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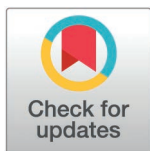
Experiences of recently diagnosed urban COVID-19 outpatients: A survey on patient worries, provider-patient interactions, and neutralizing monoclonal antibody treatment

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Abstract

Background

COVID-19 patients have experienced worry, altered provider-patient interactions, and options to use novel treatments, initially with neutralizing monoclonal antibodies (mAbs). Limited research has been performed on these aspects of the COVID-19 outpatient experience.

Objective

This study aimed to evaluate the experiences of outpatients recently diagnosed with COVID-19, who were eligible for use of mAbs, during the diagnosis and treatment process based on sociodemographic and clinical factors.

Methods

This was a self-reported cohort study performed via telephone surveys. Participants included COVID-19 outpatients who met at least one emergency use criterion for mAbs during the first 120 days after a SARS-CoV-2 positive test. We analyzed survey results using multivariable logistic regression for non-scale outcomes and adjusted proportional odds logistic regression for scaled outcomes.

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Data availability statement: Data may be available through the authors/institution if in compliance with HIPPA, institutional data access, and Colorado Institutional Review Board for researchers who meet the criteria for access to confidential data. We can collaborate with someone external via a process that entails a reasonable request and determination by the study steering committee (or in their absence, the Colorado Clinical and Translational Sciences Institute at the University of Colorado). We cannot publicly share data due to data sharing policies and data use agreements in place with participating sites. Data requests should be sent to Dr. Adit A. Ginde, adit.ginde@cuanschutz.edu. If unavailable, please contact CCTSI at CCTSI. Helpdesk@uccdenver.edu, phone 720.848.7100.

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Results

Greater worry about their COVID-19 diagnosis was reported by younger, female, and Hispanic patients and those with Medicaid insurance, two or more comorbid conditions, BMI > 25, and at least 2 COVID-19 vaccinations. Greater provider trust was reported by patients with ≥ 2 years of college education, one or more comorbid conditions, and one or more COVID-19 vaccinations; whereas less provider trust was reported by patients ages 45–64 years, with usual place of care in a walk-in clinic, and those without Commercial, Medicare, or Medicaid insurance. In patients who did not receive mAbs, patients with Medicaid and those without Commercial/Medicare insurance were among the factors that were less likely to be offered mAbs by a provider.

Discussion

This report describes factors associated with multiple aspects of outpatients' experience of COVID-19. This study demonstrated that there are important differences in the experience of outpatient COVID-19 patients based on sociodemographic factors and clinical factors, as well as where additional strategies are needed to improve this experience and associated outcomes.

Introduction

Patients with recently diagnosed COVID-19 have varied experiences of emotional worry, interactions with health care professionals, and considerations regarding novel treatments such as neutralizing monoclonal antibodies (mAbs) [1–40]. The COVID-19 pandemic has led to an increase in mental health problems including fear of infection, uncertainty, mood disorders including anxiety and depression, and sleep problems [1–3]; and fear of COVID-19 infection is known to vary by demographic and clinical factors [4–12]. High fear of COVID-19 illness has also been associated with decreased access to healthcare [13]. However, the extent to which patients worry about adverse outcomes once diagnosed with COVID-19 has not been measured, and it is not known whether worry or other factors affect patient behaviors including seeking medical consultation, seeking and/or accepting treatment, and conforming to other medical recommendations.

When seeking medical consultation, patients rely on their providers to direct their care. The provider-patient relationship is complex and based on multiple factors including verbal and non-verbal communication, information sharing between both parties, empathy, and decision-making [14]. Mutual trust within that relationship is critical to success and prior to the COVID-19 pandemic, trust in medical scientists was trending upwards [15]. The impact of the COVID-19 pandemic on the provider-patient relationship is unclear; however, most studies demonstrate an adverse impact on this relationship including decreased trust, with a few exceptions [16–20]. However, it is unknown if there is an impact on patients' trust in their providers once personally diagnosed with COVID-19.

mAbs were the first authorized antiviral therapeutics available for high-risk outpatients with COVID-19 to reduce the risk of severe illness, hospitalization, and death [21–31]. Unfortunately, uptake of mAbs was extremely low, with only 7.2% of Medicare beneficiaries receiving treatment [32]. In the broader population, well below 1% of eligible COVID-19 patients received mAbs [33], and even lower rates were observed for patients in rural areas, those of non-white race/ethnicity, non-English language speakers, and those with fewer social supports, low health literacy, high economic concerns, and/or limited access to a health care facility [34–38]. Among healthy community members, mAbs are generally viewed positively and most people indicate being open to receiving treatment [39]. Among those who received mAbs, most expressed satisfaction with their overall experience, communication with providers, and the quality-of-care provided [40]; however less is known of the experiences of mAb untreated patients.

This study aimed to explore the experiences of outpatients recently diagnosed with COVID-19, who were eligible for the use of mAbs, immediately after the diagnosis and treatment process including experiences of worry, interactions with providers, and decisions about treatment with mAb, based on sociodemographic and clinical factors.

Methods

Study design and participants

As part of a longitudinal prospective cohort study, we surveyed adults with a documented SARS-CoV-2 positive test or mAb administration within 120 days of their SARS-CoV-2 positive test date. This manuscript's specific survey questions and results were part of the initial survey administered. Patients were selected for survey administration using the electronic health record at two health systems in Colorado: UCHHealth and Denver Health (S1 File). A third-party contract research organization contacted selected patients for potential study participation and obtained informed consent verbally via a script with verbal acceptance over the phone and documented this prior to survey administration. The Colorado Multiple Institutional Review Board (IRB# 21–2935) approved the study (including the consent process), and all study procedures were per the institution's ethical regulations according to the Declaration of Helsinki (1975). Contact for the survey was between April 20, 2021 and December 27, 2021. Participants could complete up to three consecutive surveys but at least one survey needed to be completed to be included in this study with a minimum of 14 days between surveys. Participants were eligible for a single survey if enrollment and survey administration occurred more than 77 days after their positive SARS-CoV-2 test date. They were eligible for two surveys when enrollment and first survey administration occurred >35 days and ≤ 77 days from their SARS-CoV-2 test date, and eligible for three surveys when enrollment and first survey administration occurred ≤35 days from their SARS-CoV-2 test date.

The survey included questions on participants' demographic information, COVID-19 treatment, COVID-19 symptoms, hospitalization, COVID-19 vaccination status, experience with mAbs, and COVID-19 disease and provider experience (S1 File). The survey was developed via expert consensus by the study investigators and was pilot tested and revised amongst study staff and then potential study participants to ensure clarity and face validity. This was done in an expedited process due to the pandemic induced public health emergency.

We excluded participants for the following reasons: 1) no reported COVID-19 symptoms after positive SARS-CoV-2 test date (N = 11); 2) mAb treatment status (treated or untreated) not reported (N = 14); 3) survey answers indicated the individual was not eligible to receive mAb treatment based on the established emergency use authorization (EUA) criteria (N = 207); or 4) were contacted more than 120 days after their positive SARS-CoV-2 test or mAb administration date (N = 10).

Outcomes

For this study, we were interested in the participants' experience of their SARS-CoV-2 infection, including their level of worry when diagnosed with COVID-19, their provider-patient relationship during the diagnosis and treatment process, and

factors influencing whether they received mAbs. From the larger survey, we analyzed the responses to eight questions ([S1 File](#)); four had Likert scale responses with a scale from 1 (lowest) to 10 (highest), and four had categorical responses.

