Appendix I: Comparison of PCR, Serology and Antigen Rapid Tests

Aspects	Polymerase Chain Reaction (PCR)	Antigen Rapid Test	Serology
Scientific basis	Detection of SARS-CoV-2 viral sequences by nucleic acid amplification tests in respiratory tract specimens.	Detection of SARS-CoV-2 viral proteins (antigens) in respiratory tract specimens.	Detection of antibodies produced by the human body in response to infection with the SARS-CoV-2.
Aim of test	Diagnosis of SARS-CoV-2 infection	Diagnosis of SARS-CoV-2 infection	Check for previous SARS-CoV-2 infection as part of epidemiological investigations
Sample type	Nasopharyngeal (NP), Oropharyngeal (OP), Midturbinate (MT)	Nasopharyngeal (NP), Oropharyngeal (OP), Midturbinate (MT)	Venous blood, fingerprick, for point-of-care testing (POCT)
Turnaround time	• 4-6 hours per run (lab) • ~1 hour per run in POCT PCR or PCR that does not require separate extraction step (Cepheid)	• 15-30 minutes per run • All kits are POCT, no analyser machines required for most kits	• Lab-based: 40-120 minutes per test; 100-200 tests per hour • POCT: ~30 minutes per test
Clinical performance **(Sensitivity/ Specificity)**	>99.5%/100%	Variable sensitivity but generally higher sensitivity for individuals with high viral load. WHO criteria for antigen-detecting rapid diagnostic tests: >80%/97%	Performance of serologic assays varies widely in different testing groups (such as disease severity, age), timing of testing and the target viral protein. In general, lab-based tests using

Aspects	Polymerase Chain Reaction (PCR)	Antigen Rapid Test	Serology
			venous blood has higher sensitivity/specificity than POCT.
Examples of use cases and role in overall testing strategy	• Symptomatic individuals • Stay-Home Notice (SHN) exit swab • Quarantine Order (QO) entry and exit swab • Rostered routine testing	• Screening for pre-event testing, rostered routine testing	• Differentiate between acute and old infections in cases that test positive for COVID-19
Limitations	• Unable to differentiate between acute and old infections due to persistent shedding of viral fragments among recovered individuals.	• Potentially high false negative rate in individuals with low viral load. • Higher false positive rate than PCR tests.	• Unable to rule out acute/early infection if serology-negative.