Sociodemographics, Social Vulnerabilities, and Health Factors Associated with Telemedicine Unreadiness Among US Adults

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BACKGROUND

In the United States (US), the COVID-19 pandemic has caused substantial shifts in outpatient health care delivery from in-person visits to telemedicine.[1] Although intended to maintain access to care, there is mounting concern that increasing use of telemedicine may widen the "digital divide" and exacerbate existing health inequities among at-risk populations.[2]

OBJECTIVE

To describe the prevalence and examine factors associated with telemedicine unreadiness among US adults.

METHODS

We performed a cross-sectional analysis (2016–2018) of the National Health Interview Survey (NHIS), a nationally representative telephone-based survey conducted by the Centers for Disease Control. We defined a survey participant as "telemedicine unready" if the participant reported all three of the following criteria: (1) lack of a computer; (2) lack of e-mail; and (3) lack of internet access. We extracted data on demographics, social vulnerabilities, and comorbid conditions from the survey. We defined social vulnerabilities as answering "yes" to any of the 39 survey questions assessing: (1) economic instability (10 questions), (2) disadvantaged neighborhood (4 questions), (3) low educational attainment (2 questions), (4) food insecurity (9 questions), and (5) social isolation (4 questions). We then estimated the national prevalence of all covariates. Finally, we examined the association of age, sex, race, ethnicity, health insurance, social vulnerabilities, and comorbidity with telemedicine unreadiness using multivariable logistic regression. NHIS data are publicly available and fully de-identified and not subject to institutional review board approval. All analyses took into account the complex survey design and incorporated person-level weights included in the NHIS datasets.[3]

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FINDINGS

Among the 55,220 participants, over 1 in 6 (17.9%) appear digitally unprepared to engage in telemedicine. Mean age was 47.5±18.1 years, with sociodemographic characteristics representative of the USA. Respondents reported a mean of 2.1±1.2 chronic conditions and 1.9±0.9 social vulnerabilities.

Compared to the overall population, older aged individuals, racial and ethnic minorities (e.g., Blacks and Hispanics), and those with government-sponsored insurance (e.g., Medicare and Medicaid) or no insurance had a higher prevalence of telemedicine unreadiness. Additionally, those with multiple comorbid conditions and certain social vulnerabilities (lower educational attainment, food insecurity, and social isolation) had higher prevalence of telemedicine unreadiness (range: 20.3–36.3%). Notably, half (53%) of all respondents ≥75 years of age and those with dual Medicare and Medicaid coverage were telemedicine unready.

In adjusted analyses, advanced age (age 65–74: aOR 16.0, 95% CI 13.6–18.9; age ≥75: aOR 56.3, 95% CI 47.6–66.5) low educational attainment (aOR 6.4, 95% CI 5.7–7.2), government-sponsored or no insurance (aOR range 2.6–5.2), minority background (Hispanic: aOR 2.9, 95% CI 2.5–3.3; Black: aOR 1.7, 95% CI 1.5–2.0; other: aOR 1.5, 95% CI 1.2–1.9), food insecurity (aOR 2.2, 95% CI 2.0–2.4), and social isolation (aOR 1.5, 95% CI 1.4–1.6) were associated with telemedicine unreadiness (Table 1).

DISCUSSION

In this nationally representative survey of US adults, over 1 in 6 appear to be digitally unprepared for telemedicine engagement with key vulnerable populations (e.g., older adults, racial and ethnic minorities, government-sponsored or no insurance, and socially vulnerable) at even higher risk.

