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Brief Communications

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Embedding research study recruitment within the patient portal preCheck-in

Richard K. Leuchter, MD[1,*], Suzette Ma, BS[2], Douglas S. Bell, MD, PhD[1,3], Ron D. Hays, PhD[1,4], Fernando Javier Sanz Vidorreta, BS[3], Sandra L. Binder, MHS[3], Catherine A. Sarkisian, MD, MSHS[1,5]

[1]Division of General Internal Medicine & Health Services Research, Department of Medicine, David Geffen School of Medicine at UCLA, Los Angeles, CA 90024, United States, [2]UCLA Health Information Technology, UCLA Health, Los Angeles, CA 90095, United States, [3]Clinical and Translational Science Institute, UCLA, Los Angeles, CA 90095, United States, [4]Department of Health Policy and Management, Fielding School of Public Health, UCLA, Los Angeles, CA 90095, United States and [5]VA Greater Los Angeles Healthcare System Geriatric Research Education and Clinical Center, Los Angeles, CA 90073, United States

*Corresponding author: Richard K. Leuchter, MD, Division of General Internal Medicine & Health Services Research, David Geffen School of Medicine, University of California, Los Angeles (UCLA), 1100 Glendon Avenue #726, Los Angeles, CA 90024 (rleuchter@mednet.ucla.edu)

ABSTRACT

Objective: Patient portals are increasingly used to recruit patients in research studies, but communication response rates remain low without tactics such as financial incentives or manual outreach. We evaluated a new method of study enrollment by embedding a study information sheet and HIPAA authorization form (HAF) into the patient portal preCheck-in (where patients report basic information like allergies).

Materials and Methods: Eligible patients who enrolled received an after-visit patient-reported outcomes survey through the patient portal. No additional recruitment/messaging efforts were made.

Results: A total of 386 of 843 patients completed preCheck-in, 308 of whom signed the HAF and enrolled in the study (37% enrollment rate). Of 93 patients who were eligible to receive the after-visit survey, 45 completed it (48% completion rate).

Conclusion: Enrollment and survey completion rates were higher than what is typically seen with recruitment by patient portal messaging, suggesting that preCheck-in recruitment can enhance research study recruitment and warrants further investigation.

Key words: HIPAA authorization form; patient portal; preCheck-in; survey; research study recruitment

Background and significance

Patient portals and electronic research consents are increasingly used to recruit participants in research studies.[1–3] However, these efforts are limited by patient portal message open rates of 50% or less,[4–7] and completion rates under 15% for questionnaires used in broad-based patient messaging campaigns.[8–18] Another barrier to recruitment is completion of the Health Insurance Portability and Accountability Act (HIPAA) authorization form (HAF), which has been criticized for unnecessarily overburdening patients in minimal-risk research such as survey-based studies.[19–21] For example, enrollment rates for studies that newly added a HAF decreased by 65%–75%,[22–24] and studies that received approval to drop the HAF observed 36%–167% increases in enrollment.[21,25]

Investigators have sought to enhance recruitment and questionnaire completion rates by utilizing financial incentives and reminder messages, engaging clinicians and staff to encourage patient participation, and hiring research associates to administer in-person consent and questionnaires.[26–30] While these efforts have successfully increased enrollment rates, less resource-intensive methods to enhance study participation are needed.[31–33] Like many other institutions, UCLA Health has historically obtained electronic signatures on the HAF using approved third-party data capturing software such as REDCap.[2,3,34,35] For patient portal-based recruitment and survey efforts, the additional complexity of navigating to an external website that patients would not normally visit poses substantial recruitment challenges.[36]

We added a new functionality to our institution's patient portal that embedded a study information sheet and HAF into the visit preCheck-in process, allowing patients to electronically sign the HAF and enroll in a survey-based study during a workflow they were already completing. We evaluated this minimally disruptive recruitment strategy by assessing study enrollment and after-visit survey completion rates during a 2-week period.

