International Association of Oil & Gas Producers

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POSITION STATEMENT | JUNE 2021

IOGP-IPIECA Health Committee statement on COVID-19 testing in the oil and gas industry

Note

This document has been prepared using collective insights from the IOGP-IPIECA Health Committee, with consideration of the latest information and positions of international bodies such as the World Health Organization (WHO), United States Centers for Disease Control and Prevention (US CDC), national health bodies, Oil and Gas UK, and others.

The need to urgently address issues in the rapidly moving COVID-19 situation means this document has been subject to a truncated approval process, and will be under regular review as the situation evolves. This document is intended to help companies harmonize protocols for testing and quarantine for the oil and gas industry. Many local factors, such as prevalence of the virus, the type of operation/location, accommodation, and response capability affect the total risk picture. Therefore, measures to manage the risk to as low as reasonably practicable (ALARP) may differ across different locations, including the timelines for quarantine.

Users are encouraged to use the document in support of public health advice and any legal frameworks that may exist from national authorities.

Introduction

Testing is an essential tool in continuous evolution to adequately address the COVID pandemic. It faces several challenges and limitations that we need to be aware of and overcome as we implement preventive and mitigation measures while using the various COVID testing methodologies. Limited societal readiness, lack of available testing infrastructure, and the validity of tests used are some of the principal hurdles to establishing an effective and consistent testing regime. The confusion is further amplified by the rapid development and deployment of new testing methods and protocols by many labs and manufacturers, with limited verification of their validity or peer reviewed research.

This document aims to provide clarity on the current types of testing, the opportunities and limitations they provide and a method to assess if testing is appropriate for a specific operational site or organization. It will be reviewed monthly, or sooner if appropriate. The user is encouraged to verify that they are in possession of the latest revision before use. A revision history is included on the last page of this document.

What about sensitivity and specificity?

When assessing the usefulness of COVID-19 testing methods, two factors are considered:

1) **Sensitivity**: the percentage of people with the disease who have a positive test. A sensitivity of 90% means that if you have 100 people with a disease, the test will correctly identify 90 of them. The remaining 10 people will have a false negative test result.
2) **Specificity**: the percentage of people who do not have the disease and have a negative test result. A specificity of 95% means that if you have 100 healthy people, the test will correctly identify 95 of them as not having the disease. The remaining five people will have a false positive result.

Challenges for COVID-19 detection are primarily around the sensitivity of tests early in the disease and in asymptomatic people. If sensitivity of a test is low, this means that people with the disease will not be identified and can potentially go on infecting others at the work site. The consequence of low specificity is that some people will be incorrectly told that they have the disease. The proportion of false positive results rises when community prevalence of disease is low, and it falls when disease prevalence is high. This may lead to unnecessary quarantine and isolation impacting operations, in addition to the emotional impact of a positive diagnosis.

Types of test

There are two main types of test currently available for COVID-19; tests for diagnosing current infection and tests for detecting recent or past infection.

Tests for diagnosis

Viral[1] and antigen tests are used to diagnose SARS-CoV-2 infection. Tests may be performed in a laboratory or at the point of care by a medically trained individual or the patient themselves.

Different types of tests include:

- Polymerase chain reaction (PCR) test is a molecular type of viral test that detects and amplifies the unique genetic material (nucleic acid) of the virus through use of enzymes and multiple heating cycles and requires expensive lab equipment.
- Loop mediated isothermal amplification (LAMP) is another type of molecular test that detects and amplifies the unique genetic material (nucleic acid) of the virus through use of enzymes but does not require heating cycles or expensive lab equipment.
- Antigen testing is a type of viral test that detects virus specific proteins.
- Newer and evolving methods of viral testing are in development including use of electron microscopy of exhaled breath samples. Although results are available within seconds, such new technologies have not been fully evaluated for accuracy or approved by public health authorities for widespread adoption at this time.

General limitations of testing

The key limitations have been availability of tests, turnaround times, and inconvenient sampling methods. Self-sampling, without professional assistance, is associated with a lower sensitivity due to the difficulty and discomfort associated with swab sampling. Inaccurate sampling of nose/throat swab and errors in storage and transportation lowers the sensitivity of the test and increases the risk of false negative test results[2].

[1] NAATs include RT-PCR, LAMP, and CRISPR.

[2] In addition, it is possible that false negative results may occur with any molecular test for the detection of SARS-CoV-2 if a mutation occurs in the part of the virus' genome assessed by that test. For further information on the likelihood of this rare occurrence, please refer to the information in the US FDA Letter to Clinical Laboratory Staff and Health Care Providers, January 8th 2021.

False negatives are also more common during first few days after exposure because virus levels are still below the detection limit. A false negative result should be considered if the PCR test is negative while the patient has symptoms suggestive of COVID-19. A PCR test can be repeated or other tests (CT scan or immunoassays) can be considered to determine if the symptoms are related to COVID-19 or not.

Antigen tests are generally point of care tests and do not require expensive equipment or a trained technician for analysis. The antigens detected are expressed only when the virus is replicating; therefore, these tests are most suited to identify acute or early infection. Antigen tests are specific, but not as sensitive as PCR. Due to its lower sensitivity, antigen tests may miss infected people at a very early stage of disease when the viral load is low (please refer to the section on antigen tests for more detail).

Tests for detection of recent or past infection

Antibody tests (also known as serology tests or immunoassays) are used to detect previous SARS-CoV-2 infection. At this time, there are three main types of antibody tests approved by the regulatory authorities. A rapid antibody test, a lab-based antibody test (ELISA), and a neutralizing antibody test.

