# Implementation of COVID-19 Surveillance Testing Procedures in Dental School

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## Introduction

- Dental practitioners and students of dentistry may be at increased risk of COVID-19 infection due to frequent usage of aerosol-generating procedures (AGP). Individuals in different positions within dental practice will have different exposures to AGP [1]
- To mitigate risk to patients and providers, the University of Utah School of Dentistry began regular surveillance PCR testing of its patient-facing faculty, staff, and students in May 2020. The department employed the following enhanced environmental control measures:
  - Patient pre-procedural testing within 3 days of appointments
  - Additional clinical spacing
  - HEPA filters placed in clinics to turn over the air every 10 minutes
  - All clinical providers wore fit tested N95 masks during all patient care
- We present an analysis to assess whether groups with more frequent exposure to AGP are at increased risk of positive COVID-19 surveillance test.

## Methods

- Surveillance PCR testing every other week for non-vaccinated individuals from May 2020 and through February 2022.
- After May 2021, fully vaccinated individuals were tested monthly and encouraged to seek additional testing if symptoms or an exposure occurred.
- We assessed risk of positive test among faculty, student, and staff groups through a Cox proportional hazards regression
- To account for inconsistent testing after vaccination, time was examined as number of tests rather than calendar time.
- Additional analysis was performed on a subgroup of the population for which survey data of direct involvement with AGP was available.
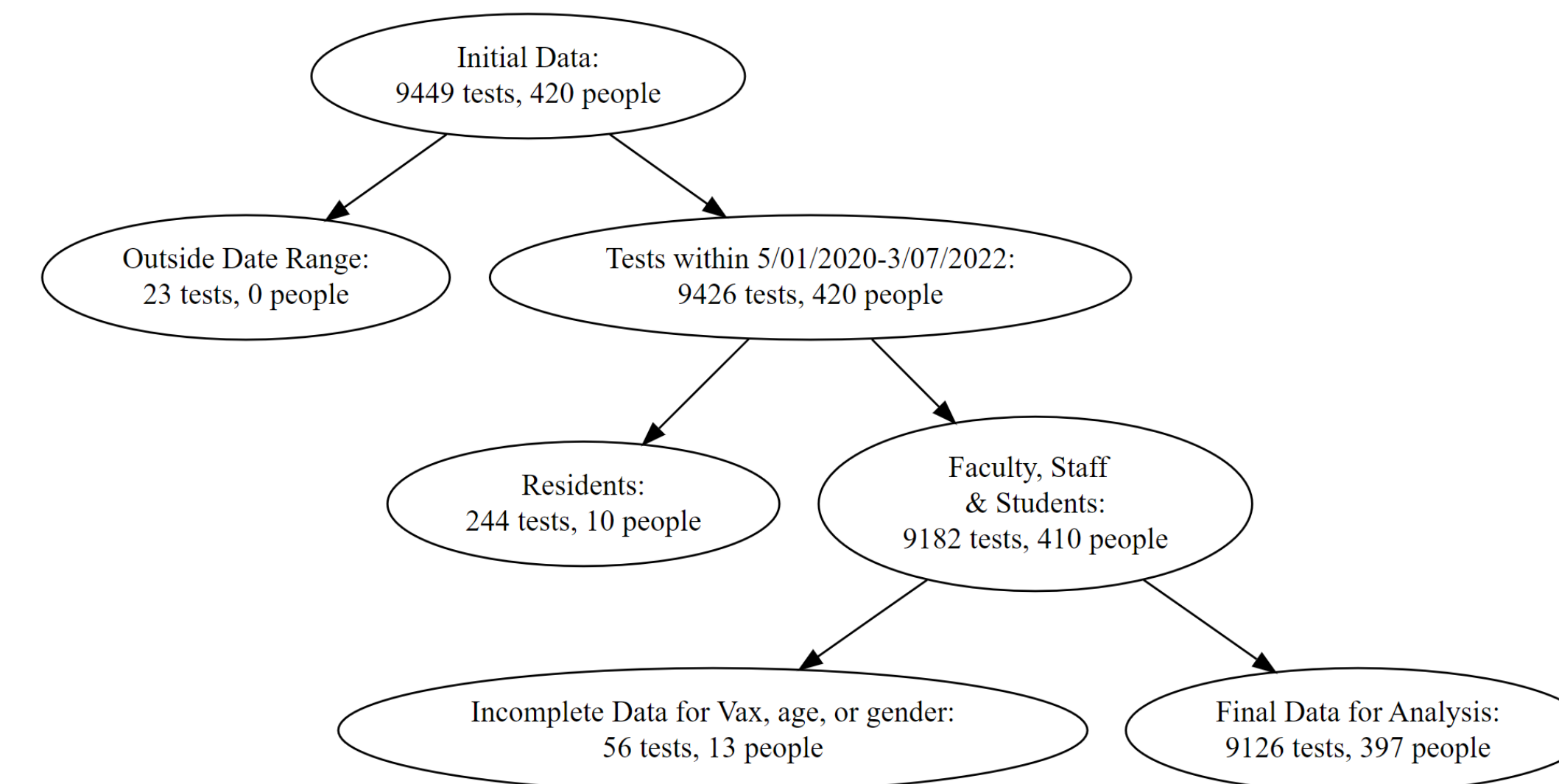


