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Differences in the Use of Telephone and Video Telemedicine Visits During the COVID-19 Pandemic

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Abstract

OBJECTIVES: The coronavirus disease 2019 (COVID-19) pandemic forced health systems to offer video and telephone visits as in-person visit alternatives. Although video visits offer some benefits compared with telephone visits, they require complex setup, which may disadvantage some patients due to the "digital divide." Our objective was to determine patient and neighborhood characteristics associated with visit modality.

STUDY DESIGN: This was a cross-sectional study across 1652 primary care and specialty care practices of adult patients at an integrated health system from April 23 to June 1, 2020.

METHODS: We used electronic health record and administrative data. Our primary outcome was visit modality (in-person, video, or telephone), which was captured using billing codes. We assessed predictors of using video vs telephone using multivariable logistic regression. We used hierarchical logistic regression to determine the contribution of patient-, physician-, and practice-level components of variance in the choice of video or telephone visits.

RESULTS: We analyzed 231,596 visits by 162,102 patients. Sixty-five percent of the visits were virtual (31.7% telephone, 33.5% video). Patients who were older than 65 years (adjusted odds ratio [AOR], 0.41; 95% CI, 0.40–0.43), Black (AOR, 0.60; 95% CI. 0.57–0.63). Hispanic (AOR, 0.76; 95% CI. 0.73–0.80). Spanish-speaking [AOR, 0.57; 95% CI, 0.52–0.61). and from areas with low broadband access (AOR, 0.93; 95% CI, 0.88–0.98) were less likely to use video visits. Practices (38%) and clinician· (26%) draw more of the variation In video visit use than patients (9%).

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CONCLUSIONS: Telemedicine access differences may compound disparities in chronic disease and COVID-19 outcomes. Institutions should monitor video visit use across demographics and equip patients, clinicians, end practices to promote telemedicine equity.

During the Coronavirus disease 2019 (COVID-19) pandemic social distancing requirements compelled health systems, practices, clinicians, and patients ta use video and telephone visits as alternatives to in-person visits.[1] This shift was further supported by policy changes—for example, CMS offered temporary payment parity across in-person, telephone, and video visits.[2] There are concerns that the shift to telemedicine may exacerbate disparities in health care access. Early evidence on telemedicine use overall has demonstrated less use among female and non-English-speaking patiente compared with other groups, but no differences among racial/ethnic groups.[3,4]

Given key trade-offs between telemedicine modalities, there may be additional, potentially concerning differences in access to video and telephone visits. Compared with telephone visits, video visits allow some aspects of a physical examination and a more personal connection between clinicians and patients. However, video requires more complex setup and broadband internet access, which may present barriers for older adults, racial/ethnic minorities, and those with limited English proficiency (LEP) who are on the wrong side of the “digital divide.” The digital divide refers to the gap between those who have access to and can meaningfully engage with technology and those who cannot. For example, at least 21 million people lack broadband internet access in the United States, many from underserved communities that also face worse health outcomes.[5] Further, a recent study suggests that 13 million older adults are not ready for video visits due to difficulties using technology.[6] Video visits may also present technical and logistical challenges for some practices and clinicians to set up and incorporate into workflows. However, we know little about differences in and drivers of the use of video vs telephone visits. Therefore, we analyzed detailed electronic health record (EHR) data from a large, integrated health system to fill these gaps.

Objectives

Understanding drivers of differences in use of telephone and video visits would help to inform rapidly changing telemedicine payment policies and practices. In this study, we examined trends in use of outpatient care, including telephone and video visits across 1652 outpatient primary care and specialty practices in a large, integrated health system.

METHODS

Data Source

We used data from Mass General Brigham (MGB) in Boston, Massachusetts, a large, integrated health system with 16 member organizations across New England. We extracted EHR data from the enterprise data warehouse, which includes patient demographic information collected during registration and detailed clinical encounter and billing data.

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Patient and Visit Cohorts

We identified a cohort of adult patiente 18 years or older who were attributed to an MGB primary care physician (PCP) (defined by the EHR "PCP" field) as of March 1, 2020. We assessed all outpatient encounters occurring between March 1 and June 1, 2020. We excluded encounters that required in-person care (eg, dialysis, procedures, chemotherapy or radiation administration).

