

## Background

- Health care personnel (HCP) are at increased risk for SARS-CoV-2 exposure. However, the exposure sources among HCP are poorly understood .

## Objectives

- We describe burden of SARS- CoV-2 infection among HCPs in a large healthcare facility , sources of infection and occupational factors such as role, setting, vaccination status and patient contact.

## Methods

- Design: We conducted active prospective surveillance for all employed HCP newly diagnosed with COVID-19 between March 2020 and May 2022.
- Setting: SUNY Upstate Medical University
- Data collection: We inquired about their sources of exposure using a standardized health department checklist and CDC guidance for managing healthcare personnel with SARS-CoV-2 infection or exposure.
- Data Analysis:
  - Frequencies and percentages of employment characteristics, masked contact, and vaccination status were described across COVID-19 exposure categories and statistically compared with chi-square statistics.
  - Cumulative incidences of COVID-19 were calculated for all cases and separately among each exposure type.

## Results

- We identified n=4,430 HCP COVID-19 cases between March 2020 and May 2022.
- The median age of cases was 37 years (range 18-89); 2840 (64.1%) were females; and the majority were white (n=2907, 65.6%).
- Most of the infected HCP were in the general medicine department followed by ancillary departments, and support staff. Less than 10% of HCP positive cases worked on a COVID unit, only 194 (4.4%) admitted unmasked contact with a patient or co-worker.

## Source of Exposure

- Most of the reported SARS-CoV-2 exposures were from an unknown source n=2,571 (58.0%), followed by household source, n=1,185 (26.8%), community source n=458 (10.3%) and health care exposures, n=211 (4.8%).

## Results (cont.)

### Vaccination Status

- A higher proportion of cases with reported health care exposures were vaccinated with only 1 or 2 doses, while a higher proportion of cases with reported household exposure were fully vaccinated and boosted (p<0.0001), table 1.

Table 1. Vaccine status of All HCP Covid-19 Cases by Exposure (N=4430)\*

Characteristic	Health Care Exposure (N=211)	Household Exposure (N=1185)	Community Exposure (N=458)	Unknown Exposure (N=2571)
	No. (%)	No. (%)	No. (%)	No. (%)
<b>Covid Vaccine Doses</b>				
No Doses	58 (27.5)	321 (27.1)	174 (38.0)	991 (38.6)
1 or 2 Doses	90 (42.7)	396 (33.4)	154 (33.6)	784 (30.5)
3 Doses	63 (29.9)	468 (39.5)	130 (28.4)	796 (31.0)

\*Five cases (0.1%) were missing information on exposure type.

