California COVID-19 Testing Task Force

# CALIFORNIA TESTING TASK FORCE GUIDANCE FOR SAMPLE POOLING
# AUGUST 2020 UPDATE

**Summary of changes:**
Revised on August 25, 2020, to incorporate guidance on pooled testing for COVID-19 from the Centers for Disease Control and Prevention issued on August 1, 2020. This update provides:

- Insights into the benefits and challenges of pooled testing for populations with low prevalence
- Guidance for pooling utilization for screening and surveillance purposes, to include which populations are best served by screening testing compared to surveillance testing
- Clarifies requirements for FDA emergency use authorization, CLIA certification for labs, and reporting to public health jurisdictions

The California COVID-19 Testing Task Force (TTF) recommends sample pooling (also referred to as "group testing") for populations with low prevalence (<6%) of COVID-19 as a method for expanding testing capacity. On August 1, 2020, the Centers for Disease Control and Prevention (CDC) issued guidance on pooled testing for COVID-19. It is best used when the population tested is expected to have a low positivity rate (less than 5-6%). Populations that may benefit from pooled testing include:

- Health care workers
- First responders
- Essential workers
- Correctional facilities: prisoners and staff
- Congregate care facilities: residents and staff
- Education sector
- Businesses for return-to-work

**Pooled testing can be performed as:**

**Screening Test**
CLIA-certified lab: Required
FDA emergency use authorization: Required
Results reported to individual and public health department: Yes

Screening tests are typically performed on asymptomatic individuals according to CDPH guidelines for testing. The FDA requires a sensitivity of at least 85% for pooled testing to receive emergency use authorization (vs. >95% for diagnostic SARS-CoV-2 assays).

Negative screening pooled result

- No further testing is required.
- Patients receive their negative results at the same time and possibly more quickly than if each test were done individually.
- Because samples are pooled, fewer tests will be run overall, meaning fewer testing supplies are used.

Positive screening pooled result

- A positive pool means that one or more of the individuals tested in that pool may be infected, so each of the samples in that pool must be tested again individually.
- In this situation, pooling may use slightly more supplies than would have been used if each specimen had been tested independently originally.

Testing turnaround time for positive samples may also be impacted by pooling strategies due to "unbundling" pooled samples and re-testing individually.

Optimal groups for pooled screening tests: health care workers, first responders, essential workers. Immediate deconvolution of positive pools allows for efficient identification of positive individuals.

While pooled testing may be used to screen low-risk patients before hospital admission or procedures, it is important to recognize that individuals with low viral loads will be missed. When possible, it is best to perform individual COVID-19 tests for pre-admission or pre-procedure evaluation since the result will guide decisions about personal protective equipment use and respiratory precautions.

**Surveillance Testing**

CLIA-certified lab: Optional
FDA emergency use authorization: Optional
Results reported to individual and public health department: No (aggregate results reported)

Surveillance testing can be performed to monitor a community for a COVID-19 outbreak. Since FDA generally does not regulate surveillance testing, a lower sensitivity assay (e.g. larger pool sizes) could be used. A strategy of frequent repeat testing (e.g. weekly) could be used to mitigate the higher false negative rate.

Optimal groups for pooled surveillance tests: correctional facilities, congregate care facilities, education sector (i.e. teachers, students), businesses for return-to-work. Individuals could be assigned to a pool based on physical proximity. For example, students and teachers within a single classroom or pod could be tested as a single pool.