Materials and methods

Study setting and design

The University of California, Los Angeles (UCLA) Health System is a large academic medical system including more than 50 primary care clinics. We designed a survey-based study

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specifically for the purpose of evaluating the research enrollment rate achieved by a new preCheck-in recruitment process, which was tested from November 7, 2021 to November 23, 2021 at a single primary care clinic staffed by internal medicine residents and attendings.

Eligible patients were 18 years or older, had a UCLA primary care provider (PCP), an active patient portal account, and a scheduled clinic visit during the trial period. A study information sheet and the University of California HAF37 (with interactive checkboxes and an electronic signature field) were made available to eligible patients as part of the preCheck-in process (Figure 1).

These documents appeared under a newly created "Sign Documents" tab and were voluntary to view (Figure 2). This tab also displays other documents with the option to electronically sign such as advance directives (electronically signing these forms was not an option prior to this study). In addition to the required information regarding voluntary participation, risks, benefits, and confidentiality, the study information sheet stated (full text in Supplementary Material):

> *"The goal of the study is to gain a better understanding of how patients' own perceptions of their health (called "patient-reported outcomes", PROs) relate to other measures of health in the medical record. You are receiving this form because you have a UCLA primary care provider, use UCLA's electronic patient portal (MyChart), and have an upcoming doctor visit. If you agree to participate in this study, you may receive a questionnaire(s) measuring PROs after your visit."*

Patients who signed the HAF were enrolled in the study and received no further previsit communication.

After patients enrolled in the study and completed their visit, we employed a second set of eligibility criteria to determine who would receive the after-visit survey. Eligibility was determined after patient encounters were signed so that inclusion logic could include the primary diagnostic code and encounter type (cases such as no-shows or conversions to telephone visits cause encounter types to change day-of). Enrolled patients were eligible if the primary encounter ICD-10 code matched a list of conditions that were preselected to be a mix of symptomatic and asymptomatic illnesses (eTable 1 in Supplementary Material), and if their encounter type was office visit or telemedicine (video visit). We excluded encounters that were no-shows, immunization, clinical support, orders only, patient messages, surgical consult (ie, pre-op), or telephone only (usually for lab or imaging follow-up), to be consistent with our messaging to patients that surveys were to track health after physician visits.

The primary outcome was study enrollment rate (no. of patients signed HAF/no. of patients received HAF) and the

