February 21, 2020, and on February 23, 2020. The 2 positive samples showed detection of E and RdRtp. Sanger sequencing revealed 100% identity with the SARS-CoV-2 E gene. Only 1 pool showed a positive E signal that was not reproducible with testing of the individual samples of that pool.

**Discussion** | Results from this screening strategy support that the burden of disease in the San Francisco Bay Area early in the pandemic was low; less than 1% of all symptomatic individuals with negative routine testing had SARS-CoV-2 infection. The timing of the positive pools overlapped with the first 3 individuals with positive results reported from Santa Clara County, tested using criteria established by the Centers for Disease Control and Prevention. 

Thus, public health counts of individuals with SARS-CoV-2 infection indicated a reasonable estimate of overall disease burden among symptomatic individuals in this area. Nevertheless, the individuals identified with positive results via this screening strategy would not have met the existing testing criteria.

A pooled screening strategy was pursued to increase testing throughput, limit use of reagents, and increase overall testing efficiency at an expected slight loss of sensitivity. With only 1 false-positive reading, the strategy was specific. Due to the challenges of restricted access to diagnostic tests and kit supplies across the United States, early testing has largely been limited to symptomatic individuals fulfilling testing criteria. Although this approach facilitates rational use of resources, it may miss individuals in whom COVID-19 risk has not been identified. This study is limited in that it was performed in a single laboratory in a restricted geographical area; additional data are thus required to validate this approach on a larger scale. Furthermore, this screening strategy does not obviate the need for individual diagnostic testing, particularly as community transmission intensifies.

Strategies such as pooled screening may facilitate detection of early community transmission of SARS-CoV-2 and enable timely implementation of appropriate infection control measures to reduce spread.

**Additional Contributions:** We thank Chun-Hong Huang, PhD, Department of Pathology, Stanford University, for her contribution in generating the data for this study, without compensation.


**Seasonal Influenza Activity During the SARS-CoV-2 Outbreak in Japan**

Since the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak began, measures for avoiding disease transmission have been widely promoted in Japan, such as use of masks and handwashing, remote work, and cancellation of large events. If effective, these measures may also reduce the spread of other infectious diseases, such as seasonal influenza. We compared the weekly influenza activity in the 2019/2020 season vs 5 previous seasons.

**Methods** | We used data from 2014 to 2020 from the National Institute of Infectious Diseases Japan, which gathers the number of cases of seasonal influenza weekly, diagnosed by physicians based on clinical symptoms or laboratory findings, from approximately 5000 sentinel centers, including hospitals and clinics (60% pediatrics and 40% internal or general medicine clinics). We grouped the weekly reports into seasons (week 40 of the year through week 11 of the following year [September 30, 2019, through March 15, 2020, for the 2019/2020 season]; the season was truncated after week 11 because this was the latest available data for 2020). In each season we assessed the weekly influenza activity, presented as a crude standardized estimate of influenza activity nationally, calculated by multiplying the mean number of reported cases per sentinel center with a constant number (n = 72,201) representing the number of outpatient visits to hospitals and clinics in the country in 2019 vs the health care institutions in the surveillance system. We estimated the change in influenza activity after the SARS-CoV-2 outbreak using a “difference-in-difference” regression model that included a variable for each week, a variable representing the average difference in influenza activity per week for the 2019/2020 season vs the 2014 to

**Author Affiliations:** Department of Pathology, Stanford University School of Medicine, Stanford, California.

**Corresponding Author:** Benjamin A. Pinsky, MD, PhD, Department of Pathology, Stanford University School of Medicine, 3375 Hillview, Room 2913, Palo Alto, CA 94304 (bpinsky@stanford.edu).

**Published Online:** April 6, 2020. doi:10.1001/jama.2020.5445

**Author Contributions:** Drs Hogan and Pinsky had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

**Concept and design:** All authors.

**Acquisition, analysis, or interpretation of data:** All authors.

**Drafting of the manuscript:** Hogan, Pinsky.

**Critical revision of the manuscript for important intellectual content:** All authors.

**Statistical analysis:** Hogan, Sahoo.

**Administrative, technical, or material support:** Pinsky.

**Supervision:** Pinsky.

**Conflict of Interest Disclosures:** None reported.
2019 seasons before the outbreak (week 1-11), and interaction variables for each week after the outbreak and the 2019/2020 season. The difference-in-difference value was considered statistically significant if the 95% CI did not overlap 0. Approximately 10% of the sentinel centers provided samples from a subset of influenza cases from week 36 through week 7 in the 2019/2020 season and from week 36 through week 35 in the 2014 to 2019 seasons for analysis using polymerase chain reaction (PCR) testing. Using these data we assessed the predominant subtype of the influenza virus and compared the distribution of cases by age group (aged <15, 15-54, and ≥55 y) in the 2019/2020 season vs the 2014 to 2019 seasons (not including the 2015/2016 season, for which age-specific data were not available) using the χ² test. Stata version 16.1 (StataCorp) was used. Institutional board review was not required because no individual-level data were used.

Results | Analyses were based on 8,414,693 cases of influenza (981,373 from the 2019/2020 season). Across all seasons, influenza activity increased toward the end of the year. While influenza activity reached its peak between week 4 and 6 in the 2014 to 2019 seasons, there was a plateau in the beginning of the year and a decrease from week 5 onwards in the 2019/2020 season (Figure). In the difference-in-difference analysis, influenza activity was significantly lower from week 3 through week 7 in the 2019/2020 season vs the 2014 to 2019 seasons (Table). PCR test results were available on 51,847 samples. The predominant subtypes of influenza virus are shown in the Figure. The number of PCR-confirmed cases in the 2014 to 2019 seasons was 25,930 (63.3%) in individuals younger than 15 years, 10,215 (24.9%) in individuals aged 15 to 54 years, and 4,801 (11.7%) in individuals aged at least 55 years; in the 2019/2020 season, the numbers were 22,674 (68.9%) in individuals younger than 15 years, 7,707 (23.4%) in individuals aged 15 to 54 years, and 2,545 (7.7%) in individuals aged at least 55 years. A lower proportion of cases in the 2019/2020 season vs previous seasons included individuals aged at least 15 years (P < .001).
Seasonal influenza activity was lower in 2020 than in previous years in Japan. Influenza activity may have been affected by temperature or virulence (although influenza activity in the 2019/2020 season was moderately severe in other parts of the world), but also by measures taken to constrain the SARS-CoV-2 outbreak. While closure of schools and suspension of large events occurred late in the influenza season, awareness regarding measures to reduce the risk of disease transmission was high among the Japanese public from early in the year. Limitations of this study include lack of availability of age-specific weekly data on influenza activity and information regarding means of diagnosis. Concerns regarding the SARS-CoV-2 outbreak may have changed detection of influenza through changes in symptomatic individuals seeking medical attention or in physicians’ inclination to test for influenza.

Haruka Sakamoto, MD, MPH
Masahiro Ishikane, MD, PhD
Peter Ueda, MD, PhD

Accepted for Publication: April 6, 2020.
Published Online: April 10, 2020. doi:10.1001/jama.2020.6173

Author Contributions: Dr Ueda had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: All authors.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: All authors.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Sakamoto, Ueda.

Administrative, technical, or material support: Sakamoto, Ishikane.

Supervision: Sakamoto, Ishikane.

Conflict of Interest Disclosures: None reported.