Antibody tests to detect IgM (recent infection) and IgG (recent or past infection) are available in many countries. Laboratory and point of care tests exist which may offer both quantitative and qualitative results. Some rapid antibody tests are easy to use by non-health professionals and are scalable.

The main limitation with antibody tests is the relatively high rates of false negative results at the time of early symptoms, due to the immune response only appearing days after someone already has high levels of virus in their body. False positive results, likely due to cross reactivity with other human coronaviruses, have been reported using some tests. In some reported case series, up to 50% of infected individuals did not produce an antibody response despite symptomatic or PCR documented infection. Some individuals, while not mounting an antibody response, do still recover and appear to be protected from further infection, perhaps by an alternate T cell mediated pathway. At present, there are no international standardized lab methods agreed for antibody tests, which makes it difficult to compare results from different labs and countries. Further research is needed to determine the amount of antibodies necessary to define a protective level.

The different detection methods impact how soon after infection the test may become positive and how accurate these results are.

Figure 1 shows the different detection methods and timeframes.

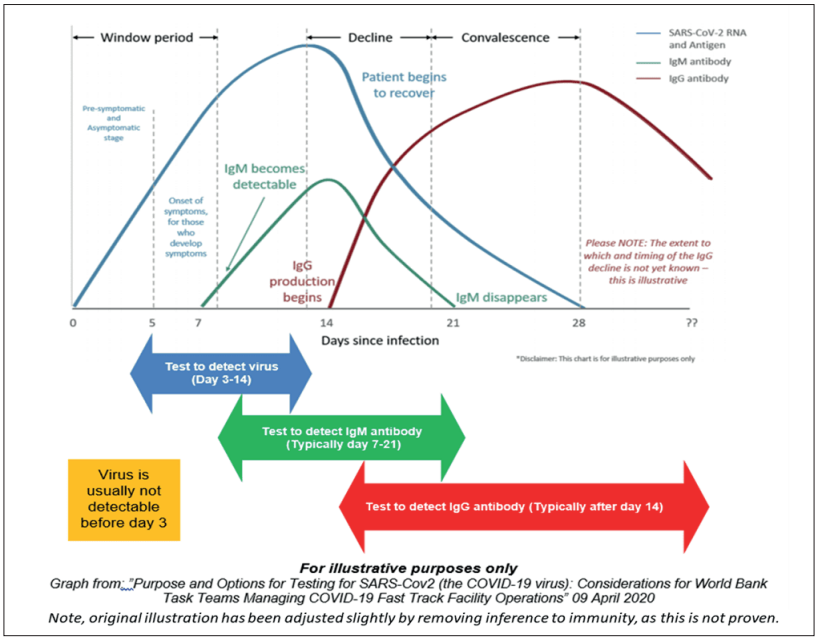


Figure 1: Virus detection methods and timeframes. Courtesy of the World Bank.

Testing considerations for the oil and gas industry

This section examines the different types of COVID-19 detection tests available, their comparative strengths and weaknesses, and presents hypothetical scenarios in which these tests might best be deployed. Operational context should be considered when assessing the value of testing for managing the risk of spreading SARs-CoV-2 to remote locations and installations. Furthermore, any decision on how and when to use diagnostic tools to manage the COVID-19 risk in the workplace will need to be evaluated by a qualified medical professional who considers the type of test available and its limitations, the date and technique of sample collection, the history of any symptoms, and contact with infected people. The below points summarize the high-level considerations in making these decisions.

PCR Tests

PCR tests are considered to be the most accurate for the diagnosis of COVID-19, but due to their limited availability in some countries, the test should be reserved for those who need it most. As such, prioritized testing specific to our industry becomes a moral issue when not strictly indicated on medical grounds. It therefore needs to be aligned with priorities and guidance set by local health authorities. In some areas, oil and gas workers are clearly identified as critical societal workers and will be prioritized. In other areas, this is not the case.

PCR testing is a valuable tool to test close contacts of confirmed cases in the workplace. Testing does not remove the need for quarantine of close contacts. Testing is most informative (having the lowest rate of false negative results) when sampled by a health professional 5-7 days after exposure. Testing before this time interval or after has lower sensitivity (more false negative results). PCR testing can be used to shorten quarantine times to less than 14 days; see section on 'the role of testing and quarantine in practice' for more details. Repeated testing for negative cases should be considered before deciding on return to work.

People with COVID-19 symptoms should be tested as per relevant national health guidance.

A key priority for the use of such tests in our industry remains to keep offshore or isolated remote installations COVID-19 free. Therefore, the operators of such installations need to ensure and facilitate a coordinated testing/quarantine approach for all personnel wishing to travel to such installations.

