messaging, blanket email campaigns, targeted postcards, and social media postings. Outreach campaigns were initially "staged" in parallel to CDC age and comorbidity eligibility and in recognition of relative vaccine scarcity. Phone contact was made by a corps of dedicated medical support assistants (MSA) to schedule vaccine appointments for high-risk groups and documented in the electronic health record via a templated "COVID-19 Vaccine

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INTRODUCTION

Vaccine hesitancy—"the reluctance or refusal to vaccinate despite the availability of vaccines"—was identified as a "top 10" threat to global health in the years leading up to the COVID-19 pandemic.¹ Factors unique to the current pandemic (sociopolitical factors, rapid spread of dis/misinformation) as well as to the vaccines devised to address it (perceived novel science, rapid development, emergency use

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Contact Note.” This note specified if outreach efforts were unsuccessful or if the patient declined the offer for vaccination. As outreach and scheduling efforts to the highest risk veteran groups reached saturation, and as vaccine supply improved, VACHS repeated general outreach efforts and established walk-in vaccine clinics across campuses and held mass-vaccination community events. Finally, after the initial phase of targeted outreach to the highest risk, followed by the second phase of large-scale availability to the entire population of VACHS veterans, we implemented a program to address the remaining, potentially “vaccine-hesitant” veterans.

Program Description

Steps to improving vaccine acceptance included identification of a local champion, education sessions for clinicians and veterans, development of vaccine acceptance tools, and application of a population health approach by primary care patient-aligned care (PACT) medical home teams using available tools/data.

In March 2021, VACHS identified a primary care physician champion to develop a systematic approach to improved vaccine acceptance, tailored to the VACHS resources and patient population. The vaccine acceptance champion partnered with a subject matter expert in the field of vaccine acceptance to optimize the approach within VACHS. This involved two separate 30-min meetings and review of relevant evidence-based information/toolkits.^{6–9} Information from these toolkits was summarized and tailored to VACHS, and then presented in three 1-h educational sessions: VACHS VA Connecticut Team Huddle (open to all employees), VACHS clinical leadership meeting, and VACHS primary care meeting.

Existing EHR reports, including the “Immunization by PACT Report” is accessible by all clinical care teams within VACHS via a direct link within the EHR and can be used to generate a list of patients who have not yet had documentation of receipt of COVID-19 vaccination (either receipt of vaccination within the VA system or receipt of vaccination outside of the VA via documentation of visual confirmation of the vaccination card).

Vaccine hesitancy tools were developed within the EHR. These included two templated notes: a “COVID-19 Prevention Letter” which can be personalized by PACT teams and mailed to patients and a “COVID-19 Prevention Telephone Note” a scripted step-wise note with discussion prompts, using motivational interviewing framework included in the “VHA Moving to COVID-19 Vaccine Acceptance Clinical Tool.” These templated notes are available under [Appendix 1](#). PACT teams were encouraged via email reminders from primary care leadership to review the “Immunization by PACT Report” and reach out to patients without documentation of COVID-19 vaccination, using these tools.

Additionally, a prioritization scheme and playbook were developed and shared in order to help PACT teams address various situations where patients had not yet demonstrated

documentation of vaccination ([Appendix 2](#)). The “COVID-19 Vaccine Contact Note” was utilized to identify and sort patients who did not accept initial vaccination scheduling efforts via collaboration with a health system specialist. Lists of patients individualized for each PACT team and sorted by reasons for not having COVID-19 vaccination documentation were sent via encrypted email to all VACHS primary care teams.

Program Evaluation

The total percentage of VACHS veterans accepting immunization was evaluated 6 months after implementation, in September 2021. In VACT, as of September 1, 2021, 65.16% of veterans had documentation of receipt of at least one vaccine dose,¹⁰ compared with 61.89% in the remaining geographic region (VISN1). These rates largely reflect veterans vaccinated at the VA, with actual uptake likely significantly higher when accounting for vaccination outside of the VA that had yet to be captured by the population health tool (via documentation of visual confirmation of the vaccination card).

We also assessed, 3 months after implementation, whether use of vaccine hesitancy tools (either the templated “COVID-19 Prevention Letter” or the “COVID-19 Prevention Telephone Note”) resulted in improved uptake of vaccination. In a small early sample of 133 patients contacted using the “COVID-19 Prevention Letter” or the “COVID-19 Prevention Telephone Note,” 32 (24.1%) received subsequent vaccination. We compared this to the population of 147 patients who declined vaccination offers during the initial campaign (as documented in the “COVID-19 Vaccine Contact Note”), who did not have documentation of contact using these templates; of these patients, 20 (13.6%) received vaccination. Chi-square statistical analysis with Yates correction yields a *P* value of 0.036, indicating that use of these notes led to significantly more completed vaccinations.