Figure 1. Selection diagram for analysis dataset of dental school COVID-19 screening participants
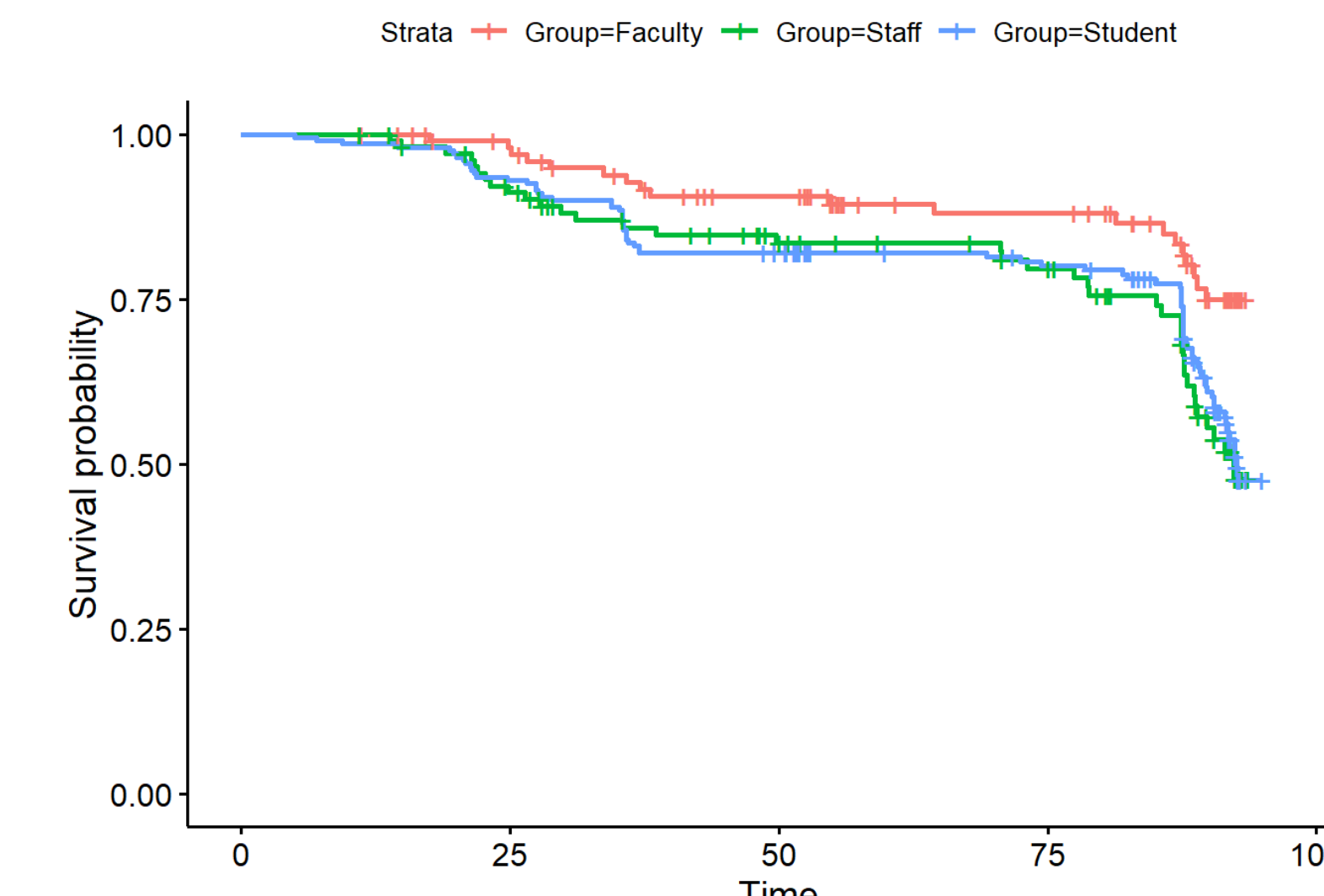