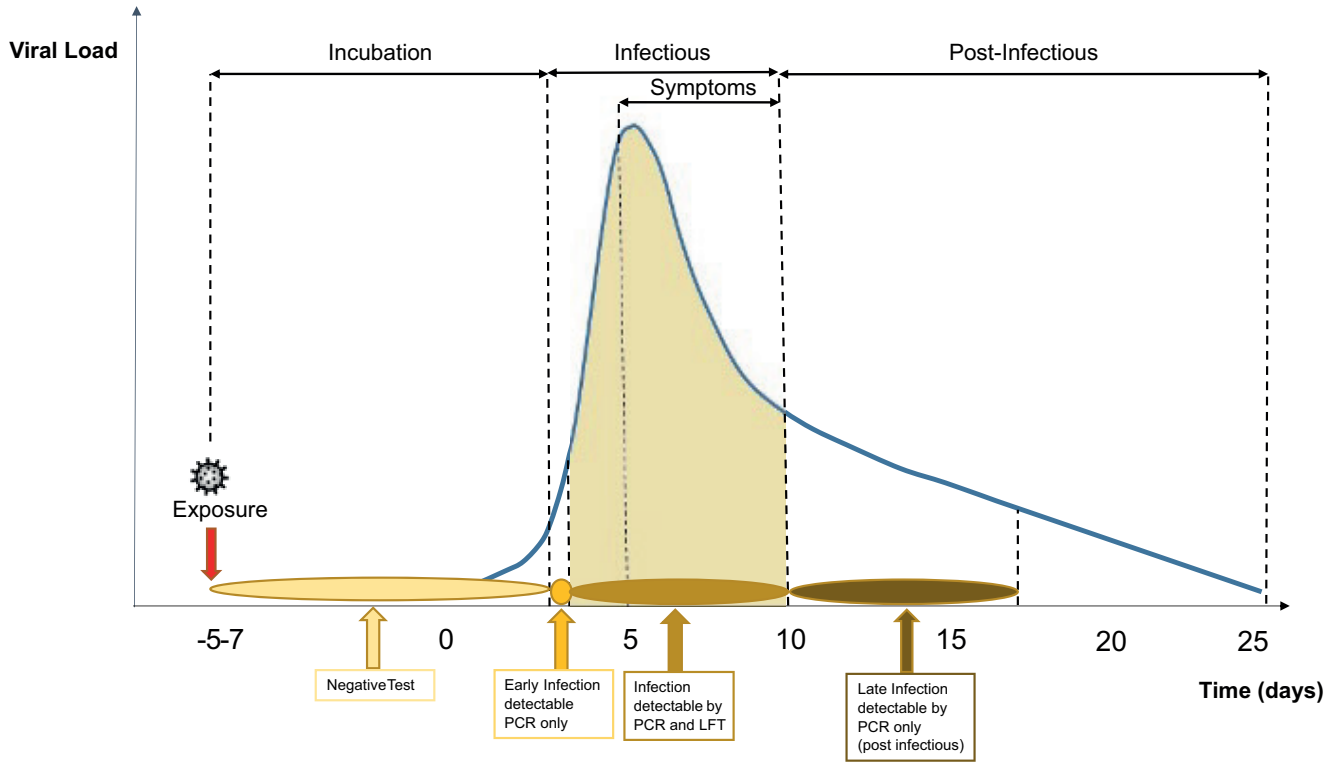
If an inconclusive test result is obtained, it should be considered positive. According to the US CDC, personnel may be considered non-infectious 10 days after the day the sample was taken or symptoms commenced, provided symptoms are improving and they are fever free without medication for at least 24 hours. Other public health authority advice may vary in terms of the time frames and criteria for considering a person non-infectious.

Timing of the test may vary, depending on exact travel history, and there may be cases or situations which necessitates several tests during the quarantine period.

Antigen tests

There are many different antigen tests available. Antigen tests are specific, but typically not as sensitive as PCR tests. Confirmation of the test features, as evaluated by a national medical or public health authority, should be sought prior to adopting or choosing a specific test.

In situations where a reliable antigen test is available with an acceptable but lower sensitivity (>90%) and high specificity (>95%), companies may wish to adopt a high frequency or repeat test strategy as outlined in Figure 4 below.



In situations where a reliable antigen test is available with an acceptable but lower sensitivity (>90%) and high specificity (>95%), companies may wish to adopt a high frequency or repeat test strategy as outlined in Figure 4 below.

Figure 2: Antigen Testing and PCR testing - cycle threshold equivalence

Due to the lower sensitivity, there is a higher probability of false negatives with a single antigen test than with a PCR test, especially in mild or presymptomatic/asymptomatic cases, limiting their accuracy. Positive antigen tests may require a confirmatory PCR test in some locations. Faster turnaround than other test options may allow for quicker isolation of those who have tested positive, potentially further limiting the spread.

Antigen test performance depends on several factors, such as the time from onset of illness, the viral load, the quality of the specimen collected from a person and how it is processed, the precise formulation of the reagents in the test kits, and the subjectivity of the result analysis. Reasons for false negatives and false positives also includes improper storage of test components, cross-contamination when testing patient specimens (false positive), test interference from patient-specific factors or highly viscous specimens (false positive), reading the test before or after the specified time (false positive or false negative), and low disease prevalence (higher probability of false positives).

Overall, in alignment with WHO practice, use of virus antigen tests is not recommended for diagnosis of SARS-CoV-2 infection. It can be considered in situations where PCR tests are not available, and a diagnostic test is needed for symptomatic individuals. In addition, the WHO and the US CDC have also advised getting a PCR test if symptomatic individuals test negative with a rapid antigen test.

Antigen testing for the purpose of access to a site may be a valid additional preventive control, in combination with symptom declaration. Consideration should be given to the availability, cost, and technical support required for PCR testing and the return time of PCR test results versus the lower sensitivity. In addition, the site remoteness and the operational criticality should be factored to determine the most suitable test choice.

Antigen testing may be used in shortening quarantine periods, in a similar manner to PCR testing, at around days 7-10. Serial recurrent antigen testing will reduce the likelihood of false results. The lower sensitivity of antigen tests, compared to PCR tests, may carry a higher risk of false negative results, but may still be preferable compared to PCR testing, which may take several days to provide a result.

Serial testing on at least two occasions over a period of 2-3 days reduces the likelihood of inaccurate results. It increases the positive predictive value of antigen testing to levels comparable with PCR testing (see the scenarios for rapid antigen testing beginning overleaf). The United States Food and Drug Administration (US FDA) has released a calculator for positive predictive value and negative predictive value for single and combined tests (see Figure 3).

