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The Health Plan Environment In California Contributed To Differential Use Of Telehealth During The COVID-19 Pandemic

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ABSTRACT The COVID-19 pandemic has led to substantial increases in the use of telehealth and virtual care in the US. Differential patient and provider access to technology and resources has raised concerns that existing health disparities may be extenuated by shifts to virtual care. We used data from one of the largest providers of employer-sponsored insurance, the California Public Employees' Retirement System, to examine potential disparities in the use of telehealth. We found that lower-income, non-White, and non-English-speaking people were more likely to use telehealth during the period we studied. These differences were driven by enrollment in a clinically and financially integrated care delivery system, Kaiser Permanente. Kaiser's use of telehealth was higher before and during the pandemic than that of other delivery models. Access to integrated care may be more important to the adoption of health technology than patient-level differences.

To avoid COVID-19 transmission and preserve resources for US patients with COVID-19, many health systems and providers canceled elective procedures and reduced in-person care as the pandemic spread.¹ Many types of care also shifted to virtual care modalities.^{2–4} Several studies have documented changes in the use of non-COVID-19 health services during the pandemic.^{1,5–8} One of the largest changes to care delivery has been the increased use of telehealth during the pandemic.^{5,9,10} However, many studies have documented race and ethnicity, income, language, and rurality differences in the use of telehealth during the pandemic.^{5,10–18} Potential disparities in the use of telehealth are of particular importance for vulnerable patient populations with less potential access to new care modalities and to patients with chronic conditions, who have greater care needs.

Although population-level differences in the use of telehealth are well documented, how the adoption of telehealth use during the pandemic

varies across payment models has received less focus. In the US health care system, the dominant provider reimbursement model is fee-for-service, under which provider groups receive payment for each service performed.^{19,20} A potential adverse consequence of fee-for-service medicine is the incentive to perform higher-price treatments and services when lower-price options are available.²¹ Before the pandemic, telehealth services were commonly reimbursed at lower rates than in-person services.²² Although the pandemic has led to increased payment parity, the longer-run payment parity of in-person versus telehealth services is unclear.²³ Among providers reimbursed by fee-for-service, the differences in payment rates may create a financial incentive to favor in-person care instead of telehealth. In contrast, providers paid using capitation, where the provider bears any increased costs, may have a financial incentive to efficiently use virtual care modalities but may also face incentives to “skimp” on necessary or high-value care. Ignoring differences in health care delivery

Potential unequal access to telehealth has raised concerns of equity and the efficacy of telehealth as a substitute for in-person care.

system incentives to adopt and use telehealth risks misattributing differences in the use of telehealth to alternative factors.

To examine these questions, we used 2019–20 medical and pharmaceutical claims data from the California Public Employees' Retirement System (CalPERS). By leveraging the large natural experiment generated by COVID-19, we examined how care was switched to telehealth, in both the short and the long run, and how providers ultimately decided whether to continue with telehealth or to return to in-person care. We found large race and ethnicity, income, and language differences in use of telehealth, but adjusting for integrated health plan enrollment reduced the magnitude of these differences. Unique to our setting, we also documented large differences in telehealth use across plans, with fully integrated health plan enrollees using telehealth at higher rates before and during the COVID-19 pandemic than enrollees of nonintegrated plans.

Before the COVID-19 pandemic, CalPERS was an early adopter of telehealth.²⁴ Relative to existing studies of the COVID-19 pandemic, an advantage of the CalPERS data is the relatively generous benefits among the CalPERS population. In addition, and relative to other studies, the CalPERS data allowed us to examine differences in the use of health services during the COVID-19 pandemic among patients who were enrolled in different health insurance plans but who still were part of the same group purchaser. Doing so allowed us to examine the role of health plan characteristics in the use of health care services and substitution toward telehealth.