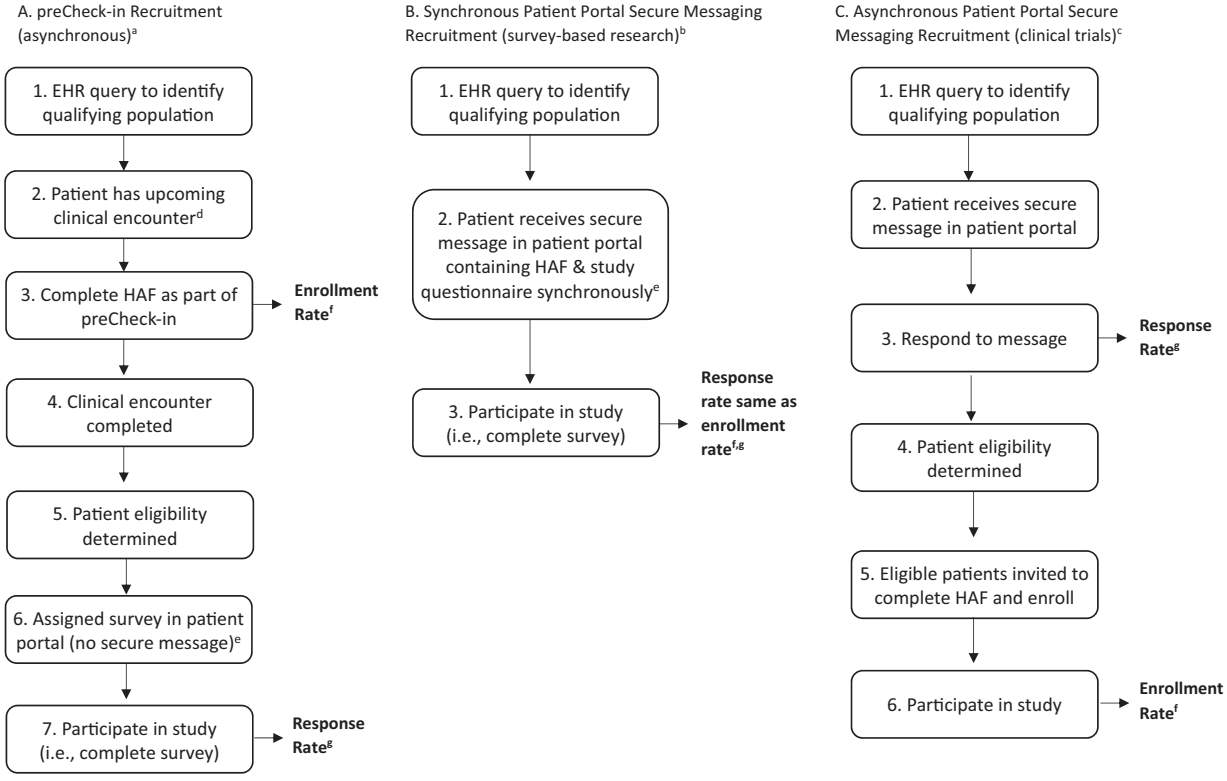

Figure 1. Comparison of preCheck-in recruitment to synchronous and asynchronous patient portal secure messaging recruitment. [a]This report describes an asynchronous application of preCheck-in recruitment for survey-based research, though this framework could be modified to mimic synchronous enrollment (ie, administering the survey simultaneously with the HAF during pre-Check-in) or for use in clinical trial or voluntary research registry recruitment. [b]A commonly utilized workflow for survey-based research, though some studies do collect surveys asynchronously from the time of HAF completion. [c]A commonly utilized workflow for clinical trial recruitment through the patient portal. preCheck-in recruitment could theoretically be adapted to replace steps 1–3. [d]Clinical encounter does not need to be related to the research study (ie, occurring regardless of any research activity). [e]These steps trigger a generic notification to be sent to a patient's personal email asking that they log in to the patient portal. Notification emails do not contain links to surveys; these can only be accessed by logging into the patient portal. [f]Calculated as the number of patients who signed the HAF divided by the number of patients who received the HAF. [g]Calculated as the number of patients who responded to the communication (eg, secure message, survey) divided by the number of patients who received the communication. Abbreviations: HAF: HIPAA authorization form.

