Supplementary information

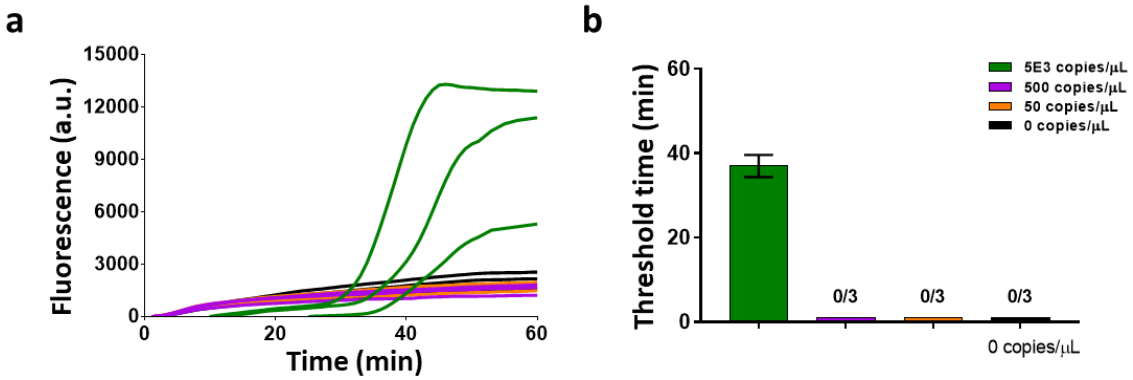

Fig. S1. Characterization of SARS-CoV-2 virus in nasal fluid in a 96 µL reaction. (*a*-*b*) Raw fluorescence data and amplification threshold times (for 3 replicates of data) for viral detection in a 96 µL reaction with 50% nasal fluid per reaction. Thermal lysis at 95°C was conducted for 1 min. of the virus in nasal fluid sample before addition of RT-LAMP reagents for the final reaction. The bar graphs show mean and standard deviation. Fraction indicates number of replicates amplified.