Study Data And Methods

MEDICAL CLAIMS DATA This study used medical claims data from CalPERS. The second-largest

public purchaser of private health benefits in the US, CalPERS provides insurance coverage to all State of California employees, retirees, and their dependents. California municipalities and local government organizations are also eligible to provide health insurance benefits through CalPERS. Overall, CalPERS provides health benefits to 1.5 million people.²⁵ Before the pandemic, CalPERS implemented direct-to-consumer telehealth programs through several telehealth platforms.²⁴ Under this existing model, CalPERS enrollees were able to receive telehealth care during the pandemic even if their traditional provider did not use telehealth.

CalPERS enrollees have several insurance plan options. Most members are enrolled in a fully integrated plan offered by Kaiser Permanente, in which the enrollee receives most, if not all, care from Kaiser providers. CalPERS members also have choices between several non-Kaiser health maintenance organization (HMO) and preferred provider organization (PPO) plans. Importantly for telehealth use, Kaiser plans are paid on a fully capitated basis, in which the integrated provider and plan are paid a fixed amount per patient for providing care. Potentially reflecting these incentives, even before the pandemic, Kaiser emphasized telehealth and patient-connected electronic health records, including patient-provider email capabilities, telephone calls, and video visits.^{26–28} In 2016, virtual interactions, including telehealth visits and email, exceeded in-person visits among Kaiser patients.²⁹

Across all plans, we obtained medical claims and encounter data during the period 2019–20 from CalPERS. These data included all sources of insurance coverage offered through CalPERS. We excluded CalPERS enrollees ages sixty-five and older, those who received supplemental Medicare coverage, and those located outside California. We also excluded enrollees of plans not administered by CalPERS. Our final sample consisted of 1.1 million CalPERS enrollees. From this data sample we identified telehealth claims with procedure codes in the following set: 99441, 99442, 99443, 99444, 99421, 99422, 99423, 98970, 98970-2, 98971, 98972, G0071, G2025, G2061, G2061-3, G2062, G2063, and G2250-2 and claims with a procedure code modifier of 95, GT, or GQ or a place-of-service code equal to 2.

DATA ON ZIP CODE CHARACTERISTICS To measure differences across patient populations, we obtained census data on ZIP code characteristics, including income, race, and language, from the American Community Survey's estimates for 2019. We were unable to measure these characteristics at the individual or household level. Other studies have found that aggregate-level

data are less accurate for racial minorities and people with lower socioeconomic status than for people who are White and of higher socioeconomic status.³⁰ ZIP code-level median household income was categorized into four quartiles: less than \$50,875, \$50,876–\$68,640, \$68,641–\$95,114, and \$95,115 or more. We likewise categorized California ZIP codes into quartiles according to the share of non-White residents: less than 13.5 percent, 13.6–25.8 percent, 25.9–44.0 percent, and 44.1 percent or more. We also categorized ZIP codes into quartiles of residents who do not speak English as a primary language: less than 13.4 percent, 13.5–28.9 percent, 29.0–49.6 percent, and 49.7 percent or more.

EMPIRICAL APPROACH With these data we compared monthly telehealth use rates per 1,000 CalPERS enrollees between 2019 and 2020. We examined differences in telehealth trends on the basis of ZIP code-level income, race, non-English language speaking, and CalPERS members' health insurance plan enrollment. To test for the contribution of health plan choice to these differences, we separately examined differences between all CalPERS enrollees who received insurance from Kaiser and all combined non-Kaiser plans. Because many of these characteristics may be overlapping (for example, non-English-speaking members may reside in lower-income ZIP codes), in sensitivity analyses we also used multivariate regressions to test for differences in the use of telehealth. We used linear regressions with controls for each ZIP code characteristic and fixed effect controls for health plan. To control for geographic differences in populations, regression models included county-level fixed effect controls. We also adjusted for enrollee-level differences by including controls for sex, age, age squared, and the Johns Hopkins ACG (Adjusted Clinical Groups) risk score-based health status in the regression models.