Figure 2. Survival Probability (Kaplan Meyer Curve) of participants for positive COVID-19 screening test.

## Results

Table 1. Demographics and testing characteristics of dental school study participants. Survey Data Exists for a select subgroup of the overall population, including frequency of involvement with aerosol procedures.

| | All Participants | | | | Survey Subgroup | | | |
|---|---|---|---|---|---|---|---|---|
| | Faculty (N=104) | Staff (N=106) | Student (N=200) | Total (N=410) | Faculty (N=24) | Staff (N=23) | Student (N=69) | Total (N=116) |
| **Age** | | | | | | | | |
| Median | 61.5 | 36.0 | 27.0 | 31.0 | 65.5 | 39.0 | 28.0 | 30.5 |
| Range | 34.0 - 85.0 | 19.0 - 69.0 | 22.0 - 43.0 | 19.000 - 85.0 | 38.0 - 85.0 | 24.0 - 69.0 | 22.0 - 43.0 | 22.0 - 85.0 |
| Mean (SD) | 59.0 (12.8) | 37.857 (11.2) | 27.9 (3.3) | 38.4 (15.6) | 62.2 (13.8) | 43.7 (13.1) | 28.7 (4.1) | 38.6 (16.2) |
| **Gender** | | | | | | | | |
| N-Miss | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 |
| F | 15 (14.4%) | 83 (84.7%) | 68 (34.0%) | 166 (41.3%) | 5 (20.8%) | 20 (87.0%) | 30 (43.5%) | 55 (47.4%) |
| M | 89 (85.6%) | 15 (15.3%) | 132 (66.0%) | 236 (58.7%) | 19 (79.2%) | 3 (13.0%) | 39 (56.5%) | 61 (52.6%) |
| **Total # of Tests** | | | | | | | | |
| Median | 22.0 | 20.5 | 25.0 | 24.0 | 30.0 | 29.0 | 26.0 | 27.0 |
| Range | 1.0 - 50.0 | 1.0 - 45.0 | 10.0 - 41.0 | 1.0 - 50.0 | 23.0 - 50.0 | 8.0 - 40.0 | 12.0 - 37.0 | 8.0 - 50.0 |
| Mean (SD) | 21.5 (12.058) | 20.4 (13.1) | 24.0 (5.8) | 22.5 (10.0) | 32.8 (8.0) | 28.0 (9.0) | 24.7 (5.4) | 27.0 (7.5) |