The Likert Scale responses were grouped (responses 1–3, 4–6, 7–10) to create a spread and make the responses statistically meaningful. For the following questions: “On a scale of 1 to 10, how worried were you when you learned you have COVID-19?” and “On a scale of 1 to 10, how worried were you about getting the mAb treatment?”, we grouped responses to not worried (1–3), moderately worried (4–6), and extremely worried (7–10). For the question: “On a scale of 1 to 10, how difficult was it for you to get the mAb treatment?”, we grouped responses to not difficult (1–3), moderately difficult (4–6), and extremely difficult (7–10). For the question, “If you had a close friend or relative who got COVID-19 and they were eligible to receive the mAb treatment...on a scale of 1 to 10, how likely would you be to recommend it?”, we grouped responses to not likely (1–3), moderately likely (4–6), and extremely likely (7–10).

The categorical responses were dichotomized to make the responses statistically meaningful. For the question, “Do you think you were treated fairly when it comes to COVID-19-related care?”, we dichotomized responses to treated fairly and not treated fairly. For questions regarding trust in doctors (“In general, how much do you trust that doctors or providers will do what is right when it comes to your COVID-19-related care?” and “How much do you trust that your doctor or provider will do what is right when it comes to your COVID-19-related care?”) we dichotomized responses to trusting doctor and not trusting doctor. For the question, “To better understand why you did not receive the mAb treatment for COVID-19...do any of the following reasons apply to you?”, we dichotomized responses to offered mAbs and not offered mAbs.

Statistical analysis

We summarized the baseline sociodemographic characteristics of survey participants, mAb treatment status, and survey responses using descriptive statistics (mean and standard deviations (SD) for continuous variables, frequency and percentage for categorical variables) by treatment status (i.e., mAb treated vs. no mAb treatment groups) ([S1 File](#)). We assessed the association between our sociodemographic and clinical factors of interest and the categorical outcomes using multivariable logistic regression. We used multivariable proportional odds logistic regression to assess the association between our sociodemographic and clinical factors of interest and the Likert scale outcomes. To address potential confounding, we conducted adjusted analysis including all sociodemographic and clinical factors in our models. We also developed an analysis with baseline sociodemographic factors only ([S1 File](#)). Sociodemographic factors included age, gender, race/ethnicity, level of education, usual place to receive healthcare, and health insurance. Clinical factors included the number of comorbid conditions, BMI (using standard calculation in the EHR), and COVID-19 vaccination status. We used R Statistical Software [\[41\]](#) (version 3.6.0; R Foundation for Statistical Computing Vienna, Austria) to conduct analyses.

Results

Survey sample

The survey sample consisted of 1612 adult participants, 539 mAb treated and 1073 untreated patients. Those that received mAb treatment were older [mean = 59 (SD = 15) vs. 51 (SD = 16) years], more likely to be non-Hispanic White (81.6% vs. 71.2%), more immunocompromised (18.9% vs 10.7%), and had at least two COVID-19 vaccinations (41.6% vs. 24.4%) ([Table 1](#)).

Worry about COVID-19 diagnosis

Evaluation of the participant’s worry about their COVID-19 diagnosis was performed using a question regarding worry ([S1 File](#)). Greater worry about a COVID-19 diagnosis was reported in female and Hispanic patients and those with, Medicaid insurance, one or more co-morbid medical conditions, BMI > 25, and at least two COVID-19 vaccinations ([Table 2](#), [Fig 1](#)). The largest effect was having two or more co-morbid conditions with an adjusted odds ratio (aOR) of 2.01 (confidence

Table 1. Sociodemographic characteristics and clinical conditions of mAb treated and mAb untreated survey participants.

	No mAb treatment (N = 1073)	mAb treated (N = 539)
Age in years, mean (SD)	51 (16)	59 (15)
18–44	419 (39.0%)	101 (18.8%)
45–64	391 (36.4%)	202 (37.5%)
≥ 65	263 (24.5%)	235 (43.7%)
Gender-Female	542 (50.5%)	286 (53.1%)
Race/Ethnicity		
Non-Hispanic White	764 (71.2%)	440 (81.6%)
Non-Hispanic Black	77 (7.2%)	16 (3.0%)
Hispanic	182 (17.0%)	61 (11.3%)
Other	20 (1.9%)	7 (1.3%)
Level of Education		
≥ 2-year college	663 (61.8%)	374 (69.4%)
< 2-year college	386 (36.0%)	154 (28.6%)
(Missing)	24 (2.2%)	11 (2.0%)
Usual Place of Care		
Regular Doctor	802 (74.7%)	467 (86.6%)
Walk-In Care	263 (24.5%)	71 (13.2%)
Health Insurance		
Commercial	644 (60.0%)	319 (59.2%)
Medicaid	156 (14.5%)	45 (8.3%)
Medicare	185 (17.2%)	162 (30.1%)
None/Other	73 (6.8%)	9 (1.7%)
Immunocompromised	115 (10.7%)	102 (18.9%)
Body Mass Index (BMI)		
BMI < 25	204 (19.0%)	117 (21.7%)
BMI ≥ 25	862 (80.3%)	418 (77.6%)
Number of Other Comorbid Conditions		
None	514 (47.9%)	172 (31.9%)
One	324 (30.2%)	187 (34.7%)
Two or more	235 (21.9%)	180 (33.4%)
COVID-19 Vaccination		
None	667 (62.2%)	239 (44.3%)
One	131 (12.2%)	54 (10.0%)
At Least 2	262 (24.4%)	224 (41.6%)

Legend: Sociodemographic characteristics and clinical conditions of mAb treated and mAb untreated survey participants. Some variables have missingness, which are not reported as separate categories if they are less than 5%, mAb – monoclonal antibody.

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interval [95%CI]: 1.51–2.68; $p < 0.001$) times that of those who did not have any co-morbid conditions (Table 2). The smallest significant effect was receiving at least two COVID-19 vaccinations with an aOR of 1.33 (95%CI: 1.04–1.71) times that of those who were unvaccinated (Table 2).

Provider-patient relationship

Evaluation of the provider-patient relationship was performed using questions regarding fair treatment (S1 File) and trust of the provider (S1 File). Fair treatment was reported among patients who had at least two COVID-19 vaccinations

Table 2. Adjusted odds ratio for worried about COVID-19 diagnosis.

	OR	95% CI
Age in Years		
18–44 years	NA	
45–64 years	0.82	(0.62, 1.08)
65+ years	0.60	(0.44, 0.82)
Gender		
Male	NA	
Female	1.92	(1.54, 2.40)
Race/Ethnicity		
Non-Hispanic White	NA	
Non-Hispanic Black	1.35	(0.82, 2.24)
Hispanic	1.64	(1.18, 2.29)
Other	2.27	(0.87, 6.19)
Level of Education		
< 2 yr college	NA	
≥ 2 yr college	0.93	(0.73, 1.18)
Usual Place of Care		
Regular Doctor	NA	
Walk-In Care	1.01	(0.76, 1.35)
Health Insurance		
Commercial/Medicare	NA	
Medicaid	1.69	(1.16, 2.48)
None/Other	1.25	(0.73, 2.13)
Number of Comorbid Conditions		
None	NA	
One	1.37	(1.06, 1.78)
Two or more	2.01	(1.51, 2.68)
Body Mass Index (BMI)		
BMI < 25	NA	
BMI ≥ 25	1.38	(1.06, 1.81)
Vaccination Status		
No Vaccine	NA	
One Vaccine	0.92	(0.63, 1.35)
At Least 2 Vaccines	1.33	(1.04, 1.71)

Legend: Adjusted Odds Ratio for Worried about COVID-19 Diagnosis based on response to the question “On a scale of 1 to 10, how worried were you when you learned you have COVID-19?” with responses grouped into not worried (1–3), moderately worried (4–6), and extremely worried (7–10). OR, odds ratio; CI, confidence interval.