LIMITATIONS This study was not without limitations. First, our study sample came from a single purchasing organization located in one state. However, CalPERS is one of the largest purchasing organizations in the US and is well represented throughout a large and diverse state. Because we were limited to a population with employer-sponsored insurance, we were unable to measure telehealth use among uninsured people or people with public insurance.³¹ We also were not able to adjust for differences in health plan availability throughout California. For example, Kaiser providers are more likely to be located in urban and metropolitan settings than in rural areas. Also, we focused on a single model of integrated care delivery. We were unable to examine other forms of both clinical and financial integration between health plans and pro-

Differences in use of virtual modalities may have exacerbated care disruptions and contributed to the pandemic's long-running impacts.

viders. Future studies should examine whether our findings are specific to the population we studied or whether they generalize to other settings.

In addition, although we documented differences in the use of telehealth across patient populations, we did not examine the underlying reasons for these differences, nor did we evaluate policies to ensure the equitable use of telehealth. We used ZIP code-level race, income, and language as a proxy for patient characteristics, but we did not directly measure these characteristics across patient populations. We also did not examine the quality impacts of increased telehealth use or compare quality between in-person and virtual care. Also, we measured procedures submitted as telehealth procedures through health insurance claims and encounter data. The quality of submitted data may have differed between health plans. We did not measure less formal virtual care interactions (for example, phone calls with providers or clinics) that were not submitted for reimbursement or recorded in medical records. We also were not able to distinguish between audio and video telehealth visits. Finally, among submitted claims, we combined telehealth procedure codes. Certain telehealth procedures may have been used more or less in different plans or in different phases of the pandemic. Future research should examine code-specific differences in the use of telehealth.

Study Results

CHARACTERISTICS OF STUDY POPULATION Online appendix exhibit 1 presents the sample characteristics of the CalPERS population and compares Kaiser enrollees with all non-Kaiser enrollees.³² Among the CalPERS study population in 2019–20, 50 percent of enrollees were Kaiser members. The age and sex distributions of Kaiser

and non-Kaiser enrollees were similar (for example, 52.6 percent female in Kaiser plans and 52.8 percent in non-Kaiser plans). Kaiser enrollees lived in ZIP codes that had slightly higher (6 percent relative difference) median household incomes, that were less White (23 percent relative difference), and that spoke a language other than English (11 percent relative difference). Kaiser enrollees were more likely to live in Northern California and less likely to live in the non-Los Angeles Southern California regions, where Kaiser penetration is lower.

TRENDS IN USE OF TELEHEALTH

► **BY HEALTH PLAN:** We observed large differences in the use of telehealth across different health insurance plans among CalPERS enrollees (exhibit 1). Most notably, in 2019 and the period in 2020 before the COVID-19 pandemic, CalPERS enrollees enrolled in a Kaiser Permanente health plan used telehealth at a much higher rate than non-Kaiser enrollees. Monthly pre-COVID-19 telehealth use averaged 120 claims per 1,000 Kaiser enrollees compared with a weighted average of 1.5 per 1,000 in all non-Kaiser plans.

After the COVID-19 pandemic expanded the use of telehealth, broader adoption of telehealth occurred sooner and at a higher level among the Kaiser plans than the non-Kaiser plans. By March 2020, monthly use of telehealth averaged