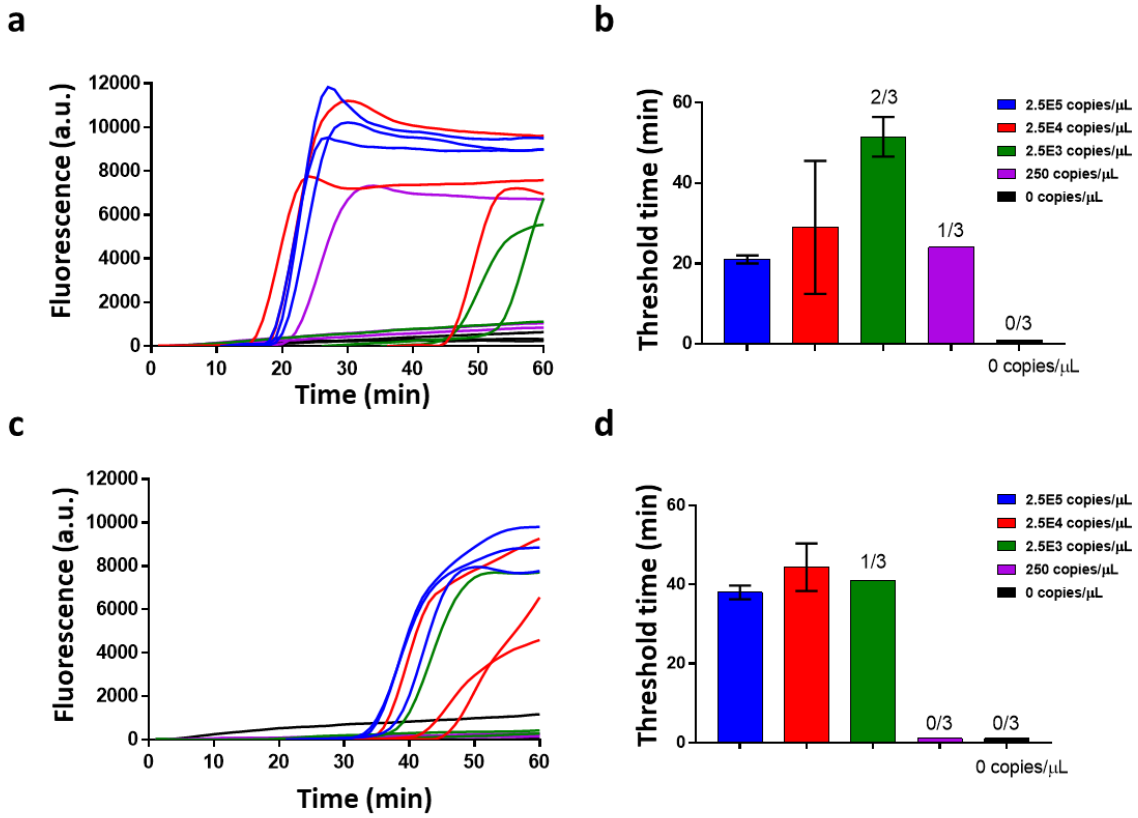

Fig. S2. Characterization of SARS-CoV-2 virus in mock swab samples transported in 100 µL Viral Transport Media. (*a*-*b*) Raw fluorescence data and amplification threshold times (for 3 replicates of data) for viral detection in a 16 µL reaction with 12.5% VTM per reaction from a 100 µL VTM sample. (***c*-*d***) Raw fluorescence data and amplification threshold times (for 3 replicates of data) for viral detection in a 16 µL reaction with 12.5% VTM per reaction from a 100 µL VTM sample. The bar graphs show mean and standard deviation.