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(aOR=1.88, 95%CI: 1.11–3.32) compared to those who were unvaccinated (Table 3). Trust in general for providers to do the right thing when it comes to patient COVID-19 care varied. Lower trust in their provider was reported among those ages 45–64 years old and those receiving primarily walk-in care; whereas higher trust in their provider for COVID-19 care was reported among patients with one or two co-morbid conditions and those who received one or at least 2 vaccinations. Lower trust in providers to do the right thing was reported in patients with a usual place of care as a walk-in clinic (aOR=0.62, 95%CI: 0.43–0.90) compared to those patients with a regular doctor (Table 3). Higher trust in providers to do

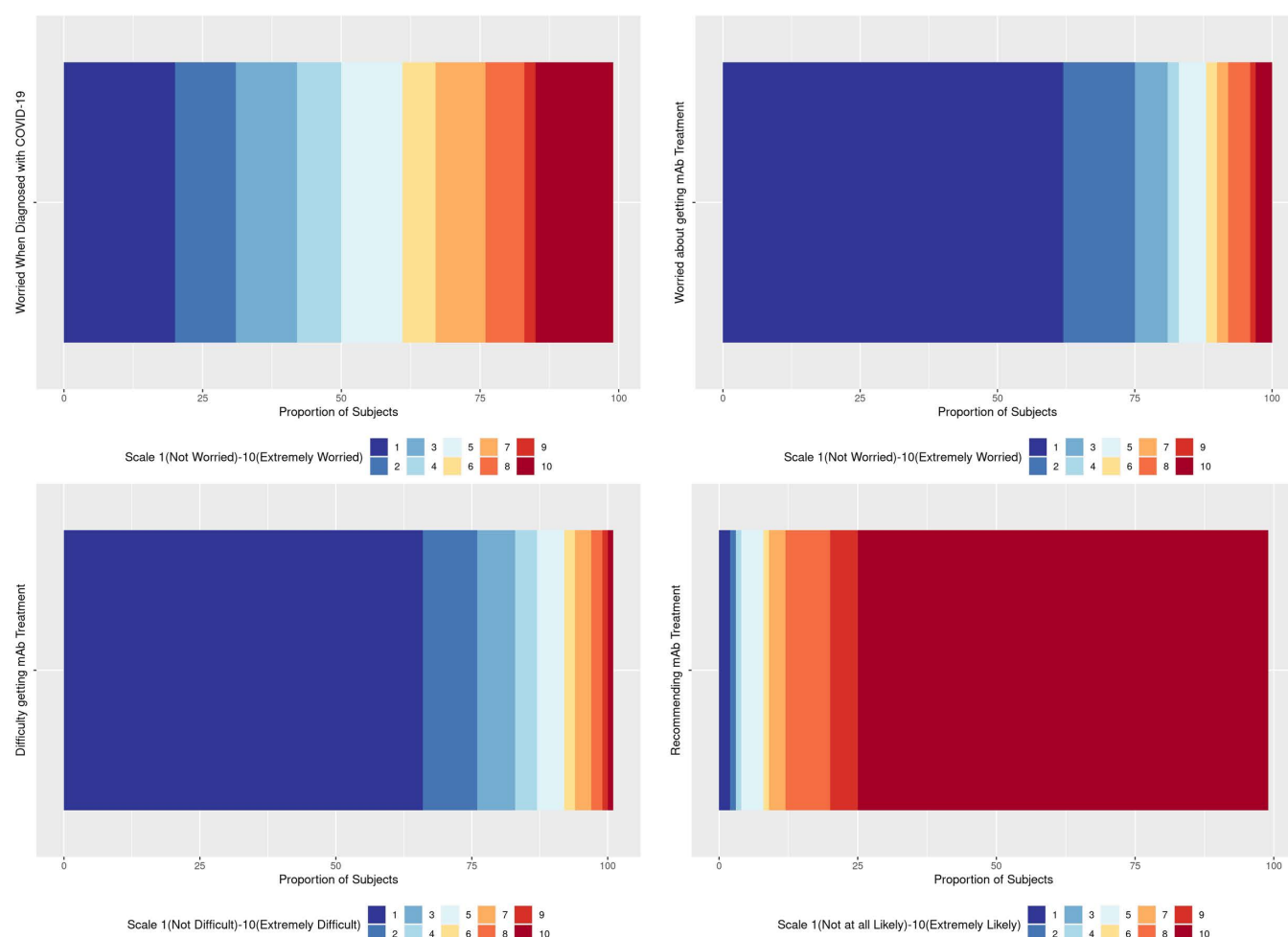


Fig 1. Survey responses to worry about COVID-19 and worry, difficulty getting and recommending monoclonal antibody treatment. Responses to questions “On a scale of 1 to 10, how worried were you when you learned you have COVID-19?”, “On a scale of 1 to 10, how worried were you about getting the mAb (monoclonal antibody) treatment?”, “On a scale of 1 to 10, how difficult was it for you to get the mAb treatment?”, and “If you had a close friend or relative who got COVID-19 and they were eligible to receive the mAb treatment...on a scale of 1 to 10, how likely would you be to recommend it?”.

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the right thing regarding COVID-19 care was reported among patients with one comorbid condition compared to those that did not have any co-morbid conditions (aOR=1.59, 95%CI: 1.11–2.29). Higher trust in their provider was reported by patients who had a regular provider and greater than 2 years of college education (aOR=2.94, 95%CI: 1.35–6.41) compared to those with less than 2 years of college. Lower trust in their provider was reported in patients who had a regular provider but whose usual place of care was a walk-in clinic (aOR=0.34, 95%CI: 0.14–0.87) compared to those whose usual place of care was with their regular doctor (Table 3, Fig 2).

Treatment with monoclonal antibody

Evaluation of the participant’s experience with mAb was performed using questions regarding several aspects of treatment (S1 File). Lower odds of not being offered mAbs was reported among patients aged ≥ 65 and those with two or more COVID-19 vaccinations (aOR=0.56, 95%CI: 0.35–0.89; aOR=0.61, 95%CI: 0.42–0.89); whereas higher odds of

Table 3. Adjusted odds ratio for trust in doctors for COVID-19 related care and treated fairly by doctors.

