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Research and Applications

Racial and ethnic disparities in use of a personal health record by veterans living with HIV

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ABSTRACT

Objective: To examine sociodemographic characteristics associated with use of My HealthVet (MHV) by veterans living with HIV.

Materials and Methods: Veterans Health Administration administrative data were used to identify a cohort of veterans living with HIV in fiscal years 2011–2017. Descriptive analyses were conducted to examine demographic characteristics and racial/ethnic differences in MHV registration and tool use. Chi-Square tests were performed to assess associations between race/ethnicity and MHV registration and tool use.

Results: The highest proportion of registrants were non-Hispanic White veterans living with HIV (59%), followed by Hispanic/Latino (55%) and Black veterans living with HIV (40%). Chi-Square analyses revealed that: (1) MHV account registration was significantly lower for both Black and Hispanic/Latino veterans in comparison to White veterans and (2) Black MHV registrants were less likely to utilize any MHV tool compared with White MHV registrants including Blue Button record download, medication refills, secure messaging, lab, and appointment views.

Discussion: In line with prior research on personal health record (PHR) use among non-veteran populations, these findings show racial and ethnic inequities in MHV use among veterans living with HIV. Racial and ethnic minorities may be less likely to use PHRs for a myriad of reasons, including PHR privacy concerns, decreased educational attainment, and limited access to the internet.

Conclusion: This is the first study to examine racial and ethnic disparities in use of MHV tools by veterans living with HIV and utilizing Veterans Health Administration health care. Future research should examine potential moderating factors linked to decreased PHR use among racial and ethnic minority veterans, which could inform strategies to increase PHR use among vulnerable populations.

Key words: health disparities, HIV, patient health record, race, veterans

INTRODUCTION

Although the incidence of HIV in the US has decreased from 2011 to 2016, significant disparities exist between racial and ethnic minorities and White individuals.^{1,2} In 2016, the Centers for Disease Control and Prevention (CDC) reported the incidence rate for HIV diagnoses among Black individuals was nearly nine times higher than for Whites (ie, 43.6% of all new HIV diagnoses were among Blacks vs 5.2% among Whites).¹ These disparities also extend to linkage to and retention in HIV care. For instance, in a 2011–2013 CDC report, fewer Black individuals were consistently retained in HIV care compared with other racial or ethnic groups, regardless of sex or transmission category.³ Disparities extend even further into the management of comorbid conditions, including hypertension, cardiovascular disease, and diabetes.^{4–6} The considerable burden of managing multiple conditions among individuals living with HIV has led health care systems to rely on health information technology to improve disease management.

Personal health records (PHRs), or electronic records tethered to a health care system's electronic health record (EHR) system, hold promise for enhancing the continuum of care among individuals living with HIV.⁷ The passage of both the Patient Protection and Affordable Care Act in 2010 and the Health Information Technology for Economic and Clinical Health Act in 2009 demonstrate the investment of the federal government in incentivizing health care systems to use PHRs.^{8,9} They provide patients with a streamlined, secure method of accessing medical records and communicating with providers about their ongoing care plans.¹⁰

The Veterans Health Administration (VHA), the largest integrated health care system in the US, introduced its web-based PHR called My Health_eVet (MHV) in 2003.¹¹ Since that time, the MHV program office increased the number of tools available and enhanced functionality. These tools are designed to improve care coordination and personal health information management and include detailed health records, prescription refills, secure messaging, and appointment scheduling. Using MHV, veterans living with HIV can track CD4 (T-cell test) counts and viral load test results, request refills and access detailed information on their HIV medications, communicate with their care teams and manage appointments, and manage information related to comorbid conditions. Further, the MHV Blue Button tool enables users to easily access their personal health information with a single click. MHV is only available in English but can be accessed via mobile devices in addition to public or private computers. There is no cost to patients. All facilities have an MHV coordinator who is responsible for disseminating information about MHV via posters or brochures and providing training to both patients and providers via group or individual instruction. Many facilities provide computer access to patients.¹¹

Despite the efficiency and privacy offered by MHV, it is unclear how disparities in PHR utilization impact disparities in the receipt of care among individuals living with HIV. Prior research has established that, despite displaying interest in using electronic methods to manage care, racial and ethnic minority patients remain less likely to enroll in and use PHRs compared with White patients.^{12–16} Among MHV users, veterans living with HIV are the chronic disease population displaying highest overall use of the PHR.¹⁷ However, given past trends in racial and ethnic disparities in PHR use, disparities may also extend to this population.

