

# Understanding COVID-19 Vaccine Hesitancy among Firefighters: Application of the Health Belief Model

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## BACKGROUND:

- Vaccination is one of the major tools to combat COVID-19, yet many are hesitant.
- COVID-19 was the leading cause of duty-related firefighter deaths in 2020 and 2021.
- More than half of firefighters were hesitant about getting vaccinated prior to its availability.

## OBJECTIVES:

- Assess the prevalence of COVID-19 vaccination among firefighters in the state of Minnesota (MN)
- Explore whether attitudes, informed by the Health Belief Model (HBM), are associated with being fully vaccinated or receiving a booster shot in this population

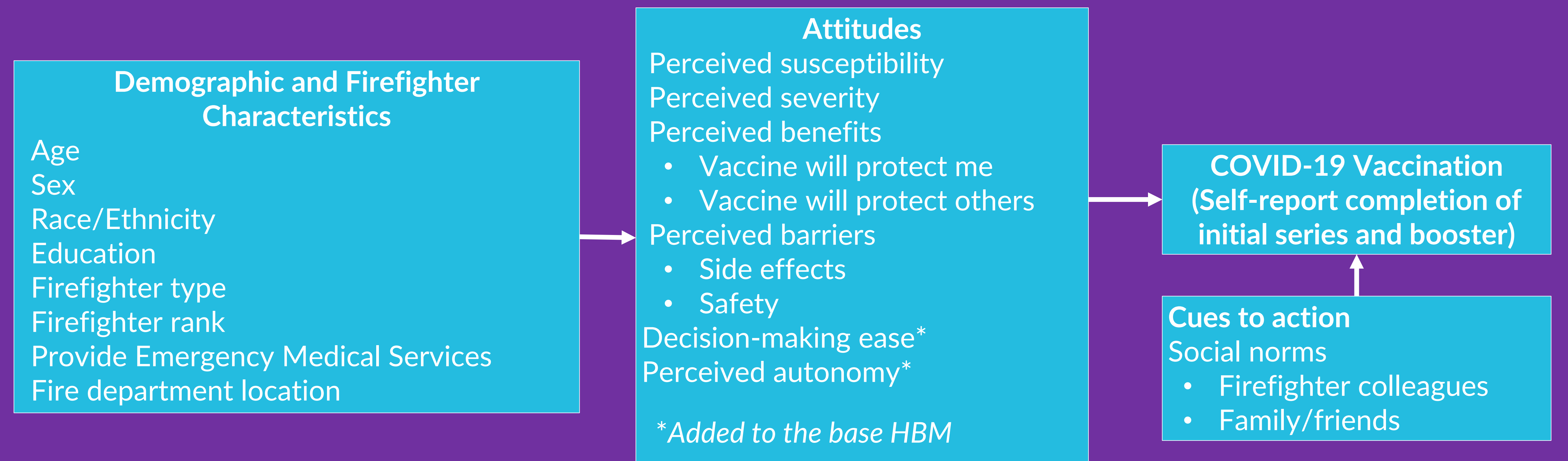
## TARGET POPULATION & SETTING:



Firefighters in MN (estimated 19,911)

## METHODS:

### Conceptual Model (based on the Health Belief Model [HBM]) and Survey Measures

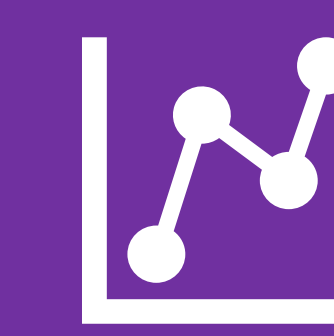


## Procedure



- Cross-sectional online survey (March-April 2021)
- Distributed via email lists from state firefighting leadership and union organizations and subsequent snowball sampling
- Optional participation in a drawing for one of 50 \$100 Amazon gift cards

