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Supplement 1: Comparison District Matching Procedure

The use of a matched cohort study minimizes the influence of confounding variables on measures of association between SLIV and vaccination coverage. By matching schools in the intervention district to similar schools in the comparison district, we aim to achieve similar distributions of unmeasured and measured confounding variables between the two groups.

To select an appropriate comparison district, we compiled a list of candidate districts of all elementary schools in the San Francisco Bay Area that had 4+ elementary schools. A genetic multivariate matching algorithm was used to generate school-pairs between the intervention district and each candidate comparison district. The matching algorithm considered pre-intervention levels of mean enrollment, class size, parental education, academic performance index scores, California standardized test scores, and school-level percentage of English language learners and students eligible for free lunch.

We calculated the generalized Mahalanobis distance in each set of school-pairs and selected the comparison district with the lower average distances. The absolute values of the standardized differences were used to assess the quality of school pair matches.

The number of elementary schools in the comparison district (N=34) was large enough to ensure adequate statistical power in our vaccination coverage analysis; sample size calculations are reported elsewhere.

To assess the impact of SLIV on community influenza hospitalizations, we included all hospitalizations of residents living in ZIP codes that were at least partially contained in either school district’s boundaries.
Supplement 2: Categorization of caregiver-reported reasons for non-receipt

Caregivers reported reasons for their child vaccine non-receipt in a survey distributed during the 2017-18 influenza season. We categorized these reasons into three overarching groups, as described below:

Logistics
- “It costs too much.”
- “I didn’t have time to take my student to the doctor.”
- “I thought my student needed health insurance to get it.”
- “I didn’t know where to get it.”
- “My student is afraid of needles.”

Non-belief
- “I don’t believe in it.”
- “I believe it might make my student sick.”
- “Our doctor did not recommend it.”

SLIV-specific concerns
- “I didn’t receive the consent form to get the vaccine at school.” (Intervention only)
- “I forgot to return the consent form to get the vaccine at school” (Intervention only)
- “I didn’t trust schools to vaccinate my student.” (Intervention only)
- “I didn’t want to share my insurance information on the consent form to get the vaccine at school.” (Intervention only)
Supplement 3: Concordance analysis of reported vaccination status for seasons measured in March 2017 caregiver survey

A “Don’t Know” option was provided as an option for each question relating to vaccine receipt in the 2017 survey. In the intervention district, 472 of 2,246 returned surveys selected the option for at least one season. In the comparison district, 646 of 3,824 surveys selected the option for at least one season. There were 1,774 surveys in the intervention district and 3,178 surveys in the comparison district that provided a vaccination status other than “Don’t Know” for all three seasons. Of these, 1,292 (72.8%) surveys in the intervention district and 2,226 (70.0%) surveys in the comparison district reported the same vaccine status in all three seasons. An additional 430 (24.2%) surveys in the intervention district and 836 (26.3%) surveys in the comparison district had vaccine status concordance for two consecutive seasons (either the same in 2014-15 and 2015-16 or 2015-16 and 2016-17).

Table S1: Distribution of race/ethnicity among multiple race students reported on caregiver surveys

| Race/Ethnicity                  | 2017 Intervention | 2017 Comparison | 2018 Intervention | 2018 Comparison |
|---------------------------------|-------------------|-----------------|-------------------|-----------------|
| Black/African American + Hispanic/Latino | N 24 Percent 13.1 N 33 Percent 8.0 | N 30 Percent 12.4 N 48 Percent 10.6 |
| Black/African American + Hispanic/Latino | N 26 Percent 14.2 N 39 Percent 9.4 | N 35 Percent 14.4 N 56 Percent 12.3 |
| Black/African American + API    | N 22 Percent 12.0 N 35 Percent 8.4 | N 32 Percent 13.2 N 48 Percent 10.6 |
| Hispanic/Latino + White         | N 18 Percent 9.8 N 96 Percent 23.1 | N 24 Percent 9.9 N 91 Percent 20.0 |
| Hispanic/Latino + API           | N 16 Percent 8.7 N 39 Percent 9.4 | N 15 Percent 6.2 N 35 Percent 7.7 |
| API + White                     | N 30 Percent 16.4 N 72 Percent 17.4 | N 42 Percent 17.3 N 67 Percent 14.8 |
| Other                           | N 47 Percent 25.7 N 101 Percent 24.3 | N 65 Percent 26.8 N 109 Percent 24.0 |
Table S2: Differences in vaccination coverage among students enrolled in the intervention versus comparison district, adjusted for parental education.