	Trust Doctor General		Trust Main Doctor		Treated Fairly	
	OR	95% CI	OR	95% CI	OR	95% CI
Age in Years						
18–44 years	NA		NA		NA	
45–64 years	0.64	(0.44, 0.93)	1.34	(0.58, 3.08)	0.85	(0.53, 1.33)
65+ years	0.85	(0.54, 1.35)	2.16	(0.79, 6.22)	1.48	(0.82, 2.74)
Gender						
Male	NA		NA		NA	
Female	0.91	(0.66, 1.24)	0.78	(0.37, 1.59)	1.08	(0.73, 1.60)
Race/Ethnicity						
Non-Hispanic White	NA		NA		NA	
Non-Hispanic Black/Other	1.33	(0.74, 2.55)	4.23	(0.80, 78.54)	1.02	(0.52, 2.15)
Hispanic	1.16	(0.76, 1.80)	4.24	(1.32, 19.52)	0.89	(0.54, 1.52)
Level of Education						
< 2 yr college	NA		NA		NA	
≥ 2 yr college	1.28	(0.92, 1.78)	2.94	(1.35, 6.41)	1.29	(0.84, 1.96)
Usual Place of Care						
Regular Doctor	NA		NA		NA	
Walk-In Care	0.62	(0.43, 0.90)	0.34	(0.14, 0.87)	0.65	(0.41, 1.03)
Health Insurance						
Commercial/Medicare	NA		NA		NA	
Medicaid	0.76	(0.48, 1.22)	0.78	(0.29, 2.25)	0.69	(0.40, 1.21)
None/Other	0.64	(0.35, 1.23)	1.89	(0.33, 36.11)	0.77	(0.35, 1.88)
Number of Comorbid Conditions						
None	NA		NA		NA	
One	1.59	(1.11, 2.29)	1.15	(0.52, 2.59)	0.97	(0.61, 1.55)
Two or more	1.50	(1.01, 2.26)	1.70	(0.68, 4.54)	0.80	(0.48, 1.32)
Body Mass Index (BMI)						
BMI < 25	NA		NA		NA	
BMI ≥ 25	1.13	(0.77, 1.66)	0.44	(0.12, 1.22)	0.99	(0.58, 1.64)
Vaccination Status						
No Vaccine	NA		NA		NA	
One Vaccine	2.23	(1.32, 3.98)	1.82	(0.59, 8.00)	1.63	(0.90, 3.16)
At Least 2 Vaccines	4.22	(2.77, 6.62)	1.05	(0.44, 2.72)	1.88	(1.11, 3.32)

Legend: Adjusted Odds Ratio for Trust in Doctor for COVID-19 Related Care and Treated Fairly by Doctors. Responses to questions “Do you think you were treated fairly when it comes to COVID-19-related care?”, “In general, how much do you trust that doctors or providers will do what is right when it comes to your COVID-19-related care?”, and “How much do you trust that your doctor will do what is right when it comes to your COVID-19-related care?”. Responses were dichotomized into treated fairly and not treated fairly, and trusting doctor and not trusting doctor. OR, odds ratio; CI, confidence interval

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not being offered mAbs was reported among patients with Medicaid insurance and none/other insurance (Table 4, Fig 1). None/Other insurance had the highest effect with a 3.01 (95%CI: 1.26–8.92) higher odds of not be offered mAbs and Medicaid insurance had the weakest with a 1.88 (95%CI: 1.06–3.50) higher odds of not being offered mAbs compared to those with Commercial/Medicare insurance. More difficulty to receive mAbs was reported in female patients (aOR=1.79, 95%CI: 1.08–3.00) compared to males (Table 4). Less difficulty to receive mAbs was reported among Medicaid patients (aOR=0.20, 95%CI: 0.03–0.73) compared to patients who had Commercial/Medicare insurance. Although not statistically

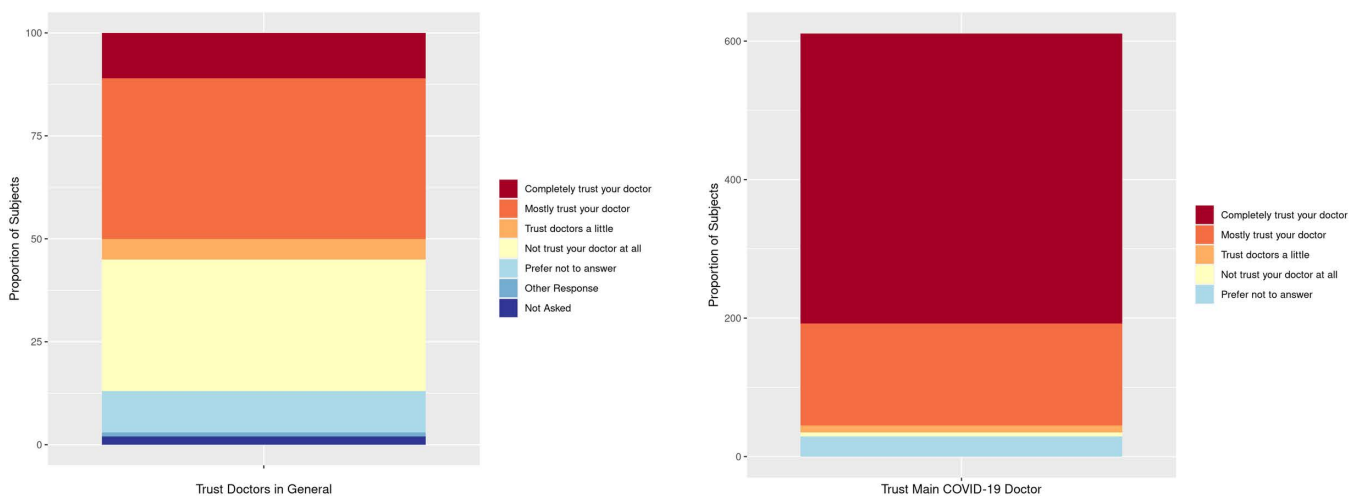


Fig 2. Survey responses for trust in providers. Responses to questions “In general, how much do you trust that doctors or providers will do what is right when it comes to your COVID-19-related care?” and “How much do you trust that your doctor will do what is right when it comes to your COVID-19-related care?”.

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significant, Hispanic patients were more likely to recommend mAbs to friends or relatives compared to Non-Hispanic White patients (aOR=2.73, 95%CI: 0.77–17.39 (Table 4, Fig 1)).

Discussion

This report describes multiple aspects of outpatients’ experience of COVID-19, including worry when diagnosed with COVID-19, provider-patient relationships during the diagnosis and treatment process, and treatment with monoclonal antibodies. This begins to fill a gap in our understanding of outpatient COVID-19 experiences. This study demonstrated that there are some important differences in the experience of COVID-19 based on sociodemographic and clinical factors; which indicates where additional strategies are needed to improve this experience, address disparities, and improve equity in receipt of antiviral treatment for COVID-19.

Sociodemographic factors

Older adults had less worry about COVID-19 in the post-acute phase, which is consistent with prior research assessing worry before infection [5,10]. In this study, newly identified contributing factors to this may be having increased trust in their regular healthcare provider and increased odds of being offered mAb treatment (per EUA guidelines [21–22]). However, patients aged 45–64 had less trust in general of providers. Further understanding is needed of the components that affect trust in these age groups.

Female patients had higher worry about COVID-19, which was true before they were infected [5,6,8,9]. This is an interesting finding given that males had worse outcomes from COVID-19 [13,42]. Female patients also had increased worry about mAbs and experienced more difficulty in receiving mAbs indicating that there may be unidentified barriers (i.e., childcare, transportation) for female patients. Addressing these barriers via policy changes, case management, and community support could enhance access to in-person treatments. Further understanding of these differences between the male and female COVID-19 patients is needed to decrease barriers to treatment.