Calculator for Positive Predictive Value (PPV) and Negative Predictive Value (NPV) for individual tests and combined

		Prevalence	1.0%				
Test 1		**Test 1**					
Sen1	Sp1	%Pos1 (Test1=pos)	**PPV1 for (Test1=pos)**	%Neg1 (Test1=neg)	NPV1 for (Test1=neg)		
93.0%	98.0%	2.9%	**32.0%**	97.1%	99.9%		
Test 2		**Test 2**					
Sen2	Sp2	%Pos2 (Test2=pos)	**PPV2 for (Test2=pos)**	%Neg2 (Test2=neg)	NPV2 for (Test2=neg)		
93.0%	98.0%	2.9%	**32.0%**	97.1%	99.9%		
		Combined					
		%Pos (Test1=pos, Test2=pos)	**PPV for (Test1=pos, Test2=pos)**	%Discordant (Test1=pos, Test2=neg)	NPV for (Test1=pos, Test2=neg)	%Neg (Test1=neg)	NPV for (Test1=neg)
		0.9%	**95.6%**	2.0%	96.8%	97.1%	99.9%

Single antigen test screening strategy in an asymptomatic population

When the prevalence of disease is low (1% = 0.01), the test sensitivity is 93% and the specificity is 98%, the probability that a **single positive** result represents a true positive is only 32%. The proportion of false positives is high. Correspondingly, the probability that a **single negative** test is a true negative is nearly 100%. The proportion of false negatives is very low.

Repeat or 2 antigen test screening strategy in an asymptomatic population

When the prevalence of disease is low (1% = 0.01), the test sensitivity is 93% and the specificity is 98%, the probability that **two positive** results represent a true positive is 95.6% The proportion of false positives is much lower (4.4%) Correspondingly the probability that **two negative** tests is a true negative remains high at 99.9%. The proportion of false negatives is very low.

When selecting a test strategy, users should be conscious that the prevalence of disease in the population effects the positive predictive value of the tests. The lower the pre-test probability of disease/prevalence in the study population, the higher the proportion of false positive results.

Figure 3: Positive Predictive Values for single versus a repeated test in an asymptomatic population with COVID-19 prevalence 1% using antigen assays with a sensitivity of 93% and specificity of 98%)[3]

[3] PPV and NPV Calculator courtesy of the United States Food and Drug Administration.

Practical use of rapid antigen testing in different scenarios

Rapid antigen testing's key benefit is the fast result and the ease of use in field operations. Due to some limitation in their accuracy when compared to PCR testing, companies are advised to only use these tests in specific contexts. The below overview provides four scenarios illustrating the uses and limitations of rapid antigen tests.

Scenario one: screening all staff entering a site to maintain a COVID-free bubble

An isolated work site where all staff entering and leaving can be controlled, and where there are no daily commuters to and from the site, can be set up as a COVID-free bubble. Screening staff for COVID-19 before entering the site is a critical barrier. The ALARP way of managing this is through a combination of quarantine and PCR testing (see 'The role of testing and quarantine in practice' section of this paper for more details).

If PCR testing is not available, quarantine is still advised, with a rapid antigen test on day 5-7 of quarantine. If the test is negative and the person in question asymptomatic, they can enter the worksite. A repeat rapid test is advised on the 3rd, 6th and 9th day of working at site, for a total of four tests. In case of symptoms (fever, shortness of breath, etc.) the worker should be isolated and tested immediately.

The accuracy of this method is impacted by the prevalence of COVID-19 in the population where staff come from. A positive result from a rapid test can be a false positive result, meaning that the person does not actually have COVID-19, despite a positive test result. The risk of these false positive results goes up as the prevalence of COVID-19 in society goes down. Because companies need to act on all positive test results, a high rate of false positives could potentially unnecessarily impact business operations. A plan should be in place for managing a higher risk of false positive results in a low prevalence population, and for how operations may be modified based on test results. See Scenario three for more detail on interpreting positive results of rapid antigen tests.

Scenario two: screening all staff during a COVID-19 outbreak at a site that normally functions as a COVID-free bubble

The ALARP way of isolating and stopping the spread of COVID-19 is through individual contact tracing, isolating close contacts, and finally PCR testing. If this is not feasible (for example, if there are several, seemingly unrelated cases, or too many suspected close contacts) then mass testing using rapid tests can be considered to quickly assess the extent of the outbreak.

If there is a confirmed presence of several (unrelated) COVID-19 cases in the work population, any positive test result should be interpreted as a confirmed case (the positive predictive value of the rapid test in a high prevalence environment is higher compared to Scenario one). See Scenario three for more detail on interpreting positive results of rapid antigen tests.

If a test is negative, staff can continue to work, but should adhere strictly to preventative measures such as distancing, hygiene, and mask wearing. Additional COVID-19 control measures, such as closing recreation areas and limiting numbers in dining facilities, should be considered.

Scenario three: diagnosing COVID-19 in suspected cases in bubble and non-bubble environments

If someone is a close contact or has symptoms, a rapid antigen test can be used in the following ways:

- If the person is symptomatic, the positive rapid test result should trigger the same reaction as a positive PCR test: isolation and treatment of the positive case, as well as identification and isolation of close contacts (see Scenario four for more details on exceptions).
- If the tested person is asymptomatic with a positive first test, a second confirmatory test can be done:
  - If the second test is also positive the likelihood of the results being a false positive is low. Any close contacts should be isolated and tested as well.
  - If the second test in negative while the first one is positive the person being tested should still be treated as positive and isolated. Asymptomatic close contacts can continue to work observing the normal preventative measures in line with Scenario four and be subject to repeated testing.