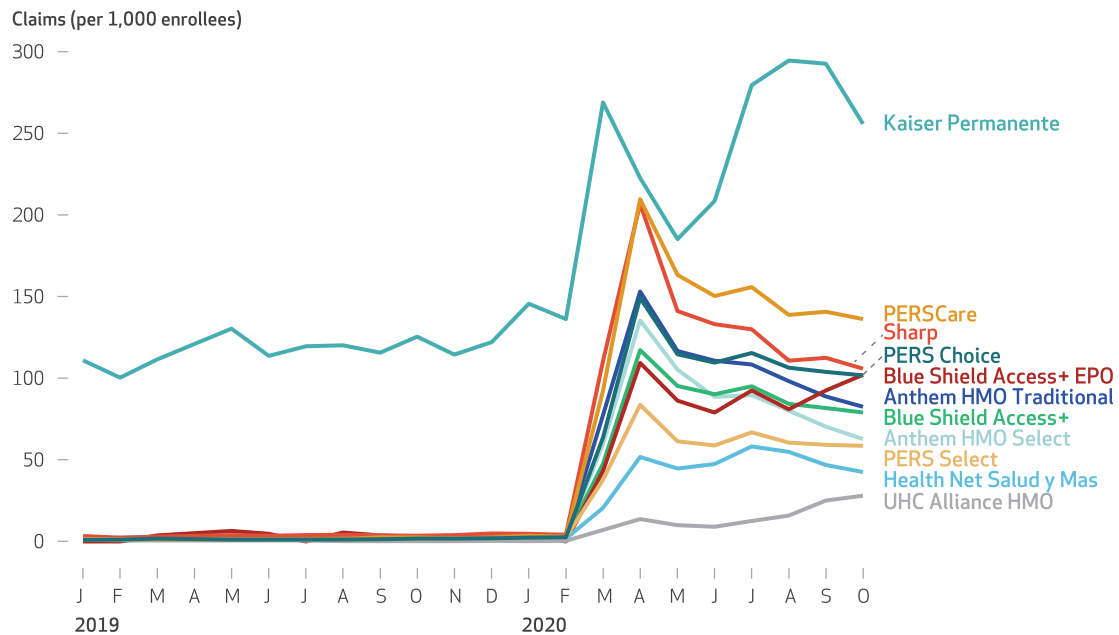
269 claims per 1,000 Kaiser enrollees compared with a weighted average of 48 per 1,000 among non-Kaiser enrollees. In addition, non-Kaiser enrollees' use of telehealth declined after the April 2020 peak, whereas that of Kaiser enrollees peaked at 295 claims per 1,000 in August 2020.

Among enrollees in non-Kaiser plans, wide variation existed in the use of telehealth during the COVID-19 pandemic. CalPERS enrollees of the UHC Alliance HMO had a maximum monthly rate of telehealth use of 28 claims per 1,000 compared with 207 per 1,000 for CalPERS members enrolled in the Sharp HMO plan, which, similar to Kaiser, is an integrated health plan centered in the San Diego region.

► **BY ZIP CODE INCOME:** Appendix exhibit 2 presents the unadjusted number of telehealth-related medical claims per CalPERS enrollee based on ZIP code-level income during the 2019–20 period.³² For all four quartiles of household income, use of telehealth was below 80 claims per 1,000 CalPERS enrollees during 2019 and before the COVID-19 pandemic started in March 2020. After the March 2020 national emergency declaration in the US and changes to telehealth reimbursement and access policies, use of telehealth increased dramatically, but at a faster rate among the CalPERS enrollees in California ZIP codes with the highest household

EXHIBIT 1

Telehealth claims per 1,000 enrollees, by health plan, California Public Employees' Retirement System (CalPERS), 2019 and 2020



SOURCE Authors' analysis of CalPERS medical claims data, 2019 and 2020. **NOTES** This figure shows telehealth claims per 1,000 enrollees among health plans offered to CalPERS enrollees. We received incomplete data for April 2019 from CalPERS, and thus we excluded this month from the analysis; we assumed a linear change between the observed points for March and May 2019.

incomes. Among households in the top income quartile (\$95,115 or more), monthly telehealth use peaked in September 2020, at 195 claims per 1,000 enrollees. Relative to the use rate in September 2019, this increase represents an approximately 200 percent increase in telehealth use. Among households in the lowest quartile of ZIP code-level income, monthly telehealth use peaked at 169 per 1,000 enrollees.

