ANALISA & FAKTA VARIAN OMIKRON

Moh Indro Cahyono

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Virus Corona

Varian Omicron Diduga Sudah Masuk dan Menyebar di Indonesia

Senin, 6 Desember 2021 21:02 WIB

Penulis: Wahyu G...

Editor: Arif Fajar ...

Ilustrasi varian baru Covid-19, Omicron. Varian Omicron diduga sudah masuk dan menyebar di Indonesia.

suara.com

8 Ciri-ciri Gejala Varian Omicron yang Perlu Diwaspadai

Chyntia Sami Bhayangkara

Minggu, 05 Desember 2021 | 18:10 WIB

Covid-19 varian Omicron. [Dok.Antara]

suara.com

WHO menyampaikan, belum ada bukti yang pasti bahwa ciri-ciri gejala varian Omicron ini berbeda dari varian Covid-19 lainnya. Itu artinya, gejala Omicron hampir sama dengan gejala varian lainnya. Adapun gejala Omicron yaitu sebagai berikut:

1. Batuk Kering
2. Demam
3. Flu
4. Berkeringat saat malam hari
5. Nyeri di berbagai bagian tubuh
6. Kelelahan
7. Tenggorokan gatal
8. Indra perasa dan penciuman tidak hilang

Jika sudah mengalami ciri-ciri gejala varian Omicron seperti yang sudah disebutkan di atas, lekas isolasi mandiri

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HEALTH / KONSULTASI

Waduh, Ilmuwan Temukan Versi Lain Varian Omicron yang Sulit Terdeteksi

Yasinta Rahmawati | Shevinna Putti Anggraeni

Kamis, 09 Desember 2021 | 08:11 WIB

Ilustrasi virus Corona Covid-19, varian Omicron. (Dok. Envato)

CNN Indonesia

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Cara Kerja SGTF Deteksi Varian Omicron Kala Sulit Pakai PCR di RI

CNN Indonesia

Kamis, 02 Dec 2021 11:10 WIB

REPUBLIKA.co.id

Indonesia Gunakan Metode SGTF Deteksi Varian Omicron

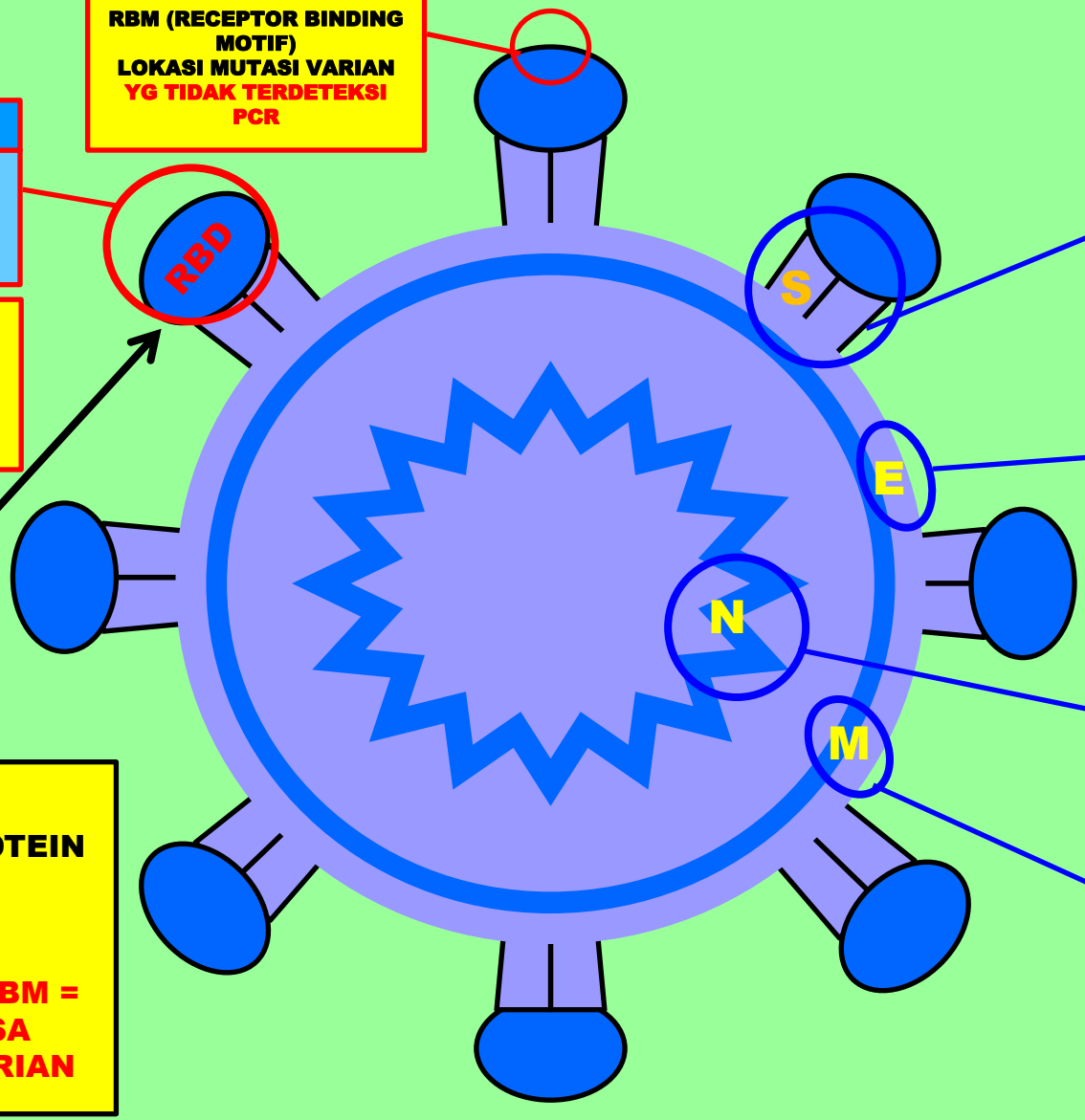
Deteksi varian Omicron di Indonesia gunakan metode S-gene target failure (SGTF).

Rabu , 01 Dec 2021, 20:30 WIB

AP/Ariel Schalit

Deteksi varian Omicron di Indonesia gunakan metode S-gene target failure (SGTF).

VARIAN, PROTEIN VIRUS COVID19 & TARGET UJI DETEKSI PCR



RBM (RECEPTOR BINDING MOTIF)
LOKASI MUTASI VARIAN
YG TIDAK TERDETEKSI PCR

TARGET SEQUENCE

VARIAN - RBD (RECEPTOR BINDING DOMAIN)

VARIAN HANYA BISA DIDETEKSI DENGAN SEQUENCING GEN S-RBD
BUKAN DENGAN PCR

PCR HANYA MENDETEKSI PROTEIN S, N, ORF

PCR TIDAK MENDETEKSI S-RBM = PCR TIDAK BISA MENDETEKSI VARIAN

TARGET DETEKSI PCR & RAPID TEST

S (SPIKE)

TARGET PCR

E (ENVELOPE)

