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COMMENTARY

Health information technology utilization and impact on COVID-19 vaccination

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ABSTRACT

The use of health information technology (HIT) during the coronavirus disease 2019 (COVID-19) pandemic has rapidly increased. During the pandemic, HIT has been used to provide telehealth services, education on the severe acute respiratory syndrome coronavirus 2 disease, updates on epidemiology and treatments, and most recently, access to scheduling systems for the COVID-19 vaccines. Disparities and health equity, with higher rates of illness, hospitalization, and death, during the pandemic has been documented in Hispanic or Latinx, black, and Native American or Alaska Native persons. Social determinants of health affect these persons disproportionately, including having lower socioeconomic status, lack of reliable transportation, lack of good quality broadband, being employed as an “essential worker,” lack of quality housing, and access to and distrust of the government and health care setting. Patients who have limited or low health literacy will also be at risk for inequitable access to the COVID-19 vaccine owing to the complexities associated with the current vaccine distribution models and the heavy reliance on HIT.

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The use of health information technology (HIT) has significantly increased during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic (hereafter referred to as the coronavirus disease 2019 [COVID-19] pandemic). Social distancing and remote work prompted the expansion of telehealth, while public health agencies provided webinars to educate health care workers and the general public on SARS-CoV-2. The use of HIT has also been instrumental in vaccinating the global population. The Internet is a valuable tool that can be used to order the COVID-19 vaccine, schedule patients for vaccination, disseminate reminders to improve the receipt of the follow-up dose when indicated, and monitor the safety and efficacy of the vaccines. However, overreliance on the Internet can also be an impediment to vaccine access.

People who use HIT to monitor their health or to communicate with their providers can better track and manage their care.¹ HIT is an integral part of Healthy People 2030. This entails a focus on increasing the proportion of adults with

broadband Internet, the proportion of patients with access to their medical records, and the proportion of patients who use HIT to track their health care data and to communicate with their providers. Although these federal government initiatives are commendable, HIT does not always account for disparities such as age, sex, and income level. It has been reported that individuals with higher annual household incomes and those with greater educational attainment are more likely to view and access their online medical record.²

Government and health care agencies are committed to providing equitable access to the COVID-19 vaccine. However, scheduling systems that rely heavily on HIT may increase the divide for equitable access to health care, particularly among those who have low health literacy.³ Although scheduling a vaccine appointment through a website, app, or patient portal may be second nature to some, it entails a high degree of health literacy, access to and comfort with technology, and familiarity with the health care system. For example, when attempting to schedule a COVID-19 vaccine, the patient must first locate the correct website, which varies between states and by the entity offering vaccination (e.g., a community pharmacy, a local health department, or a hospital), and may need to access a portal or create an online account before doing so. Nearly 4 in 10 people who have received the COVID-19 vaccine reported needing to have someone else find or schedule their appointment, with those without a college degree or having a household income less than \$40,000 being

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Key Points**Background:**

- Health Information Technology has been relied on heavily during the severe acute respiratory syndrome coronavirus 2 disease pandemic for COVID-19 vaccine information and scheduling appointments.
- Patient with social determinants of health, including those with limited or low health literacy, are at risk for inequitable access to the COVID-19 vaccine.

Findings:

- Alternative vaccination strategies, including identifying patients at risk, engaging community partners and locations, and providing in-person education or assistance, should be combined with health information technology in order to improve vaccination efforts.

somewhat more likely to need assistance with finding or scheduling an appointment.⁴ This should give the health care community pause, especially considering the likelihood that COVID-19 vaccination will necessitate booster doses as SARS-CoV-2 variants emerge.

The older adult (aged 65 years and older), which comprise approximately 50 million people in the United States, are in Advisory Committee on Immunization Practices (ACIP) group 1a and 1b of vaccination. Vaccinating this population is of great importance because of the higher mortality rates and complications associated with SARS-CoV-2 in this age group. The older adult population has a lower health literacy level and as a population uses the Internet less frequently for health information.⁵ As a consequence, when the use of HIT tools is too heavily relied on, this population is at risk for not receiving the vaccine or completing the vaccine series. As of March 2021, 44% of the U.S. older adult population had received 1 dose of the vaccine and another 8% had an appointment scheduled.⁴ Approximately 16% tried but were unable to get an appointment. Nearly 40% of the patients surveyed indicated that it was difficult to get an appointment. The difficulty in securing appointments will likely increase as the pool of eligible patients expands. The authors of this article had to help their parents navigate this system and have frequently seen adult children accompanying their parents to vaccine clinics. Educating the older adult population about the COVID-19 vaccine is also important to encouraging vaccine uptake. Data suggest that the older adult population is more likely to ask for and receive vaccine information from a health care provider, an insurance company, or a public health agency than younger age groups, highlighting the impact the health care community can have on vaccine acceptance.⁴

According to the 2003 national assessment of adult literacy, as compared with white and Asian or Pacific Islanders, Hispanics followed by blacks and American Indian or Alaska Natives had lower health literacy.⁶ Patients living

below the federal poverty level also had lower health literacy. Patients who have lower health literacy tend to use less HIT,⁷ and many of these patients also have comorbidities and will therefore either fall into ACIP phase 1c or 2. If these populations are unable to navigate a vaccine scheduling system driven by HIT, it will only further increase the health care disparities highlighted by the pandemic.