- In an outbreak situation, it may be beneficial to perform serial antigen testing which will identify SARS-CoV-2 during early stages of infection and thus reduce disease transmission. Sensitivity and specificity for the tests used are important parameters in making such decisions.

Scenario four: using rapid antigen tests as a substitute for quarantine for suspected but asymptomatic cases

A close contact of a confirmed COVID-19 case (PCR positive; symptomatic and a positive rapid test; or asymptomatic and two positive rapid tests) who remains asymptomatic can continue working while observing the normal COVID preventative measures, provided she/he gets repeatedly tested with a rapid antigen test. After an initial negative test, repeat rapid tests are advised on the 3rd, 6th and 9th day of working at site for a total of four tests. If the person in question at any time develops symptoms, they should be isolated and immediately tested again. Isolation should continue for at least five days following the positive rapid test result, provided the person is asymptomatic. In this scenario, there may be an increased risk of transmission compared to applying quarantine. The residual risk depends largely on how rigorously standard transmisson measures are applied.

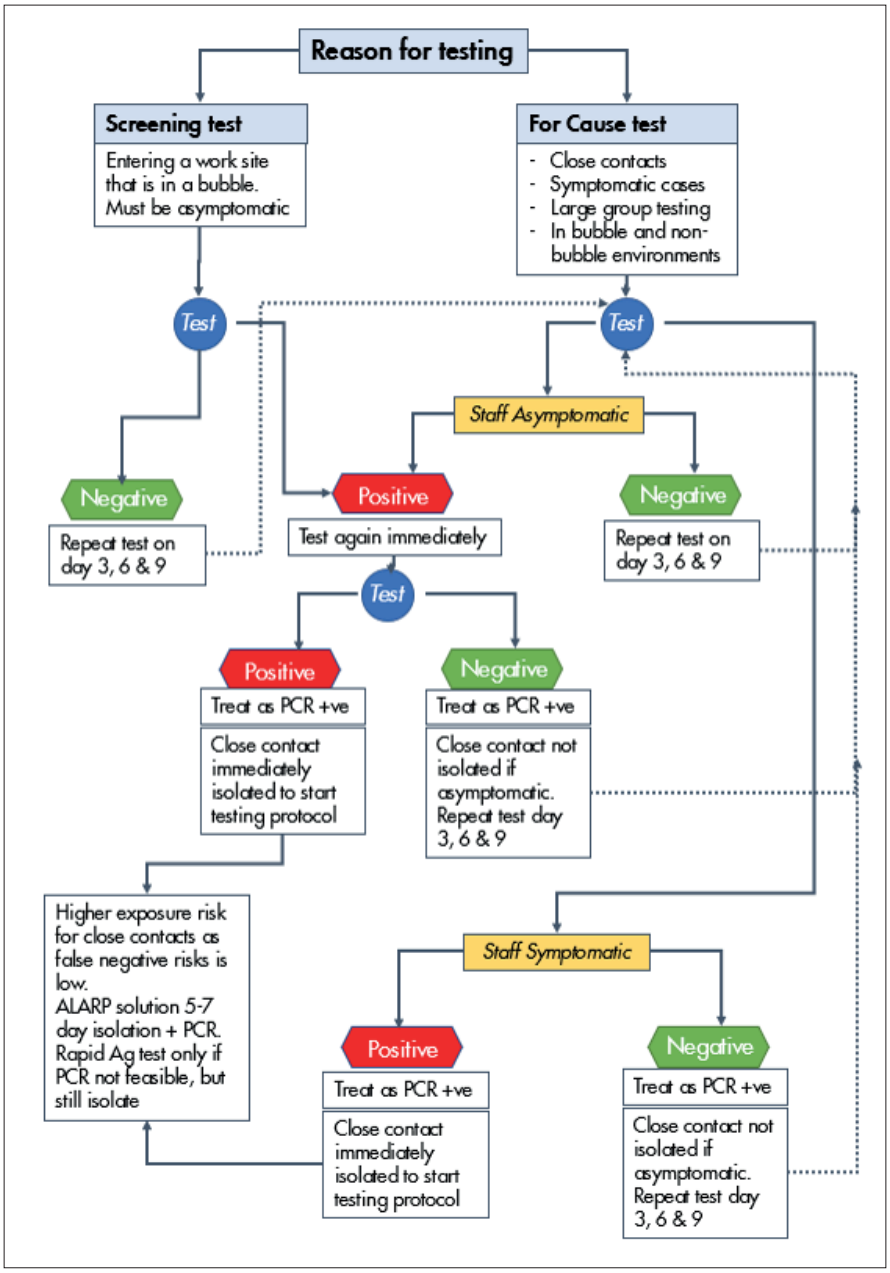


Figure 4: Summary of rapid testing scenarios

Antibody tests

Antibody (IgM and IgG) tests are rapidly evolving and readily available. The accuracy of the products on the market remains debatable and current WHO advice is that antibody tests are only useful in large population prevalence surveys. The tests do not have the required accuracy for screening workers or controlling outbreaks, due to the high rate of false negatives and false positives and variable quality of the different brands of tests. While the quality of testing kits is improving, the fundamental aspect of antibody testing is an assessment of the body's immune response to the virus. Tests will therefore always have higher levels of false negative results in the days following infection, as the body's immune response will still be low.