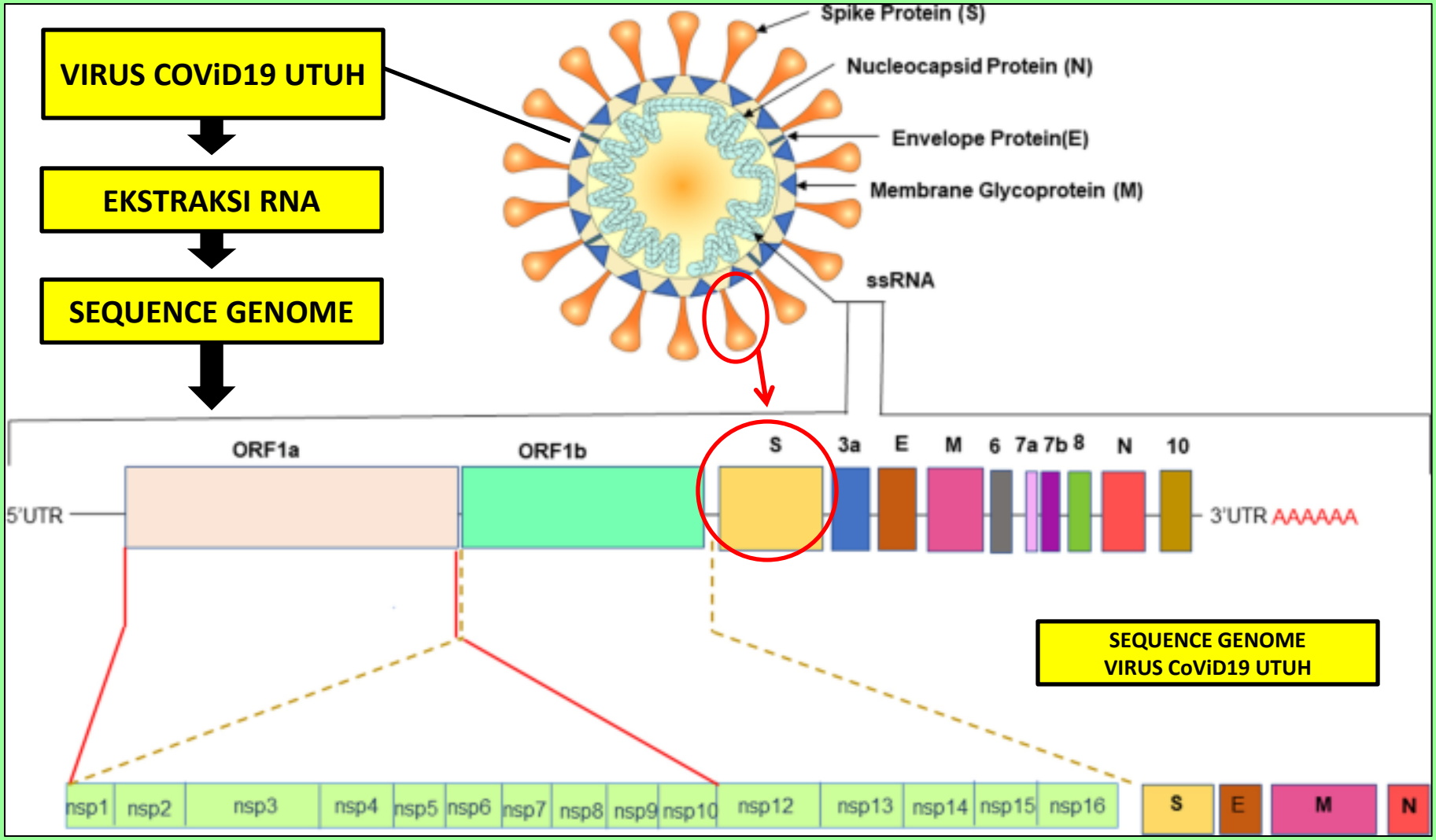
TARGET PCR

N (NUKLEOPROTEIN)

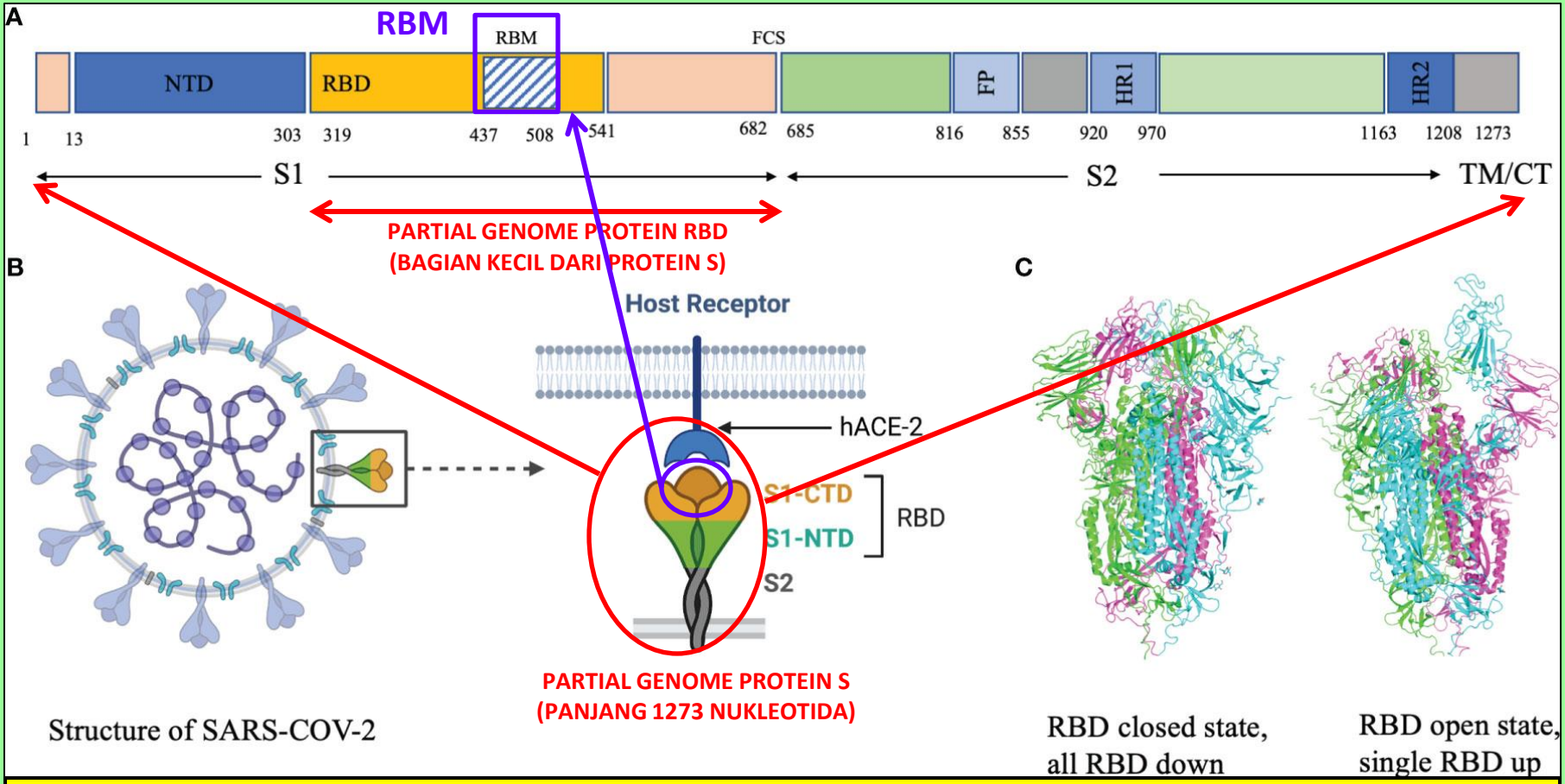
TARGET PCR

M (MEMBRANE)

WHOLE GENOME SEQUENCE VIRUS UTUH CoViD19 (PANJANG 0-29903 Nt/NUKLEOTIDA)