However, after stratifying by Kaiser enrollment, we found that much of the income-based variation in telehealth use was driven by health plan enrollment. As presented in exhibit 2, CalPERS members enrolled in a Kaiser plan in both the highest and lowest income quartiles had qualitatively similar telehealth usage rates, and both had higher telehealth use rates than all other non-Kaiser members in either income quartile.

► **BY ZIP CODE RACE:** Appendix exhibit 3 presents analogous figures that examine differences based on the share of non-White residents across California ZIP codes.³² Before the pandemic, the CalPERS enrollees in the highest quartile of non-White race residents were more likely to

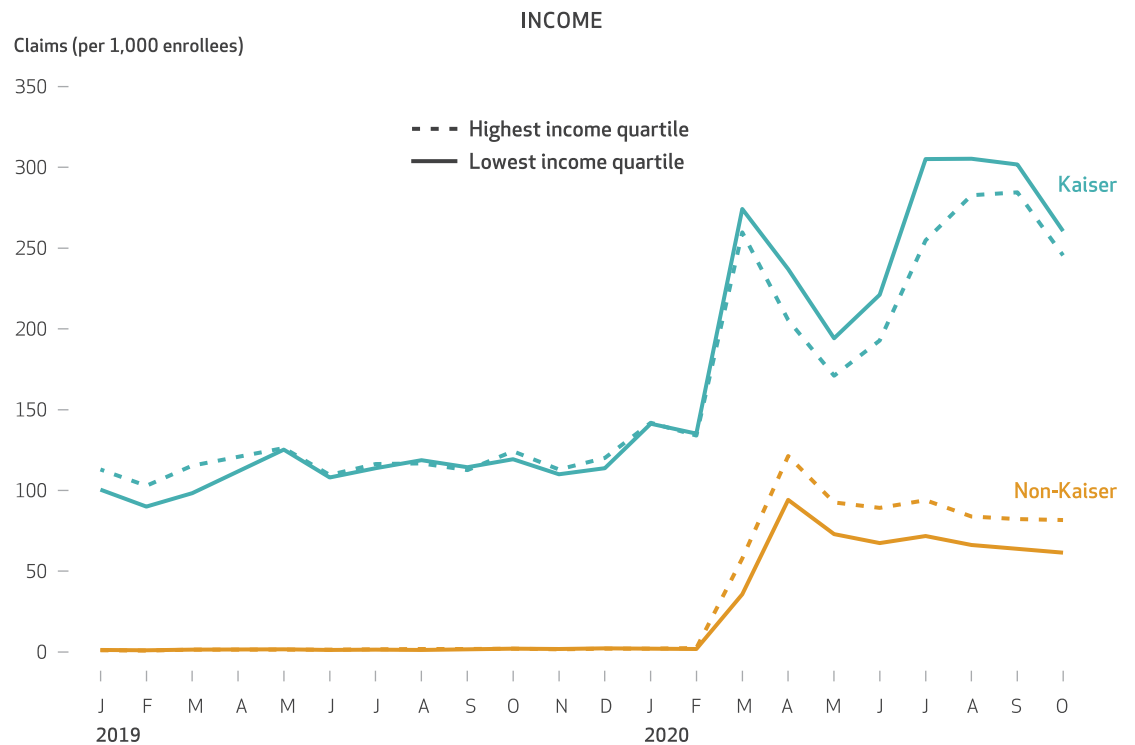
use telehealth, and this higher use continued during the pandemic. By September 2020 telehealth use among the lowest non-White race quartile averaged 108 claims per 1,000 enrollees compared with 204 per 1,000 enrollees among residents of the highest non-White race quartile.

However, as with income, race-based differences in use of telehealth were lower when we stratified by Kaiser enrollment (exhibit 3). Kaiser enrollees in the top and bottom quartiles of non-White residents had qualitatively similar trends in use of telehealth, both before and during the pandemic. Both Kaiser populations had higher rates of telehealth use than all other plan enrollees.

