

# Digital Health Engagement in the US Population: Insights From the 2018 Health Information National Trends Survey

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**Objectives.** To examine prevalence and predictors of digital health engagement among the US population.

**Methods.** We analyzed nationally representative cross-sectional data on 7 digital health engagement behaviors, as well as demographic and socioeconomic predictors, from the Health Information National Trends Survey (HINTS 5, cycle 2, collected in 2018; n = 2698–3504). We fitted multivariable logistic regression models using weighted survey responses to generate population estimates.

**Results.** Digitally seeking health information (70.14%) was relatively common, whereas using health apps (39.53%) and using a digital device to track health metrics (35.37%) or health goal progress (38.99%) were less common. Digitally communicating with one's health care providers (35.58%) was moderate, whereas sharing health data with providers (17.20%) and sharing health information on social media (14.02%) were uncommon. Being female, younger than 65 years, a college graduate, and a smart device owner positively predicted several digital health engagement behaviors (odds ratio range = 0.09–4.21; *P* value range < .001–.03).

**Conclusions.** Many public health goals depend on a digitally engaged populace. These data highlight potential barriers to 7 key digital engagement behaviors that could be targeted for intervention. (*Am J Public Health.* 2021;111(7):1348–1351. <https://doi.org/10.2105/AJPH.2021.306282>)

Digital technologies have become vital tools for empowering individuals to engage with their health. Through the use of health information technology and digital communication platforms, people can now access health care or health resources, exchange health knowledge with social networks, and keep track of their personal health data conveniently and inexpensively.<sup>1,2</sup>

The nation's vision for precision health—that is, tailoring disease prevention and treatment strategies to patients' genomic, physiologic, environmental, and behavioral profiles<sup>3</sup>—will

also require digital undergirding. For example, the All of Us research initiative (the forefront of data collection in precision medicine) uses patient-generated health data as the basis for both discovery and clinical implementation.<sup>3,4</sup> Furthermore, precision public health goals include using publicly shared information to track outbreaks and identify the need for community- and population-level health interventions.<sup>5,6</sup>

Accordingly, a key national objective is to achieve widespread digital health engagement among patients and the broader public.<sup>7</sup> Yet, despite

increased uptake, data from the past decade point to persistent inequalities in both access and usage, with racial/ethnic minority and lower socioeconomic status individuals more likely to be among the digitally disadvantaged.<sup>8–10</sup> Thus, understanding the prevalence of digital health engagement behaviors and potential social gaps is a priority.<sup>10</sup> We used 2018 data from the National Cancer Institute's Health Information National Trends Survey (HINTS) to provide baseline estimates and sociodemographic predictors of 7 digital

engagement behaviors central to national public health goals.

## METHODS

HINTS is administered annually to a stratified probability sample of noninstitutionalized US adults. Weights are applied to the data to generate estimates representative of the US population in terms of sex, age, and race and ethnicity distribution.<sup>11</sup> We used items from HINTS 5, cycle 2 (collected January–April 2018) to estimate population levels of digital health engagement ( $n = 3504$ ) and predictors of engagement ( $n = 2698$ ). Sample characteristics, including levels of technology access, are presented in Table A (available as a supplement to the online version of this article at <http://www.ajph.org>). Detailed information about HINTS sampling, data collection, and weighting methods are available at <https://hints.cancer.gov/data>.

We conducted all analyses using SAS version 9.4 (SAS Institute, Cary, NC). We used descriptive statistics to estimate population digital health engagement. We used multivariable logistic regression models to estimate relationships between engagement behaviors and predictors, controlling for all other sociodemographic characteristics in each model. The analytic sample for estimating engagement predictors consisted of the 2698 respondents with complete data for all survey items used in those analyses. We used jackknife weighting methods to generate conservative estimates of variance.

HINTS measures are developed through a process of extensive cognitive testing.<sup>11</sup> We classified the behaviors we selected for this study into categories of digital health engagement—accessing, communicating, and generating health information—

**TABLE 1— Level of Digital Health Engagement by Type: Health Information National Trends Survey 5, Cycle 2, United States, 2018**

Behavior	Weighted Prevalence Estimates, % (95% CI)
<b>Accessing</b>	
In the past 12 mo, have you used a computer, smartphone, or other electronic means to look for health or medical information for yourself?	70.14 (67.26, 73.02)
On your tablet or smartphone, do you have any “apps” related to health and wellness? <sup>a</sup>	49.24 (45.79, 52.69) <sup>b</sup>
<b>Communicating</b>	
In the past 12 mo, have you used e-mail or the Internet to communicate with a doctor or a doctor’s office?	35.58 (33.14, 38.02)
Have you shared health information from either an electronic monitoring device or a smartphone with a health professional within the past 12 mo?	17.20 (15.20, 19.20)
In the past 12 mo, have you used the Internet to share health information on social networking sites, such as Facebook or Twitter?	14.02 (11.87, 16.17)
<b>Generating</b>	
Has your tablet or smartphone helped you track progress on a health-related goal such as quitting smoking, losing weight, or increasing physical activity?	38.99 (36.56, 41.43)
Other than a tablet or smartphone, have you used an electronic device to monitor or track your health within the past 12 mo? Examples include Fitbit, blood glucose meters, and blood pressure monitors.	35.37 (32.74, 38.00)

*Note.* CI = confidence interval. Survey population size was  $n = 3504$ . The full questionnaire and data set can be found at <https://hints.cancer.gov/data>. Less than 3% of data were missing for each of these variables.