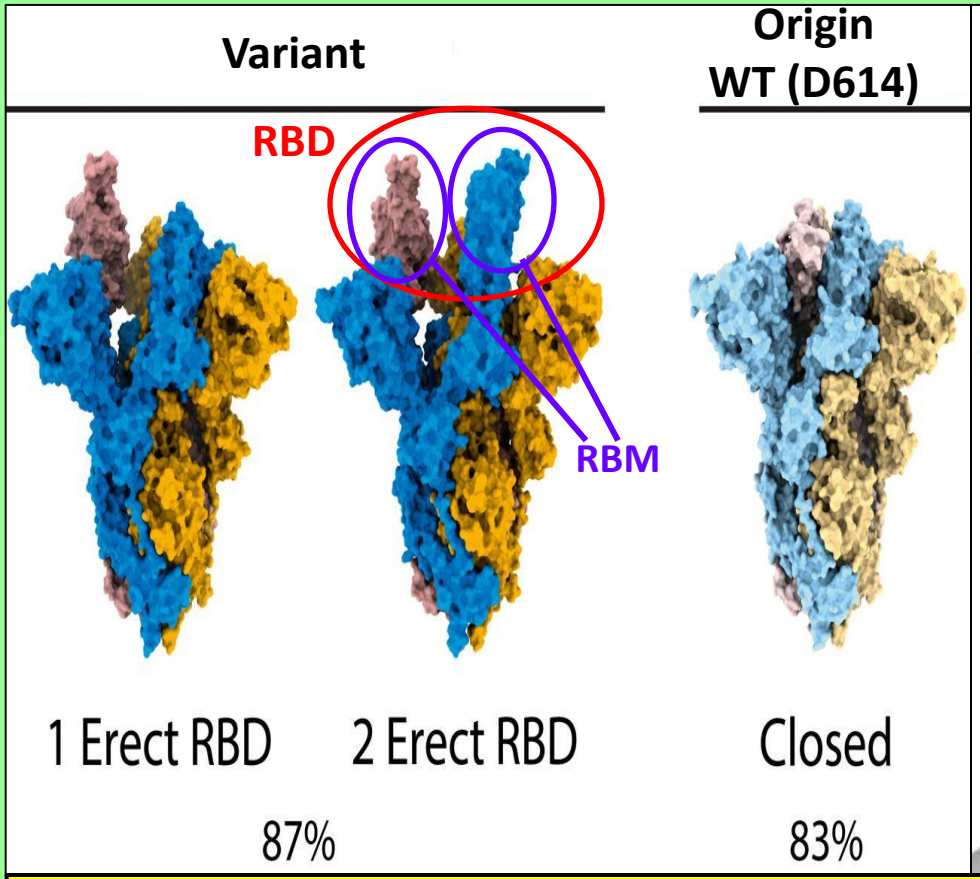


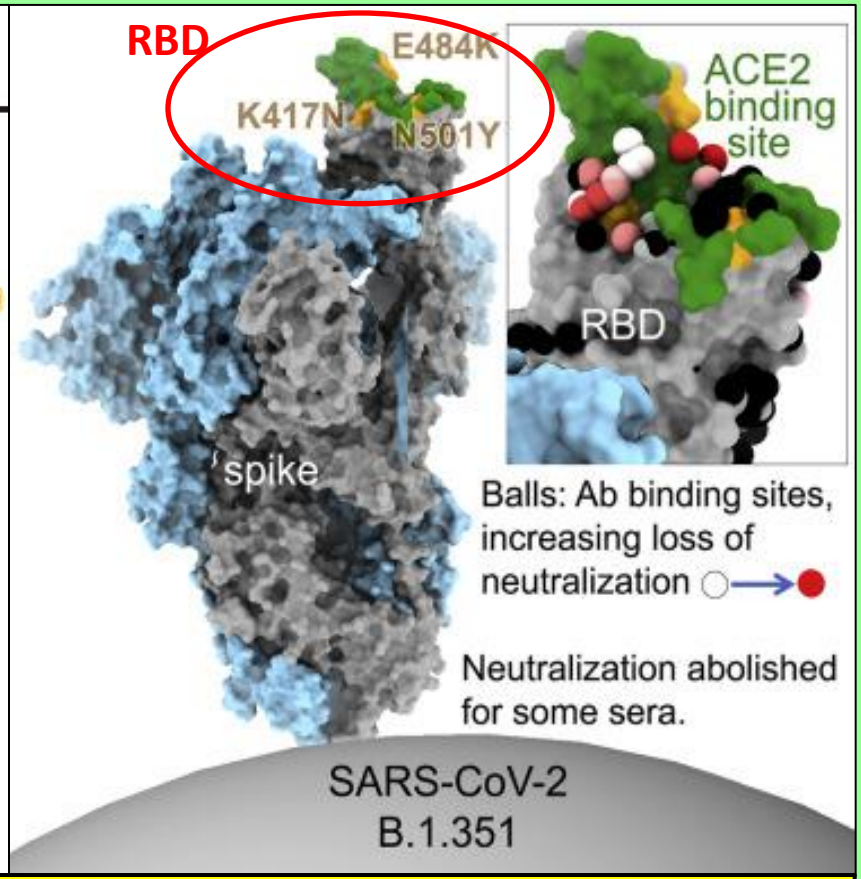
PARTIAL GENOME SEQUENCE PROTEIN S VIRUS CoViD19



- RBM (Receptor Binding Motif) adalah lokasi perubahan ujung RBD (urutan nukleotida protein S - 437-508).
- RBD (Receptor Binding Domain) adalah lokasi ujung spike virus yang menempel di receptor sel (ACE2).
- RBM adalah bagian dari RBD & RBD adalah bagian dari protein S (spike/duri virus CoViD19)

PERKIRAAN BENTUK MUTASI DI LOKASI RBM (BAGIAN DARI RBD)





Perubahan / Mutasi asam amino pada RBM (urutan protein S -437-508) tejadi di 3 lokasi yaitu :

1. **N501Y : perubahan N (Asparagine) menjadi Y (Tyrosine) di urutan 501**
2. **E484 K : perubahan E (Glutamic Acid) menjadi K (Lysine) di urutan 484**
3. **K417N : perubahan K (Lysine) menjadi N (Asparagine) di lokasi 417**

DAFTAR NAMA SINGKATAN ASAM AMINO

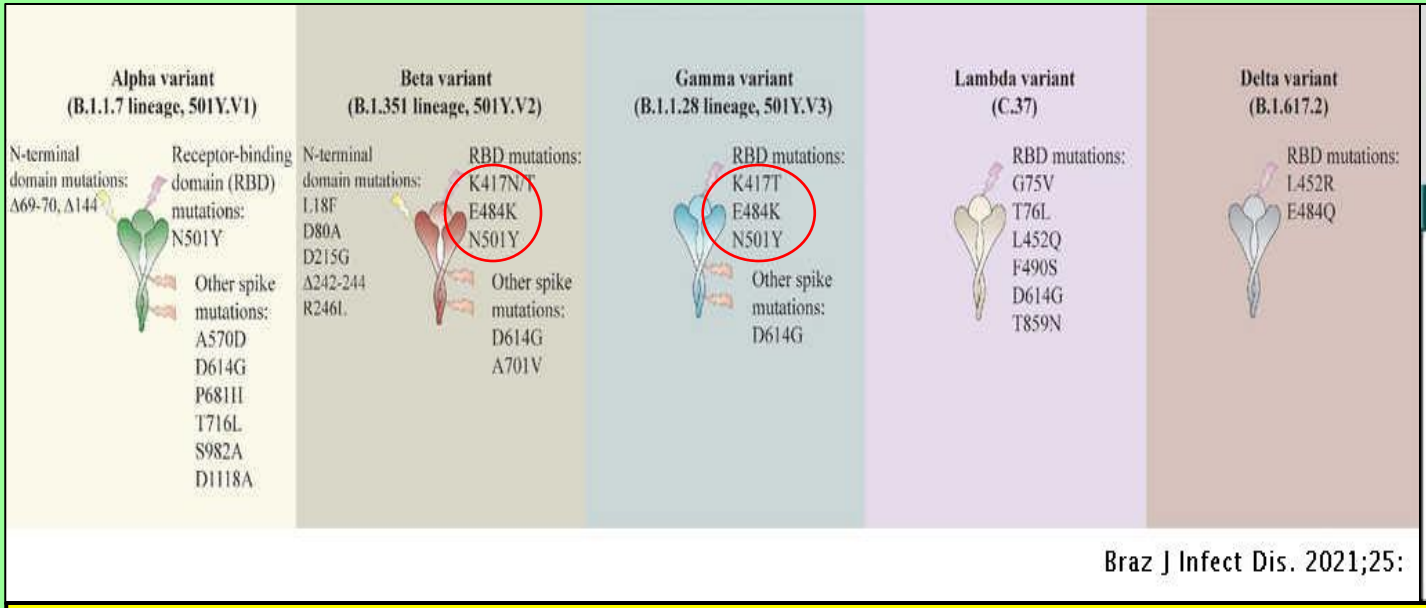
TABLE 2.2 Abbreviations for amino acids

Amino acid	Three-letter abbreviation	One-letter abbreviation	Amino acid	Three-letter abbreviation	One-letter abbreviation
Alanine	Ala	A	Methionine	Met	M
Arginine	Arg	R	Phenylalanine	Phe	F
Asparagine	Asn	N	Proline	Pro	P
Aspartic acid	Asp	D	Serine	Ser	S
Cysteine	Cys	C	Threonine	Thr	T
Glutamine	Gln	Q	Tryptophan	Trp	W
Glutamic acid	Glu	E	Tyrosine	Tyr	Y
Glycine	Gly	G	Valine	Val	V
Histidine	His	H	Asparagine or aspartic acid	Asx	B
Isoleucine	Ile	I			
Leucine	Leu	L	Glutamine or glutamic acid	Glx	Z
Lysine	Lys	K			

Table 2-2
Biochemistry, Sixth Edition

Asam amino adalah penyusun terkecil dari protein.
Ada 20 jenis asam amino & jumlah asam amino yang menyusun protein bervariasi.
Pada lokasi RBD virus CoViD19 tersusun dari sekitar 16 macam asam amino.