The exact duration of protection after infection is not known, although it is widely accepted that the risk of reinfection is low for at least 6 months duration after initial symptoms. Milder infection, especially in older persons, may reduce the detection of protective antibodies and shorten the duration of protection after infection. Reinfection may be more likely with the spread of new COVID-19 variants and re-exposure.

Antibody tests can be used for mapping of controlled larger populations that can include several companies/facilities in the same work area but should not be used for diagnostic purposes. The results may give insights into previous disease prevalence within a single company, location, or population, and may also provide valuable information for national and international health bodies.

The role of testing and quarantine in practice

Testing for SARS-CoV-2 virus infections is an important element of managing the risk of an outbreak at a worksite. Nevertheless, the tests themselves are not a barrier to infection and a testing regime should only be introduced when all other infection control and preventive measures stopping the transmission of the virus between people have been implemented and optimized. There is a risk of "COVID fatigue" and people disengaging with infection prevention and control procedures, meaning regular updates and continued engagement are vital. Once this has been achieved, testing can be introduced, in combination with quarantine, with the aim of preventing the virus from entering the workplace.

This section considers the role of testing as part of quarantine protocols prior to deployment to a remote work site. Testing may also be used in several other work-related scenarios mentioned elsewhere, but not detailed here, as they are beyond the scope of this document. For example:

1) Screening of an asymptomatic population for surveillance or early detection of the virus.
2) Facility entry protocol to help prevent early or asymptomatic cases from entering a location undetected.
3) Contact tracing after a suspect or proven case is identified, during a cluster or outbreak.
4) Diagnosis of a symptomatic individual.
5) Pre-travel government or aviation authority requirement to allow embarkation on a vessel or aircraft, usually for international movement.

Screening and quarantine of asymptomatic populations for facility entry

Quarantine is a critical tool to manage the risk of COVID-19 spread at a worksite. It separates a person or group of people reasonably believed to have been exposed to a communicable disease (COVID-19) but not yet symptomatic, from others who have not been exposed. The aim is prevention of the possible spread of the communicable disease. Even with testing, appropriate quarantine measures will remain necessary.

Pre-deployment screening of all personnel prior to departure to an offshore or remote site is accepted as good practice. This may involve up to 14 days of quarantine and a SARS-CoV-2 testing regimen. Within the quarantine period, those who are infected will likely show clinical symptoms necessitating further testing and isolation[4]. For those who remain asymptomatic, some will still have carried the virus; however, if they remain asymptomatic for the entire quarantine period, they are unlikely to be able to infect others after the quarantine ends. Personnel in extremely clinically vulnerable and moderately clinical vulnerable groups should have an individual occupational health risk assessment before returning to the workplace.

At the start of the quarantine period a questionnaire can be conducted to assess the baseline risk of infection. The questions should determine whether the individual:

1) Has any symptoms associated with COVID-19.
2) Has had contact with confirmed or suspected COVID-19 case(s) in the past 14 days.
3) Has travelled to areas with a high COVID-19 prevalence over the past two weeks.

Answering 'yes' to any of these three questions can be the basis for postponing access to the worksite or initiate for-cause SARS-CoV-2 testing. When all questions are answered with 'no', PCR testing or serial antigen testing (on at least two occasions between days 7 and 10 of quarantine), can be used to shorten the quarantine time. To manage the risk of missing cases due to this shortening, it is critical to still identify those individuals who would have only become symptomatic the second week of quarantine while they are still in the shorter quarantine period. To identify these cases through testing in the first quarantine week, the timing of testing in combination with the length of the quarantine period are essential to maximize effectiveness of this effort. There are different testing regimes during shorter quarantine period to mitigate the increased risk of missing a symptomatic case (see the section 'Testing considerations for the oil and gas industry'). When using PCR testing, this method is most accurate (having the lowest rate of false negative results) when sampled by a health professional after 5-7 days of quarantine. Nevertheless, this shorter quarantine and PCR testing strategy still leads to a moderately higher risk of missing cases compared to a 2-week quarantine period. The acceptance of this increased risk should be discussed with business line management to ensure adequate understanding of the risk posed to other workers and the benefits of shorter quarantine times on the mental health and wellbeing of quarantined staff as well as the positive impact on business operations.

For those who have tested positive for the virus or those who developed symptoms while in quarantine, the duration of quarantine may need to be extended to meet requirements for isolation. For people that remain asymptomatic after testing positive, isolation for a further 10 days following the positive result is recommended. After this period, the person is unlikely to pose any risk of infection to others and according to US CDC guidance, there is no need for retesting after this period. For people with symptoms, isolation can generally be discontinued 10 days after symptom onset and resolution of fever and other symptoms for at least 24 hours, without the use of fever-reducing medications, and with improvement of other symptoms, or as per medical advice.

[4] For further information on testing during isolation periods, see Figure 2 in Lauer SA et al, "The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application", *Annals of Internal Medicine* 172 (9), May 2020.

Changes to quarantine protocols for vaccinated staff

Recent evidence supporting the safety and efficacy of COVID-19 vaccines has led to the question of an exemption from testing and quarantine requirement for vaccinated persons. Although no vaccine guarantees protection from infection, the risk of infection, hospitalization, or death are reduced. Further, there is emerging evidence that the risk of transmission from a vaccinated person is significantly reduced.[5]

The following considerations and actions apply when considering an exemption process for COVID-19 vaccinated employees:

- Review of the published evidence for the safety and efficacy of the specific vaccine made available to employees at a location. Efficacy may vary significantly, between 30% and 95%, depending on the vaccine type and the dosing regimen.
- The employee's role, activity, and the criticality of the work location. Residual risk tolerance for a vaccinated employee with access to an office location may be different than for remote sites or those with critical operations.
- Completion of the full course of the vaccine, e.g., both doses where appropriate.
- Additional time of at least two weeks beyond the final vaccine dose to allow for the generation of antibodies.
- Evidence from some studies supports immune protection from vaccination for a duration of at least 6 months. Immune protection from vaccination (depending on the vaccine type) beyond this duration is likely but currently uncertain.