METHODS

Study setting, sample, and data sources

Institutional Review Board (IRB) approval was obtained from the IRB at our affiliated university. The study cohort consisted of 34 183 veterans living with HIV and accessing care at 128 VHA facilities between October 1, 2010 and September 30, 2017. Inclusion in the cohort required either receipt of an inpatient HIV diagnosis code or a minimum of two outpatient HIV diagnosis codes during the study period; this method has been shown to maximize the accuracy of identifying patients with an HIV diagnosis.¹⁸ The selected study period allowed for comprehensive identification of the population of veterans living with HIV who have been actively receiving VHA care in recent years.

Demographic characteristics

VHA administrative data were used to obtain measures of age, sex, and the ZIP code in which each veteran lived. Age category and sex were ascertained at cohort entry using the date of birth and sex most commonly reported by the veteran in VHA administrative data. Each veteran's ZIP code of residence was assigned according to the residence ZIP code most often recorded at visits to infectious disease or primary care clinics during the study period. Rural Urban Commuting Area (RUCA) codes were used to classify residence rurality based on each patient's residential ZIP code.¹⁹ In addition, we used the 2016 American Community Survey (ACS) 5-year estimates of the proportion of adults who attained at least a high school degree within each veteran's residential ZIP code.²⁰

Primary independent variable

The primary independent variable was race/ethnicity. The application of the Observational Health Data Sciences and Informatics (OHDSI) common data model to VHA administrative data resulted in assignments of a single race and ethnicity for each veteran.²¹ These assignments were made according to the veteran's most frequently self-reported race and ethnicity. One feature of this categorization to note is that individuals are not able to be classified as multiracial, as the model first chooses the race value that is most frequently self-reported and then defaults to the most common racial category non-self-reported. We mapped these race and ethnicity values to a combined race/ethnicity variable based on the method outlined in the *National Veteran Health Equity Report—FY13* Technical Appendix.²² The resulting categories included veterans reporting Hispanic or Latino ethnicity, and the following categories of veterans reporting non-Hispanic ethnicity: American Indian/Alaska Native, Asian, Black, Native Hawaiian/Other Pacific Islander, and White. The mapping allowed for an "unknown" category of race/ethnicity, which signified that both a veteran's race and ethnicity were unknown, or that a veteran reported non-Hispanic ethnicity, but his/her race was unknown. We excluded veterans with unknown race/ethnicity from our analyses.

Outcomes

The primary outcomes of interest were the proportions of veterans in racial or ethnic subgroups who had registered for MHV and their use of five key MHV tools. MHV tools allow veterans to manage their health through secure communication with their care teams (Secure Messaging), the ability to view, download, save, and print extensive information from their personal health record (Blue Button), the ability to request prescription refills (Rx Refill), and inter-

Table 1. My HealtheVet (MHV) tool descriptions

Feature	Description
Secure Messaging	Secure messaging is an MHV tool available to VHA patients with <i>Premium</i> accounts. It allows patients to communicate with their VHA health care teams by securely sending and receiving messages, and maintaining a record of past conversations.
Blue Button	Blue Button is an MHV tool available to users with <i>Advanced</i> or <i>Premium</i> accounts; however, its functionality is expanded for VHA patients with <i>Premium</i> accounts. It allows patients with any type of account to enter, view, print, and download self-entered health information; patients with <i>Advanced</i> accounts to view, print, and download allergy and medication history from their VHA electronic health record; and patients with <i>Premium</i> accounts to view, print, and download information from their VHA electronic health record, including: <ul style="list-style-type: none"> • Admissions and discharges • Allergies • Future and past appointments • Demographics • Electrocardiogram history • Immunizations • Laboratory results • Medications • Pathology reports • Problem list • Clinical Progress notes • Radiology reports • Vitals and readings • Wellness reminders • DoD military service information <i>Premium</i> users may also download or send a summary of their essential health and medical care information, referred to as a VA Health Summary. The tool allows the user to select the types of information to include and a date range for what they would like to view, print, or download.
Rx Refill	Rx Refill is available to VHA patients with <i>Advanced</i> or <i>Premium</i> accounts. It provides a secure way to refill previously filled, active VHA prescriptions online. The tool displays information about active prescriptions and allows patients to track when their medications are shipped and which delivery service is handling their package. It also allows patients to view their prescription histories and self-entered medications and supplements.
View Labs	View Labs allows VHA patients with <i>Premium</i> MHV accounts to view results from their laboratory tests, as they become available. This information can also be viewed using Blue Button, but View Labs provides easy access to information specific to VHA laboratory results. VHA patients may also view self-entered laboratory tests using View Labs, and do not need a <i>Premium</i> account.
View Appointments	View Appointments allows VHA patients with <i>Premium</i> MHV accounts to view upcoming VHA clinic appointments as well as appointments that took place in the last two years. This information can also be viewed using Blue Button, but View Appointments provides easy access to information specific to VHA appointments.