Primary Outcome

Our primary outcome was visit modality (in-person, video, or telephone visit), captured using billing codes. Telemedicine visits were identified by code GT for video visits and GPH for telephone visit. For visits with billing codes that did not clearly indicate modality, we included the visits in total visit counts but not in analyses about types of modalities.

Measures

We chose patient characteristics that have been previously demonstrated to influence telemedicine use: age (18–44, 45–64, ≥ 65 years), gender (male, female), race/ethnicity (White, Black, Hispanic, Asian, other), preferred language (English, Spanish, other), insurance type (commercial, Medicaid, Medicare, veteran/military, missing/no insurance), and patient portal access (activated, not activated)[7] We merged patient zip codes with the American Community Survey data to capture zip code-level broadband internet access (quartiles based on percentage of the population with broadband internet access), educational attainment (quartiles based on percentage of the population with a high school diploma), and income (quartiles based on median household income).[8]

Statistical Analysis

We performed descriptive statistics to show trends in use of telephone, video, and in-peison visits between March 1 and June 1. We then focused on the period April 23 to June 1 (the study period), which began 1 month after the shift to telemedicine (Massachusetts issued a stay-at-home advisory on March 23). We chose this period to bypass transition challenges, including rapid workflow and technical requirements, that could affect initial uptake of video visits. During this period, we examined trends in the percentage of ail telemedicine visits done via video by patient sociodemographic categories. We assessed predictors of video vs telephone use with bivariate analyses using χ^2 tests and t tests as appropriate for the previously described patient- and zip code-level variables. We then built a multivariable logistic regression model in which the outcome was video or telephone visit Finally, we built a hierarchical logistic regression model to determine the relative contribution of patient-, physician- and practice-level components to variance in the choice of video or telephone visite. Hierarchical models account for the fact that patients are nested within clinicians and clinicians are nested within clinics. In a sensitivity analysis, we repeated our main analyses among primary care practices alone. The MGS Institutional Review Board approved this study and waived the use of informed consent. Analyses were performed using R statistical software (version 3.53).

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RESULTS

We examined 746,356 patients with a PCP at MGB, From March l to June 1, telephone visits were more common in the early weeks of telemedicine expansion and were then overtaken by video visits (Figure 1). During the study period, we found lower video visit use among Black and Hispanic patients (compared with White and Asian patients), among Spanish-speaking patients (compared with English-speaking patients), and among patients 65 years and older (compared with those aged 18–64 years) (Figure 2). These trends developed early and grew steadily over time.

During the study period, 162,102 patients (21.7% of all attributed patients) attended 231,596 visits to primary care and specialty practices. Of all visits during this period, 65.2% were telemedicine visits (73,353 [31.7%] telephone and 77,530 [33.5%] video) (Table). Among patients with a telemedicine visit, 53,999 (33.3%) patients had at least 1 video visit, 50,576 (31.2%) patients had at least l telephone visit, and 8187 (5.0%) patients had at least l of each.

In bivariate analyses, patients using video visits were more likely to be White, portal users, enrolled in commercial insurance, and living in areas with higher income and broadband access. In adjusted analyses, patients who were older than 65 years (adjusted odds ratio [AOR], 0.41; 95% CI, 0.40–0.43), Black (AOR, 0.60; 95% CI, 0.57–0.63), Hispanic (AOR, 0.76; 95% CI, 0.73–0.80), Spanish-speaking (AOR, 0.57; 95% CI, 0.52–0.61), and not active patient portal users (AOR, 0.39; 95% CI, 0.38–0.40) were less likely to use video visits (Figure 3). Additionally, patients living in areas with the lowest broadband internet access (AOR, 0.93; 95% CI, 0.88–0.98), lowest median income (AOR, 0.4–9; 95% CI, 0.46–0.52), and lowest educational attainment (AOR, 0.84; 95% CI, 0.80–0,88) were less likely to use video visits. The hierarchical model revealed that practice (38%) and clinician (26%) factors accounted for more of the variance in video visit use than patient-level factors (9%), whereas 27% of the variance was unexplained. īn our sensitivity analysis examining primary care visits, we found similar results (eAppendix [available at ajmc.com]).