In addition, some jurisdictions are extending exemptions from testing and quarantine procedures to those who recover from a proven COVID-19 infection for a period lasting no longer than 6 months.[6]

US CDC guidance on post-vaccination exemption from quarantine

Examples of post-infection and post-vaccination exemption criteria that may be considered and incorporated into an existing testing and quarantine protocol are detailed on the US CDC page below:

Interim Public Health Recommendations for Fully Vaccinated People (US CDC)

Post mRNA-based vaccination exemption: for those who have received an mRNA-based vaccine (only Pfizer BNT162b2 & Moderna mRNA-1273 as of May 2021), and who:

- Are fully vaccinated (i.e., ≥2 weeks following receipt of the second dose in a 2-dose series).
- Are within 6 months following receipt of the last dose in the series.
- Have remained asymptomatic since vaccination.
- Have a repeat pre-embarkation negative PCR test.

New COVID-19 variants have been shown to challenge the efficacy of some available, first-generation vaccines[7]. In some studies, the ability of antibodies to neutralize the virus is limited and the protection offered may be reduced by 70-90%. Due consideration as to the efficacy of the available vaccine at a location versus its effectiveness against the circulating COVID-19 variant must be considered when determining the duration of any testing and quarantine exemption for vaccinated employees.

[5] Juno J and Wheatly A. "Mounting evidence suggests COVID vaccines do reduce transmission. How does this work?" Gavi, the Vaccine Alliance. 11 May 2021. https://www.gavi.org/vaccineswork/mounting-evidence-suggests-covid-vaccines-do-reduce-transmission-how-does-work

[6] Council of the European Union. "Council Recommendation amending Council Recommendation (EU) 2020/912 on the temporary restriction on non-essential travel into the EU and the possible lifting of such restriction." Item 5, page 3. The European Union's 'Digital Green Certificate' for free movement within the bloc during the pandemic will be available to those who have recovered from COVID-19.

[7] World Health Organization. "The effects of virus variants on COVID-19 vaccines". 1 March 2021.

Testing of close contacts at operational sites

In countries where close contacts are not required to self-quarantine at home, or where deviations from public health policy can be officially negotiated for operational sites, then close contact testing at the worksite can help to identify positive cases, potentially reduce the numbers required to self-quarantine (in cabins/rooms) and potentially minimize staffing issues. Following the confirmation of a case of COVID-19, there are two options for managing close contacts:

- Quarantine all asymptomatic close contacts and conduct a laboratory or point-of-care PCR test at day 5 after exposure.
- Quarantine all close contacts and implement serial rapid antigen testing. All asymptomatic close contacts who have negative tests at baseline and day 3 can return to work, and should continue to be tested every 3-4 days after returning to work until there are no more new cases in the population. Symptomatic close contacts need to remain in isolation as per national public health guidelines.

The second option is based on evidence that serial rapid antigen testing, when carried out every 3-4 days and with a rapid results turnaround, is effective at removing enough infectious individuals in the population to reduce transmission, despite rapid antigen tests being less sensitive than PCR testing. The time to result is as important as the sensitivity and the frequency. Serial testing only works if positive individuals are rapidly removed from circulation as soon as possible after they screen positive and long delays in getting results will reduce the impact of serial testing.

Local public health regulations usually define what is meant by a close contact, and this must be adhered to when carrying out contact tracing. Many countries require all close contacts to self-quarantine at home for 10-14 days, even if asymptomatic and/or testing negative. Testing is usually of little value in this scenario where compliance with this rule is mandatory, but may prevent unnecessary anxiety from diagnostic uncertainty. In situations when local public health contact tracing and testing resources are overwhelmed, such testing may be carried out to support contact tracing even when self-quarantine is mandated.

Screening at operational sites through serial testing of a fluid population as part of a wider government supported public health intervention

Some governments are starting to initiate/support schemes for serial testing of asymptomatic workers at operational sites as a screening tool. In such situations and for specific, limited scenarios where critical workforce issues could arise in the event of an outbreak, regular serial testing may be carried out in asymptomatic workers. Approved scenarios would include offshore/onshore locations with commuters, sites with company-sponsored accommodation, introduction of large contractor staff populations due to projects, and turnarounds.

Procedures for this type of screening include:

- Rapid antigen testing of all asymptomatic workers every 3 days (or twice per week).
- Any positive results should have confirmatory PCR testing.
- As per normal COVID rules, all symptomatic workers must isolate and never come to the site.
- A plan should be in place for managing a higher risk of false positive results in a low prevalence population, and for how operations may be modified based on test results.

IOGP-IPIECA position

1) The IOGP-IPIECA Health Committee views PCR testing as the preferred testing tool currently available for diagnostic purposes. This testing method should be considered for use in those situations where there is a legal requirement to do so, where critical functions for safety or business continuity that cannot be done remotely are performed, and where the consequences of having COVID-19 cases on site for people and operations are high (e.g., offshore, remote and site accommodation).

