SAHPRA
South African
Health Products
Regulatory Authority

CSIR Campus
Building 10F
Meiring Naudé Road
Brummeria
Pretoria

Communication to Stakeholders 22 July 2020

MD018: Specification criteria for COVID-19 molecular test kits

BACKGROUND

1. Irrespective of a closed or open system or component, the overall specimen to result process must comply with the minimal acceptable key features outlined below.
2. These specifications are subject to review and may need to be updated at short notice.
3. This is a specification of the minimally (and some preferred options) clinically acceptable specifications for SARS-CoV-2 molecular test kits to be manufactured and/or distributed in South Africa during the current COVID-19 pandemic caused by the SARS-CoV-2 virus.
4. It sets out the clinical requirements based on the consensus of what is 'minimally acceptable' performance in the opinion of the South African Health Products Regulatory Authority (SAHPRA) given the emergency situation.
5. A SARS-CoV-2 molecular test kit with lower specifications than this is likely to provide no clinical benefit and might lead to increased harm, which would be unacceptable.
6. Definitions:

Acceptable:	Defines the minimum acceptable specification
Desired:	Highly desirable features of considerable benefit. As time is of the essence if omitting one of these features significantly accelerates development and production it should be considered
Point of care test	An in vitro diagnostic medical device intended to be used by a healthcare professional outside of a laboratory in primary or secondary care environments

SPECIFICATIONS FOR COVID-19 MOLECULAR TEST KITS

7. Specifications are subject to review and can be updated.

Specification criteria for SARS-CoV-2 molecular test kits
These are initial specifications based on current information. *These specifications are subject to review and may need to be updated at short notice.*

Key Features	Desired	Acceptable
Priority features		
Intended use	Diagnose SARS-CoV2 in clinical specimens submitted to a biosafe testing laboratory or point of care	Diagnose SARS-CoV2 in clinical specimens submitted to a biosafe testing laboratory or at point of care
Goal of the test	Identify the presence of SARS-CoV2 based on patient risk stratification	Identify the presence of SARS-CoV2 based on patient risk stratification
Target population	Asymptomatic and symptomatic virally infected individuals	Asymptomatic and symptomatic virally infected individuals
Target use setting	ER, hospital admission wards, self-collected specimen from HCW, HCP presumptive patient referred specimens or other points of care	ER, hospital admission wards, self-collected specimen from HCW, HCP presumptive patient referred specimens, or other points of care
SARS-CoV2 gene target	Multiplex target	1 target (not E gene)
Sensitivity (clinical) on low viral load	95%	>90%
Sensitivity (clinical) on high viral load	100%	100%
Specificity (analytical)	100%	100%
Data output	Qualitative or quantitative (provision of Ct or Tm)	Qualitative
Specimen type	NP or OP swab transported in UVT at 2-8°C stored in the laboratory for 5 days at 2-8°C or >5days at -70°C	N, NC swab transported dry at room temperature to reach the testing laboratory within 2 days. Stored in the laboratory at 2-8°C for 5 days or >5days at -70°C
UVT	2ml that maintains viral RNA stability 2-8°C stored in the laboratory for 5 days at 2-8°C or >5days at -70°C	1ml PBS or saline transported at 2-8°C and stored no longer than 5 days at 2-8°C or >5days at -70°C in the laboratory
Test procedure		
Compatibility	Compatible with existing in-country laboratory footprint	Equipment provided as part of test procedure

Number of steps to be performed by the operator	≤4 (label tube, add tube to extractor, add RNA to amplifier, interpret result)	<6 (label tube, add inactivator/extraction reagents, add RNA, add mastermix, interpret result)
Type of operator	Laboratory technician	Laboratory molecular scientist
Transfer of precise volumes	>20µl	>5µl
Biosafety	No additional biosafety in addition to PPE	BSL2 and PPE
Internal control	Endogenous (RNaseP)	Synthetic
Positive and negative batch control	Included	Included
Result interpretation	Automated with no interpretation required	Manual review of amplification curves
Operational characteristics		
Reproducibility (precision), SD	<1.0 Ct	<3.0 Ct
Overall variability (%CV)	≤2%	≤5%
Limit of detection (LOD)	<300copies/ml	<300copies/ml
Linearity	R^2>0.98	R^2>0.95
Limit of the blank (carryover)	No carryover	No carryover
Amplification inhibition	No invalids	<3% invalid
Error rate	No repeat testing required	<1% repeat testing required
Reagent storage (stability)	24months @ Room temperature	12months @ -70C
Reagent reconstitution	All reagents ready to use	Reconstitution acceptable if very simple procedure. All liquids including DNase free water in the kit
Training needs	<half day	<2days
Ease of use (hands on time)	<15 minutes	<60 minutes
Daily maintenance	<15 minutes	<30 minutes
Additional consumables required[1]	To be provided by applicant	To be provided by applicant
Additional equipment required[1]	To be provided by applicant	To be provided by applicant
Connectivity	Interface capability with in-country LIS	Result file electronically transferrable

[1] Over and above standard laboratory and in-country accessible

Kit storage	Minimal space	Compatible with existing lab set up
Waste disposal	Minimal (<5L /day) and non-biohazard	Minimal (<20L /day) and non-biohazard
Reagent wastage	Minimal and not batch specific	Minimal if batch specific
Package Insert	Easy to follow	Easy to follow
Instructions for use	Comprehensive for intended use	Comprehensive for intended use
Automated time to result	<60 minutes	<4hrs
Specimens/run (high throughput)	≥90	≥20
Specimens/8-hour shift	≥360	≥160
Specimens/24-hour shift	≥1080	≥480

DR B SEMETE-MAKOKOTLELA

CHIEF EXECUTIVE OFFICER OF SAHPRA

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