VARIANT OF CONCERN (VARIAN KEPRIHATINAN)



Braz J Infect Dis. 2021;25:

- Omicron memiliki **lebih dari 30 mutasi** pada Spike protein.
- Beberapa mutasi, telah diketahui efeknya

Protein	Mutasi	Efek
Spike	del 69-70 dan D796Y K417N del 144 E484A N440K del 144-145	penurunan respon imun
	N501Y P681H	penurunan respon imun dan kenaikan transmisi
	D614G Q493R G339D	Transmisibility

Varian yang menyebabkan keprihatinan – varian yang DIPERKIRAKAN membuat perubahan pada bagian paling ujung dari RBD serta DIPERKIRAKAN mempengaruhi proses penempelan virus CoViD19 dengan RESEPTOR SEL (ACE2).
Virus CoViD19 yang memiliki perubahan E484K, N501Y, & K417N sekaligus DIKHAWATIRKAN & DIPERKIRAKAN akan lebih mudah menempel pada sel dengan reseptor ACE2.

PERUBAHAN PROTEIN S-RBM VIRUS COVID19 VARIANT OF CONCERN

VOC 202012/02 (B.1.351)

As of 10 February 2021, 126 confirmed and 56 probable cases of VOC 202012/02 (B.1.351, initially detected in South Africa) have been identified in England. This variant was designated VUI on detection and on review re-designated as VOC 202012/02 (B.1.351) on 24 December 2020.

Genomic profile

The VOC is lineage B1.351 (first sequence detected in South Africa in October 2020; and in the UK in December 2020). The complete mutation profile is shown in Table 4.

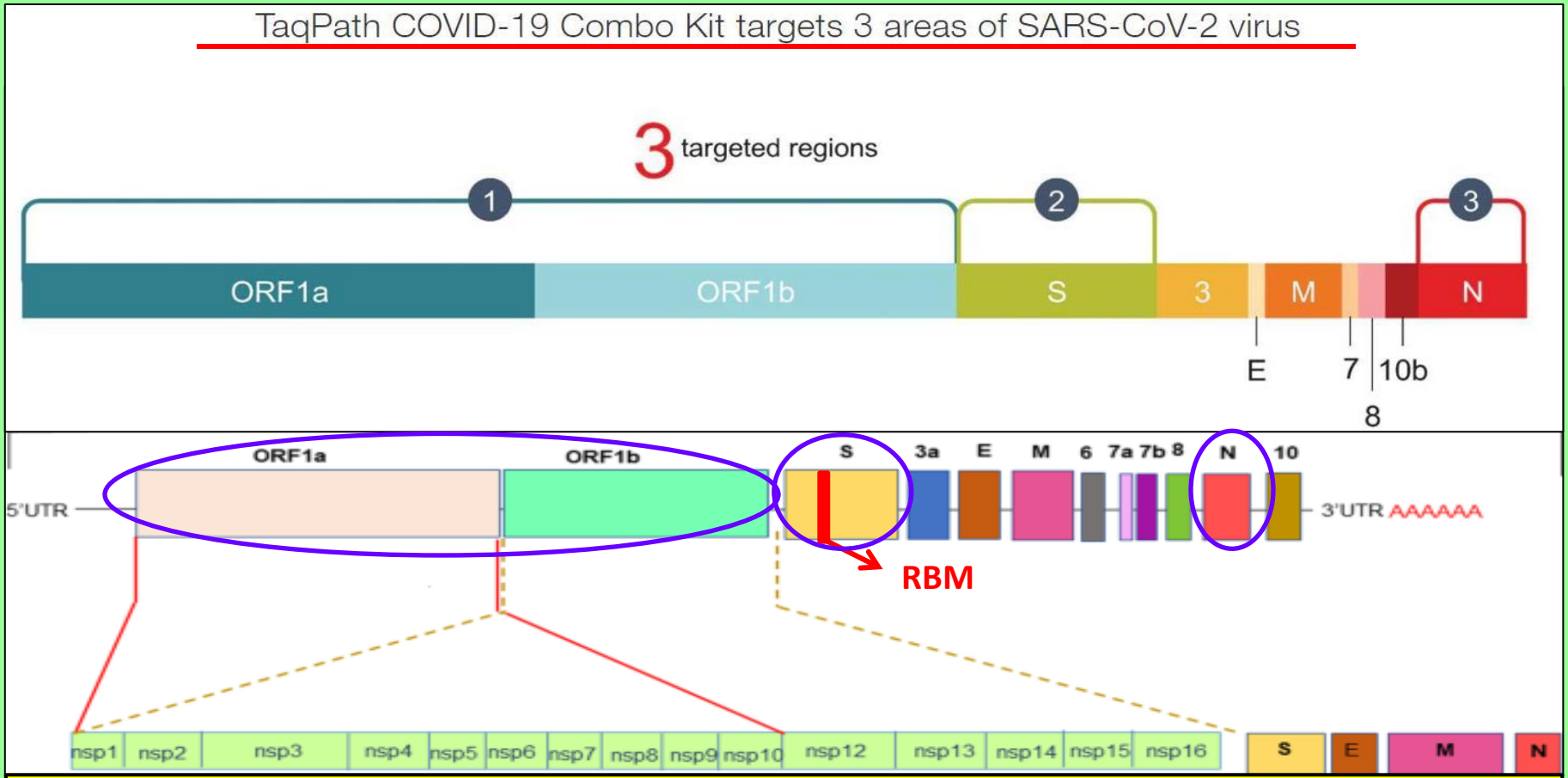
Table 4a. VOC 202012/02 (B.1.351) Variant defining mutations. Red text indicates acquisition in subset of isolates within the lineage

Gene	amino_acid	actual_nucleotide
S Gene	L18F	21614C>T
	D80A*	21801A>C
	D215G*	22206A>G
	R246I	22299G>T
	K417N*	22813G>T
	E484K*	23012G>A
	N501Y*	23063A>T
	A701V*	23664C>T
	242-244del	

VOC sudah terdeteksi sejak Desember 2020 sejak munculnya varian Alfa.
Varian virus CoViD19 yang termasuk VOC hingga saat ini :

- **Alfa (N 501Y) – 1 mutasi RBM**
- **Beta & Gamma (N501Y, E484K, & K417N) – 3 mutasi RBM**
- **Delta (E484Q) – 1 mutasi RBM**
- **Omikron (n501Y, E484K, & K417N) – 3 mutasi RBM**

DETEKSI VARIANT OF CONCERN RBM MENGGUNAKAN RT-PCR



Deteksi virus CoViD19 bisa dilakukan menggunakan mesin RT-PCR dengan 3 primer di lokasi urutan protein ORF, S, & N.

Kit deteksi TaqPath untuk protein S TIDAK BISA MENGENALI perubahan asam amino di lokasi RBM (E484K, N501Y, & K417N)

SGTF (S PROTEIN TARGET FAILURE)