2) A 14-day quarantine prior to starting an offshore rotation puts a significant mental and social strain on workers. It is also a costly measure. Plans should attempt to balance the mental health impact of extended periods in confinement against the risk mitigations afforded by quarantine. Shortening the quarantine length will increase the risk of COVID-19 cases or carriers slipping through and bringing the virus into the workplace. A screening questionnaire or medical assessment prior to starting quarantine, in combination with well-timed lab-based PCR testing, point-of-care PCR testing, or antigen testing, can help limit this increase in risk. Repeated testing is more effective than one-time testing in this regard. For vaccinated staff exemptions could be made.

3) The IOGP-IPIECA Health Committee does not support general diagnostic antibody testing for (remote) locations/ installations unless for mapping of controlled larger populations.

4) The IOGP-IPIECA Health Committee would like to see a harmonized approach to testing for COVID-19 across the oil and gas industry, but recognizes constraints set at the national health authority levels. The IOGP-IPIECA Health Committee will therefore continue to monitor the development of testing methods/protocols and offer updates to this guidance as and when needed.

Key testing considerations and quarantine protocols

Table 1: Summary of key testing strategies.

Method	Intervention	Pros (+)	Cons (-)
A	**Screening questionnaire** Use of a self-administered questionnaire to identify vulnerable people, those that are ill, and those that may have been exposed to confirmed or suspected cases	Easy to administer and low cost Quick turnaround time aids decision making	Personnel may not provide truthful responses to questions Personnel may be unaware of having been in contact with a confirmed or suspected case
B	**PCR**	Most reliable and accurate test. Sensitive and highly specific (>99.9%) if lab-based equipment (multi-channel) and test kits using 3 genome fragments are used	May miss early infections (high false negative rates in first 5 days post infection) Requires a laboratory test or mobile test unit Commercial turnaround time of two days, excluding sample shipping in many locations Testing costs Public health agencies and hospitals rely on these tests for managing the outbreak
C	**Antigen Test**	Accuracy much better in symptomatic cases Accuracy improves with repeated testing in a high prevalence environment Poor in asymptomatic people or when used for screening Inexpensive, fairly rapid tests (10-30 minutes to results), that could be used for serial testing Does not require special equipment	Lower sensitivity than PCR, when viral load is low Increased probability of false negatives and false positives, as compared to PCR tests Short time frame for high sensitivity Recommended for use in a window 4 days post infection to 7 to 12 days post infection for best sensitivity. May yield false negatives if the viral protein production is low

Method	Intervention	Pros (+)	Cons (-)
D	**Quarantine 10-14 days** Refers to managed quarantine where compliance is assured. Self-quarantine in the home environment is vulnerable to non-compliance	Infectious period for both symptomatic and asymptomatic cases is between 10-14 days. Full compliance with this approach will capture the infectious period for nearly all employees	Requires quarantine accommodation which should be managed to eliminate the individual transparency factor Significantly extends the period of relative isolation for the individual (10-14 days quarantine plus days deployed). Mental health risk Costs of keeping the crew in self-quarantine for 10-14 days
E	**Quarantine for 7-10 days + serial rapid antigen screening tests at end of quarantine** Risk associated with this method lower at the 10-day end of the spectrum. Using 7 days can be justified depending on base line COVID risk and operational considerations, type of operations, and additional mitigation measure in place	Relatively cheap and rapid test that can be done onsite. Repeat or serial testing to reduce false negative rates Quarantine will increase likelihood of identifying people with symptoms	High rate of false positives as well as false negatives Likelihood of missing a true positive Costs of keeping the crew in quarantine for 7 days (or longer in case of (false) positive result) Longer social isolation for employees – quarantine plus offshore or hitch time Compensation of false positive workers
F	**Quarantine for 5-7 days + PCR at end of quarantine** Risk associated with this method lower at the 10-day end of the spectrum. Using 5-7 days can be justified depending on base line COVID risk and operational considerations	Balances risk of missing a COVID case with the benefits of shorter quarantine Increased odds of capturing a symptomatic person or a COVID-19 positive person compared to rapid antigen test method Low rate of false positives	Resource intensive Still a small likelihood of missing a case Costs of keeping the crew in quarantine for 5-7 days Longer social isolation for employees – quarantine plus offshore or hitch time

Table 2: ALARP methods for screening suspected COVID cases, contacts, and managing risk

	Isolated (remote) site	Non-isolated site (daily commuters coming to and from the site)
Pre-arrival screening	Method F or E (when PCR is unavailable, or results take several days) (Additional PCR test at start of quarantine/pre travel can be considered in areas of high COVID prevalence [>3%])	Not practical Method A to focus staff on risk and barriers Method C
Routine screening testing	Method A to focus staff on risk and barriers	Method A to focus staff on risk and barriers
For cause testing for close contact cases while still asymptomatic	Method F with PCR test timed 5 days after close contact to reduce false negative risk	Method F with PCR test timed 5 days after close contact to reduce false negative risk
For cause testing for symptomatic (close contact) case	Method B or C. Keep in isolation and case manage based on symptoms	Method B or C. Keep in isolation and case manage based on symptoms

Revision history

VERSION	DATE	AMENDMENTS
Initial issue	4 May 2020	
1st Revision	11 May 2020	Added IPIECA logo
2nd Revision	6 July 2020	Updated to include Figure 1 and provide additional information on quarantine policies and antibody and antigen rapid test usage.
3rd Revision	29 September 2020	Added information on questionnaires, updates on immunity, and summary table.
4th Revision	18 December 2020	Revised and expanded summary intervention table and section on antigen testing. Added Table 2 on screening and risk management.
5th Revision	30 June 2021	Additional information on antibody test result validity, serial antigen testing, impact of vaccines, and references lists added.