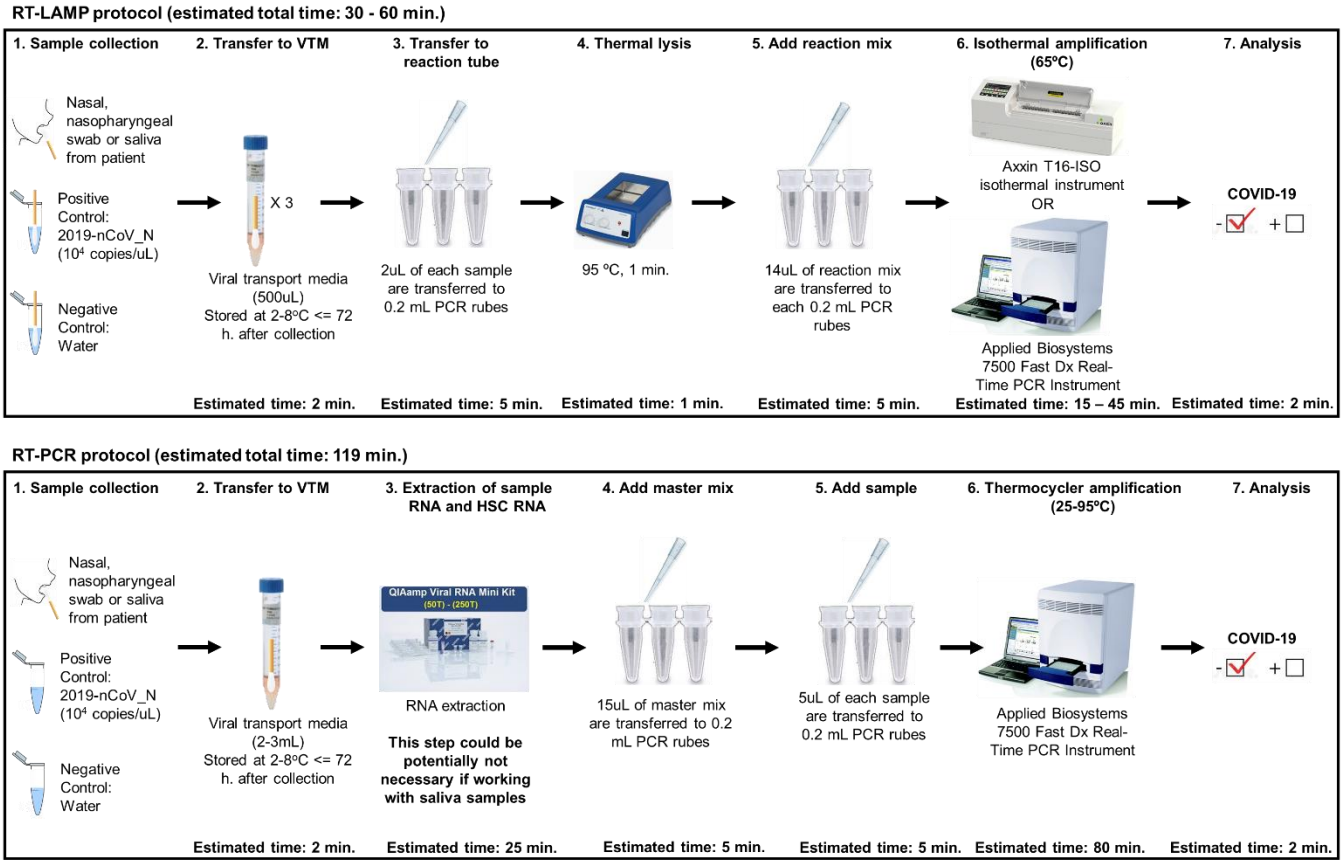

Fig. S3. RT-LAMP assay process flow and comparison side by side with the RT-PCR assay process flow.

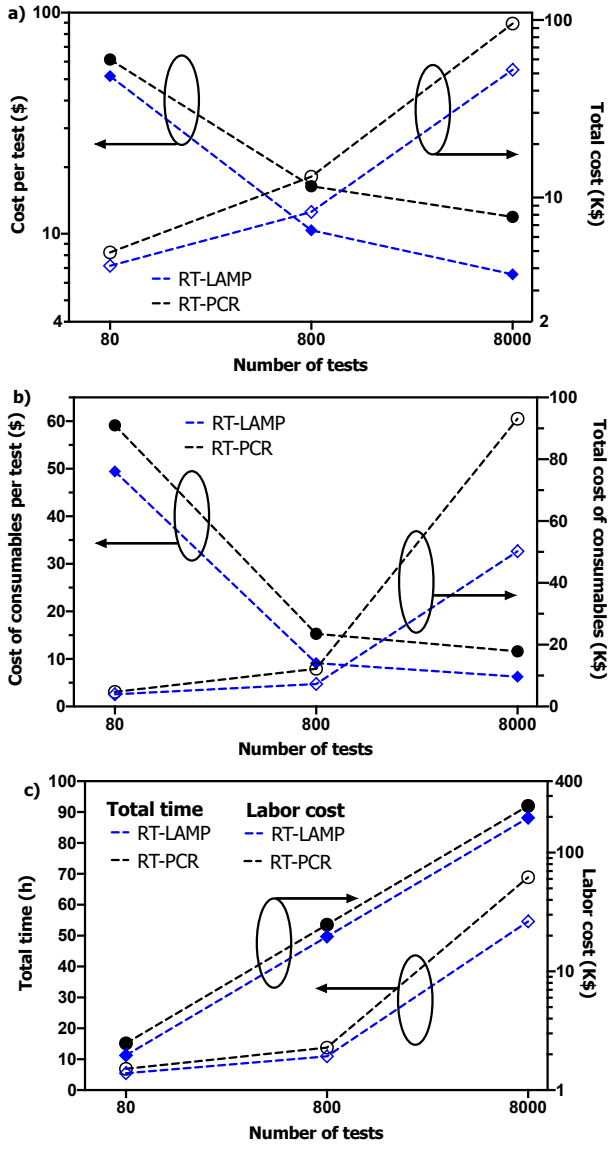

Fig. S4: Resources modeling results. a) Cost per test and total cost (excluding labor) for the three scenarios considered; b) Total cost of consumables and Cost of consumables per test for the 3 models designed; c) Labor cost and Total time for the 3 models designed. The labor cost assumes a gross salary rate = $1/min.

Table S1. RT-LAMP primer sequences for 12 primer sets (3 primer sets each for 4 target genes)