Investigation of SARS-CoV-2 Variants of Concern

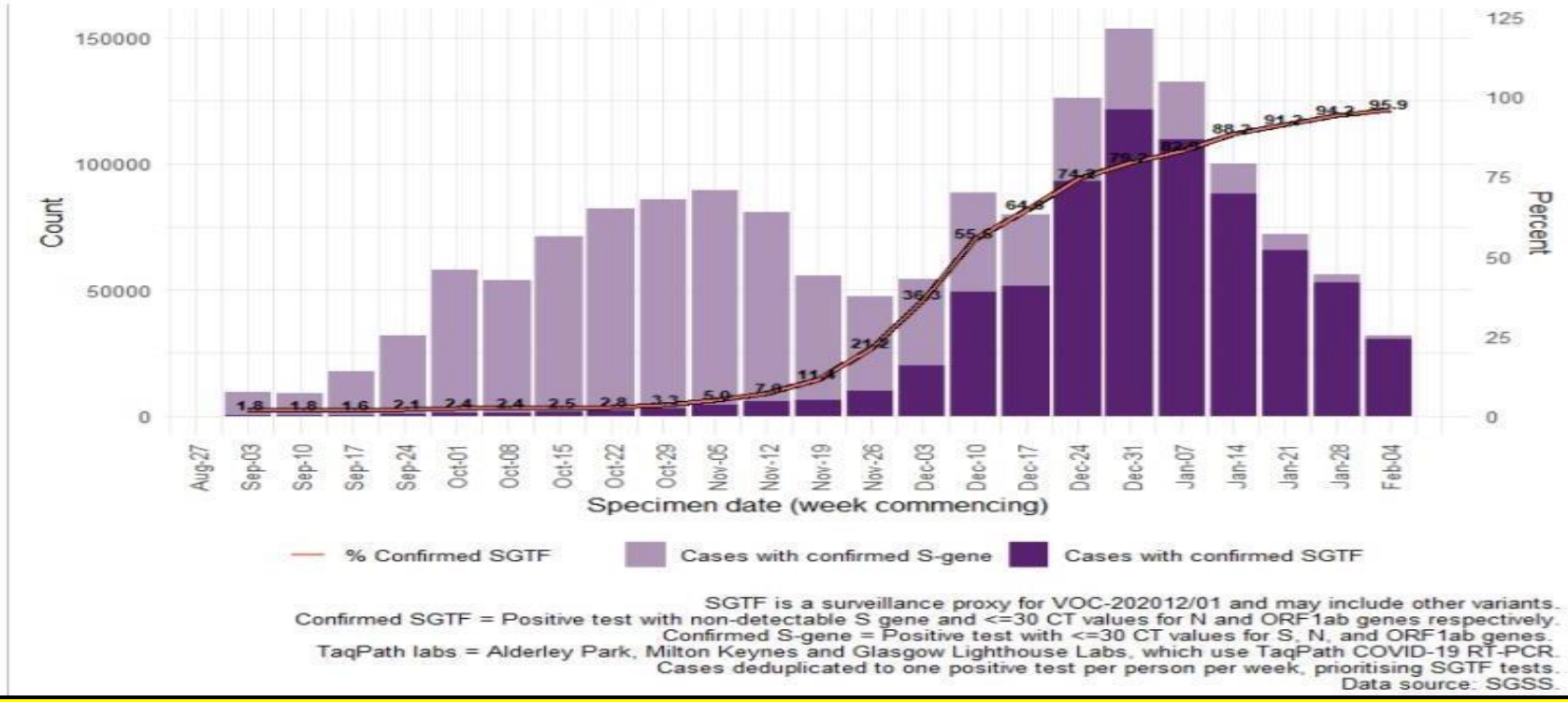
Surveillance of SGTF, as a proxy for VOC 202012/01 (B.1.1.7), is based on positive tests reported by 3 lighthouse laboratories that use the Thermo Fisher TaqPath RT-PCR, and for which CT values are low enough to classify if the S gene is detectable. Specifically, positive tests with CT values >30 for any gene target are excluded. SGTF is defined as a positive test with CT values <=30 for the N and ORF1ab genes and an undetectable S gene. S gene positive is a positive test for which all 3 gene targets (N, ORF1ab, S) have CT values <=30.

Samples with SGTF have predominated since mid-December 2020, reaching 95.9% of cases in the week starting 4 February 2021 (Figure 6). All regions in England have reached >93% SGTF in the most recent week (Figure 7). Total cases detected using the TaqPath assay have also been declining since the first week of 2021, reflecting the general decline in case rates across England.

GISAID (Global Initiative on Sharing All Influenza Data) adalah organisasi nirlaba yang berlokasi di Munich, Jerman dibentuk pada tahun 2008 untuk meneliti Avian Influenza & saat ini meneliti semua data global tentang CoViD19.
GISAID menggunakan kit RT-PCR TaqPath Thermo Fischer untuk mendeteksi sampel virus CoViD19.
Definisi SGTF untuk sampel yang terdeteksi protein N & ORF (CTV < 30) + protein S tidat terdeteksi atau CTV >30 (karena mutasi di lokasi RBM)

GRAFIK DETEKSI SGTF

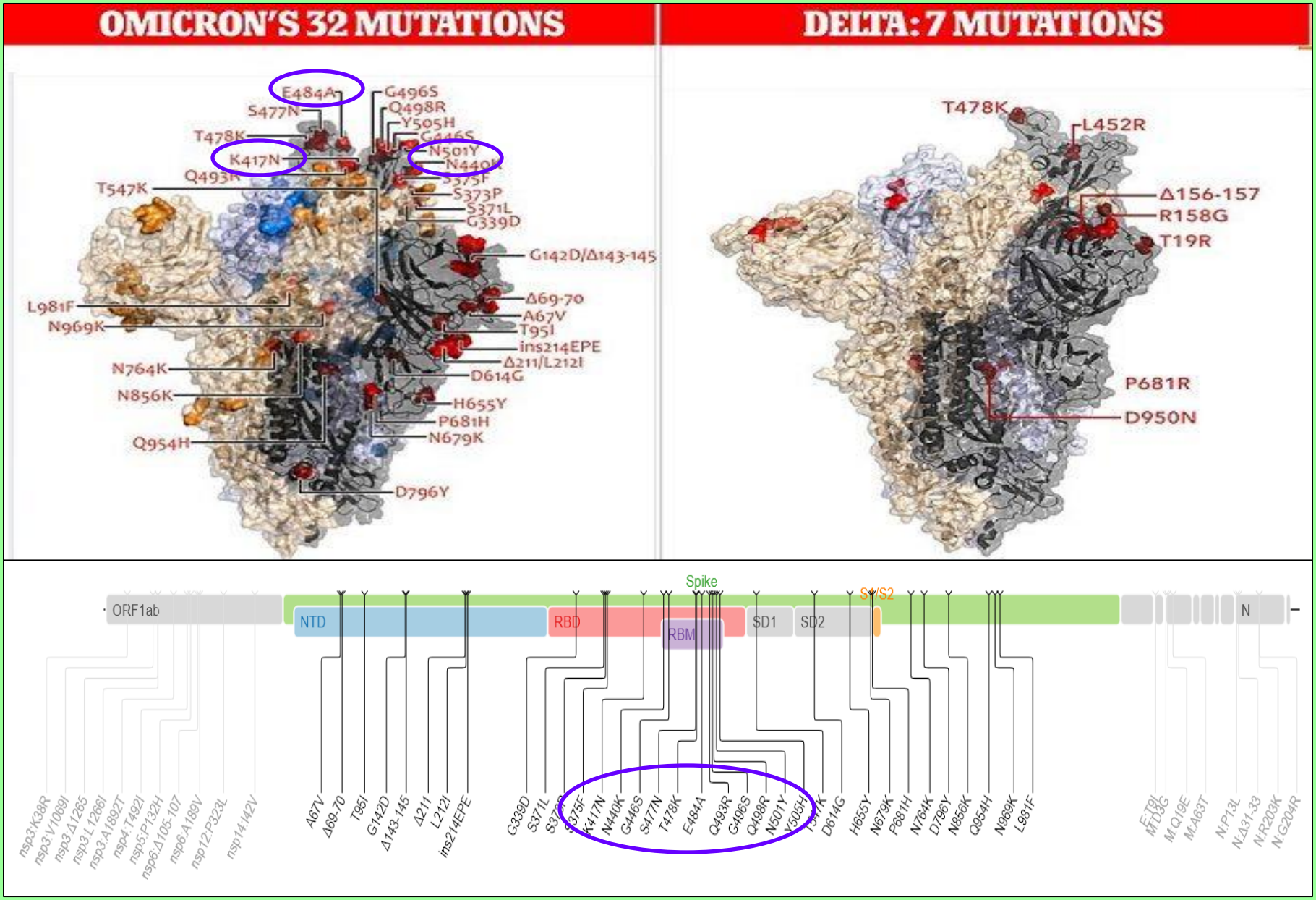
Figure 6. Weekly number and proportion of England Pillar 2 COVID-19 cases with SGTF among those tested with the TaqPath assay and with S gene detection results (3 September 2020 to 10 February 2021)



SGTF is a surveillance proxy for VOC-202012/01 and may include other variants.
Confirmed SGTF = Positive test with non-detectable S gene and <=30 CT values for N and ORF1ab genes respectively.
Confirmed S-gene = Positive test with <=30 CT values for S, N, and ORF1ab genes.
TaqPath labs = Alderley Park, Milton Keynes and Glasgow Lighthouse Labs, which use TaqPath COVID-19 RT-PCR.
Cases deduplicated to one positive test per person per week, prioritising SGTF tests.
Data source: SGSS.

Tampilan grafik kemunculan SGTF sejak September 2020-February 2021.
Tampak kejadian SGTF meningkat dimana deteksi menggunakan kit TaqPath terhadap protein N & ORF tetap terdeteksi (CTV < 30) & protein S semakin tidak terdeteksi (CTV>30).