Two MHV account types (*Advanced* and *Premium*) with different levels of functionality are available at no cost to all veterans who receive VHA care. For privacy and data security reasons, when VHA patients first register for MHV, they receive an *Advanced* account which provides access to Rx Refill, limited information from VHA and Department of Defense records (eg, prescription history and allergies), as well as functionality to self-enter health-related information including VHA or non-VHA lab results (eg, CD4 counts and viral load). As soon as the veteran authenticates their identity through one of several means, the account converts to a *Premium* account, enabling full access to all MHV tools, such as Secure Messaging, and extracts from his/her VHA electronic medical record (eg, clinical notes, VHA lab results, appointments, immunizations, etc.). MHV registration was defined as a veteran signing up for an *Advanced* or *Premium* MHV account at any point between November 10, 2004 (when earliest MHV registration data was available) and September 30, 2017. We operationalized use of the specified MHV tools as any recorded action related to each of the MHV tools between October 1, 2012 and September 30, 2017 by VHA patients living with HIV and accessing VHA care during that same time period.

Abbreviation: MHV, My HealtheVet; VHA, Veterans Health Administration.

faces for viewing certain types of health information (View Appointments and View Labs). [Table 1](#) describes these five MHV tools in greater detail.

Analytic approach

We examined summary statistics (means, medians, range, and interquartile range) and multiway tables of the independent and dependent variables and demographic characteristics, and performed Chi-Square tests to assess unadjusted differences in MHV registration and MHV tool use according to race/ethnicity.

RESULTS

We excluded 1282 (4%) veterans with unknown race/ethnicity, resulting in a final analytic sample of 32 901 veterans living with HIV in fiscal year (FY) 2011 to FY 2017. Demographic summaries of these veterans are shown in [Table 2](#).

Among the sample, 16 026 (49%) veterans registered for an *Advanced* or *Premium* MHV account. Seventy-nine percent ($n = 12\ 738$) of MHV registrants in the cohort upgraded to a *Premium* account before or during the study period, while the remaining 21% ($n = 3288$) had an *Advanced* account. Of the five MHV tools we explored during FY13-FY17, View Appointments was used