Gene Orf1a	**P1**	F3	ATCTAGTTGTAATGGCCTACA
		B3	ACAAGCACAGGTTGAGAT
		FIP	TGAGTTTTTCATAAACAGTGCCAAA-CAGGTGGTGTTGTTCAGT
		BIP	AACCCGTCCTTGATTGGCTT-AATTTAACAATTTCCCAACCGTC
		Loop F	TGTTAGTTAGCCACTGCGAAGT
	P2	F3	AAACCCGTCCTTGATTGG
		B3	CTTTAAGTTTAGCTCCACCAAT
		FIP	TCACAAGCACAGGTTGAGATAAATT-GAAGGTGTAGAGTTTCTTAGAGAC
		BIP	GTCACCTGTGCAAAGGAAATTAAG-AGAGTCAGCACACAAAGC
	P3	F3	CGGTGGACAAATTGTCAC
		B3	CTTCTCTGGATTTAACACACTT
		FIP	TCAGCACACAAAGCCAAAAATTTAT-CTGTGCAAAGGAAATTAAGGAG
		BIP	TATTGGTGGAGCTAAACTTAAAGCC-CTGTACAATCCCTTTGAGTG
Gene S	**P1**	F3	TCTTTCACACGTGGTGTT
		B3	CAGTGGAAGCAAAATAAACAC
		FIP	GAAAGGTAAGAACAAGTCCTGAGT-TTACCCTGACAAAGTTTTCAG
		BIP	TTCCAATGTTACTTGGTTCCATGC-GACAGGGTTATCAAACCTCT
		Loop B	TATACATGTCTCTGGGACCAATGG
	P2	F3	GGTGTTTATTACCCTGACAAAG
		B3	GTACCAAAAATCCAGCCTC
		FIP	TGGAACCAAGTAACATTGGAAAAGA-TTTTCAGATCCTCAGTTTTACATTC
		BIP	CTCTGGGACCAATGGTACTAAGAG-GACTTCTCAGTGGAAGCA
		Loop B	AACCCTGTCCTACCATTTAATGATG
	P3	F3	CCTGACAAAGTTTTCAGATCC
		B3	GTACCAAAAATCCAGCCTC
		FIP	GCATGGAACCAAGTAACATTGGAAA-TCAGTTTTACATTCAACTCAGGA
		BIP	CTCTGGGACCAATGGTACTAAGAG-GACTTCTCAGTGGAAGCA
		Loop B	AACCCTGTCCTACCATTTAATGATG
Gene Orf 8	**P1**	F3	ACGCCTAAACGAACATGAA
		B3	AGAACCAGCCTCATCCAG

		FIP	GGTTGATGTTGAGTACATGACTGTA-CTTGTTTTCTTAGGAATCATCACA
		BIP	ATATGTAGTTGATGACCCGTGTCC-TAAAGGTGCTGATTTTCTAGCT
		Loop F	CTACATTCTTGGTGAAATGCAGCTA
	P2	F3	CTCAACATCAACCATATGTAGT
		B3	CAATTTAGGTTCCTGGCAATT
		FIP	GGTGCTGATTTTCTAGCTCCTACTC-GACCCGTGTCCTATTCAC
		BIP	TGCTGGATGAGGCTGGTTCTA-TGTAAAAGGTAACAGGAAACTG
		Loop B	ATCACCCATTCAGTACATCGATATC
	P3	F3	AGCTGCATTTCACCAAGAA
		B3	CGATATCGATGTACTGAATGG
		FIP	TGAATAGGACACGGGTCATCA-GTAGTTTACAGTCATGTACTCAA
		BIP	GAGTAGGAGCTAGAAAATCAGCAC-TGATTTAGAACCAGCCTCATC
Gene N	**P1**	F3	GTTCCTCATCACGTAGTCG
		B3	GTTTGGCCTTGTTGTTGTT
		FIP	GCCAGCCATTCTAGCAGGAG-CAACAGTTAAGAAATTCAACTCC
		BIP	GATGCTGCTCTTGCTTTGCT-ACCAGACATTTTGCTCTCAA
		Loop B	GCTGCTTGACAGATTGAACCAG
	P2	F3	AGACGAATTCGTGGTGGT
		B3	TTGTTAGCAGGATTGCGG
		FIP	TGGCCCAGTTCCTAGGTAGT-GACGGTAAAATGAAAGATCTCAG
		BIP	CTTCCCTATGGTGCTAACAAAGAC-TGGTGTATTCAAGGCTCC
		Loop B	GGCATCATATGGGTTGCAACTGAG
	P3	F3	GTCATTTTGCTGAATAAGCATAT
		B3	GAGTCAGCACTGCTCATG
		FIP	TAAGGCTTGAGTTTCATCAGCCTT-ACGCATACAAAACATTCCCA
		BIP	CAGAGACAGAAGAAACAGCAAACT-GATTGTTGCAATTGTTTGGAG
		Loop B	GTGACTCTTCTTCCTGCTGCAGATT

Table S2. Supply chain: RT-LAMP and RT-PCR assay

See excel file.

Video S1. Uniform filling of the amplification chambers.

See video

Video S2. Time stamped videos of amplification on the cartridge for 5000 copies/μL of virus in VTM.

See video

Video S3. Time stamped videos of amplification on the cartridge for negative control (VTM only).

See video