As of February 2021, the number of adults who received or wanted to receive the vaccine varied across racial and ethnic groups: 41% of blacks, 52% of Hispanics, and 61% of whites indicated a desire to be vaccinated against COVID-19.⁸ Although there is no difference in the desire to get vaccinated between older white and black adults, data show the number of older white adults outpace the number of older black adults who have received the vaccine (46% vs. 35%). In addition, adults are more likely to get vaccinated if they know a close, personal contact who has been vaccinated: These numbers are much higher for white adults (75%) compared with black or Hispanic adults (57%). This demonstrates the impact a community can have on increasing vaccination level among the different races or ethnicities. In addition, blacks and Hispanics are more likely to be concerned with having vaccine adverse effects that would necessitate that they take time off of work, needing to travel to the vaccination site, trusting the place of vaccination, paying for the vaccine out-of-pocket, being infected with COVID-19 as a result of receiving the vaccine, and having a lack of adequate testing in black and Hispanic patients in clinical trials.⁸ These results highlight the need for a multimodal approach to educating and vaccinating black and Hispanic patients beyond what is currently offered through HIT.⁹

There is also a notable urban and rural divide when it comes to receiving the COVID-19 vaccine. Although there is a similar response to the statement “would get vaccinated as soon as possible or already received it,” 24% of the rural residents surveyed consistently stated that they will “definitely not” get vaccinated.¹⁰ Many rural communities are in pharmacy “deserts” and those who are not are having difficulty in being approved as vaccine providers or having enough supply.¹¹ In addition, mountainous and remote areas do not always have good quality broadband, which will cause limitations in the use of HIT. This demonstrates a need to make sure that rural communities are educating patients on the COVID-19 vaccine, have vaccines to distribute, and have the infrastructure to distribute them effectively.

So, what can we do? One study demonstrated improved vaccination rates at a mobile vaccination clinic in the black community with a 3-tiered approach.⁹ The interventions included (1) engaging black faith leaders to support vaccination efforts by coordinating educational webinars, distributing paperwork, and assisting with appointment lists; (2) providing education about SARS-CoV-2 to the black community through a black, infectious disease-trained pharmacist; and (3) holding a mobile vaccination clinic at a familiar and easily accessible church. In rural communities, examples of innovations to provide care are listed in [Table 1](#).¹² Many of these rural strategies can be used to expand vaccine access to the older adults and those living in urban poor regions.

Table 1
Vaccination strategies for rural communities¹²

Vaccination strategy	Population
“Vaccine SWAT teams”	Homeless, homebound, long-term care facilities
In-person scheduling and transportation	Native Americans
Mobile clinics and “hotline” scheduling	Those who lack transportation or cannot use online appointment scheduling
Calling patients to schedule vaccinations	Veterans, Native Americans
Using black preachers and leaders to discuss vaccination efforts	Black community members
Phone trees/transit systems	Older adults
Community health center organized vaccine delivery	Rural community
Using community members, radio, and interpreters for educating the community	Hispanic, Marshallese community
Plane, water, taxi, or sled	Alaska Natives
Drive-through sites	Native American
Small, independent pharmacies	Long-term care facilities

In summary, until the vaccine supply and vaccination rates permit a “walk-in” system, several strategies should and can be used to improve vaccination efforts as a supplement to HIT. First, online scheduling and follow-up should be combined with a telephone system for those persons in the category with lower health literacy, with a percentage of appointments reserved for each scheduling platform. Second, the local health care community should conduct outreach to patients identified at risk for inequitable access to the vaccine. Third, health care providers need to go to patients who are less likely to come to the health care setting, have transportation issues, or are geographically isolated from the health care entities offering vaccination (e.g., urban poor and rural communities). Fourth, engage pharmacists to increase access to the COVID-19 vaccine: Pharmacies are readily located in both urban and rural areas, making pharmacists one of the most accessible health care providers. To facilitate this, public and government agencies, private and corporation sectors, and health professions schools should provide pharmacies with the support they need to assist with in-person scheduling and vaccine administration. Medical offices should also provide similar assistance and support, since many of these patients will attempt to contact their primary care provider to receive the vaccine or gain information on how to access it. Fifth, community health care workers could be used to assist in the field, if provided proper training. Globally, community health care workers have had a notable impact in reducing disparities globally but are often underused in the United States. Finally, we need to work with community partners (e.g., fire halls, churches, community centers, etc.) to educate and vaccinate. This provides an opportunity to meet patients where they live, thereby removing the barrier of transportation.

This is a call for public health agencies, the health care community, and professional schools to develop an approach to allocate the COVID-19 vaccine in a way that does not rely on HIT as the predominant means to vaccine access. If we do not, the health care community may fail many patients who need the vaccine most. Doing so will provide better access to medical care during the ongoing pandemic and perhaps carve out a new model that improves health care access after we conquer COVID-19.

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