► **BY LANGUAGE:** Appendix exhibit 4 presents monthly telehealth trends based on the share of non-English-speaking residents in each ZIP code.³² We observed comparable patterns of telehealth use among the top three quartiles of non-English-speaking residents, both before and during the COVID-19 pandemic. However, CalPERS enrollees who lived in the lowest quartile of non-English-speaking residents in California ZIP codes were less likely to use telehealth. By

EXHIBIT 2

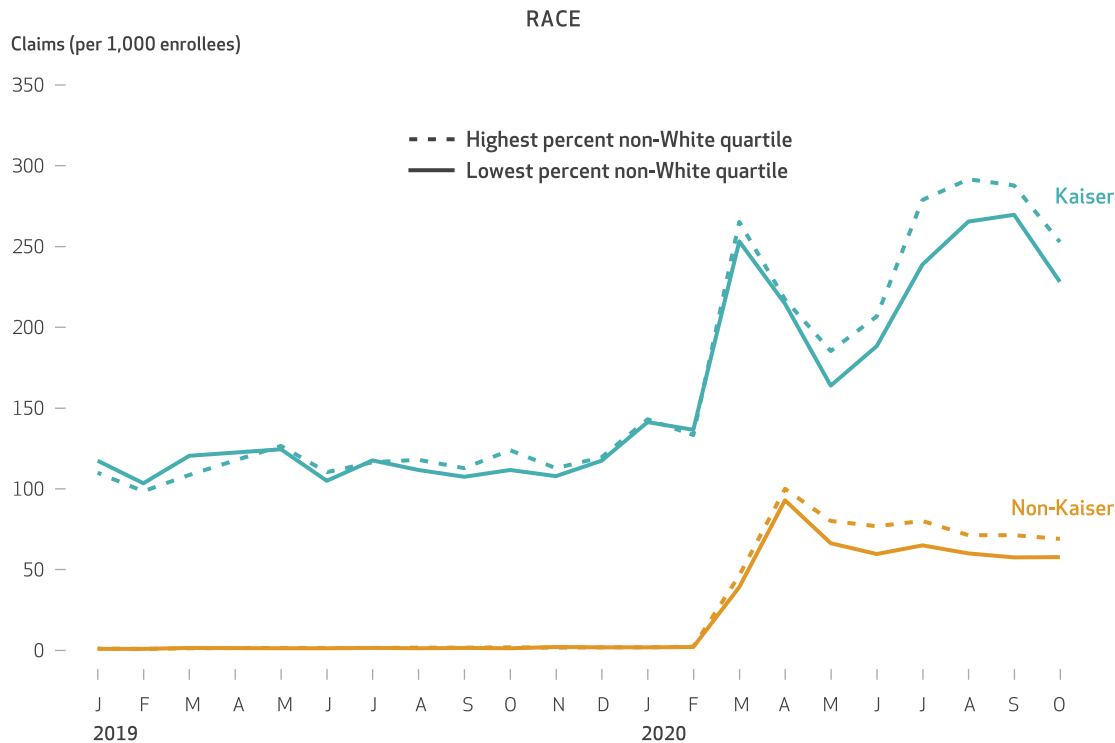
Telehealth-related claims per 1,000 enrollees, by health plan and highest and lowest quartiles of median household income in enrollee ZIP codes, California Public Employees' Retirement System (CalPERS), 2019 and 2020



SOURCE Authors' analysis of CalPERS medical claims data, 2019 and 2020. **NOTES** This figure shows telehealth claims per 1,000 enrollees in Kaiser and non-Kaiser plans in the highest and lowest quartiles of ZIP code-level income in California. We received incomplete data for April 2019 from CalPERS; see the exhibit 1 notes.

