



**MINISTRY OF NATIONAL HEALTH SERVICES,
REGULATIONS & COORDINATION
GOVERNMENT OF PAKISTAN**

**DEPARTMENT OF VIROLOGY
NATIONAL INSTITUTE OF HEALTH (NIH)
PUBLIC HEALTH LABORATORIES DIVISION (PHLD)**

**SARS-COV-2 VARIANTS OF CONCERN
SITUATIONAL REPORT # 11
MAY 01, 2021 TO JUNE 15, 2022
PHONE # +92-51-9255238**



HIGHLIGHTS

- The emergence of SARS-CoV-2 variants of concern (VOCs) have posed a serious challenge to the public health. Among the VOCs, delta, omicron and more recently omicron BA.2.12.1, BA.4 and BA.5 have been associated with an increased number of cases in United States of America, South Africa and Portugal, respectively.
- In Pakistan, all the five VOCs (alpha, beta, gamma, delta and omicron) have been detected through whole genome sequencing. The first case of Omicron was reported on Dec 13, 2021, and as of Jun 15, 2022, 6,650 cases have been detected from Pakistan (based on whole-genome sequencing and PCR-based genotyping). Further, first cases of BA.2.12.1 (on May 09, 2022), BA.4 and BA.5 (on June 06, 2022) were reported in Pakistan.

S.No	Sequencing & PCR Testing	Alpha	Beta	Gamma	Delta	Omicron	Number (n)
1	Whole genome sequences (as of Jun 15, 2022)	495	100	1	1,289	514	2,399
2	Partial Sequences (as of Jun 15, 2022)	30	2	0	8	58	98
3	PCR based VOCs genotyping (May 2021 to Jun 7, 2022)	2,889	196	42	7,040	6,650	16,817

Detection of variants of concern based on whole genome
sequencing and PCR Genotyping



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VARIANTS OF CONCERN (VOCs)

Nextstrain clade	20I (V1)	20H (V2)	20J (V3)	21A, 21I, 21J	21K, 21L, 21M, 22A, 22B, 22C			
GISAID clade	GRY	GH/501Y.V2	GR/501Y.V3	G/478K.V1	GRA			
WHO label	Alpha	Beta	Gamma	Delta	Omicron	Omicron BA.2.12.1	Omicron BA.4	Omicron BA.5
First detected in	United Kingdom	South Africa	Brazil	India	South Africa & Botswana	USA	South Africa	South Africa
Defining mutations (spike)	N501Y, A570D, P681H, T716I, S982A, D1118H	D80A, D215G, K417N, A701V, N501Y, E484K	L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, H655Y, T1027I	T19R, L452R, T478K, P681R, D950N	A67V, T95I, G339D, S371L, S373P, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, T547K, D614G, N501Y, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K	+ L452Q + S704L	+ 69-70 del + L452R - Q493R	+ 69-70 del + L452R - Q493R
Available sequences worldwide	1,184,594	42,448	126,289	4,396,961	4,142,142	115,765	10,423	17,479
Cumulative prevalence worldwide	11%	< 0.5%	1%	40%	36%	1%	< 0.5%	< 0.5%
Available sequences Pakistan	495	100	1	1,276	436	1	2	3
*First detection from Pakistan	Dec 25, 2020	March 15, 2021	May 17, 2021	Apr 12, 2021	Dec 3, 2021	Apr 20, 2022	May 19, 2022	May 21, 2022
**Cumulative prevalence in Pakistan	19%	4%	< 0.5%	52%	33%	N/A	N/A	N/A

*Based on date of sample collection

**Apparent cumulative prevalence is the ratio of the VOC sequences to all sequences collected since its identification in Pakistan.