| **Total Positive Tests** | | | | | | | | |
| 0 | 85 (81.7%) | 68 (64.2%) | 122 (61.0%) | 275 (67.1%) | 18 (75.0%) | 13 (56.5%) | 42 (60.9%) | 73 (62.9%) |
| 1 | 16 (15.4%) | 32 (30.2%) | 64 (32.0%) | 112 (27.3%) | 5 (20.8%) | 6 (26.1%) | 22 (31.9%) | 33 (28.4%) |
| 2 | 3 (2.9%) | 6 (5.7%) | 14 (7.0%) | 23 (5.6%) | 1 (4.2%) | 4 (17.4%) | 5 (7.2%) | 10 (8.6%) |
| **Follow-up time (weeks from final to last observation)** | | | | | | | | |
| Median | 77.5 | 73.6 | 74.3 | 74.6 | 88.0 | 88.6 | 74.9 | 77.9 |
| Range | 0.0 - 91.3 | 0.0 - 91.9 | 33.6 - 91.6 | 0.0 - 91.9 | 52.0 - 91.3 | 26.0 - 91.7 | 44.1 - 90.0 | 26.0 - 91.7 |
| Mean (SD) | 64.8 (27.6) | 59.7 (32.0) | 68.2 (13.1) | 65.1 (23.5) | 84.7 (8.6) | 80.0 (19.8) | 69.0 (13.7) | 74.4 (15.7) |
| **Max Vaccines Reported by end of follow-up** | | | | | | | | |
| N-Miss | 2 | 9 | 0 | 11 | 0 | 1 | 0 | 1 |
| 0 | 14 (13.7%) | 19 (19.6%) | 19 (9.5%) | 52 (13.0%) | 0 (0.0%) | 1 (4.5%) | 7 (10.1%) | 8 (7.0%) |
| 1 | 4 (3.9%) | 7 (7.2%) | 10 (5.0%) | 21 (5.3%) | 1 (4.2%) | 0 (0.0%) | 2 (2.9%) | 3 (2.6%) |
| 2 | 34 (33.3%) | 46 (47.4%) | 105 (52.5%) | 185 (46.4%) | 5 (20.8%) | 12 (54.5%) | 33 (47.8%) | 50 (43.5%) |
| 3 | 50 (49.0%) | 25 (25.8%) | 66 (33.0%) | 141 (35.3%) | 18 (75.0%) | 9 (40.9%) | 27 (39.1%) | 54 (47.0%) |
| **Aerosol Procedure Frequency** | | | | | | | | |
| N-Miss | - | - | - | - | 1 | 0 | 0 | 1 |
| Often/Frequently (Once a per week or more) | - | - | - | - | 16 (69.6%) | 9 (39.1%) | 59 (85.5%) | 84 (73.0%) |
| Once a month or less | - | - | - | - | 7 (30.4%) | 14 (60.9%) | 10 (14.5%) | 31 (27.0%) |