DISCUSSION

At a large, integrated health system scaling telemedicine visits in response to the COVID-19 pandemic, we found lower use of video vs telephone visits among older, Black, Hispanic, and Spanish-speaking patients that developed almost immediately and persisted. We also found that clinicians and practices largely drove this variation in the use of video vs telephone visits, suggesting an important target for intervention.

Various factors likely influence the choice between a telephone and video visit, including patient access to technology, an organization’s telemedicine infrastructure, and patient and clinician preferences. To the extent that video is better than telephone, it is important to expand access to video visits. At the same time, given that telephone visits may be more accessible for some and are often reasonable substitutes, it will be important to offer patients flexibility and ensure payment parity for both visit types.

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We found that Spanish-speaking patients were less likely to use video visits. This extends prior findings that showed decreased telemedicine use among patients with LEP.[3,9] For example, Eberly et al found that non-English-speaking patients were 50% less likely to use telemedicine, although they did not find differences in video visit use.[3] Given these findings, practices might develop video visit workflows that integrate interpreter services and assign dedicated language-concordant guides to train patients in the use of video visits.

We found that patients in areas with lower levels of broadband internet access were less likely to engage in video visits, corroborating prior work showing that internet access predicts telemedicine use and patient portal adoption.[10,11] Importantly, internet access is necessary yet not sufficient for use of video visits. Patients must also have a video-enabled device, as well as digital literacy, or the ability to navigate telehealth platforms, which underserved and older patients often lack.[12,13]

Clinician- and practice-level factors contributed to the gaps in video visit use. Clinicians and practices that serve primarily underserved patients may be less equipped to provide video visits given additional implementation requirements. Thus, a focus on supporting video visit infrastructure and training clinicians on using video visits may help ad dress these challenges. Due in part to implicit biases, clinicians may also offer telephone over video visits for some patients based on assumptions about their ability or desire to engage in video visits.[14–17] A structured approach to screening patients for video visit readiness can help cheek these assumptions. Further, practices should develop efficient workflows to make it easy for both patients and clinicians to use video visits.

Addressing differences in use the of visit modalities will require a multilevel approach. To ensure that greater telephone visit use among underserved populations does not contribute to decreased access to medical care, payment parity for telephone and video visits is critical. In March 2020, CMS extended parity for both telephone and video relative to in-person visits; these changes should persist beyond the pandemic, and commercial payers should follow suit In addition, policy initiatives to narrow digital divides, such as investments in telemedicine and broadband infrastructure, are essential. Policy makers should establish universal broadband laws and funding to ensure that patients have essential digital access and to mitigate pressures faced by health systems to connect their patients. The recent COVID-19 Telehealth Program, which provided $200 million for health care organizations to expand their telemedicine infrastructure, is a start.[18] At the organizational level, effective workflows are important to ensure that patients and providers feel satisfied with care in the digital setting. Additionally, collaboration with community organizations already focusing on digital literacy will address digital divides in local communities. Finally, EHR and telemedicine vendors should develop inclusive platforms that account for the varied literacy, numeracy, and usability needs of underserved and older populations.

CONCLUSIONS

We found differences in telemedicine access that may compound existing racial, ethnic, and language-based disparities in chronic disease outcomes and COVID-19 case rates and mortality. With the pandemic still ongoing, institutions should carefully monitor video visit

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use across patient demographics and equip patients, clinicians, and practices to promote equitable access to all telemedicine modalities.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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TAKEAWAY POINTS

The coronavirus disease 2019 pandemic promted a transition to telemedicine, including video and telephone visits. Video visits offer some benefits, but they may disadvantage some patients due te the “digital divide.” Using data from a large, integrated health system, we determined patient, clinician, clinic, and neighborhood characteristics associated with visit modality.