Hispanic patients had increased worry about COVID-19 once they had been diagnosed which has been shown in some studies [11–12] prior to infection. Interestingly, Hispanic patients had higher trust in their regular provider (limited to those

Table 4. Adjusted odds ratio for worried about, difficulty getting, recommending, and never offered mAb treatment.

	Received mAbs N = 539						Didn't Receive mAbs N = 986	
	Worried Getting mAbs		Difficulty Getting mAbs		Recommend mAbs		Never Offered mAbs	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age in Years								
18–44 years	NA		NA		NA		NA	
45–64 years	0.81	(0.42, 1.60)	1.08	(0.54, 2.23)	1.13	(0.45, 2.73)	0.73	(0.48, 1.09)
65+ years	0.64	(0.31, 1.33)	0.81	(0.40, 1.70)	1.52	(0.58, 3.74)	0.56	(0.35, 0.89)
Gender								
Male	NA		NA		NA		NA	
Female	2.3	(1.39, 3.89)	1.79	(1.08, 3.00)	0.89	(0.46, 1.69)	0.86	(0.62, 1.19)
Race/Ethnicity								
Non-Hispanic White	NA		NA		NA		NA	
Non-Hispanic Black	2.37	(0.67, 7.80)	1.55	(0.32, 5.65)	0.88	(0.21, 6.15)	0.74	(0.39, 1.48)
Hispanic	0.88	(0.38, 1.86)	0.73	(0.26, 1.72)	2.73	(0.77, 17.39)	1.12	(0.70, 1.84)
Other	1.13	(0.05, 9.22)	1.41	(0.07, 10.45)	0.90	(0.10, 20.26)	5.67	(1.10, 104.20)
Level of Education								
< 2 yr college	NA		NA		NA		NA	
≥ 2 yr college	0.49	(0.29, 0.83)	0.95	(0.54, 1.73)	1.39	(0.66, 2.82)	0.82	(0.57, 1.18)
Usual Place of Care								
Regular Doctor	NA		NA		NA		NA	
Walk-In Care	0.54	(0.24, 1.15)	1.11	(0.50, 2.30)	2.76	(0.88, 12.43)	0.77	(0.52, 1.16)
Health Insurance								
Commercial/Medicare	NA		NA		NA		NA	
Medicaid	1.32	(0.56, 2.94)	0.20	(0.03, 0.73)	2.03	(0.53, 13.57)	1.88	(1.06, 3.50)
None/Other	3.03	(0.37, 17.65)	0.60	(0.03, 4.13)	0.50	(0.07, 10.19)	3.01	(1.26, 8.92)
Number of Comorbid Conditions								
None	NA		NA		NA		NA	
One	1.36	(0.74, 2.50)	1.13	(0.63, 2.05)	1.35	(0.61, 2.97)	0.70	(0.48, 1.02)
Two or more	1.24	(0.64, 2.43)	0.86	(0.45, 1.67)	1.07	(0.48, 2.39)	0.86	(0.56, 1.33)
Body Mass Index (BMI)								
BMI < 25	NA		NA		NA		NA	
BMI ≥ 25	1.92	(1.00, 3.93)	0.85	(0.48, 1.54)	1.85	(0.90, 3.69)	0.77	(0.50, 1.16)
Vaccination Status								
No Vaccine	NA		NA		NA		NA	
One Vaccine	0.47	(0.18, 1.12)	0.42	(0.13, 1.10)	0.68	(0.27, 1.94)	1.61	(0.92, 2.96)
At Least 2 Vaccines	0.60	(0.35, 1.04)	0.91	(0.53, 1.54)	1.30	(0.64, 2.69)	0.61	(0.42, 0.89)

Legend: Responses to questions “To better understand why you did not receive the mAb treatment for COVID-19...do any of the following reasons apply to you?” with responses dichotomized into offered mAbs and not offered mAbs; “On a scale of 1 to 10, how worried were you about getting the mAb treatment?” with responses grouped into not worried (1–3), moderately worried (4–6), and highly worried (7–10); “On a scale of 1 to 10, how difficult was it for you to get the mAb treatment?” with responses grouped into not difficult (1–3), moderately difficult (4–6) and very difficult (7–10); and “If you had a close friend or relative who got COVID-19 and they were eligible to receive the mAb treatment...on a scale of 1–10, how likely would you be to recommend it? With responses grouped into not likely (1–3), moderately likely (4–6) and very likely (7–10). mAb, monoclonal antibody; OR, odds ratio; CI, confidence interval

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patients who have a regular provider (79 Hispanic/243 Total)). This finding is opposite of what was seen for older patients indicating that provider trust is not the only factor impacting worry about a COVID-19 diagnosis. Previous studies demonstrate that trust is greater in race and/or language concordant patient-provider dyads [43–45] so further investigation into understanding the components of trust for racial and ethnic groups is critical. Additionally, Hispanic patients were more likely to recommend mAbs. Given that there are many barriers for minority race/ethnicity patients in accessing care [46], addressing these are critical and may have had a significant impact on receiving mAbs [47]. Further efforts to ensure equal access to COVID-19 treatment for all race/ethnicity patients are critical [48] which may include mobile units or healthcare located in community centers.

Patients with ≥ 2 years college education had increased trust in general of providers, increased trust in their regular provider, and less worry about mAbs. Patients may have been less worried about the mAbs for various reasons including their trust in their providers as well as potentially having more education about and access to the treatment. Patients who received most of their care in a walk-in clinic site were less likely to report being treated fairly, had less trust in general of providers, and less trust in their regular provider. Despite previous studies indicating patient satisfaction with walk-in clinics [49], this study indicates that emergency departments, urgent care clinics, and other walk-in clinics need to develop patient flow systems and provider education to ensure fair treatment and processes to rapidly create trust between the patient and the provider.

Patients on Medicaid insurance had increased worry about COVID-19, potentially due to financial concerns. In addition, these patients were less likely to be offered mAbs, however, they found it less difficult to receive mAbs. Medicaid's transportation support services may have contributed to these patients' ability to access treatment. Patients with none/other insurance had less trust in general of providers and were less likely to be offered mAb treatment. Insurance status has been shown to impact access to care [50] however, in this situation, Medicaid covered the full cost of mAbs and reimbursement for the treatment of uninsured patients was provided through the Health Resources & Service Administration (HRSA) COVID-19 Uninsured Program [51]. As such, it is an interesting finding that these patients were less likely to be offered treatment and indicates that there may have been gaps in provider awareness of the process to access mAb treatment and/or reimbursement, and/or bias in the treatment of Medicaid and none/other insurance patients. In the future, extensive provider educational campaigns on financial reimbursement programs could minimize this disparity.

Clinical factors

Patients with comorbid conditions had increased worry about COVID-19 which was appropriate given that additional comorbid conditions did increase the risk for severe COVID-19 [52–53]. In addition, these patients had increased trust in general of providers which may be due to regular encounters with providers due to their comorbid conditions [54]. Patients with a BMI ≥ 25 had increased worry about COVID-19 and about mAbs. Obesity did increase the risk of severe infection [52–53] so it is congruent that these patients were more worried about COVID-19. The reasons behind their increased worry about mAbs are unclear although may have been due to the novelty of the treatment or interaction of the treatment with their medical conditions.