<sup>a</sup>Assessed only among respondents who reported having a smart device ( $n = 2770$ ).

<sup>b</sup>Of smart device owners.

for ease of reporting and interpretation. Items are described in Table 1.

We also examined sociodemographic characteristics as predictors of digital health engagement as well as 3 access-related predictors: (1) having access to the Internet, (2) having a smart device, and (3) receiving access to one’s electronic health record (EHR).

## RESULTS

Prevalence estimates and confidence intervals are reported in Table 1.

We report complete results of multivariable logistic regression models, including referent category information,

in Tables B–D (available as supplements to the online version of this article at <http://www.ajph.org>) and highlight statistically significant predictors here. For interested readers, we also report bivariate relationships in Tables E–G (available as supplements to the online version of this article at <http://www.ajph.org>).

Individuals were more likely to seek health information digitally if they had access to the Internet (odds ratio [OR] = 4.21;  $P < .01$ ), a smart device (OR = 2.82;  $P = .03$ ), or their EHR (OR = 1.86;  $P < .01$ ) but less likely if they were 65 years old or older (65–74 years: OR = 0.42;  $P = .03$ ;  $\geq 75$  years: OR = 0.27;  $P < .01$ ). They were more

likely to have health and wellness apps if they had EHR access (OR = 2.20;  $P < .01$ ) but less likely if they were 65 years old or older (65–74 years: OR = 0.33;  $P < .01$ ;  $\geq 75$  years: OR = 0.26;  $P < .01$ ).

Individuals were more likely to digitally communicate with their health care provider if they owned a smart device (OR = 2.45;  $P < .01$ ), had EHR access (OR = 3.10;  $P < .01$ ), or had a college degree (OR = 2.83;  $P < .01$ ). They were more likely to share health information from a digital device with a health professional if they had EHR access (OR = 2.08;  $P < .01$ ) or were Black/African American (OR = 2.04;  $P = .01$ ). Respondents were more likely to share health information on social media if they had a smart device (OR = 3.67;  $P = .02$ ) or were female (OR = 2.49;  $P < .01$ ) but less likely if they were 65 years old or older (65–74 years: OR = 0.32;  $P < .01$ ;  $\geq 75$  years: OR = 0.22;  $P = .02$ ) or residing in a rural area (OR = 0.55;  $P = .03$ ).

Individuals were more likely to use a smart device to track a health goal if they had EHR access (OR = 1.84;  $P < .01$ ), were female (OR = 1.63;  $P < .01$ ), or had attended college (some college: OR = 2.70;  $P < .01$ ; college degree: OR = 2.93;  $P < .01$ ) but less likely if they were 35 years old or older (OR range = 0.09–0.57;  $P$  value range = .03 to  $< .01$ ). They were more likely to monitor health with non-smart digital devices if they had EHR access (OR = 1.83;  $P < .01$ ), a smart device (OR = 2.03;  $P < .01$ ), or a college degree (OR = 2.17;  $P = .02$ ).

## DISCUSSION

Results from nationally representative HINTS data suggest that in 2018, less than half of Americans had engaged in any digital health behavior in the past year except digitally seeking health information. This

highlights potential digital divides, with greater barriers to engagement for older individuals, males, those with lower levels of education, and (for social media) rural residents. Unsurprisingly, access to Internet and digital devices predicted digital health engagement. Race and ethnicity were not major predictors, although Black individuals were more likely to digitally share data with providers.

These prevalence rates and sociodemographic predictors are similar to reports from earlier HINTS data, suggesting limited progress between 2013 and 2018.<sup>8,9</sup> For instance, in 2013, one third of Internet users digitally communicated with their health care provider or tracked personal health information, and one fourth of Internet users shared health information on social media.<sup>8</sup> Age, gender, and education have remained consistent predictors across many types of digital health activity,<sup>8,9</sup> and a recent analysis also identified access barriers among patients with chronic health conditions.<sup>12</sup>

A digitally engaged populace is expected to enable superior public health surveillance<sup>5</sup> and patient surveillance that facilitates better care.<sup>3</sup> Yet low or unequal rates of digital health engagement behaviors—especially sharing health information on social media and sharing digitally generated health data with providers—pose a threat to these goals. It will be particularly vital to assess whether these gaps have narrowed or widened during the COVID-19 pandemic, and the data from this study could serve as a useful baseline.

HINTS data are cross-sectional, so causal claims require careful interpretation. Additionally, we did not evaluate health outcomes of engagement behaviors. Past work has shown that low socioeconomic status and medically underserved individuals may not

benefit equally from health information technology access,<sup>10</sup> making outcomes important to assess in future research.

## PUBLIC HEALTH IMPLICATIONS

To lessen rather than exacerbate health inequities will require widespread digital health engagement among patients and healthy people across all population groups.<sup>10</sup> HINTS data suggest that although a majority of Americans use digital devices to seek health information, fewer use these to communicate with health care providers or track their health. Participation in digital health interventions and digitally based research is likely limited among certain population groups, pointing to areas for digital access or digital literacy interventions. **AJPH**

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## CONTRIBUTORS

C. L. Ratcliff wrote the brief. M. Krakow performed the analysis. M. Krakow, A. Greenberg-Worisek, and B. W. Hesse provided substantive feedback on the brief. All authors designed the study.

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## CONFLICTS OF INTEREST

The authors have no conflicts of interest to report.

## HUMAN PARTICIPANT PROTECTION

No protocol approval was necessary because the work reported was a secondary data analysis.

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