- Patients who were older than 65 years. Black, Hispanic, Spanish-speaking, nonportal users, or from areas with low broadband access were less likely to use video visits.
- Practica [38%] and clinician [26%] factors largely drove the variation in video visit use.
- Institutions should promots equitable access to all telemedicine modalities.

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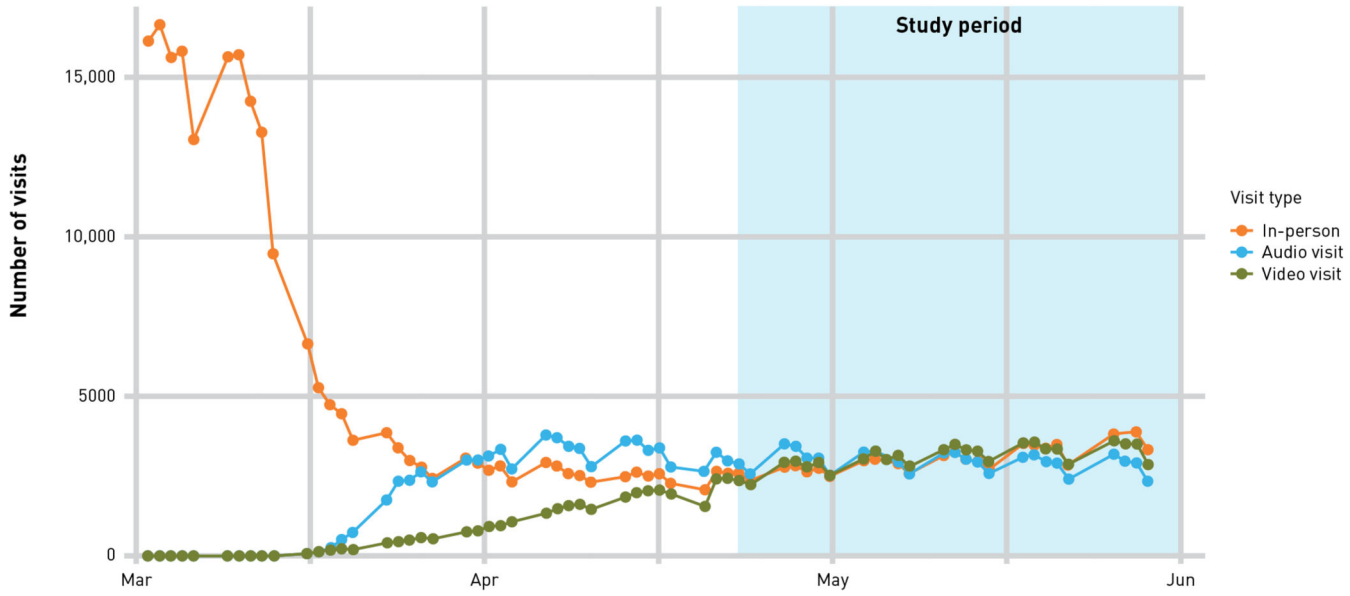

FIGURE 1. Trends in Visit Type (March 1-June 1, 2020)[a]

[a]Excludes ambiguous encounters.