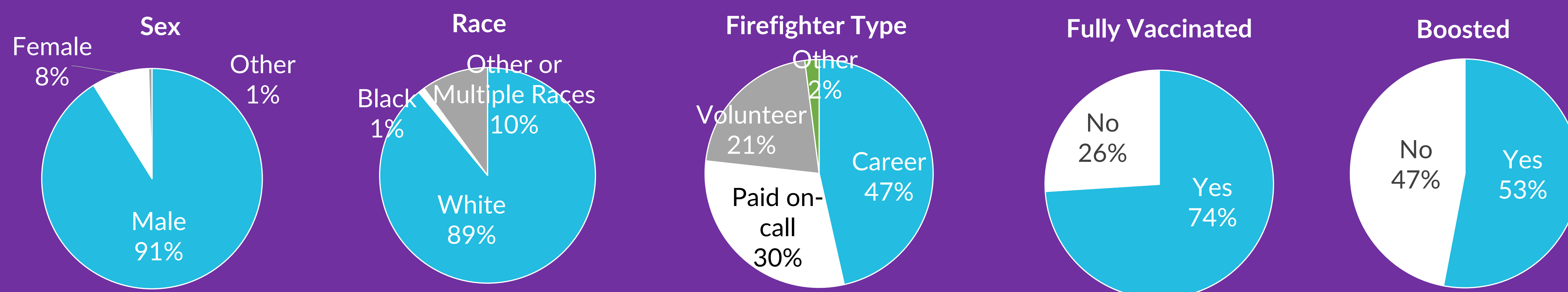
## Analysis



- Independent samples *t*-tests compared vaccinated v. not vaccinated and boosted v. not boosted on attitudes towards COVID-19 and vaccination
- Logistic regression models adjusted for demographic and firefighter characteristics and other attitudes

Attitudes towards COVID-19 and vaccination, informed by the HBM, are strongly associated with likelihood of being vaccinated or receiving a booster among MN firefighters.

## RESULTS: N = 974 firefighters responded



Firefighters who were vaccinated and boosted had more favorable attitudes towards COVID-19 and vaccines (see Figures 1 & 2)

Figure 1. Differences in attitudes between those who were fully vaccinated or not

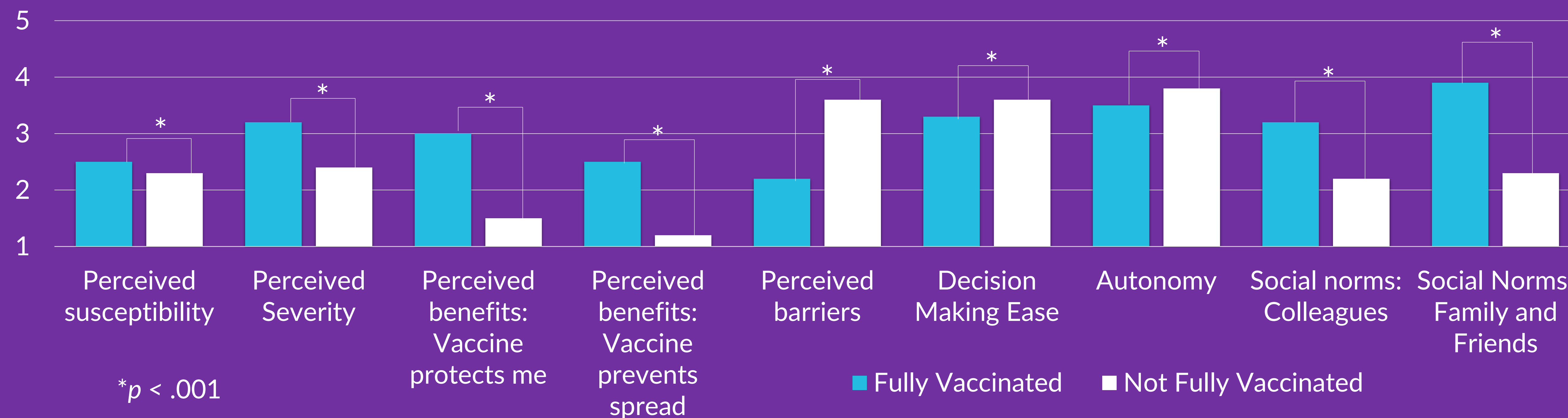
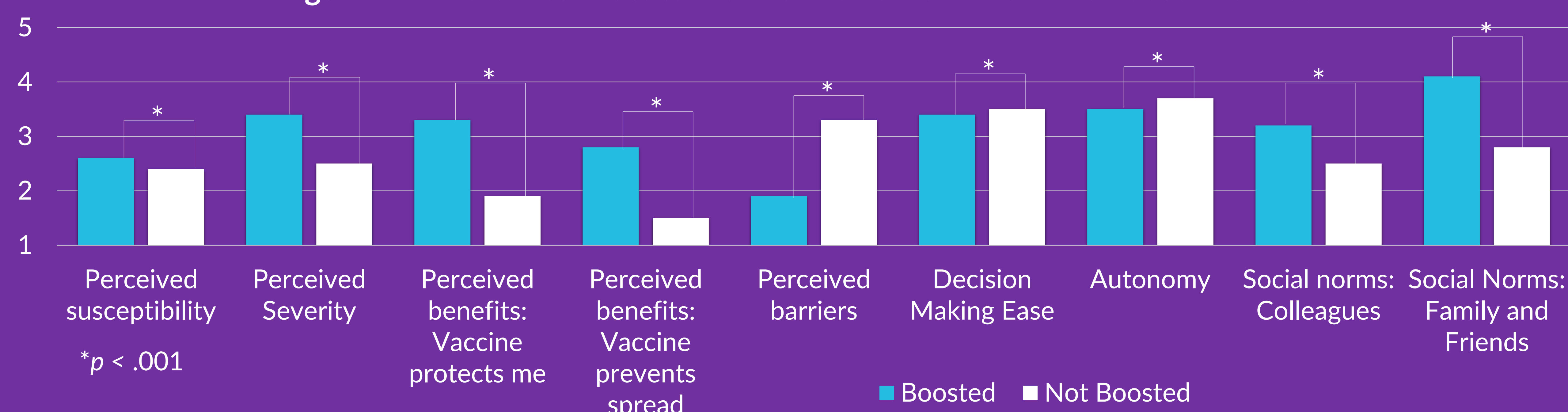


