

COVID-19 Testing

COVID-19 testing platforms include, but are not limited to, the below.

PCR diagnostic testing with nasopharyngeal (NP) or anterior nasal swab

POSITIVES:

- Very accurate.
- Most commonly used COVID-19 testing method up to this point in the pandemic.
- High throughput machines available (tests processed per hour).

NEGATIVES:

- More expensive than antigen testing (varies based on testing lab).
- Longer turnaround time than antigen testing (varies based on testing lab).
- Intermittent supply chain issues for testing reagent.
- More invasive to collect sample.
- Requires specially trained staff.
- Requires special PPE (N-95, eye protection, gown, gloves).

PCR diagnostic testing with saliva

POSITIVES:

- Very accurate.
- Less invasive to collect sample.
- Does not require specially trained staff.
- Less PPE required (routine mask and gloves).
- High throughput machines available (tests processed per hour).

NEGATIVES:

- Intermittent supply chain issues for testing reagent.
- Specimen needs additional processing to breakdown saliva prior to processing.
- Additional lab data needs to be collected to show accuracy of testing in order for the lab to expand EUA beyond NP or anterior nasal swabs.
- More expensive than antigen testing (varies based on testing lab).
- Longer turnaround time (varies based on testing lab).

Pooled sample testing using PCR

Same pros and cons as other PCR testing outlined above, depending on type of specimen collected.

POSITIVES:

- Lower cost per test based on batched testing for negative results. Cost for pooled testing will vary by testing lab, but most likely will be lower cost per test than non-pooled testing.

NEGATIVES:

- Requires testing vendor with specialized lab expertise beyond traditional PCR testing lab. Pooled sample testing is logistically complex and requires specialized liquid-handling equipment to efficiently and accurately perform pooling of samples.



COVID-19 antigen testing

POSITIVES:

- Much less expensive than PCR testing.
- Rapid turnaround time for an individual test (usually 15-60 minutes per test depending on platform).
- Specimen collection varies by testing platform – some use nasopharyngeal swabs, some use anterior nasal swabs, some use saliva.

NEGATIVES:

- Accurate, but less accurate than PCR testing; higher risk of both false positives and false negatives, compared with PCR technology.
- For asymptomatic individuals testing positive, may require additional PCR testing to confirm preliminary positive based on clinical presentation.
- For symptomatic individuals testing negative, may require additional PCR testing to confirm preliminary negative based on clinical presentation.
- Low volume/low throughput technology. Testing usually is done by manually applying reagents to testing material. Turnaround time for each test is much quicker, but large volume testing would require additional staff to ramp up number of tests per day.
- This is new technology that is in high demand so may have supply chain issues for test kits.

Wastewater testing

- Testing wastewater for the presence of COVID-19 is an evolving science.
- While the virus can be detected in wastewater, the utility of this testing methodology and how it fits into the “toolkit” for reducing transmission of the virus is not fully established.
- Most likely, the optimal situation to use wastewater testing would be as a replacement for screening testing of individuals who live in a congregate environment (like a dormitory) that has an extremely low positivity rate (0-1%) to detect an outbreak prior to any individual being symptomatic.
- At the first sign of a positive wastewater test, testing could be rapidly completed on some/all individuals in the congregate environment to permit rapid isolation/quarantine of any infected individuals and their close contacts.
- The benefit of wastewater testing would be cost savings for reduced screening testing as well as reduced hassle for individuals who would otherwise need serial testing under a traditional screening methodology.