Table 2. Characteristics of VHA patients living with HIV

Variable	Overall	Black	White	Hispanic/Latino	Native Hawaiian/Other Pacific Islander	American Indian/Alaska Native	Asian
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
N	32 901	17 175	12 950	2160	229	224	163
Residence Rurality							
Rural/Highly Rural	5211 (15.8)	1853 (10.8)	3011 (23.3)	238 (11.0)	31 (13.5)	65 (29.0)	13 (8.0)
Urban	27 533 (83.7)	15 268 (88.9)	9849 (76.1)	1916 (88.7)	196 (85.6)	157 (70.1)	147 (90.2)
Unknown	157 (0.5)	54 (0.3)	90 (0.7)	6 (0.3)	2 (0.9)	2 (0.9)	3 (1.8)
Age							
<50	11 404 (34.7)	5787 (33.7)	4384 (33.9)	928 (43.0)	96 (41.9)	90 (40.2)	119 (73.0)
50–64	17 378 (52.8)	9834 (57.3)	6266 (48.4)	1020 (47.2)	111 (48.5)	111 (49.6)	36 (22.1)
65+	4026 (12.2)	1520 (8.9)	2252 (17.4)	203 (9.4)	22 (9.6)	22 (9.8)	7 (4.3)
Unknown	93 (0.3)	34 (0.2)	48 (0.4)	9 (0.4)	0 (0.0)	1 (0.4)	1 (0.6)
Sex							
Female	1092 (3.3)	778 (4.5)	245 (1.9)	48 (2.2)	8 (3.5)	8 (3.6)	5 (3.1)
Male	31 809 (96.7)	16 397 (95.5)	12 705 (98.1)	2112 (97.8)	221 (96.5)	216 (96.4)	158 (96.9)
Census Region							
Midwest	3962 (12.0)	1813 (10.6)	1985 (15.3)	119 (5.5)	14 (6.1)	23 (10.3)	8 (4.9)
Northeast	4670 (14.2)	2747 (16.0)	1444 (11.2)	431 (20.0)	21 (9.2)	19 (8.5)	8 (4.9)
South	17 783 (54.1)	10 961 (63.8)	5694 (44.0)	892 (41.3)	101 (44.1)	89 (39.7)	46 (28.2)
West	6486 (19.7)	1654 (9.6)	3827 (29.6)	718 (33.2)	93 (40.6)	93 (41.5)	101 (62.0)
Residence ZIP Code Education Level ^a							
Low	489 (1.5)	251 (1.5)	115 (0.9)	116 (5.4)	3 (1.3)	0 (0.0)	4 (2.5)
Medium	21 818 (66.3)	12 633 (73.6)	7398 (57.1)	1405 (65.0)	142 (62.0)	153 (68.3)	87 (53.4)
High	9797 (29.8)	3831 (22.3)	5160 (39.8)	595 (27.5)	76 (33.2)	66 (29.5)	69 (42.3)
Unknown	797 (2.4)	460 (2.7)	277 (2.1)	44 (2.0)	8 (3.5)	5 (2.2)	3 (1.8)

^aResidence ZIP code education level is defined by the ACS 5-year estimate of the percentage of adults with at least a high school degree. “Low” reflects percentages from 30%–59%, “Medium” – 60%–89%, and “High” – 90% or higher.

Abbreviation: VHA, Veterans Health Administration.

Table 3. Differences in MHV registration and utilization (among MHV registrants) by race/ethnicity

Variable	Overall	Black	White	Hispanic/Latino	Native Hawaiian/Other Pacific Islander	American Indian/Alaska Native	Asian	<i>p</i>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
MHV Registered	16 026 (48.7)	6893 (40.1)	7588 (58.6)	1182 (54.7)	135 (59.0)	118 (52.7)	110 (67.5)	<.001
View Appointments User	8046 (50.2)	2916 (42.3)	4348 (57.3)	596 (50.4)	75 (55.6)	53 (44.9)	58 (52.7)	<.001
Rx Refill User	7571 (47.2)	2588 (37.5)	4261 (56.2)	541 (45.8)	75 (55.6)	50 (42.4)	56 (50.9)	<.001
View Labs User	6604 (41.2)	2323 (33.7)	3636 (47.9)	488 (41.3)	64 (47.4)	42 (35.6)	51 (46.4)	<.001
Blue Button User	6588 (41.1)	2333 (33.8)	3637 (47.9)	463 (39.2)	65 (48.1)	46 (39.0)	44 (40.0)	<.001
Secure Messaging User	5287 (33.0)	1670 (24.2)	3108 (41.0)	376 (31.8)	60 (44.4)	31 (26.3)	42 (38.2)	<.001

Abbreviation: MHV, My HealtheVet.

by the most MHV registered veterans in our cohort, followed by Rx Refill, View Labs, Blue Button, and Secure Messaging. Table 3 displays proportions of MHV registration according to race/ethnicity, which varied significantly ($\chi^2 (5) = 1077.30, p < .0001$). Veterans of Asian race/ethnicity had the highest proportion of MHV registration, followed by veterans reporting Native Hawaiian/Other Pacific Islander as their racial/ethnic background, White veterans, Hispanic/Latino veterans, American Indian/Alaska Native veterans. Black veterans had the lowest proportion of MHV registration among racial/ethnic groups.

The a priori significance level of 0.01 was adjusted using a Bonferroni correction for multiple comparisons. Each hypothesis is tested at the 0.002 significance level. We observed significant differences in proportions of use of Blue Button ($\chi^2 (5) = 300.94, p < .001$), Rx Refill ($\chi^2 (5) = 508.45, p < .001$), Secure Messaging

($\chi^2 (5) = 469.92, p < .001$), View Appointments ($\chi^2 (5) = 328.14, p < .001$), and View Labs ($\chi^2 (5) = 306.24, p < .001$), across race/ethnicity, among veterans in the cohort who registered for MHV (Table 3). Black MHV-registered veterans had the lowest proportions of use of all MHV tools, compared to veterans from other racial/ethnic groups.