## Results
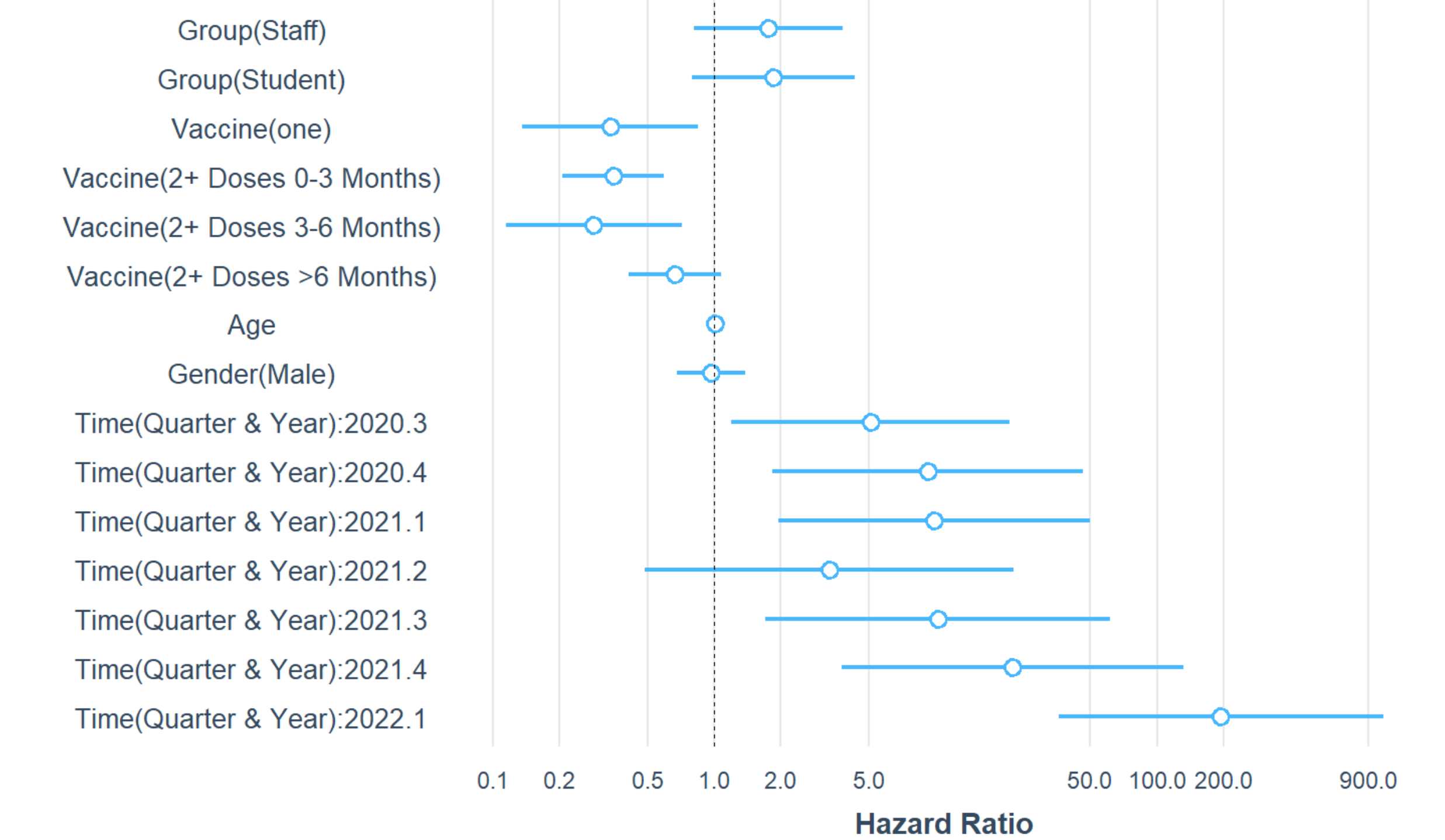


Figure 3. Risk of positive COVID-19 screening test in dental school participants from Cox proportional hazards regression, accounting for multiple events and time-dependent variables with the Andersen-Gill model. To account for inconsistent testing after vaccination, time was examined as number of tests rather than calendar time.
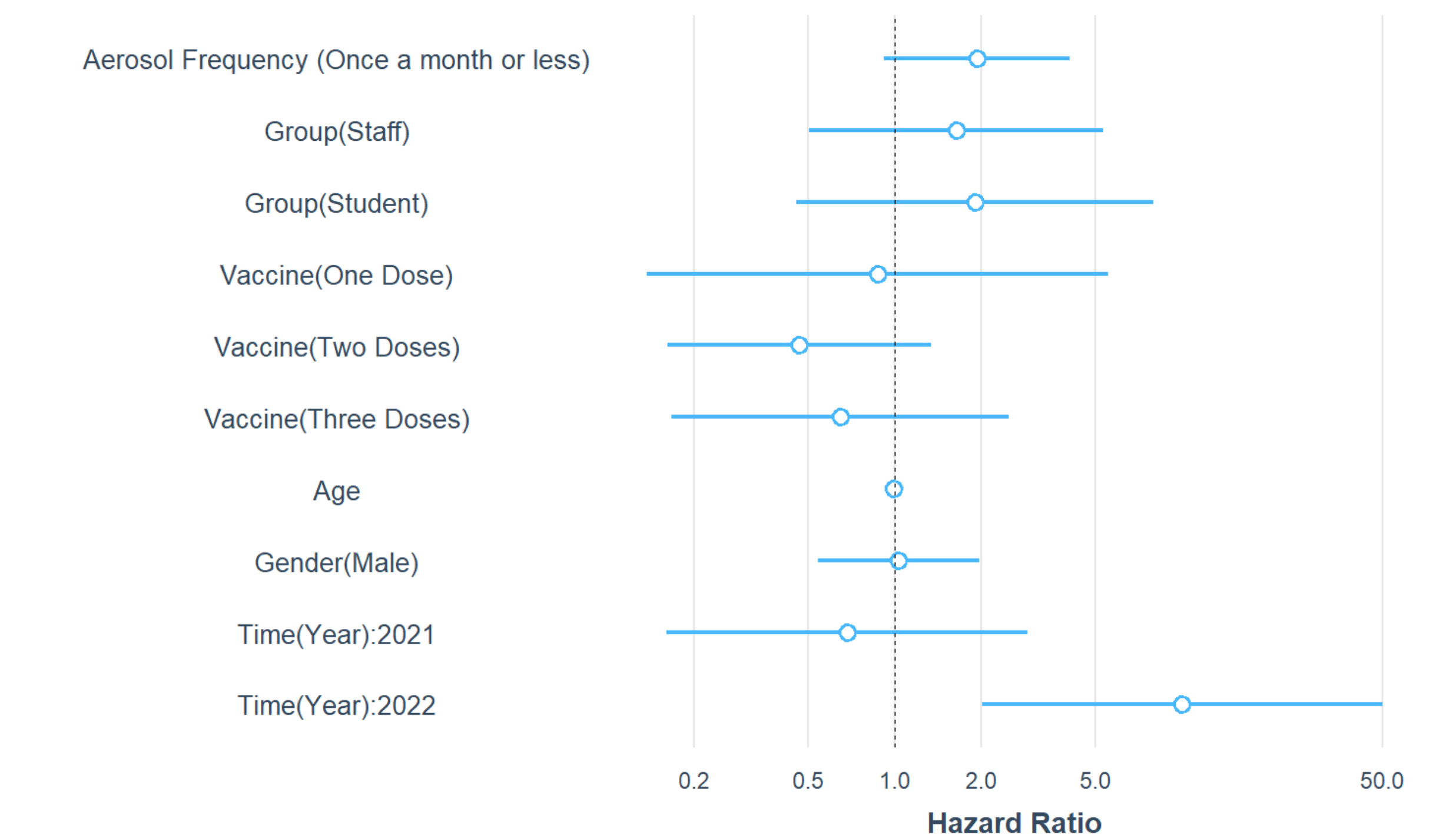


Figure 4. Risk of positive COVID-19 screening test in subgroup of dental school participants from Cox proportional hazards regression, accounting for multiple events and time-dependent variables with the Andersen-Gill model. To account for inconsistent testing after vaccination, time was examined as number of tests rather than calendar time. Frequent involvement with AGP was more common than less frequent AGP involvement, so frequent AGP use (Once a week or more) was used a reference.

## Conclusion

- Within this dental setting we do not see evidence that work role and resulting exposures increase risk when prevention measures are in place.

## References

1. Holliday R, Allison JR, Currie CC, et al. Evaluating contaminated dental aerosol and splatter in an open plan clinic environment: Implications for the COVID-19 pandemic. Journal of Dentistry 2021; 105:103565.