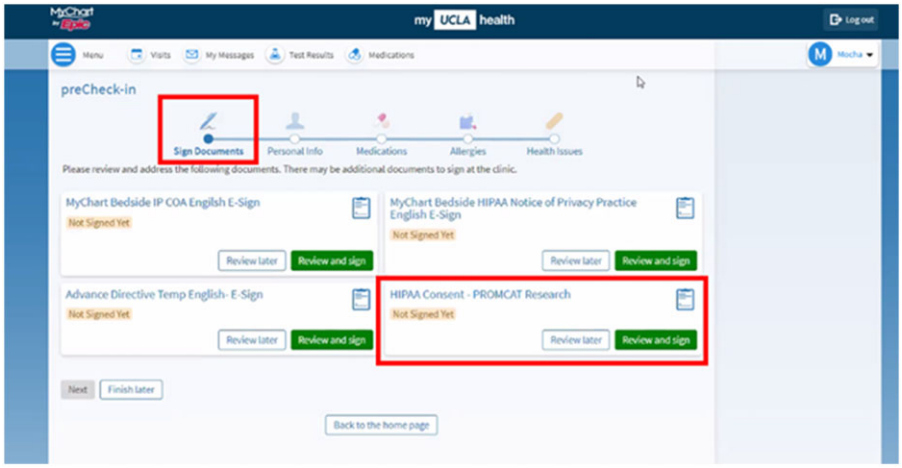

Figure 2. Patient portal screenshot of new preCheck-in process for HIPAA authorization form (HAF) completion and study enrollment. Red boxes outline the newly created "Sign Documents" tab and HAF. Prior to the modification the "Sign Documents" tab was absent, and the remainder of the preCheck-in process was unchanged. The myUCLAhealth App is poweredby MyChart® licensed from Epic Systems Corporation, © 1999–2023.

secondary outcome was the survey completion rate (no. of patients completed survey/no. of patients received survey).

UCLA Health uses Epic System Corporation (Verona, WI) for its electronic health record (EHR) and patient portal. The research study protocol was approved by the UCLA Health Institutional Review Board (IRB No. 21-000739), and the electronic HAF was approved by the UCLA Office of Compliance Services. The EHR modification was approved by the UCLA Health IT governance.

Patient-reported outcomes measure

The NIH Patient-reported Outcomes Measurement and Information System (PROMIS)-29 + 2,[38,39] a global health-related quality of life instrument, was the after-visit survey that eligible patients received immediately after their encounter was signed (triggered by primary ICD-10 code and encounter type). The PROMIS-29 + 2 appeared within the "Questionnaires" section of the patient portal, which automatically triggered an email notification directly to patients' personal emails (Figure 1). This is distinct from a patient portal secure message, which appears in the Message Center of the portal; no portal messages were sent at any point during the study. The survey was preceded by a brief version of the study information sheet reminding patients that the survey was voluntary, purely for research, and would not be viewed by their treatment team (full text in Supplementary Material). Surveys disappeared after 30 days of inactivity.

Results

Of 932 adult patients with UCLA PCPs and scheduled appointments between November 7, 2021 and November 23, 2021, 843 (90%) had active patient portal accounts and were eligible for MyChart preCheck-in, and thus received a HAF (cohort flow diagram shown in Figure 3). Of these patients, 386 (46%) completed preCheck-in and 308 (37%) completed the HAF and enrolled in the study. After patient encounters were signed, we excluded patients with ineligible encounter types ($n = 59$) and ICD-10 codes ($n = 156$). The remaining 93 patients received an after-visit survey, of whom 45 (48%) completed the survey (average days after the encounter = 2.0 [SD 2.6]).

Sociodemographic distributions of enrolled patients were generally representative of the UCLA Health patient population, with the exceptions that the enrolled cohort was: (1) slightly older, (2) contained fewer patients with no documented race/ethnicity, and (3) contained more Black/African American and "Other" race patients (and fewer non-Hispanic White patients) (Table 1).

Discussion

In this study, we found that embedding an electronic study information sheet and HAF in the patient portal preCheck-in process led to a 37% study enrollment rate and 48% survey completion rate among eligible patients. This low-cost, minimally disruptive recruitment method yielded these high participation rates without any patient portal secure messages, financial incentives, or in-person/telephone communications.

The primary outcome of enrollment rate seen here with preCheck-in recruitment was substantially higher than what has been observed in studies using the prevailing method of recruiting patients through secure portal messages. As employed here, preCheck-in recruitment differed from traditional portal messaging recruitment by consenting patients to participate in the study protocol (ie, enrolling patients) during the first point of contact, and asynchronously collecting surveys at a later date from enrolled patients who met inclusion criteria (Figure 1A). This workflow naturally produces definitions for enrollment and response rate that differ from the traditional processes of either enrolling and collecting surveys from patients synchronously in a single patient portal message (Figure 1B), or messaging patients and only enrolling a subset who respond and meet inclusion criteria (Figure 1C).[11] Thus, the most appropriate contextualization of preCheck-in recruitment is to compare our enrollment rate to the first-message response rates of other recruitment workflows (ie, Figure 1A step 3 vs Figure 1B step 3 vs Figure 1C step 3). Similar studies that have widely recruited generally healthy patient portal users with minimal exclusion criteria have reported first-message response rates of 0.9%–7.5%,[8–10] in contrast to preCheck-in recruitment which yielded a 37% response rate to the first effort of contact.