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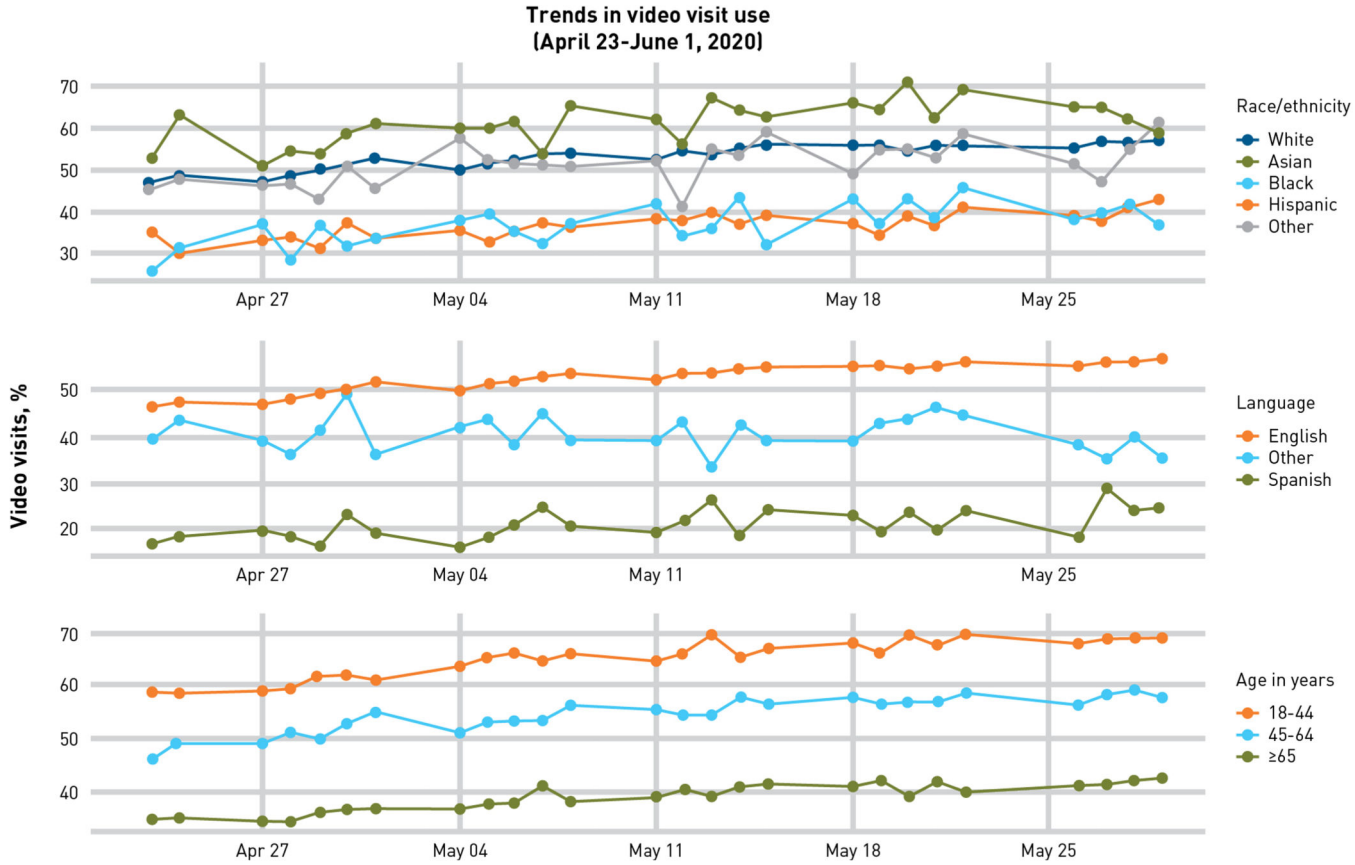

FIGURE 2. Trend in Video Visit Use by Patient Demographics[a]

[a]Y-axis represents proportion of all telemedicine visits that were video visits.