EXHIBIT 3

Telehealth-related claims per 1,000 enrollees, by health plan and highest and lowest quartiles of percent of non-White people in enrollee ZIP codes, California Public Employees' Retirement System (CalPERS), 2019 and 2020



SOURCE Authors' analysis of CalPERS medical claims data, 2019 and 2020. **NOTES** This figure shows telehealth claims per 1,000 enrollees in Kaiser and non-Kaiser plans in the highest and lowest quartiles of non-White people in California ZIP codes. We received incomplete data for April 2019 from CalPERS; see the exhibit 1 notes.

September 2020 the unadjusted rates of telehealth use were 191 claims per 1,000 enrollees among the highest quartile of non-English speakers and 111 per 1,000 enrollees among the lowest quartile.

However, as with the other characteristics, these differences were smaller when we adjusted for health plan enrollment (exhibit 4). Non-Kaiser enrollees in the top and bottom non-English language quartiles had similar unadjusted trends in use of telehealth, and both groups had lower rates of use than Kaiser enrollees in either language quartile.

REGRESSION-ADJUSTED DIFFERENCES IN USE OF TELEHEALTH After regression adjustment, similar unadjusted patterns existed in the use of telehealth (appendix exhibits 5 and 6).³² The difference in use after the March 2020 expansion was statistically significant between the first and fourth income, race, and language quartiles, but not between the first and second or first and third quartiles. However, after we controlled for Kaiser versus non-Kaiser enrollment, the income, race, and language differences in use of telehealth during the pandemic decreased in

magnitude and were less associated with the use of telehealth than was Kaiser enrollment. The lack of differences when controlling for Kaiser enrollment suggests that patient differences in the use of telehealth among this population were driven by health plan enrollment, rather than patient-level differences.

