INTRODUCTION
The coronavirus disease 2019 (COVID-19) pandemic has had dramatic effects on healthcare delivery in the USA, with decreased utilization of emergent, elective, and routine services, particularly among non-White adults and adults in poor health. However, little is known about how frequently delayed care has subsequently been received, and whether disparities exist in which patients have received delayed care. The objective of this study was to assess delays in medical care during the pandemic in a cohort of Detroit residents and assess whether patients who experienced delays subsequently received delayed care.

METHODS
The Detroit Metro Area Communities Study (DMACS) is an annual longitudinal panel survey of Detroit residents aged 18 and older. Data are collected by trained interviewers and/or by self-administered surveys. We conducted a cross-sectional analysis of COVID-19 survey data collected in October, 2020. The study was approved by the University of Michigan Institutional Review Board.

Respondents were asked whether they had experienced delays for any reason in 11 common types of care (routine well check-ups, care for new conditions, follow-up for ongoing conditions, surgical procedures, birth control, Pap smears, mammograms, colonoscopies, dental cleaning, urgent dental care, and other). Additionally, for each type of delayed care, respondents were asked if they had subsequently received that care as of the time of the survey.

RESULTS
Of the 1760 panelists invited, 1012 respondents completed the survey, for a response rate of 60% (Table 1). Nearly half (46.8%, 95% CI 42.3–51.3%) of respondents reported at least one type of delayed care—most commonly dental cleaning (23.5%, 95% CI 19.7–27.3%) and routine check-ups (23.0%, 95% CI 19.2–26.8%) (Fig. 1). Only 22.8% (95% CI 18.9–26.6%) of respondents reported having received the delayed care, representing about half (48.7%) of the respondents who experienced care delays (Fig. 1). In adjusted analyses, being non-Hispanic Black, belonging to other non-Hispanic minority/multiracial groups, and having personal experience of COVID-19 were significantly associated with delayed care. Among those who experienced delayed care, respondents reporting fair/poor health status had significantly lower adjusted odds of subsequently receiving the delayed care (Table 1).

DISCUSSION
In March 2020, the US Centers for Disease Control and Prevention recommended delaying all non-emergent care during the national COVID-19 emergency. Such policies, along with fear of exposure, resulted in disruptions in access to care and delayed or forgone care. We found that almost half of Detroit residents in our cohort experienced a delay in medical care during the first seven months of the pandemic. Non-White individuals and individuals with personal experience with COVID-19 were more likely to experience care delays. Among individuals experiencing care...
delays, half had not subsequently received that care as of October, 2020, and individuals with fair or poor self-reported health were less likely to have received delayed care.

While other studies have examined risk factors for delayed care and found similar results to ours,\(^3,4\) to our knowledge, our study is among the first to assess overall rates of receiving delayed care and examine factors that predict subsequent receipt of delayed care. Our results suggest that non-White individuals were more likely to experience care delays, and that sicker individuals potentially experienced longer delays in receiving care than people in better health. Both findings could potentially result in worse health outcomes for these vulnerable groups, and indeed, recent studies have shown both overall worsening of self-reported health and widening racial/ethnic disparities in self-reported health during the pandemic.\(^6\) Our study highlights the possibility that delays in care could be contributing to these adverse outcomes.

Study limitations include our inability to assess the exact duration of the care delays, confirm receipt of delayed care in medical records, or assess health outcomes of those who delayed care. Further, although our survey respondents were racially and socioeconomically diverse, these results may not be generalizable to other populations. Future work should assess whether pandemic-related care delays have led to changes in health outcomes for patients.

### Table 1 Sample Description and Logistic Regression Models Predicting Delayed Care and Receipt of Delayed Care Between March 2020 and October 2020

| Variable | Weighted N (%) | Predicting delays in care | Predicting receipt of delayed care |
|----------|----------------|---------------------------|-----------------------------------|
|          |                | aORs 95% CI                | aORs 95% CI                       |
| Total respondents (%) | 1012 (100) | 920 (90.9) | 449 (44.4) |
| Race/ethnicity | | | |
| Non-Hispanic White | 104.2 (10.4) | Reference | Reference |
| Non-Hispanic Black | 775.7 (77.1) | 1.86* 1.06, 3.27 | 1.31 0.55, 3.09 |
| Hispanic | 80.7 (8.0) | 1.45 0.58, 3.65 | 0.84 0.17, 4.19 |
| Other (non-Hispanic multi-race or non-Hispanic other) | 45.1 (4.5) | 3.41** 1.57, 7.40 | 1.16 0.32, 4.24 |
| Self-reported health status | | | |
| Excell lent/very good/good | 785.5 (77.9) | Reference | Reference |
| Fair/poor | 223.1 (22.1) | 1.45 0.87, 2.41 | 0.42** 0.22, 0.79 |
| Gender | | | |
| Male | 442.6 (43.8) | Reference | Reference |
| Female | 558.3 (55.3) | 1.27 0.84, 1.91 | 0.92 0.51, 1.67 |
| Gender non-conforming/non-binary/other | 9.3 (0.9) | 4.46 0.54, 36.80 | 2.87 0.40, 20.67 |
| Income | | | |
| Below $35,000 | 535.3 (53.7) | Reference | Reference |
| $35,000 or more | 461.4 (46.3) | 1.14 0.72, 1.79 | 0.87 0.46, 1.63 |
| Employment status | | | |
| Employed in the last month | 464.2 (48.3) | Reference | Reference |
| Unemployed in the last month | 134.6 (14.0) | 1.26 0.67, 2.38 | 0.73 0.30, 1.76 |
| Out of labor force in the last month | 361.6 (37.7) | 1.06 0.66, 1.68 | 1.48 0.76, 2.87 |
| Insurance status | | | |
| Uninsured | 115.6 (11.9) | Reference | Reference |
| Insured | 856.4 (88.1) | 0.81 0.44, 1.52 | 1.12 0.46, 2.71 |
| Education status | | | |
| Less than high school/high school/GED | 488.5 (48.5) | Reference | Reference |
| Greater than high school or GED | 519.3 (51.5) | 0.78 0.50, 1.22 | 0.71 0.39, 1.28 |
| Personal experience with COVID-19 | | | |
| No | 588.4 (58.2) | Reference | Reference |
| Yes | 423.6 (41.9) | 1.54* 1.03, 2.31 | 1.07 0.60, 1.91 |

aOR, adjusted odds ratio; CI, confidence interval. *p < 0.05, **p < 0.01, ***p < 0
Fig. 1 Rates of delayed care and rates of receipt of delayed care from March 2020 to October 2020.

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