Evaluation of our prioritization scheme and playbook focused on qualitative reports of acceptability by the PACT, and use of both were found to be acceptable; focused presentations of the prioritization scheme and playbook, and emails from primary care leadership encouraging use, were well received, without significant objections or concerns raised by PACT teams.

DISCUSSION

Minimizing morbidity and mortality from COVID-19 requires healthcare systems to apply effective interventions to address vaccine hesitancy. Healthcare providers are often considered the most trusted source for COVID-19 vaccine information and advice⁶; when surveyed, 60% of vaccine-hesitant patients indicated that they would be more likely to get the COVID-19 vaccine if they received a strong recommendation from their doctor.⁶ A recent survey of veterans revealed skepticism, deliberation, and distrust as top reasons for not being

vaccinated, with respondents reporting the VA as one of their top trusted sources of information.¹¹

This quality improvement initiative addresses vaccine hesitancy within a large healthcare system. Steps to improve vaccine acceptance included identification of a local champion, education sessions for staff and patients, development of informatics/EHR-based vaccine acceptance tools (including a templated “COVID-19 Prevention Letter” and “COVID-19 Prevention Telephone Note”), and application of a population health approach by medical home teams in order to identify patients not yet vaccinated and offer intervention.

Six months after implementation, rates of veterans with documentation of vaccination for COVID-19 were higher in VACT compared with the remaining New England region (VISN 1) (65.15 vs 61.89%). Though we can argue that our systematic approach to vaccine acceptance likely contributed to increased rates of vaccination, other factors such as geographic variability, affiliation with academic institutions, and regional demographic variability make it impossible to draw definitive conclusions.

In a small early sample, we found that use of the EHR-based vaccine acceptance tools was associated with a statistically significant increase in vaccination among vaccine-hesitant patients (24.1% vs 13.6%, $P = 0.036$). Three months after implementation, these vaccine hesitancy tools were only utilized by PACT teams 133 times, while the population of vaccine-hesitant patients within VACT was likely significantly larger, suggesting slow early adoption of these tools by PACT. During this time frame, the “Immunization by PACT Report” revealed nearly 20,000 VACT veterans yet to have documentation of vaccination within our EHR. This sample certainly includes vaccine-hesitant patients, but also includes those vaccinated outside the VA who had yet to submit visual documentation of vaccination to PACT (PACT teams could only satisfy the population health tool with visual confirmation of vaccination status by review of the CDC vaccine card, and documentation of status using a clinical reminder). Nevertheless, the small early uptake of use of vaccine hesitancy tools is worth noting and has several explanations. Successful population health interventions require uninterrupted, protected time from PACT teams. The COVID-19 pandemic placed considerable strain on the healthcare system, and addressing the population of unvaccinated patients is a process that takes significant finesse and time, within a system already strained by increased clinical demand. Additionally, population health approaches using these tools were encouraged, but not mandated. Finally, it is also likely that PACT teams, after educational sessions and emphasis on population approach to their unvaccinated patients, did address vaccine hesitancy using existing population health databases, without using the templates provided. PACT teams may have incorporated proposed interventions into their standard work flow (e.g., using a motivational interviewing-based strategy to frame the conversation around vaccine hesitancy without using the template or personalizing their own patient letters or secure messages

without using the template). A limitation to this assessment is that within a quality improvement framework, it is impossible to establish causality. Results are not adjusted for potential covariates or bias. For example, it is possible that primary care providers were more likely to use these tools on patients who they already had a strong therapeutic relationship with and hence were more amenable to advice. Additionally, primary care providers were encouraged to reach out to veterans not yet vaccinated; this group may have included patients who had already intended to get vaccinated but had not yet done so, as well as vaccine-hesitant patients. The comparator here, in contrast, were patients who initially outright declined offers for vaccination. This may have resulted in a selection bias. More study is needed to develop and rigorously test EHR-based vaccine acceptance tools and to tailor them for maximal effectiveness for relevant subpopulations.

Overall, we found that a structured population health approach to vaccine acceptance using EHR-based tools can have an impact on vaccination rates, and this approach may be of practical utility to other large healthcare systems.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11606-021-07353-9>.

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Declarations:

Conflict of Interest: The authors declare that they do not have any conflicts of interest.

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