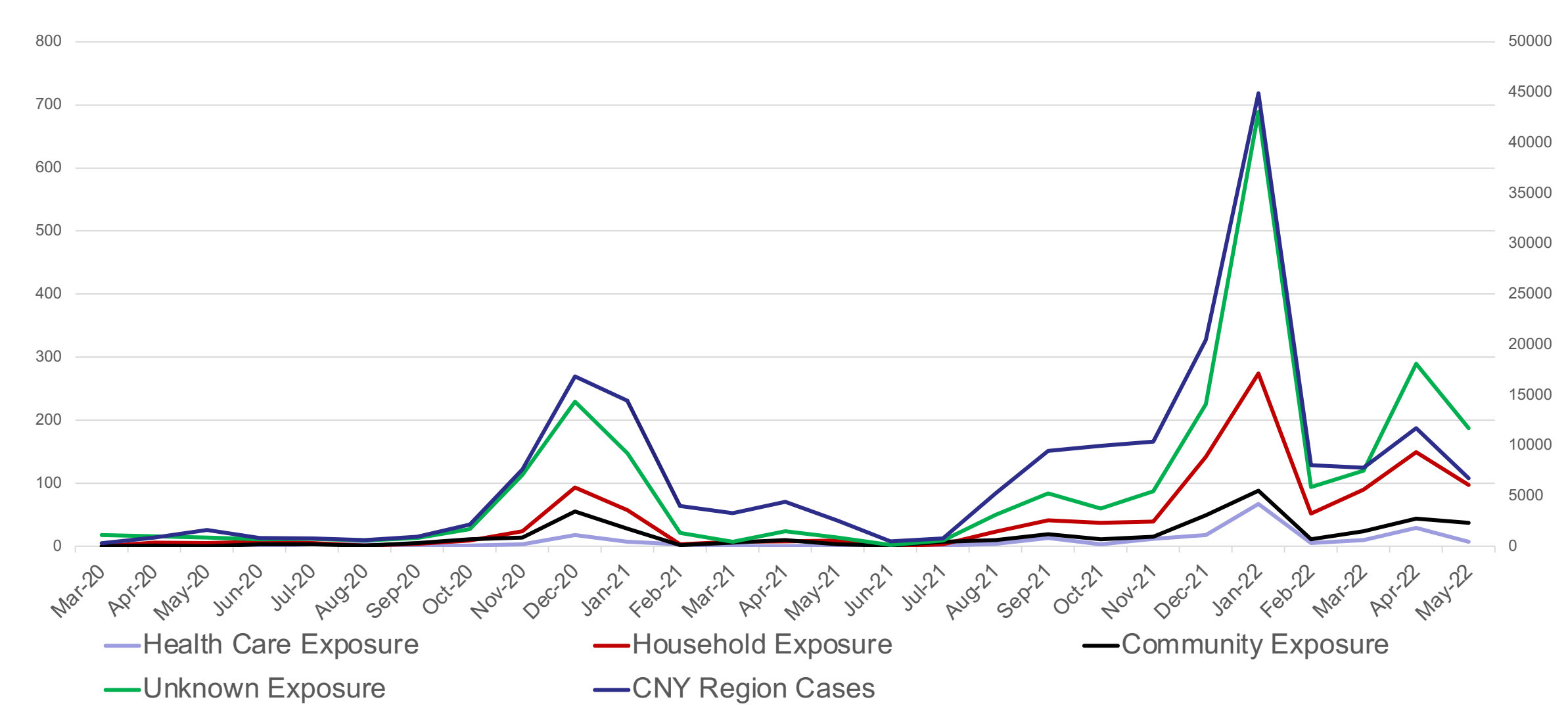
### Hospital Role

- The cumulative incidence of COVID-19 among the 8,766 HCP employees during the study period was 35.2%. There was statistically significant variability in incidence by hospital role (p<0.0001), with registered nurses being the most likely to be infected (n=888, 47.9%), followed by Master's level clinicians (n=84, 39.6%). Administration and management were the least likely to be infected with COVID-19 (n=173, 21.4%).
- Registered nurses with unknown source of exposure, had the highest incidence of 26.4%.
- Statistically significant variability was also found by level of patient contact (p<0.0001), with increasing level of patient contact resulting in increasing incidence of COVID-19.