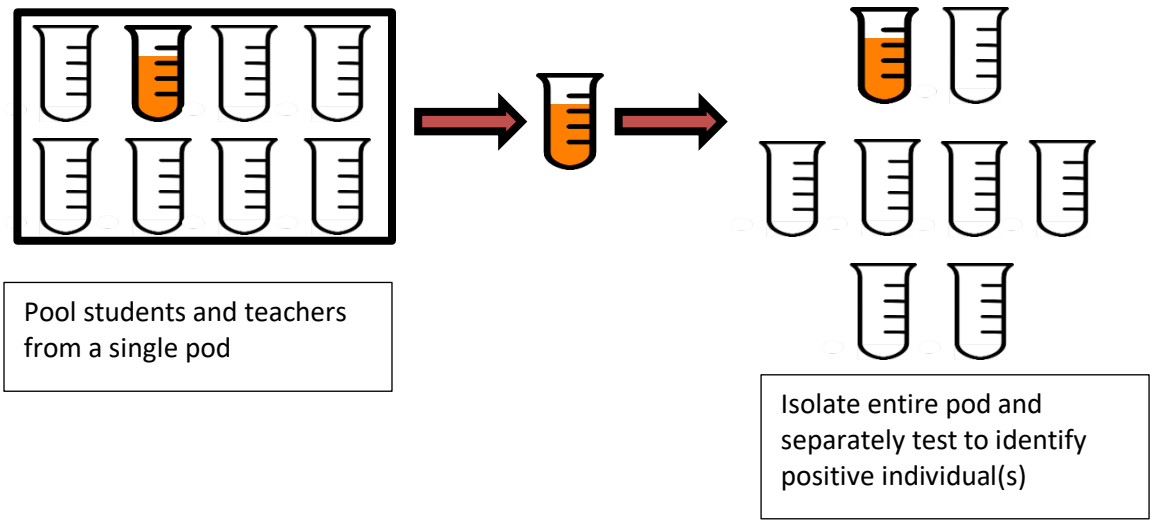
Some evidence from the literature suggests that the lower the prevalence the larger the pool size can be with no risk of having to repeat the tests. However, FDA has not yet approved pool sizes greater than five samples, so that limits the use of larger pools currently.

Negative surveillance pooled result

- If larger pools are used for surveillance testing, repeat testing is recommended on a < weekly basis to compensate for the decreased sensitivity.
- Again, in most cases, because the samples are pooled, it is expected that fewer tests will be run overall, meaning fewer testing supplies are used.

Positive surveillance pooled result

- If the pool is positive, then the entire pool is isolated. Individuals can then be referred for individual tests to identify the true positive(s).
- The benefit of this strategy is that the individuals in the pod are the most likely to be identified as requiring isolation and testing as part of contact tracing.



Pool students and teachers from a single pod

Isolate entire pod and separately test to identify positive individual(s)

**How can a lab adopt a sample pooling method?**

The Food and Drug Administration (FDA) provides a Molecular Diagnostic Template for Laboratories, including guidance for validation of SARS-CoV-2 molecular tests for specimen pooling (https://www.fda.gov/media/135658/download).

The FDA COVID EUA website posts updates to EUA protocols (https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use- authorizations-medical-devices/vitro-diagnostics-euas). Some test kit manufacturers are applying for on-label claims for pooled testing.

The U.S. Centers for Medicare &Medicaid Services (CMS) has also released regulatory guidance pertaining to sample pooling (https://www.cms.gov/files/document/06-19-2020-frequently-asked-questions-covid-surveillance-testing.pdf).

**Other considerations**

- Routine tracking of positive percentage data in the testing population to allow adjustment of pool sizes and termination of pooling if percent positive exceeds 5-6%.
- Pre-analytic: use of automated liquid handlers to help with specimen processing.
- Post-analytic: smart interfacing of laboratory instruments with laboratory information management system (LIMS) software.

**References**

1. Cleary B, Hay JA, Blumenstiel B, Gabriel S, Regev A, Mina MJ. Efficient prevalence estimation and infected sample identification with group testing for SARS-CoV-2. Preprint. *medRxiv*. 2020;2020.05.01.20086801. Published 2020 May 6. doi:10.1101/2020.05.01.20086801
2. Larremore DB, Wilder B, Lester E, et al. Test sensitivity is secondary to frequency and turnaround time for COVID-19 surveillance. Preprint. *medRxiv*. 2020;2020.06.22.20136309. Published 2020 Jun 27. doi:10.1101/2020.06.22.20136309