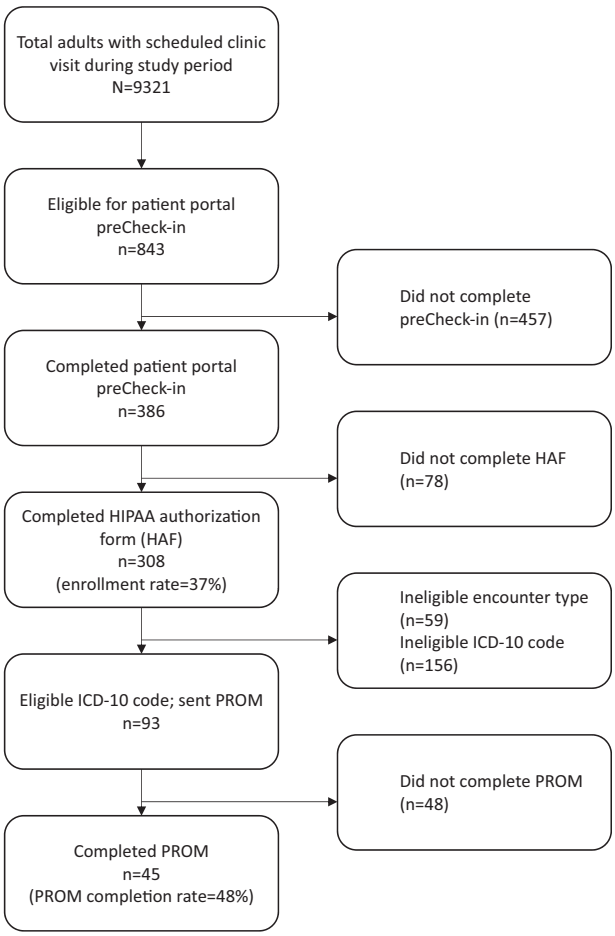

Figure 3. Cohort flow diagram. The PROM used as the after-visit survey was the PROMIS-29 + 2. See the *Materials and methods* regarding eligible encounter types and ICD-10 codes. Abbreviation: PROM, patient-reported outcome measure.

While we cannot generalize recruitment into this survey-based study to other types of recruitment efforts, preCheck-in recruitment may hold promise for enrollment into voluntary research registries or clinical trials. For context, patient portal-based efforts to recruit patients into research registries have reported enrollment rates of 4.8%–9.7%,[9,16,41] and similar recruitment efforts for clinical trials have reported first-message response rates of 1.7%–14.7%.[11–14,18] Given that lack of patient engagement is a major barrier to research recruitment,[2,42,43] preCheck-in recruitment may help overcome this hurdle and improve rates of consent to be contacted about both future research and clinical trials.

Another potential advantage to preCheck-in recruitment is that it may help overcome problems with underrepresentation of less well-resourced and minoritized populations in study enrollment.[10,16,44–47] Specifically, preCheck-in recruitment enrolled a cohort ($n = 308$) composed of more Black or African American patients and with an equal or greater social vulnerability index compared to the UCLA Health patient population. Of note, the sample that completed the questionnaire ($n = 45$) was less demographically diverse than both the enrolled sample and the health system population. While this study is unable to determine the reason(s) for this observed difference, possibilities include an artifact of small sample size (a single patient represented 2% of respondents), or true differential rates of attrition owing to historically marginalized groups being less likely to use patient portals.[48,49] Future research should investigate different methods to retain the enrolled cohort's diversity.