Patients who had received two or more COVID-19 vaccinations had increased worry about COVID-19, were more likely to be treated fairly, and have high trust in providers in general; and were more likely to be offered mAbs. Patients who received COVID-19 vaccinations had trust of providers in general which may have contributed to their willingness to get COVID-19 vaccinations. Those with two or more COVID-19 vaccinations were more likely to be treated fairly, indicating that those who were unvaccinated were not treated fairly, possibly due to provider frustration towards patients who were unvaccinated [54–56]. Those who were vaccinated were more likely to be offered mAbs which counters National Institutes of Health (NIH) prioritization guidelines when treatment supply was limited but may reflect increased trust with providers and therefore interactions with them [57]. Equitable and guideline implementation of limited resources is a challenge and

greater outreach to providers (potentially from state-based license boards) with easy access to educational resources could help alleviate some of these disparities.

The overall strength of this study is that it is a large quantitative survey on outpatients' experience with COVID-19 and exposes the differences in experience based on sociodemographic factors and clinical factors. While there has previously been focused work on Black outpatient experience with COVID-19 [12] as well as hospitalized experiences [58–60], this manuscript is novel in its expansion of explored experiences and differences between groups of patients. There are also limitations in this study. First, this study was performed in a major urban location with patients who were receiving care at two major metropolitan medical centers. As such, it may not include patient experiences in other health settings or locations throughout the country (i.e., rural). Second, the population surveyed was predominately English-speaking, with few Spanish-speaking patients. As such, it does not broadly represent the experiences of non-English speaking patients who frequently experience decreased access to care. Third, the questions included in this survey were not comprehensive to the COVID-19 experience and only targeted a few broad aspects. As such, there are gaps in understanding contributing individual and system issues. Fourth, there is a potential for a sampling/response bias given that those who chose to participate in the survey may have different opinions or experiences compared to those who declined participation in the survey. Additionally, this study excluded people who did not own or answer the phone (potentially due to health or socio-economic status) and those who are deaf. The response rate was 57% (1854/3267). Fifth, all information reported in this study was self-reported which may lead to over and underreporting biases.

In conclusion, this published report describes multiple aspects of outpatients' lived experience of COVID-19 including worry when diagnosed with COVID-19, provider-patient relationship during the diagnosis and treatment process, and treatment with neutralizing monoclonal antibodies. Future research is needed to address barriers to equitable quality medical care and health system changes are needed to reduce disparities. Our study demonstrated that there were key differences in the lived experience of COVID-19 based on sociodemographic factors and clinical factors, as well as where additional strategies are needed to improve this experience.

Supporting information

S1 File. Supplementary methods and tables. Additional methods including patient selection for creation of a survey eligibility cohort, sociodemographic variable definitions, and outcome questions. S1 Table. Adjusted odds ratio for trust in doctor for COVID-19 related care and treated fairly by doctors, demographic factors only. S2 Table. Adjusted odds ratio for worried about, difficulty getting, recommending, and never offered mAb treatment, demographic factors only. S3 Table. Adjusted odds ratio for worried about COVID-19 diagnosis, demographic factors only. (DOCX)

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References

1. Mamun MA. Suicide and suicidal behaviors in the context of COVID-19 pandemic in bangladesh: a systematic review. *Psychol Res Behav Manag*. 2021;14:695–704. <https://doi.org/10.2147/PRBM.S315760> PMID: [34113185](#)
2. Al Mamun F, Hosen I, Misti JM, Kaggwa MM, Mamun MA. Mental disorders of bangladeshi students during the COVID-19 pandemic: a systematic review. *Psychol Res Behav Manag*. 2021;14:645–54. <https://doi.org/10.2147/PRBM.S315961> PMID: [34104010](#)
3. Mertens G, Gerritsen L, Duijndam S, Saleminck E, Engelhard IM. Fear of the coronavirus (COVID-19): predictors in an online study conducted in March 2020. *J Anxiety Disord*. 2020;74:102258. <https://doi.org/10.1016/j.janxdis.2020.102258> PMID: [32569905](#)
4. Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The fear of COVID-19 scale: development and initial validation. *Int J Ment Health Addict*. 2022;20(3):1537–45. <https://doi.org/10.1007/s11469-020-00270-8> Epub 2020 Mar 27.
5. Quadros S, Garg S, Ranjan R, Vijayasarithi G, Mamun MA. Fear of COVID 19 infection across different cohorts: a scoping review. *Front Psychiatry*. 2021;12:708430. <https://doi.org/10.3389/fpsyg.2021.708430> PMID: [34557117](#)
6. Luo F, Ghanei Gheshlagh R, Dalvand S, Saedmoucheshi S, Li Q. Systematic review and meta-analysis of fear of COVID-19. *Front Psychol*. 2021;12:661078. <https://doi.org/10.3389/fpsyg.2021.661078> PMID: [34177712](#)
7. Ho SMY, Kwong-Lo RSY, Mak CWY, Wong JS. Fear of severe acute respiratory syndrome (SARS) among health care workers. *J Consult Clin Psychol*. 2005;73(2):344–9. <https://doi.org/10.1037/0022-006X.73.2.344> PMID: [15796643](#)
8. Alsharawy A, Spoon R, Smith A, Ball S. Gender differences in fear and risk perception during the COVID-19 pandemic. *Front Psychol*. 2021;12:689467. <https://doi.org/10.3389/fpsyg.2021.689467> PMID: [34421741](#)
9. Broche-Pérez Y, Fernández-Fleites Z, Jiménez-Puig E, Fernández-Castillo E, Rodríguez-Martin BC. Correction to: gender and fear of COVID-19 in a Cuban population sample. *Int J Ment Health Addict*. 2023;21(1):685. <https://doi.org/10.1007/s11469-020-00377-y> PMID: [32840245](#)
10. Samuels J, Holingue C, Nestadt PS, Bienvenu OJ, Phan P, Nestadt G. An investigation of COVID-19 related worry in a United States population sample. *J Psychiatr Res*. 2021;144:360–8. <https://doi.org/10.1016/j.jpsychires.2021.10.036> PMID: [34735840](#)
11. Niño M, Harris C, Drawve G, Fitzpatrick KM. Race and ethnicity, gender, and age on perceived threats and fear of COVID-19: evidence from two national data sources. *SSM Popul Health*. 2021;13:100717. <https://doi.org/10.1016/j.ssmph.2020.100717> PMID: [33344747](#)
12. Aliyu S, Travers JL, Norful AA, Clarke M, Schroeder K. The lived experience of being diagnosed with COVID-19 among black patients: a qualitative study. *J Patient Exp*. 2021;8:2374373521996963. <https://doi.org/10.1177/2374373521996963> PMID: [34179380](#)
13. Livingston E, Bucher K. Coronavirus disease 2019 (COVID-19) in Italy. *JAMA*. 2020;323(14):1335. <https://doi.org/10.1001/jama.2020.4344> PMID: [32181795](#)
14. Turabian JL. Psychology of doctor-patient relationship in general medicine. *Archiv Commun Med Public Health*. 2019;5(2):062–8.
15. Funk C, Hefferon M, Kennedy B, Johnson C. Trust and mistrust in Americans' views of scientific experts. Washington, DC: Pew Research Center; 2019. https://156460235934074_EmbargoedREPORTtrustscientists7-30-19.pdf
16. Leonard MB, Pursley DM, Robinson LA, Abman SH, Davis JM. The importance of trustworthiness: lessons from the COVID-19 pandemic. *Pediatr Res*. 2022;91(3):482–5. <https://doi.org/10.1038/s41390-021-01866-z> PMID: [34853429](#)
17. Roubille C, Ribstein J, Hurpin G, Fesler P, Fiat E, Roubille F. Confidence vanished or impaired until distrust in the doctor-patient relationship because of COVID-19: confidence vanished or impaired until distrust: "COVID" in relationship. *Rev Med Interne*. 2021;42(1):58–60. <https://doi.org/10.1016/j.revmed.2020.10.007> PMID: [33168352](#)
18. Gopichandran V, Sakthivel K. Doctor-patient communication and trust in doctors during COVID 19 times-a cross sectional study in Chennai, India. *PLoS One*. 2021;16(6):e0253497. <https://doi.org/10.1371/journal.pone.0253497> PMID: [34161383](#)
19. Nwoga HO, Ajuba MO, Ezeoke UE. Effect of COVID-19 on doctor-patient relationship. *Int J Community Med Public Health*. 2020;7(12):4690. <https://doi.org/10.18203/2394-6040.ijcmph20205136>
20. Zhou Y, Chen S, Liao Y, Wu Q, Ma Y, Wang D, et al. General perception of doctor-patient relationship from patients during the COVID-19 pandemic in China: a cross-sectional study. *Front Public Health*. 2021;9:646486. <https://doi.org/10.3389/fpubh.2021.646486> PMID: [34295863](#)