Figure 2. Differences in attitudes between those who were boosted or not



Note. Measures in Figures 1 & 2 are on scales from 1-5, with higher scores meaning greater endorsement of the construct.

TABLE 2. Logistic regression models predicting whether respondents were fully vaccinated or not or were boosted or not.

Parameter	Fully Vaccinated		Boosted	
	OR	95% CI	OR	95% CI
Male	2.10	0.78, 5.63	0.60	0.26, 1.38
White	0.91	0.43, 1.91	1.00	0.53, 1.89
Age				
Age 18-29	0.14	0.03, 0.58	0.12	0.04, 0.43
Age 30-39	0.35	0.11, 1.16	0.24	0.10, 0.61
Age 40-49	0.79	0.25, 2.47	0.49	0.21, 1.17
Age 50-59	0.70	0.22, 2.22	0.52	0.22, 1.23
Age 60+	REF		REF	
Education: 4-year degree or higher	0.71	0.39, 1.29	1.22	0.76, 1.94
Type: Career Firefighter	1.07	0.58, 1.99	2.06	1.28, 3.32
Rank: Officer or Inspector	0.90	0.53, 1.54	1.26	0.83, 1.93
Dept Provides EMS	1.65	0.78, 3.49	0.64	0.34, 1.21
Location				
Not Twin Cities	0.69	0.36, 1.31	1.03	0.64, 1.67
Unknown	0.69	0.31, 1.52	0.89	0.47, 1.70
Twin Cities	REF		REF	
Perceived barriers	0.40	0.29, 0.55	0.43	0.34, 0.55
Perceived susceptibility	1.17	0.87, 1.58	1.26	0.98, 1.62
Perceived severity	0.88	0.63, 1.21	1.30	1.00, 1.69
Perceived benefits: Vaccine protect me	2.57	1.78, 3.73	1.71	1.27, 2.30
Perceived benefits: Vaccine prevent spread	1.34	0.88, 2.04	1.72	1.33, 2.23
Decision-making ease	0.41	0.30, 0.55	0.98	0.75, 1.27
Autonomy	0.67	0.46, 0.98	0.81	0.62, 1.07
Social Norms: Colleagues	1.39	1.00, 1.93	0.94	0.71, 1.25
Social Norms: Family/friends	2.09	1.53, 2.85	1.73	1.32, 2.25

Note. Odds ratios (OR) that are statistically significant are in blue font. CI = Confidence Interval.

Less likely to be vaccinated if they had:

- more concerns about vaccine safety and side effects
- greater ease of decision making
- greater autonomy

More likely to be vaccinated if:

- they believed the vaccine protects them from COVID-19
- more of their family/friends were vaccinated

## CONCLUSIONS:

- Surveyed firefighters have similar rates of vaccination to the general population (76% of adult Minnesotans), despite higher exposure risks.
- Results are limited by volunteer bias.
- Attitudinal constructs, informed by the HBM, may be key targets to encourage vaccination.