DISCUSSION

In the current study, racial and ethnic minorities were less likely to register and engage with MHV than White veterans, suggesting a digital divide in the population of veterans living with HIV. Further, when considering only individuals who are registered, disparities in use of available tools persist. Of note, among registered patients liv-

ing with HIV, Black veterans were less likely to use all individual MHV tools compared with White veterans and other racial/ethnic minority groups. American Indian/Alaska Native veterans living with HIV reported the next lowest use of tools, followed by Hispanic/Latino veterans. Overall tool-specific patterns of use were relatively similar across all groups, with some tools being of high or low use regardless of group status. For example, Secure Messaging was the least-utilized tool across all racial/ethnic categories, while View Appointment was the highest-utilized tool. However, when comparing separate racial/ethnic groups, level of utilization of all tools varied significantly. Specifically, the proportions of White veterans using all features were almost always higher compared with all other racial/ethnic groups.

Our findings that MHV tool use is disparate between White and racial/ethnic minority individuals is consistent with extant literature on disparities in PHR use in general.^{12–16} Some research suggests that racial/ethnic disparities in PHR use are associated with fear that the interpersonal aspects of health communication will be compromised.²³ For instance, in a study conducted by Lyle and colleagues, Black and Latino patients preferred in-person appointments to using a PHR for communicating needs to providers.²³ The authors suggested that racial and ethnic minority patients find greater value with in-person communication and equate high-quality health care with positive interpersonal interactions. Use of a PHR creates a literal barrier (eg, a screen) between the patient and the provider and thus, may not be as desirable among certain cultural groups.

Another factor that may play a role in lower PHR use among minority veterans living with HIV is the substantial amount of stigma accompanying the disease. Some research has found that racial and ethnic minorities living with HIV may endorse greater levels of public stigma and fear of discrimination than White individuals living with HIV.^{24,25} Fear of stigmatization may result in nondisclosure of a patient's serostatus to health care providers and these individuals may even choose to discontinue medical treatment.²⁶ Although our study did not measure stigma or discrimination, these are potential moderating factors in the decision to engage in PHR use among racial and ethnic minorities living with HIV.

Related to stigma, the body of research on how intersections of identities (ie, intersectionality) influence health decisions is burgeoning and may potentially explain differences in PHR use. Intersectionality posits that multiple socioeconomic identities intersect at the person-level to reflect individual experiences and interactions with societal systems, including health systems.²⁷ In the current study, we created demographic profiles of veterans living with HIV by examining variables such as educational attainment by ZIP code, sex, and age. Across these individual socioeconomic indicators, differences have been found both in the qualitative and quantitative literature in how patients access and perceive PHRs.^{14,28,29} Notably, researchers have found that health literacy or educational attainment may impact both registration for and usage of PHRs.^{14,28} Furthermore, logistical barriers such as lack of broadband internet access, which may be related to rurality, have been associated with low PHR utilization.²⁹ The above findings draw conclusions about PHR use at an indicator-specific level; however, domains of identity are often not mutually exclusive. It may be the case that individuals at the margins of society—in other words, racial and ethnic minorities living in rural areas or lower in educational attainment—may be most negatively affected by the growth of PHR. Overall, a richer profile of PHR use or non-use may be examined by modeling the interactions of domains of identity on PHR use.

Differences in tool-specific utilization observed in our cohort may indicate that MHV tools need to be improved to increase appeal among health disparate populations. Studies that have taken a culturally-informed approach in improving electronic health tools for underserved populations are generally consistent in their recommendations. Across these studies, general recommendations include the following: (1) simplify text, graphics, and audio; (2) assess usability of PHR using health literacy assessments; and (3) create different versions of the portals for individuals who need additional assistance (eg, different language versions, enhanced versions for ocular impairment).^{30–32} However, in addition to making the aforementioned improvements, usability should be targeted specifically for racial and ethnic minority veterans living with HIV. The following recommendations should be considered when scaling MHV for this unique population:

- 1. Provide MHV training at VHA health systems nationwide.** While some locations offer comprehensive group training on MHV, these services are not available at each VHA facility. Past research has found that some racial and ethnic minority patients want guidance on how to both use PHRs and adequately interpret communications, records, or labs.²³ Additionally, offering group-based training for veterans living with HIV may promote a sense of camaraderie and comfort where individuals feel more comfortable to interact and learn. Some literature has found that emotional support from peers living with HIV is tied to engagement in HIV care among newly-diagnosed individuals.³³ By providing the option of either group training or one-on-one training, veterans living with HIV may feel more confident in using MHV and more comfortable with communicating with their care team online.
- 2. Refine features on the Rx Refill tool to streamline care management.** In the current study, racial and ethnic minority patients were less likely to use this function compared to White veterans. In a recent study assessing the usability of MHV among a general population of VA care users, participants reported that this tool did not support the management of several prescriptions. Further, these individuals stated that they would want to receive an automated notification when a prescription was about to expire.³⁴ Previous literature suggests that increased PHR utilization generally encourages medication adherence among both chronic disease patients and patients with HIV.^{10,35} However, when veterans living with HIV have to manage multiple comorbid conditions, use of the Rx Refill tool on MHV may become onerous.
- 3. Hold provider trainings on how to engage patients with MHV.** Improved patient outcomes were observed in diabetes patients who engaged with MHV's Secure Messaging function, which was the lowest-utilized MHV tool among our study cohort.³⁶ One potential factor in veterans' hesitation to use the Secure Message feature is fear that their vulnerable health information will be compromised.³⁷ These concerns could be addressed by mandating provider and/or PACT trainings on how to engage patients with MHV. In one study assessing active duty Army soldiers' engagement with PHR, it was found that soldiers' use depended on the type and level of secure messaging used by providers.³⁸ In this study, patients were 334% more likely to use secure messaging via PHR if they perceived their providers were highly responsive to the secure messages of other patients.³⁸ By training providers on how to both demonstrate the benefits of MHV and employ engagement strategies, overall use of Secure

Message among racial and ethnic minorities living with HIV may increase.

4. **Conduct qualitative interviews with racial and ethnic minority veterans living with HIV.** Given that the current study focused on a unique, vulnerable population, barriers to use of MHV may be different than other populations at non-VHA health systems. Thus, further research into barriers and facilitators of MHV use among this group is warranted.

Limitations

Although this study is an important addition to the literature examining disparities in PHR use, there are a few limitations to note. First, sample sizes among some racial/ethnic groups (eg, Asian, American Indian/Alaska Native) were small and limits generalizability of findings among those groups. Second, compared to ZIP code-level estimates, measures in smaller geographic zones more precisely classify levels of education attainment, especially in cases where stark disparities exist in neighboring geographic areas. That said, residence ZIP codes are recorded at all veterans' episodes of care, allowing us to better identify where they lived when receiving most of their HIV care, and providing adequate information for the descriptive purposes of the current study. Third, data related to potential moderating factors (eg, trust, health literacy) were not collected, but may account for some variation in the relationship between race/ethnicity and MHV use. A final limitation lies in the nature of data from electronic health records. There are known issues inherent to large data sets, such as sampling bias, ascertainment bias, errors in diagnostic coding, multiple comparisons bias, and problems with generalizability of data findings.³⁹ We have attempted to minimize these biases by utilizing a validated method of identifying VHA patients living with HIV, including them all in our analytical sample, specifying outcome measures a priori, and adjusting for multiple comparisons.

CONCLUSION

To date, this is the first study to examine racial and ethnic disparities in the use of MHV tools by veterans living with HIV utilizing VHA health care. Black veterans represent the largest racial/ethnic subset of veterans living with HIV, and yet they are the least likely to use MHV and its tools, despite evidence suggesting that use is associated with better HIV outcomes.¹⁷ As health care provision continues to transition to digital modalities, it will become increasingly important to understand and continue to monitor disparities in utilization of patient-facing technologies such as the MHV personal health record. We must ensure that existing gaps in patient care are not widened by the same technologies that have the potential to close them.

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CONTRIBUTORSHIP STATEMENT

SJ conceptualized the scope of the manuscript and wrote the manuscript with the support of LT, SS, TA, TE, and AM. LT conducted all major analyses and developed the Methods and Results sections. SS, KM, and MO are co-authors on the grant and provided feedback

and revisions on both quantitative analyses and drafts of the manuscript. AM is the primary investigator for the grant.

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CONFLICT OF INTEREST STATEMENT

None declared.

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