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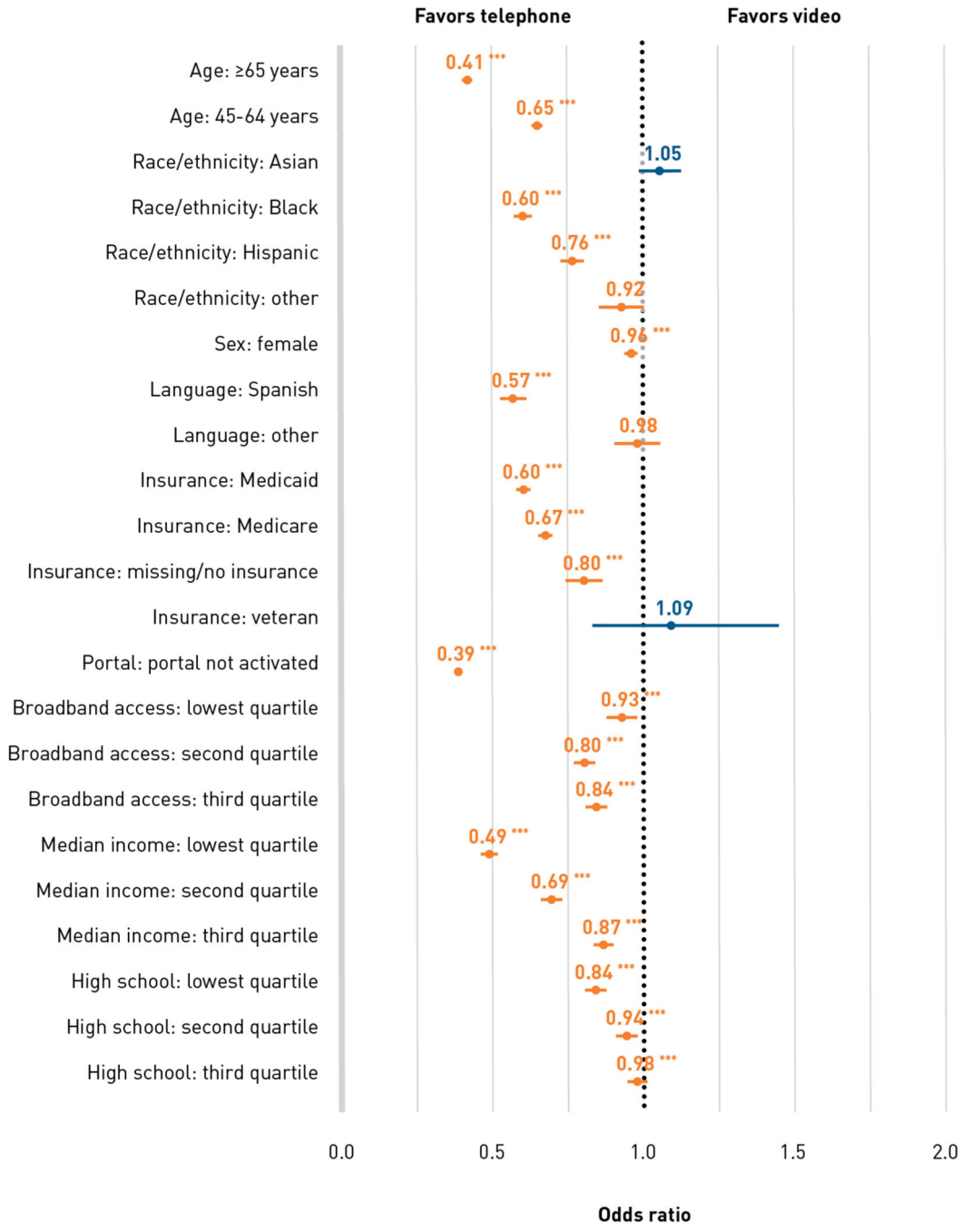

FIGURE 3. Association of Telemedicine Vist Type With Patient- and Zip Code-Level Factors[a]

[a]Excludes ambiguous encounters.

*** $P < .001$.

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TABLE.

Patient Characteristics and Zip Code-Level Factors[a]