| Race                | 2014-15  | 2015-16  | 2016-17  | 2017-18  |
|---------------------|----------|----------|----------|----------|
| Asian/Pacific Islander | -7.79 (-14.12, -1.47) | -5.60 (-11.04, -0.17) | 4.74 (0.04, 9.43) | 8.87 (1.25, 16.48) |
| Black/African American | -2.94 (-11.91, 6.03) | 2.52 (-6.97, 12.02) | 9.27 (1.51, 17.03) | 5.90 (-2.16, 13.97) |
| Hispanic/Latino      | -5.34 (-12.22, 1.54) | 4.01 (-1.11, 9.12) | 11.17 (4.90, 17.44) | 13.40 (8.76, 18.03) |
| Multiple Races       | 0.50 (-9.41, 10.40) | 1.89 (-7.27, 11.06) | 1.06 (-7.57, 9.68) | 6.27 (-1.79, 14.34) |
| White               | -1.83 (-19.57, 15.92) | 5.28 (-7.92, 18.47) | 6.62 (-0.59, 13.83) | 20.98 (9.65, 32.32) |
Table S3: Distribution of specific reasons for vaccine non-receipt among caregivers who reported non-belief in influenza vaccination

| Reason for Vaccine Non-Receipt                  | Intervention District | Comparison District |
|------------------------------------------------|------------------------|---------------------|
| I believe it might make my student sick        | 231 (57.0%)            | 558 (57.9%)         |
| I don’t believe in it                          | 123 (30.4%)            | 261 (27.1%)         |
| Our doctor did not recommend it                | 51 (12.6%)             | 144 (15.0%)         |
Table S4: Distribution of school-characteristics for schools with low versus high frequencies for categories of reason for vaccine non-receipt.

| Characteristic (%) | Non-Belief | Logistics |
|-------------------|------------|-----------|
|                   | Below Median | Above Median | P-Value | Below Median | Above Median | P-Value |
| White             | 2.39 | 10.86 | <0.01 | 10.21 | 3.04 | <0.01 |
| API               | 16.57 | 11.07 | <0.01 | 8.15 | 19.49 | <0.01 |
| Hispanic/Latino   | 48.66 | 36.1 | <0.01 | 40.81 | 43.96 | 0.26 |
| Black/African American | 30.04 | 36.57 | 0.01 | 36.46 | 30.15 | 0.01 |
| Multiple race     | 1.31 | 3.51 | <0.01 | 2.89 | 1.93 | 0.15 |
| Eligible for Free Lunch | 87.18 | 62.82 | <0.01 | 67.68 | 82.32 | <0.01 |
| English Learner   | 48.49 | 30.73 | <0.01 | 34.25 | 44.97 | <0.01 |

| Characteristic (%) | Non-Belief | Logistics |
|-------------------|------------|-----------|
|                   | Below Median | Above Median | P-Value | Below Median | Above Median | P-Value |
| White             | 7.58 | 8.77 | 0.34 | 9.41 | 6.76 | 0.03 |
| API               | 12.24 | 20.94 | <0.01 | 19.35 | 13.12 | <0.01 |
| Hispanic/Latino   | 62.44 | 45.14 | <0.01 | 46.35 | 62.84 | <0.01 |
| Black/African American | 16.57 | 23.99 | <0.01 | 23.79 | 16.05 | <0.01 |
| Multiple race     | 0.36 | 0.57 | 0.48 | 0.52 | 0.4 | 0.68 |
| Eligible for Free Lunch | 65.87 | 55.2 | <0.01 | 54.89 | 67.28 | <0.01 |
| English Learner   | 50.82 | 34.79 | <0.01 | 35.39 | 51.77 | <0.01 |
Figure S1: Location of vaccination in the intervention and comparison districts, by age and race

Percent of vaccinated students receiving a vaccine at each location, calculated from survey response data. Survey responses with a missing response or an error associated with the relevant question on vaccine location were excluded from the figure.
Figure S2: Cumulative incidence of influenza-related hospitalizations in the intervention and comparison districts, by age and race
Figure S3: Difference-in-differences in the cumulative incidence of influenza-related hospitalizations in the intervention district versus comparison district, non-elementary school ages