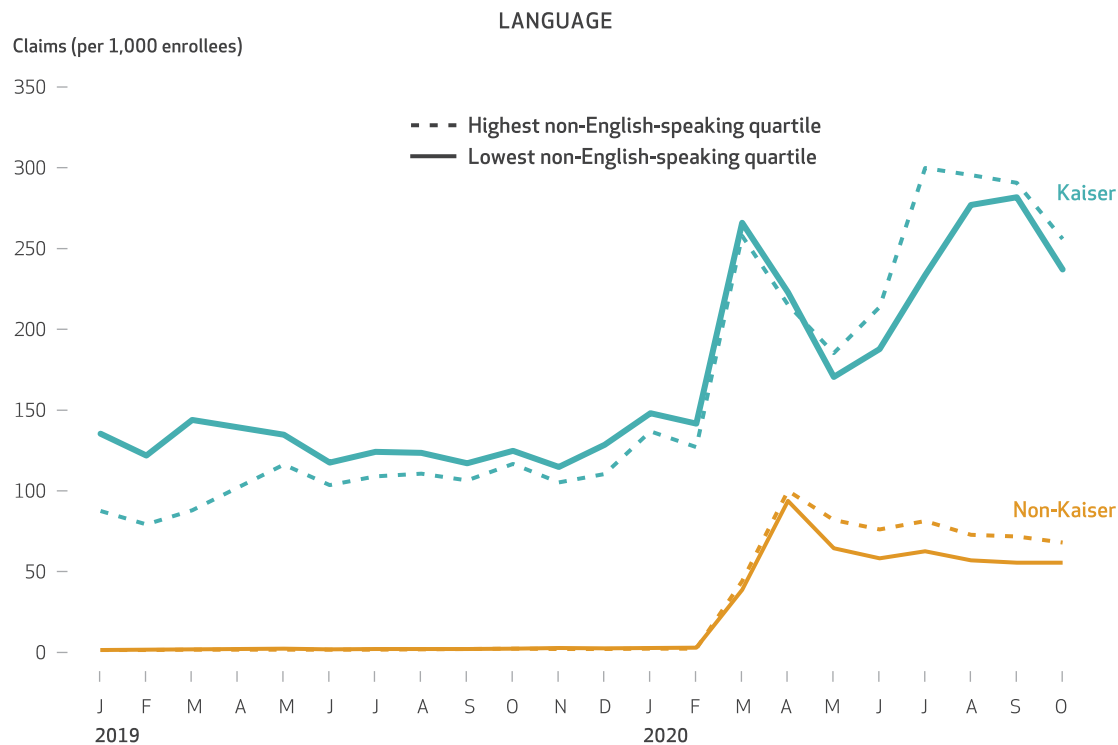
Discussion

The COVID-19 pandemic has disrupted many aspects of medical care. Although telehealth has been available in the US for several years, the COVID-19 pandemic has accelerated its use. However, potential unequal access to telehealth has raised concerns of equity and the efficacy of telehealth as a substitute for in-person care. In this study we used data from one of the largest purchasers of health care benefits in the US to document differences in the use of telehealth during the COVID-19 pandemic.

Consistent with other studies, we found rapid adoption of telehealth as the pandemic took hold. Although the adoption of telehealth was unequal, our findings differed from previous

EXHIBIT 4

Telehealth-related claims per 1,000 enrollees, by health plan and highest and lowest quartiles of non-English speakers in enrollee ZIP codes, California Public Employees' Retirement System (CalPERS), 2019 and 2020



SOURCE Authors' analysis of CalPERS medical claims data, 2019 and 2020. **NOTES** This figure shows telehealth claims per 1,000 enrollees in Kaiser and non-Kaiser plans in the highest and lowest quartiles of non-English speaking people in California ZIP codes. We received incomplete data for April 2019 from CalPERS; see the exhibit 1 notes.

studies that have examined differences in the use of telehealth during the pandemic.¹⁸ In our setting, use of telehealth was highest among patients located in ZIP codes that were lower income, had more non-White residents, and had more non-English language speakers. These differences were mostly driven by differences in health plan enrollment and, in particular, by differences in enrollment in an integrated versus nonintegrated health plan. The observed differences in telehealth use, both before and during the COVID-19 pandemic, may reflect disparities in access to alternative delivery models. These findings are consistent with those of non-COVID-19 or telehealth studies, which have found that race and ethnicity disparities in access to Medicare Advantage plans contribute to disparities in the use of care.^{33,34}

The patient-level differences in use of telehealth that we observed were driven by differences in the use of telehealth across insurance plans. Although CalPERS enrollees in all insurance plans experienced rapid adoption of telehealth at the early stages of the COVID-19 pandemic, the use of telehealth among the Kaiser population

was higher both before and throughout the pandemic. Kaiser enrollees had higher monthly rates of telehealth use before the pandemic than many CalPERS plans had at their peak pandemic rates. Among CalPERS enrollees of non-Kaiser plans, telehealth use peaked but then quickly dissipated as in-person care and travel restrictions were lifted. However, Kaiser enrollees' use of telehealth increased throughout the pandemic. Not coincidentally, Kaiser is reimbursed in a full capitation model and thus has an incentive to use telehealth instead of in-person care when appropriate.¹⁹

The COVID-19 pandemic has disrupted health care modalities. By examining the patient and health plan differences in use of telehealth during the pandemic, this study highlights the important role of health plan and provider differences in driving disparities in access to telehealth services, including income, language homophily, and health plan financial incentives in using virtual care.³⁵⁻³⁷ During the pandemic, these differences in the use of telehealth may have affected how patients form provider relationships, the quality of care delivered, and how

patients with chronic conditions receive care. As a result, differences in use of virtual modalities may have exacerbated care disruptions and contributed to the pandemic's long-running impacts. As described in this study, a health plan that both clinically and financially integrates providers and payers had higher and more equi-

table use of telehealth during the COVID-19 pandemic. To reduce these differences and promote the equitable use of both telehealth and other technologies, policy makers and health care purchasers should consider the underlying incentives of providers to use telehealth. ■

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