21. Food and Drug Administration. FDA authorizes monoclonal antibody for treatment of COVID-19. 2020. Accessed 2022 May 15. <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-authorizes-monoclonal-antibody-treatment-covid-19>
22. Food and Drug Administration. FDA authorizes monoclonal antibody for treatment of COVID-19. 2020. Accessed 2022 May 15. <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-authorizes-monoclonal-antibodies-treatment-covid-19>
23. Chen P, Nirula A, Heller B, Gottlieb RL, Boscia J, Morris J, et al. SARS-CoV-2 neutralizing antibody LY-CoV555 in outpatients with Covid-19. *N Engl J Med*. 2021;384(3):229–37. <https://doi.org/10.1056/NEJMoa2029849> PMID: 33113295
24. Gottlieb RL, Nirula A, Chen P, Boscia J, Heller B, Morris J, et al. Effect of Bamlanivimab as Monotherapy or in combination with etesevimab on viral load in patients with mild to moderate COVID-19: a randomized clinical trial. *JAMA*. 2021;325(7):632–44. <https://doi.org/10.1001/jama.2021.0202> PMID: 33475701
25. Weinreich DM, Sivapalasingam S, Norton T, Ali S, Gao H, Bhore R, et al. REGN-COV2, a neutralizing antibody cocktail, in outpatients with Covid-19. *N Engl J Med*. 2021;384(3):238–51. <https://doi.org/10.1056/NEJMoa2035002> PMID: 33332778
26. Gupta A, Gonzalez-Rojas Y, Juarez E, Crespo Casal M, Moya J, Falci DR, et al. Early treatment for Covid-19 with SARS-CoV-2 neutralizing antibody sotrovimab. *N Engl J Med*. 2021;385(21):1941–50. <https://doi.org/10.1056/NEJMoa2107934> PMID: 34706189
27. Dougan M, Azizad M, Chen P, Feldman B, Frieman M, Igbinadolor A, et al. Bebtelovimab, alone or together with bamlanivimab and etesevimab, as a broadly neutralizing monoclonal antibody treatment for mild to moderate, ambulatory COVID-19. Cold Spring Harbor Laboratory; 2022. <https://doi.org/10.1101/2022.03.10.22272100>
28. Wynia MK, Beaty LE, Bennett TD, Carlson NE, Davis CB, Kwan BM, et al. Real-world evidence of neutralizing monoclonal antibodies for preventing hospitalization and mortality in COVID-19 outpatients. *Chest*. 2023;163(5):1061–70. <https://doi.org/10.1016/j.chest.2022.10.020> PMID: 36441040
29. Aggarwal NR, Beaty LE, Bennett TD, Carlson NE, Davis CB, Kwan BM, et al. Real-world evidence of the neutralizing monoclonal antibody sotrovimab for preventing hospitalization and mortality in COVID-19 outpatients. *J Infect Dis*. 2022;226(12):2129–36. <https://doi.org/10.1093/infdis/jiac206> PMID: 35576581
30. Aggarwal NR, Beaty LE, Bennett TD, Carlson NE, Mayer DA, Molina KC, et al. Change in effectiveness of sotrovimab for preventing hospitalization and mortality for at-risk COVID-19 outpatients during an Omicron BA.1 and BA.1.1-predominant phase. *Int J Infect Dis*. 2023;128:310–7. <https://doi.org/10.1016/j.ijid.2022.10.002> PMID: 36229005
31. Molina KC, Kennerley V, Beaty LE, Bennett TD, Carlson NE, Mayer DA, et al. Real-world evaluation of bebtelovimab effectiveness during the period of COVID-19 Omicron variants, including BA.4/BA.5. *Int J Infect Dis*. 2023;132:34–9. <https://doi.org/10.1016/j.ijid.2023.04.396> PMID: 37072054
32. Behr CL, Joynt Maddox KE, Meara E, Epstein AM, Orav EJ, Barnett ML. Anti-SARS-CoV-2 monoclonal antibody distribution to high-risk medicare beneficiaries, 2020–2021. *JAMA*. 2022;327(10):980–3. <https://doi.org/10.1001/jama.2022.1243> PMID: 35119452
33. Anderson TS, O'Donoghue AL, Dechen T, Mechanic O, Stevens JP. Uptake of outpatient monoclonal antibody treatments for COVID-19 in the United States: a cross-sectional analysis. *J Gen Intern Med*. 2021;36(12):3922–4. <https://doi.org/10.1007/s11606-021-07109-5> PMID: 34495464
34. Wood DA, Aleem A, Davis D. Providing access to monoclonal antibody treatment of coronavirus (COVID-19) patients in rural and underserved areas. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2021. <https://europepmc.org/books/n/statpearls/article-133043/?extid=30335343&src=med>
35. Wu E-L, Kumar RN, Moore WJ, Hall GT, Vysniauskaite I, Kim K-YA, et al. Disparities in COVID-19 monoclonal antibody delivery: a retrospective cohort study. *J Gen Intern Med*. 2022;37(10):2505–13. <https://doi.org/10.1007/s11606-022-07603-4> PMID: 35469360
36. Bierle DM, Ganesh R, Wilker CG, Hanson SN, Moehne DE, Jackson TA, et al. Influence of social and cultural factors on the decision to consent for monoclonal antibody treatment among high-risk patients with mild-moderate COVID-19. *J Prim Care Community Health*. 2021;12:21501327211019282. <https://doi.org/10.1177/21501327211019282> PMID: 34032171
37. Carter P, Megnin-Viggars O, Rubin GJ. What factors influence symptom reporting and access to healthcare during an emerging infectious disease outbreak? A rapid review of the evidence. *Health Secur*. 2021;19(4):353–63. <https://doi.org/10.1089/hs.2020.0126> PMID: 33416425
38. Ambrose N, Amin A, Anderson B, Bertagnolli M, Campion F, Chow D, et al. The influence of social determinants on receiving outpatient treatment with monoclonal antibodies, disease risk, and effectiveness for COVID-19. *J Gen Intern Med*. 2023;38(16):3472–81. <https://doi.org/10.1007/s11606-023-08324-y> PMID: 37715096
39. Kwan BM, Sobczak C, Gorman C, Roberts S, Owen V, Wynia MK, et al. “All of the things to everyone everywhere”: a mixed methods analysis of community perspectives on equitable access to monoclonal antibody treatment for COVID-19. *PLoS One*. 2022;17(11):e0274043. <https://doi.org/10.1371/journal.pone.0274043> PMID: 36417457
40. Razonable RR, Ganesh R, Bishop RK, Culbertson TL, Destro Borgen M, Hedin MC, et al. Patient perspectives on anti-spike monoclonal antibody therapy for mild to moderate coronavirus disease-2019. *J Patient Exp*. 2022;9:23743735221105673. <https://doi.org/10.1177/23743735221105673> PMID: 35769314
41. Team R Core. R: a language and environment for statistical computing. R Foundation for Statistical Computing; 2013. p. 275–286.
42. Cai H. Sex difference and smoking predisposition in patients with COVID-19. *Lancet Respir Med*. 2020;8(4):e26. [https://doi.org/10.1016/S2213-2600\(20\)30130-2](https://doi.org/10.1016/S2213-2600(20)30130-2) PMID: 32246931