MUTASI PROTEIN S-RBM PADA VARIAN OMICRON



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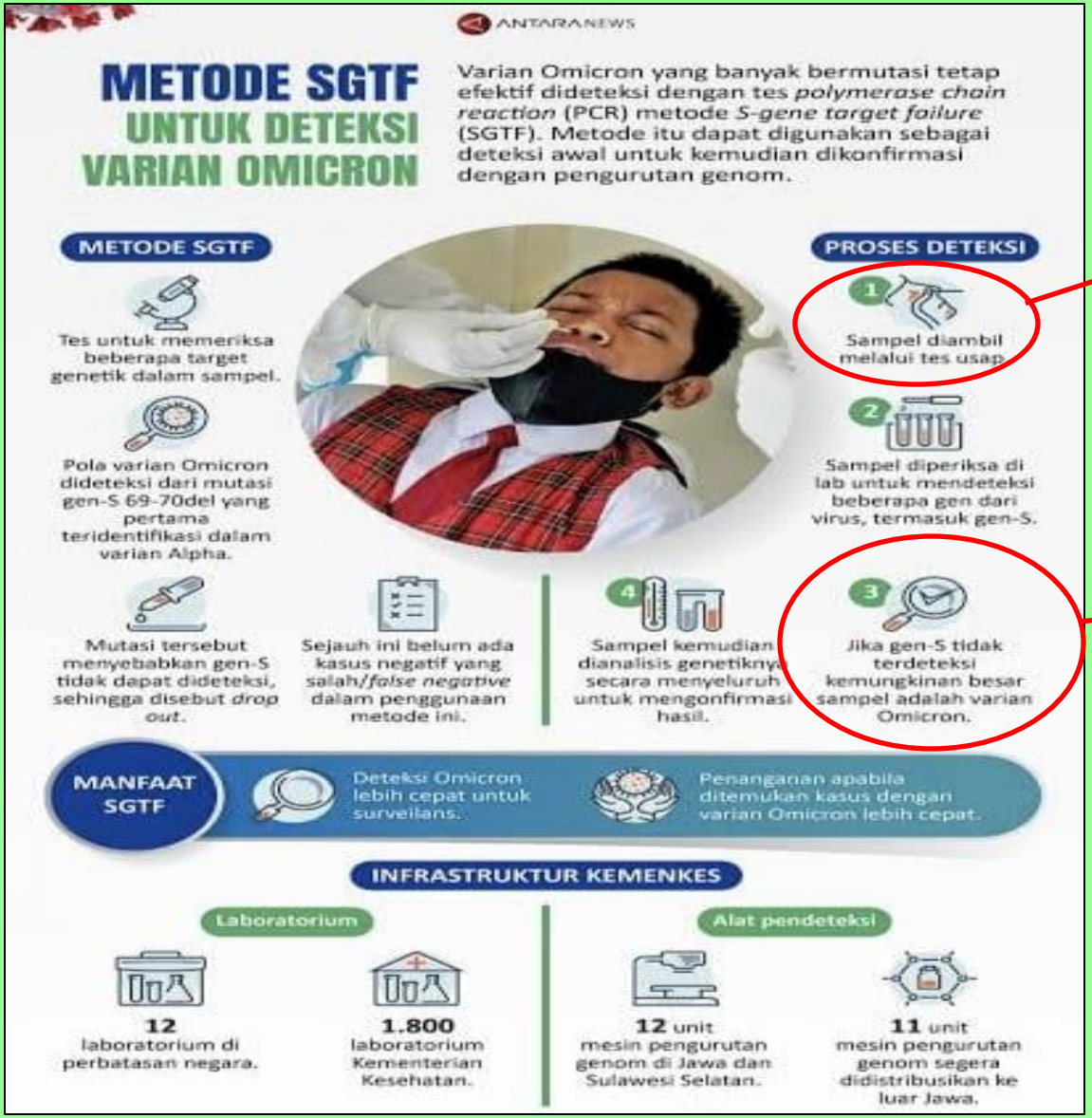
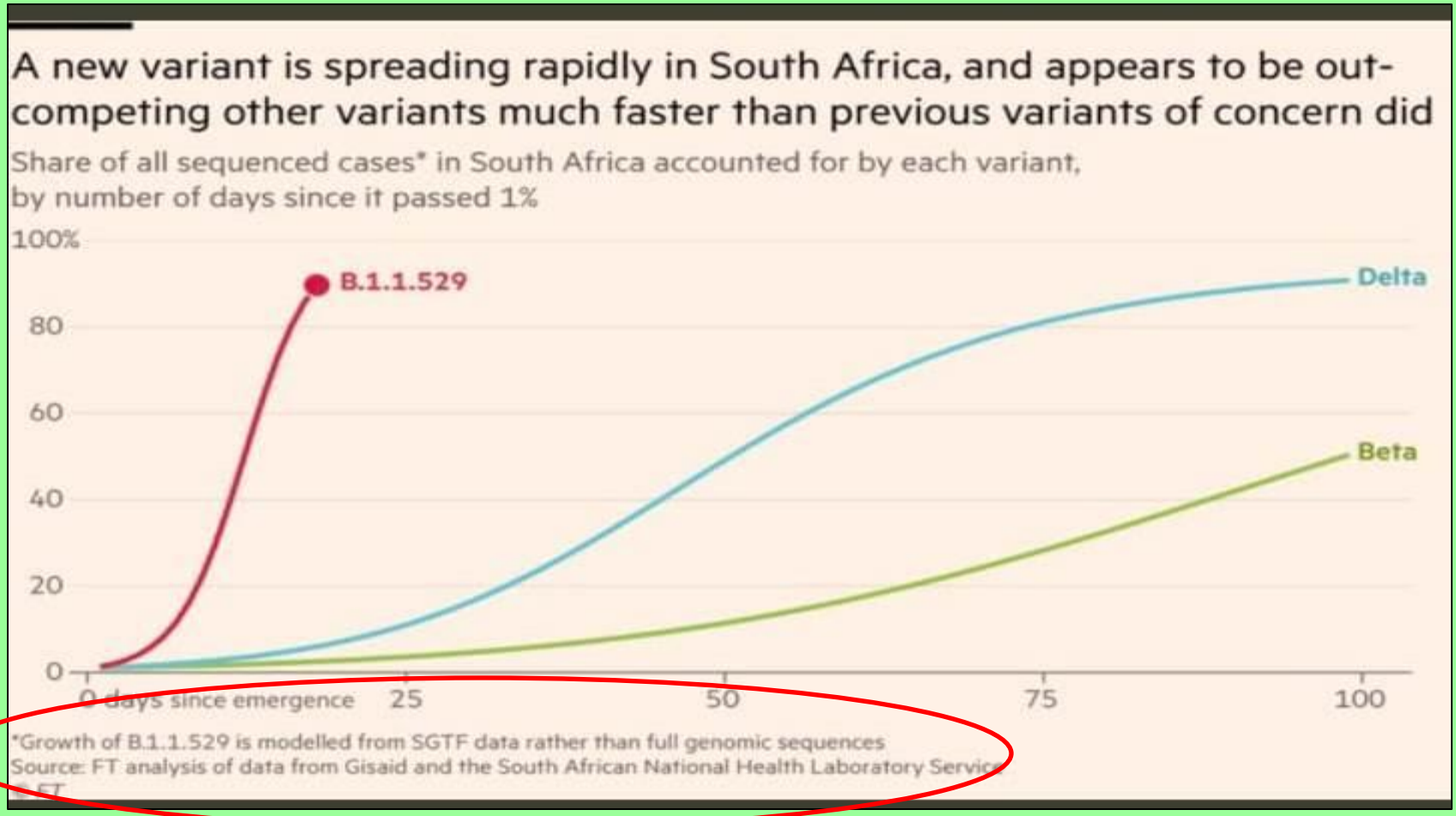


JIKA SAMPEL DIAMBIL DARI SWAB HIDUNG HANYA AKAN MENUNJUKAN PAPARAN VIRUS COVID19 BUKAN INFEKSI. UNTUK DETEKSI INFEKSI SAMPEL DIAMBIL DARI DAHAK/SALIVA.

JIKA GEN S-RBM TIDAK TERDETEKSI, GUNAKAN PRIMER RT-PCR KHUSUS YANG BISA MENDETEKSI N501Y, & E484K

BERITA MEDIA DI INDONESIA (4)



- **Pertumbuhan varian B.1.1.529 500% LEBIH CEPAT BERDASARKAN MODEL PERKIRAAN dari data SGTF bukan dari data sequence seluruh genome & bukan dari data fakta kenyataan.**

- **Sumber : Analisa data FT dari GISAID & Pelayanan Kesehatan Nasional Afrika Selatan.**

**** SGTF (Spike Gene TARGET Failure), FT (Fault Tree)**

SOLUSI SEDERHANA DETEKSI PROTEIN S-RBM UNTUK MENGATASI FENOMENA SGTF (1)

Primer/Probe Mix for N501Y

Primer/Probe Mix for E484K

Jepang mencmbuat primer RT-PCR khusus untuk mendeteksi bagian protein S-RBM yang tidak mampu terdeteksi oleh kit RT-PCR TaqPath.
N501Y & E484K terdeteksi maka fenomena SGTF akan hilang.