To contextualize the secondary outcome of survey completion rate, the most analogous comparisons are to efforts that have sent questionnaires to patient portal users who had already completed a HAF for involvement in future research. Such studies have reported that 18%–24% of patients who received a survey completed it,[50,51] while preCheck-in recruitment produced a 48% survey completion rate. This rate is particularly notable given that response rates for clinics that are newly administering patient-reported outcomes measures (PROMs; as was the case here) are regularly under 10%,[27,52] and more successful efforts collect a majority of PROMs during clinical encounters using a combination of tablets, patient financial incentives, multiple patient portal messages, research associates, leadership mandates, designated administrative support, and clinician engagement (the current study used none of these).[27–30]

This investigation did not collect data on patient perception or usability. We hypothesize that the unexpectedly high enrollment rate may be explained by decreased barriers or "frictions" to completing the HAF as a result of embedding it within a pre-existing workflow.[53,54] One plausible hypothesis for the high survey completion rate may be that the study information sheet and HAF signed during preCheck-in served as a precommitment to completing the after-visit survey. In contrast with one-off communication attempts, precommitments can increase the likelihood that someone engages in a target behavior through individuals' innate desire to be internally consistent with prior actions.[55,56]

Limitations

This study has several limitations. First, we restricted enrollment to patients with an active patient portal and UCLA PCP. Second, preCheck-in recruitment requires patients to have an upcoming appointment. While these 2 factors may introduce selection bias,[48,49] we demonstrated that both the patient portal activation rate in our overall sample (90%) and our enrolled population's sociodemographic diversity were similar to those of the UCLA Health patient population. Third, this was a 2-week single-center preliminary evaluation. Fourth, this study did not contain a control group to directly compare enrollment and response rates between preCheck-in recruitment and traditional portal messaging recruitment, and relied on retrospective comparisons to previously published studies. Finally, even though the voluntary study information sheet and HAF had to be selected and completely scrolled through before they could be signed (they were not automatically displayed during preCheck-in), we cannot exclude the possibility that bundling enrollment with preCheck-in decreased understanding of the informed consent by inadvertently signaling to patients that these forms should be completed as part of their upcoming health care.[57] Future research should investigate participant understanding of preCheck-in informed consent and whether this is associated with study response rates.

Conclusions

Embedding a study information sheet and HAF into the patient portal preCheck-in process yielded a 37% enrollment rate and 48% after-visit survey completion rate, all without any financial incentives, patient portal messages,

Table 1. Patient characteristics and rates of completing HIPAA authorization form (HAF) and the after-visit PROMIS-29 + 2 survey.