Table 1 National Prevalence and Odds of Telemedicine Unreadiness by Sociodemographics, Social Vulnerabilities, and Health Factors

	Telemedicine unreadiness *	
	Prevalence, % (95% CI)	**Adjusted odds ratio (95% CI)**
All respondents	17.9 (16.8–18.9)	–
Age		
18–39	5.2 (4.7–5.7)	Reference
40–49	10.4 (9.4–11.4)	3.0 (2.6–3.5)
50–64	16.4 (15.4–17.5)	6.5 (5.6–7.6)
65–74	26.4 (25.0–27.8)	16.0 (13.6–18.9)
≥75	53.3 (51.6–55.1)	56.3 (47.6–66.5)
Sex		
Male	15.5 (14.7–16.2)	Reference
Female	15.3 (14.6–16.1)	0.7 (0.7–0.8)
Race and ethnicity		
White	14.6 (14.0–15.3)	Reference
Black	20.3 (18.6–21.9)	1.7 (1.5–2.0)
Other †	19.2 (15.9–22.4)	1.5 (1.2–1.9)
Hispanic	24.4 (22.5–26.2)	2.9 (2.5–3.3)
Health insurance		
Private	4.5 (4.1–4.9)	Reference
Medicare	34.4 (33.2–35.6)	2.6 (2.2–3.1)
Medicaid	23.2 (21.4–25.0)	3.9 (3.3–4.6)
Medicare and Medicaid	57.0 (53.3–60.6)	5.2 (4.2–6.5)
Other‡	10.6 (9.0–12.2)	1.7 (1.4–2.0)
None	21.6 (19.7–23.5)	3.6 (3.1–4.1)
Comorbidity count §		
0	9.8 (9.0–10.7)	Reference
1–2	11.6 (10.9–12.4)	0.8 (0.7–0.9)
3–4	17.6 (16.7–18.5)	0.7 (0.6–0.8)
>5	29.1 (27.8–30.4)	0.8 (0.7–1.0)
Social vulnerabilities		
Economic instability	15.9 (15.2–16.7)	1.0 (0.9–1.0)
Disadvantaged neighborhood	17.4 (16.3–18.6)	1.1 (1.0–1.2)
Low educational attainment	21.2 (20.4–22.0)	6.4 (5.7–7.2)
Food insecurity	24.5 (23.3–25.7)	2.2 (2.0–2.4)
Social isolation	20.2 (19.3–21.0)	1.5 (1.4–1.6)

**Individuals met all three of the following criteria: (1) lack of a computer; (2) lack of e-mail; and (3) lack of internet access per survey responses*
†Includes American Indian, Native Hawaiian, Pacific Islander, other, do not know
‡Includes military health care, state-sponsored health plan, Indian Health Services, and single service plans (e.g., dental, vision, prescription)
§Includes hypertension, hyperlipidemia, coronary artery disease, myocardial infarction, stroke, asthma, peptic ulcer disease, cancer, diabetes/prediabetes, chronic obstructive lung disease/emphysema/bronchitis, kidney disease, liver disease, arthritis/rheumatologic disease, migraine, chronic pain, obesity
Notes: Missingness ranged from 1.7 to 3.5%. Missing data were not included in the analysis

While telemedicine has been shown to improve access for hard-to-reach populations, its use could further exacerbate existing health inequities. As health care systems contemplate increased and expanded post-pandemic use of telemedicine, these findings demonstrate that large segments of the population may not be prepared for such a change. If expansion does continue, healthcare systems will likely need to improve infrastructural support, such as access to high-speed internet and digital devices (i.e., computers and smartphones) to the most vulnerable populations. A recent nationwide initiative in the Veterans Health Administration to distribute video telehealth tablets to high-need patients with social and clinical access barriers may be one model moving forward.[4]

Our study has limitations. First, we lacked explicit data on smartphone access and use. Second, our findings may only apply to video-based visits as internet access is not needed for telephone-based telehealth visits. Finally, our analysis may lack current generalizability as it only focuses on pre-pandemic readiness which has potentially improved in the past year given the recent expansion of telemedicine.

In conclusion, there are striking disparities in telemedicine unreadiness among socially vulnerable and other at-risk populations—with as many as 1 in 2 being telemedicine unready in the highest risk populations. As health care systems continue to bolster telemedicine programs, attention to these disparities is urgently needed to improve health equity for the most vulnerable Americans.

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Declarations:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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