## COVID-19 infection among HCP and community level transmission

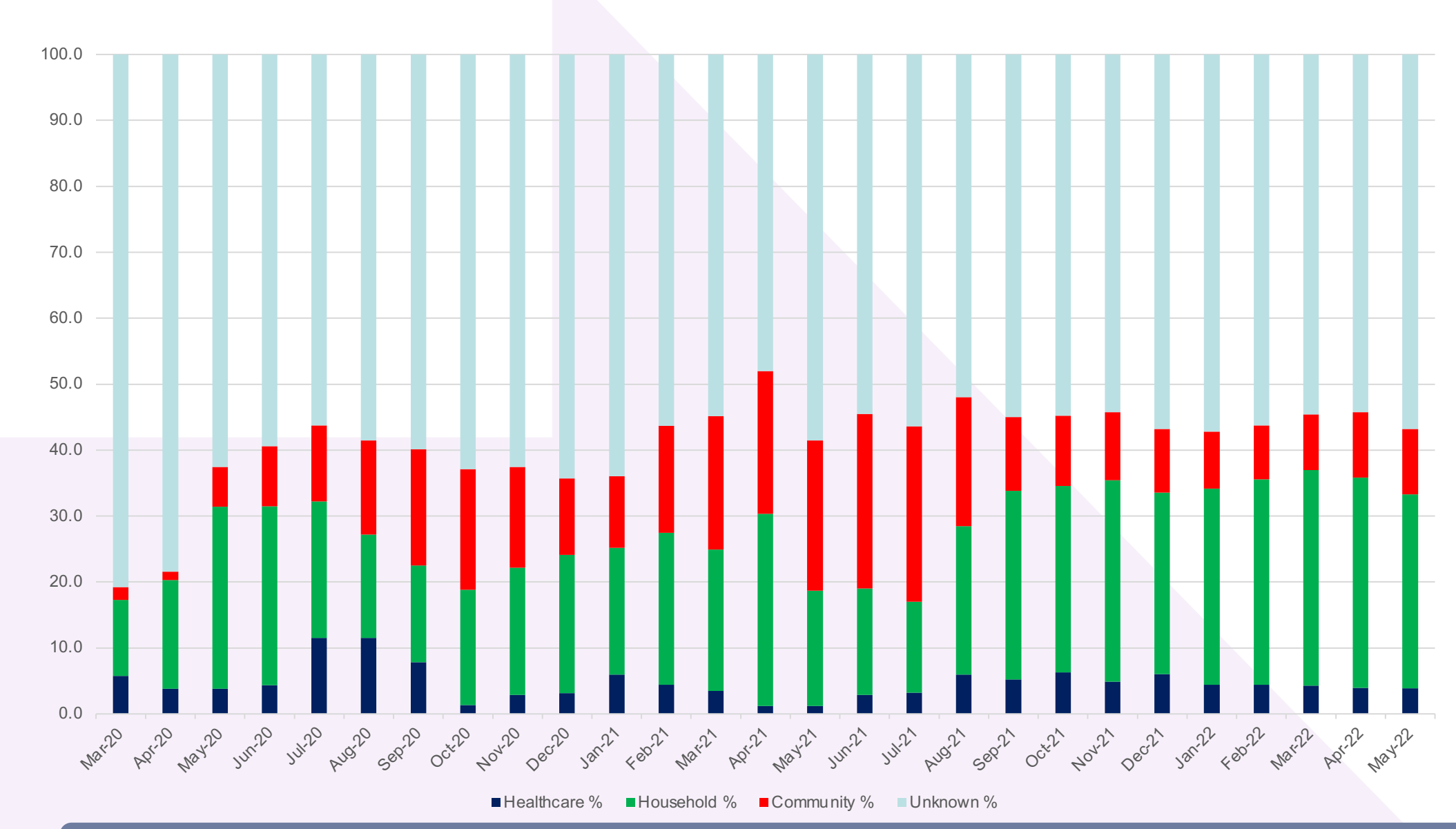
- HCP exposure to COVID-19 correlated with community level transmission regardless of type of reported exposure, figure 1.
- The sources of exposure have not changed substantially over time, figure 2.

Figure 1. HCP COVID-19 cases by source of exposure (Left Axis) in the Central New York region (Right Axis) between March 2020 and May 2022.



## Results (cont.)

Figure 2. Proportions of COVID-19 exposures among HCP



## Conclusions

- Majority of HCP had unknown source of COVID-19 exposure followed by household and community exposures.
- Health care setting was not an important source of infection among HCP and was reported in less than 5% of HCP.
- We have observed substantial variability of SARS-CoV-2 infection incidence among HCP with different hospital roles.
- COVID-19 infections among HCP correlated closely with community level.
- HCP are aware of occupational risks. HCP may let down their guard in nonoccupational settings where exposure risk, although less obvious, may in fact be greater.

## Next steps

- We must remain diligent and educate HCP about community risk to address transmission through all source settings.
- It is unclear what specific factors contributed to elevated risk among nurses and should be a focus of future study.

## References

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