	UCLA health ($n = 1\,014\,135$)[a]	Total study patients ($n = 932$)	preCheck-in eligible ($n = 843$)	Completed preCheck-in ($n = 386$)	Completed HAF ($n = 308$)	Survey eligible ($n = 93$)	Completed survey ($n = 45$)
Female, no. (%)	558 207 (55%)	516 (55%)	466 (55%)	224 (58%)	140 (56%)	51 (54%)	22 (49%)
Social vulnerability index (SD)[b]	0.38 (0.26)	0.42 (0.28)	0.42 (0.27)	0.42 (0.26)	0.42 (0.27)	0.46 (0.28)	0.38 (0.25)
Age bands							
<18 years	141 581 (n/a %)	0	0	0	0	0	0
18-30 years	219 559 (25%)	76 (8%)	137 (16%)	36 (9%)	34 (11%)	5 (5%)	1 (2%)
31–45 years	219 393 (25%)	146 (16%)	190 (23%)	75 (19%)	62 (20%)	7 (8%)	2 (4%)
46–60 years	214 846 (25%)	212 (23%)	274 (33%)	88 (23%)	78 (25%)	27 (29%)	11 (24%)
61–75 years	110 824 (13%)	297 (32%)	168 (20%)	121 (31%)	89 (29%)	38 (41%)	19 (42%)
>75 years	107 932 (12%)	201 (22%)	74 (9%)	66 (17%)	45 (15%)	16 (17%)	12 (27%)
Race							
American Indian or Alaska Native	3824 (0.4%)	2 (0.2%)	1 (0.1%)	0	0	0	0
Asian, Native Hawaiian/Pacific Islander	88 242 (9%)	129 (14%)	113 (13%)	51 (13%)	30 (12%)	12 (13%)	6 (13%)
Black or African American	42 535 (4%)	105 (11%)	96 (11%)	46 (12%)	28 (11%)	12 (13%)	1 (2%)
Middle Eastern or North African	9445 (1%)	17 (2%)	17 (2%)	8 (2%)	6 (2%)	5 (5%)	1 (2%)
White or Caucasian	404 343 (40%)	314 (34%)	275 (33%)	117 (30%)	70 (28%)	30 (32%)	17 (38%)
Multiple races	29 049 (3%)	29 (3%)	27 (3%)	15 (4%)	12 (4%)	2 (2%)	1 (2%)
Other[c]	166 298 (16%)	203 (22%)	189 (22%)	93 (24%)	76 (25%)	24 (26%)	16 (36%)
Unknown/declined	270 398 (27%)	133 (14%)	125 (15%)	56 (15%)	51 (17%)	8 (9%)	3 (7%)
Ethnicity							
Hispanic, Latino/a[d]	140 159 (14%)	134 (14%)	123 (15%)	53 (14%)	39 (16%)	15 (16%)	5 (11%)
Not Hispanic or Latino/a	612 321 (60%)	704 (76%)	630 (75%)	297 (77%)	190 (76%)	73 (78%)	37 (82%)
Unknown/declined	261 655 (26%)	94 (10%)	90 (11%)	36 (9%)	20 (8%)	5 (5%)	3 (7%)

[a] Patients seen at UCLA for any visit type or provider specialty at least once within the year prior to this study. Approximately 84% of this population have an active patient portal account.
[b] Social vulnerability index (SVI) is a composite of 16 social factors (poverty, lack of vehicle access, crowded housing, etc.) for each US Census tract. The patient's neighborhood SVI is used by the CDC as a surrogate for their own social determinants of health based on geocoding the patient's address.[40] SVI exhibited 42% missingness for the UCLA Health population as a result of addresses being geocoded improperly or a problem with addresses themselves (format, typo, data entry error); there was no missingness for other populations.
[c] Patients self-reported "other" as their race. This category is not an aggregation.
[d] Includes Cuban, Puerto Rican, Mexican, Mexican American, Chicano/a, and any Spanish origin.
Percentages calculated from within-column totals, and may not sum to 100% due to rounding.

administrative staff/research assistant support, or in-person/telephone communication. Both the enrollment and the survey response rates using preCheck-in recruitment were higher than what is typically seen for studies recruiting by patient portal messages, and the enrolled cohort was more sociodemographically diverse than our institution's general patient population. Hence, preCheck-in recruitment may enhance research study recruitment, contribute to more equitable sociodemographic representation in biomedical research, and warrants further investigation.

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Author contributions

R.K.L., C.A.S., R.D.H., D.S.B., and S.M. provided substantial contributions to the conception or design of this work. R.K.L., C.A.S., F.J.S.V., and S.L.B. provided contributions to the analysis of data. All authors provided contributions to the interpretation of data for this work. R.K.L. drafted the manuscript and all authors made contributions to revise it for content. All authors gave final approval of the current version of the manuscript.

Supplementary material

Supplementary material is available at *Journal of the American Medical Informatics Association* online.

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Conflicts of interest

None declared.

Data availability

The data underlying this article will be shared in a deidentified format on reasonable request to the corresponding author.

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