Characteristic/factor	Patients with any visit [in-person or Telemedicine] during the study period [N = 162,102]	Patients with a telemedicine visit[b]	
		Telephone visit [n = 73,353]	Video visit [n = 77,530]
Age in years			
18–44 [n = 275,308]	45,964 [16.7%]	14,001 [5.1%]	26,042 [9.5%]
45–64 [n = 268,263]	56,842 [21.2%]	24,185 [9.0%]	29,066 [10.8%]
≥65 [n = 202,785]	59,269 [29.2%]	35,167 [17.3%]	22,422 [11.1%]
Gender			
Female [n = 433,006]	100,960 [23.3%]	45,889 [10.6%]	48,711 [11.2%]
Male In =313,3501	61,142 [19.5%]	27,464 [8.8%]	28,819 [9.2%]
Race/ethnicity			
White [n = 602,495]	131,911 [21.9%]	56,779 [9.4%]	65,423 [10.9%]
Asian [n = 37,469]	5136 [13.7%]	1734 [4.6%]	2760 [7.3%]
Black [n = 34,184]	8123 [23.8%]	4891 [14.3]	2886 [8.4]
Hispanic [n = 57,981]	13,911 [24.0%]	8590 [14.8%]	5025 [8.7%]
Other [n = 14,227]	3021 [21.2%]	1359 [9.6%]	1436 [10.1%]
Preferred language			
English [n = 708,217]	152,525 [21.5%]	66,569 [9.4%]	74,986 [10.6%]
Spanish [n = 22,902]	6213 [27.1%]	4800 [21.0%]	1268 [5.5%]
Other [n = 15,237]	3364 [22.1%]	1984 [13.0%]	1276 [8.4%]
Portal status			
Activated [n = 505,231]	121,665 [24.1%]	47,891 [9.5%]	67,452 [13.4%]
Not activated [n = 241,125]	40,437 [16.8%]	25,462 [10.6%]	10,078 [4.2%]
Insurance			
Commercial [n = 502,522]	94,581 [18.8%]	32,602 [6.5%]	50,521 [10.1%]
Medicaid [n = 66,910]	16,219 [24.2%]	9493 [14.2%]	6807 [10.2%]
Medicare [n = 148,442]	47,234 [31.8%]	29,562 [20.0%]	18,279 [12.3%]
Missing/no insurance [n = 26,939]	3810 [14.1%]	1616 [6.0%]	1765 [6.6%]
Veteran/military [n = 1543]	258 [16.7%]	80 [5.2%]	158 [10.2%]
Median household income[c]			

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Characteristic/factor	Patients with any visit [in-person or Telemedicine] during the study period [N = 162,102]	Patients with a telemedicine visit[b]	
		Telephone visit [n = 73,353]	Video visit [n = 77,530]
Lowest quartile [n = 184,009]	43,118 [23.4%]	24,721 [13.4%]	16,263 [8.8%]
Second quartile [n = 194,124]	42,279 [21.8%]	20,316 [10.5%]	19,947 [10.3%]
Third quartile [n = 177,700]	37,347 [21.0%]	14,779 [8.3%]	19,858 [11.1%]
Highest quartile [n = 190,523]	39,358 [20.7%]	13,537 [7.1%]	21,462 [11.3%]
Broadband internet access, %[d]			
Lowest quartile [n = 194,719]	45,403 [23.3%]	24,791 [12.7%]	18,084 [9.3%]
Second quartile [n = 179,496]	39,283 [21.9%]	19,262 [10.7%]	18,439 [10.3%]
Third quartile [n = 184,828]	38,343 [20.7%]	15,982 [8.6%]	19,433 [10.5%]
Highest quartile [n = 187,313]	39,073 [20.9%]	13,318 [7.1%]	21,574 [11.5%]
High school diploma, %[e]			
Lowest quartile [n = 181,390]	36,603 [20.2%]	14,211 [7.8%]	19,418 [10.7%]
Second quartile [n = 190,078]	39,959 [21.0%]	15,362 [8.1%]	20,548 [10.8%]
Third quartile [n = 190,434]	42,404 [22.3%]	20,912 [11.0%]	19,751 [10.4%]
Highest quartile [n = 184,454]	43,136 [23.4%]	22,868 [12.4%]	17,813 [9.7%]

[a]This table includes all patients with established primary care in the health system [column 1] and uses row percentages to indicate how many in each demographic subgroup had any outpatient visit [column 2] and how many specifically had a telephone or virtual visit [columns 3 and 4].

[b]Patients who had a telephone and a video visit were counted in both columns.

[c]Lowest quartile: less than $70,200; second quartile: $70,200 to less than $95,200; third quartile: $95,200 to less than $115,000; highest quartile: $115,000 or more.

[d]Lowest quartile: less than 7.8%; second quartile: 7.8% to less than 11.5%; third quartile: 11.5% to less than 15.2%; highest quartile: 15.2% or greater.

[e]Lowest quartile: less than 13.8%, second quartile: 13.8% to less than 20.9%; third quartile: 20.9% to less than 28.9%; highest quartile: 28.9% or greater.

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