43. Takeshita J, Wang S, Loren AW, Mitra N, Shults J, Shin DB, et al. Association of racial/ethnic and gender concordance between patients and physicians with patient experience ratings. *JAMA Netw Open*. 2020;3(11):e2024583. <https://doi.org/10.1001/jamanetworkopen.2020.24583> PMID: [33165609](#)
44. Shen MJ, Peterson EB, Costas-Muñoz R, Hernandez MH, Jewell ST, Matsoukas K, et al. The effects of race and racial concordance on patient-physician communication: a systematic review of the literature. *J Racial Ethn Health Disparities*. 2018;5(1):117–40. <https://doi.org/10.1007/s40615-017-0350-4> PMID: [28275996](#)
45. Gonzalez D, Kenney GM, McDaniel M, O'Brien C. Racial, ethnic, and language concordance between patients and their usual health care providers. Washington, DC: Urban Institute; 2022.
46. James CV, Moonesinghe R, Wilson-Frederick SM, Hall JE, Penman-Aguilar A, Bouye K. Racial/ethnic health disparities among rural adults - United States, 2012–2015. *MMWR Surveill Summ*. 2017;66(23):1–9. <https://doi.org/10.15585/mmwr.ss6623a1> PMID: [29145359](#)
47. Fish LE, Bendelow T, Gardiner S, Wynia MK, Kwan BM, Hamer MK, et al. A multimodal strategy to improve race/ethnic group equity in administration of neutralizing monoclonal antibody treatment for COVID-19 outpatients. *J Clin Transl Sci*. 2023;7(1):e37. <https://doi.org/10.1017/cts.2022.526> PMID: [36845303](#)
48. Fiscella K, Sanders M, Yaeger J. Strategies to promote equity in COVID-19 antiviral treatment. *JAMA Health Forum*. 2022;3(3):e220050. <https://doi.org/10.1001/jamahealthforum.2022.0050> PMID: [36218879](#)
49. Arain M, Nicholl J, Campbell M. Patients' experience and satisfaction with GP led walk-in centres in the UK; a cross sectional study. *BMC Health Serv Res*. 2013;13:142. <https://doi.org/10.1186/1472-6963-13-142> PMID: [23597132](#)
50. Litaker D, Cebul RD. Managed care penetration, insurance status, and access to health care. *Med Care*. 2003;41(9):1086–95. <https://doi.org/10.1097/01.MLR.0000083741.80192.E0> PMID: [12972848](#)
51. Health Services & Resources Service. COVID-19 claims reimbursement to health care providers and facilities for testing, treatment and vaccine administration for the uninsured. Accessed 2022 May 15. <https://www.hrsa.gov/provider-relief/about/covid-uninsured-claim>
52. Ou M, Zhu J, Ji P, Li H, Zhong Z, Li B, et al. Risk factors of severe cases with COVID-19: a meta-analysis. *Epidemiol Infect*. 2020;148:e175. <https://doi.org/10.1017/S095026882000179X> PMID: [32782035](#)
53. Rod JE, Oviedo-Trespalacios O, Cortes-Ramirez J. A brief-review of the risk factors for covid-19 severity. *Rev Saude Publica*. 2020;54:60. <https://doi.org/10.11606/s1518-8787.2020054002481> PMID: [32491116](#)
54. Sircar A. Op-ed: as a doctor in a COVID unit, I'm running out of compassion for the unvaccinated. *Get the shot*. Los Angeles Times. 2021. 2021 August 21. <https://www.latimes.com/opinion/story/2021-08-17/vaccinated-covid-doctor-shot#:~:text=Op%2DEd%3A%20As%20a%20doctor,could%20not%20be%20more%20wrong>
55. Marcus R. Doctors should be allowed to give priority to vaccinated patients when resources are scarce. *The Washington Post*. 2021. Accessed 2021 December 29. <https://www.washingtonpost.com/opinions/2021/09/03/doctors-should-be-allowed-give-priority-vaccinated-patients-when-resources-are-scarce>
56. Fox J, Meisenberg B. The 3-fold harms of compassion fatigue during COVID-19 surges. *Am J Med*. 2022;135(8):e234–5. <https://doi.org/10.1016/j.amjmed.2022.01.023> PMID: [35131309](#)
57. National Institutes of Health. Prioritization of anti-SARS-CoV-2 therapies for the treatment of COVID-19 in nonhospitalized patients when there are logistical constraints. Accessed 2023 March 15. <https://www.covid19treatmentguidelines.nih.gov/overview/prioritization-of-therapeutics/#:~:text=The%20prioritization%20scheme%20below%20is,Risk%20for%20Severe%20COVID%2D19>
58. Key T, Kulkarni A, Kandhari V, Jawad Z, Hughes A, Mohanty K. The patient experience of inpatient care during the COVID-19 pandemic: exploring patient perceptions, communication, and quality of care at a university teaching hospital in the United Kingdom. *J Patient Exp*. 2021;8. <https://doi.org/10.1177/2374373521997742> PMID: [34179394](#)
59. Engel FD, da Fonseca GGP, Cechinel-Peiter C, Backman C, da Costa DG, de Mello ALSF. Impact of the COVID-19 pandemic on the experiences of hospitalized patients: a scoping review. *J Patient Saf*. 2023;19(2):e46–52. <https://doi.org/10.1097/PTS.0000000000001084> PMID: [36459699](#)
60. Elliott MN, Beckett MK, Cohea CW, Lehrman WG, Cleary PD, Giordano LA, et al. Changes in patient experiences of hospital care during the COVID-19 pandemic. *JAMA Health Forum*. 2023;4(8):e232766. <https://doi.org/10.1001/jamahealthforum.2023.2766> PMID: [37624612](#)