SOLUSI SEDERHANA DETEKSI PROTEIN S-RBM UNTUK MENGATASI FENOMENA SGTF (2)

Less frequent sequence mismatches in variants of concern (VOCs) of SARS-CoV-2 in the real-time RT-PCR assays developed by the National Institute of Infectious Diseases, Japan

Kazuya Shirato[1*], Shutoku Matsuyama[1,2], and Makoto Takeda[1]

[1]Department of Virology III, and [2]Influenza and Respiratory Virus Research Center, National Institute of Infectious Disease, 4-7-1 Gakuen, Musashimurayama, Tokyo 208-0011, Japan

Running title: Mismatches in NIID PCR assays for SARS-CoV-2

Keywords: Coronavirus Diseases 2019 (COVID-19), severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), variant of concern (VOC), real-time RT-PCR

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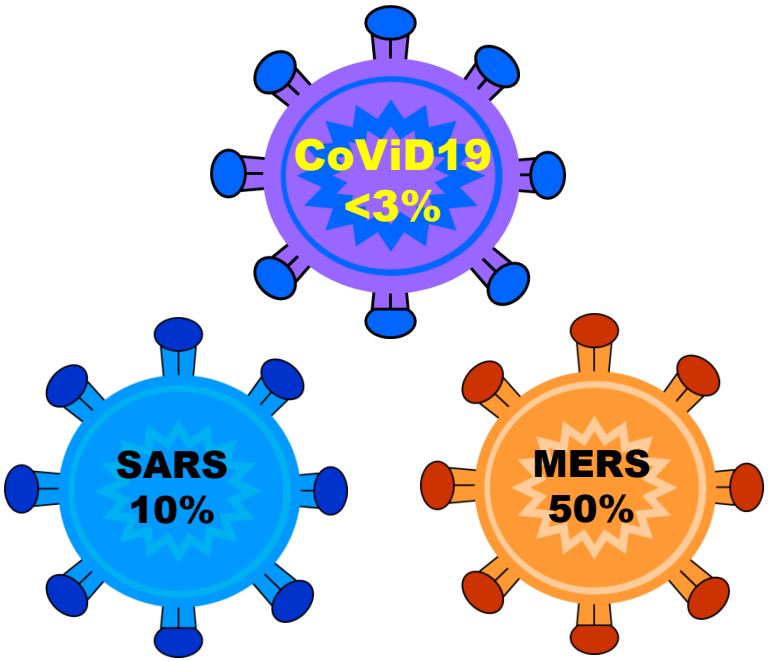
Summary

Various variants of severe acute respiratory syndrome (SARS) coronavirus 2 (SARS-CoV-2) began emerging worldwide from the end of 2020 to the beginning of 2021. The variants GRY/VOC202012/01 (B1.1.7), GH/N501Y.V2 (B1.351), and GR/N501Y.V3 (P1) are characterized by N to Y amino acid substitution at position 501 in the S protein. The variant containing L to R substitution at position 452 in the S protein G/L452R.V3 (B1.617) was endemic to India. The heightened concern regarding these variants is related to their increased viral infectivity. Information about nucleotide mismatch(es) on the primer/probe sequence is important for maintaining good performance of real-time PCR assays. In this study, real-time RT-PCR assays developed by the National Institute of Infectious Diseases, Japan (NIID-N2 and NIID-S2 assays), were reviewed to analyze nucleotide mismatches of variants in primer/probe sequences. The frequency of mismatched sequences in three variants (GRY/VOC202012/01, GH/N501Y.V2, and GR/N501Y.V3) was lower than that in all SARS-CoV-2 sequences. The mismatch, that G to C substitution at nucleotide 8 in reverse primer of S2 set, elevated to about 16.3% in G/L452R.V3, however the substitution did not affect the analytical sensitivity of assay. Therefore, the study indicates that the NIID-N2 and NIID-S2 sets detect VOCs of SARS-CoV-2 with reliable efficiency.

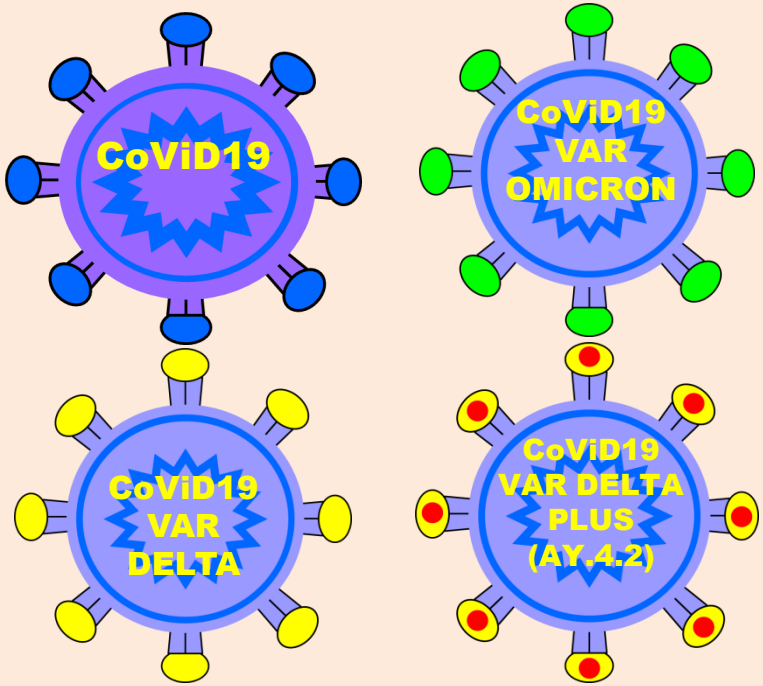
Jepang mencmbuat primer RT-PCR khusus untuk mendeteksi bagian protein S-RBM yang tidak mampu terdeteksi oleh kit RT-PCR TaqPath.
N501Y & E484K terdeteksi maka fenomena SGTF akan hilang.

PERBEDAAN STRAIN & VARIAN

STRAIN : PERBEDAAN PROTEIN M,E & N MENUNJUKAN SIFAT VIRUS YANG BERBEDA. TINGKAT KEMATIAN MERS 50%, SARS 10%, & CoViD19 <3%. SIFAT STRAIN TETAP & TIDAK BERUBAH



VARIAN : PERUBAHAAN PROTEIN S PADA STRAIN YANG SAMA – CoViD19 (TANPA PERUBAHAN PROTEIN M,E, & N) SIFAT MASIH SAMA DENGAN 97% KESEMBUHAN



SIFAT CoViD19 DI SOUTH AFRICA MASIH SAMA DENGAN 97% KESEMBUHAN

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Covid-19: 'No need to panic' about Omicron variant, 'symptoms are mild' so far - SAMA board chair

3h ago
Getrude Makhafola

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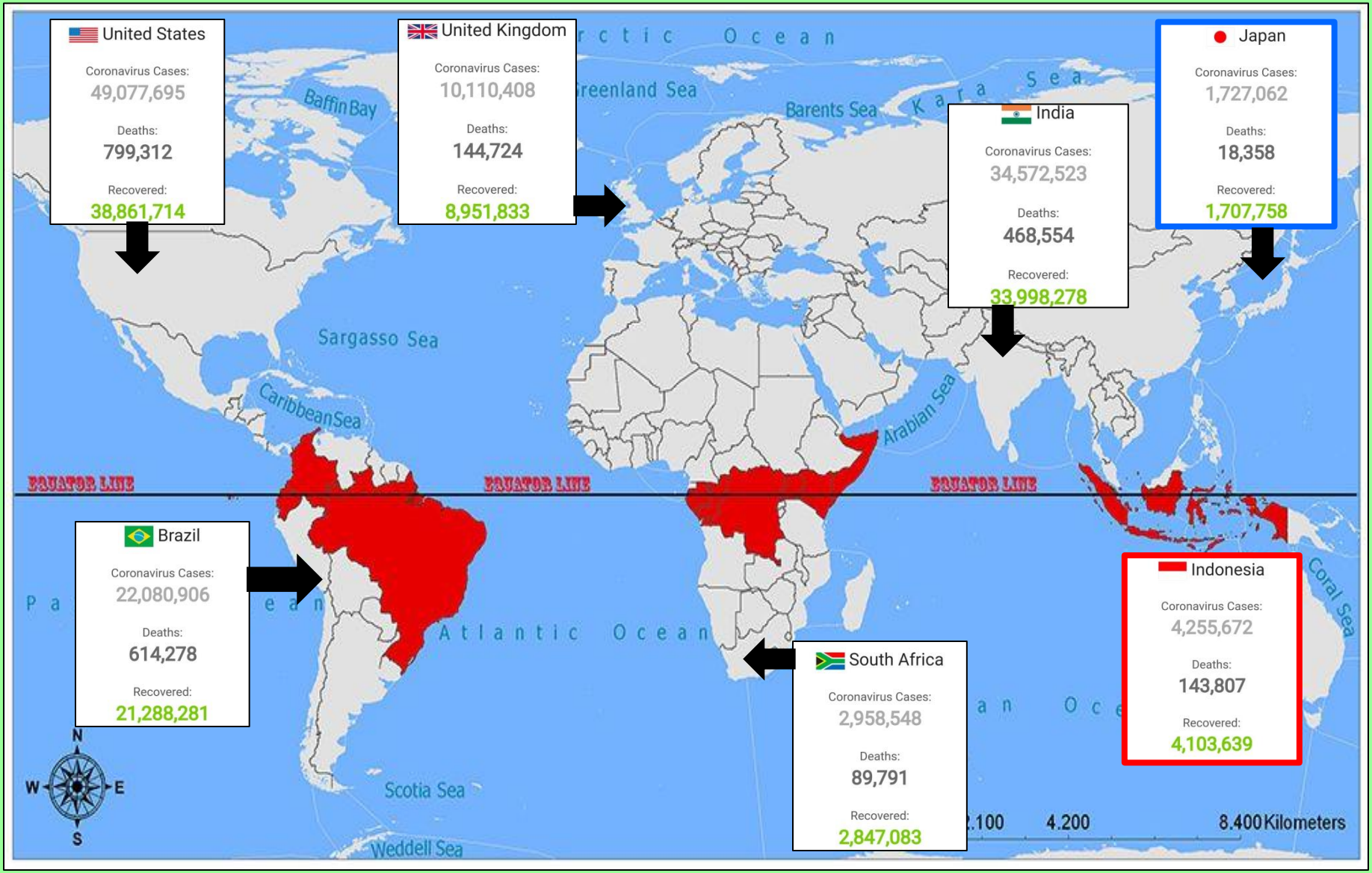
Dr Angelique Coetzee – who is also board chairperson of the SA Medical Association.

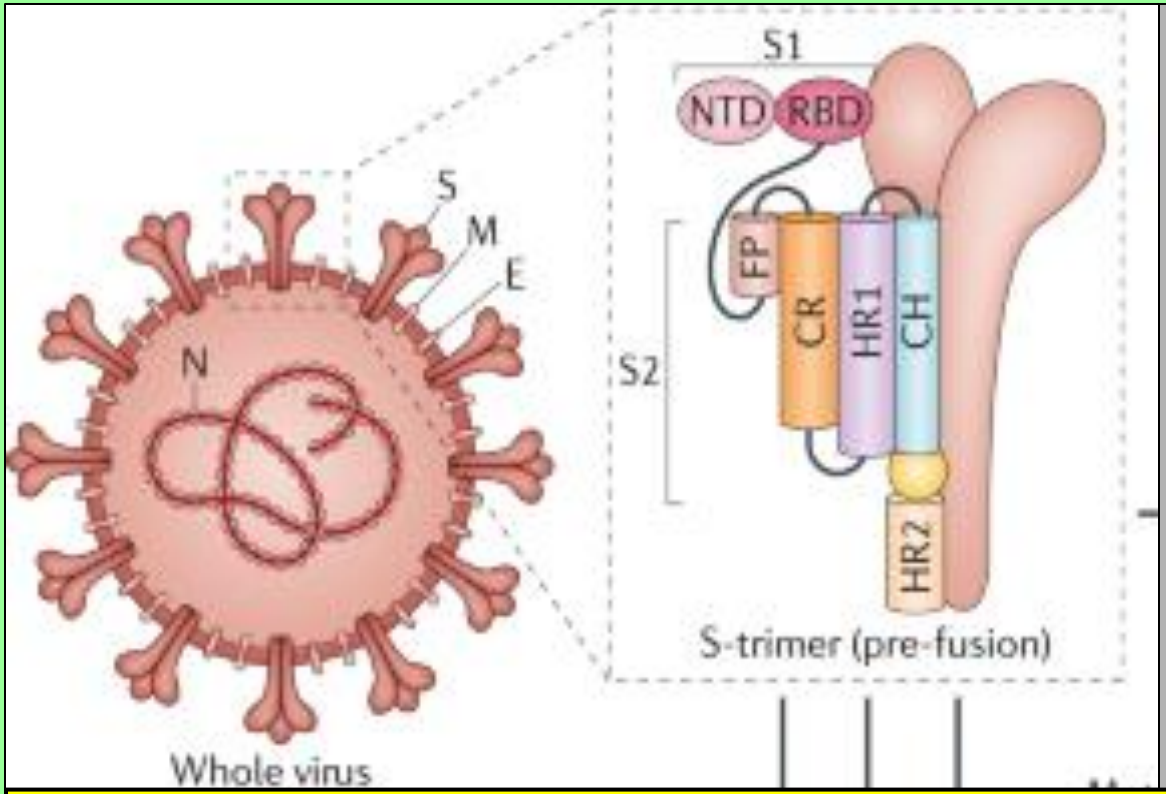
PHOTO: Deon Raath

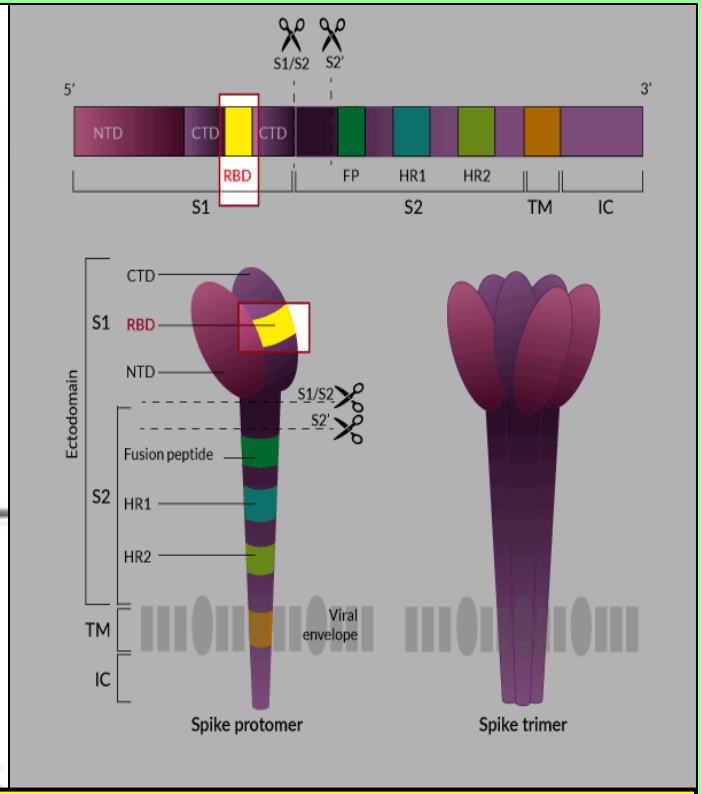
- A Tshwane medical doctor says, unlike previous variants, the Covid-19 patients she treats do not have serious symptoms.
- She urged people not to panic, as the patients have not needed hospital admission.
- An expert in infectious diseases says, although the mild symptoms are good news, doctors should be cautious because not much is known about the new variant.

INDONESIA & POSISI NEGARA LAIN SELAMA PANDEMI COVID19



VARIASI MUTASI (VARIAN) VIRUS COVID19





KESIMPULAN

1. Varian Omikron bisa didteksi menggunakan primer N501Y & E484K.
2. Fenomena SGTF HANYA masalah kegagalan primer mendeteksi mutasi protein S-RBM.
3. Varian Omikron HANYA perubahan di ujung kecil duri virus, virus MASIH TETAP SAMA CoViD19 dengan kesembuhan 97% BUKAN berubah menjadi virus ganas.
4. Pengambilan sampel RT-PCR dilakukan menggunakan dahak/saliva pada orang sakit
5. Indonesia memerlukan divisi khusus ilmuwan untuk mengkonfirmasi & mengevaluasi semua berita media terkait CoViD19 agar tidak menimbulkan kepanikan rakyat.

“Logika mengalahkan kepanikan, Pengetahuan mengalahkan ketakutan”

- Moh Indro Cahyono, 2020