Overview of variants of concern (as of Jun 15, 2022)



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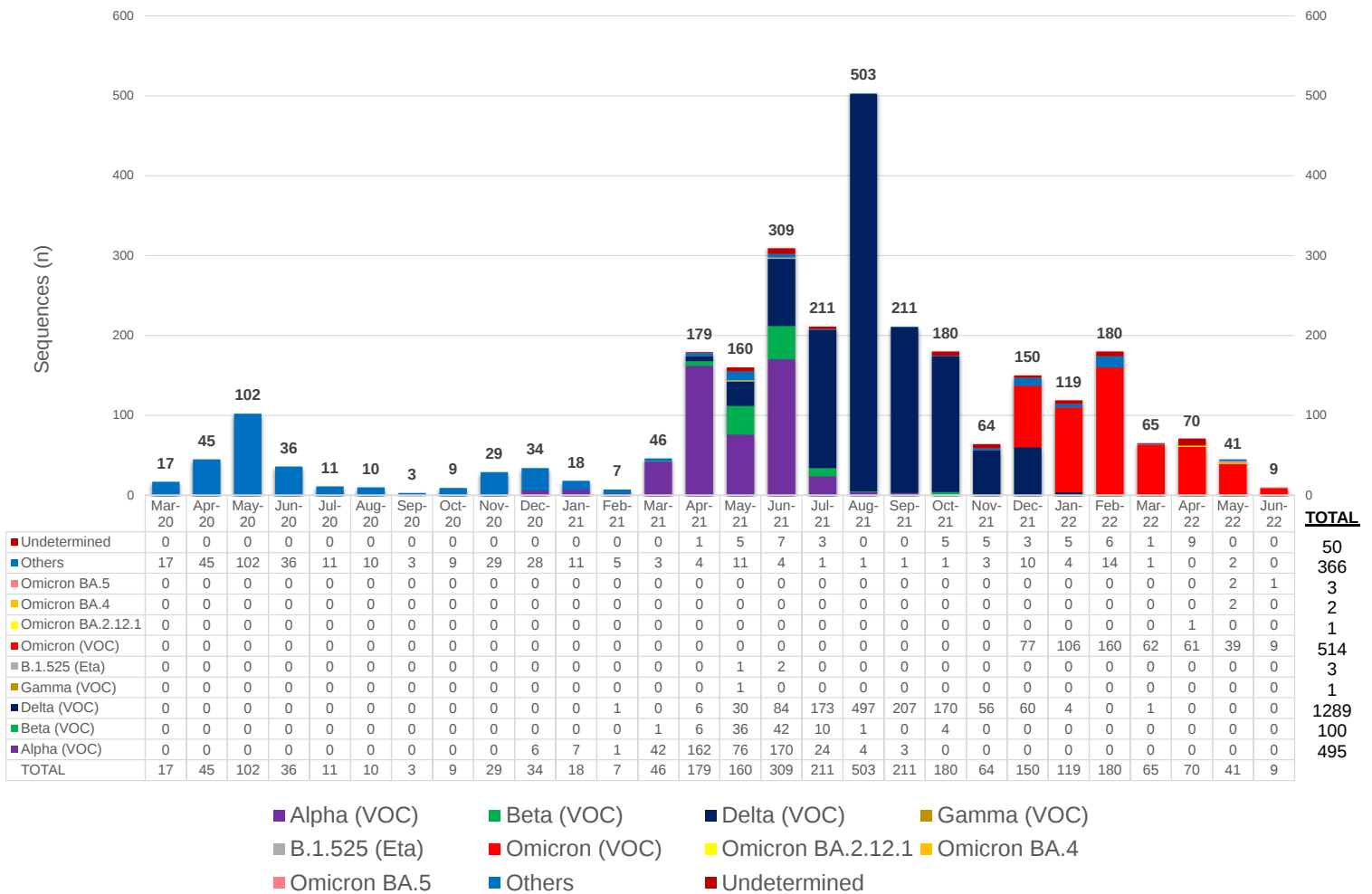
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SARS-CoV-2 Whole-Genome sequences from Pakistan (n=2,818)

(MAY 2020 TO JUN 7, 2022)



*Based on date of sample collection



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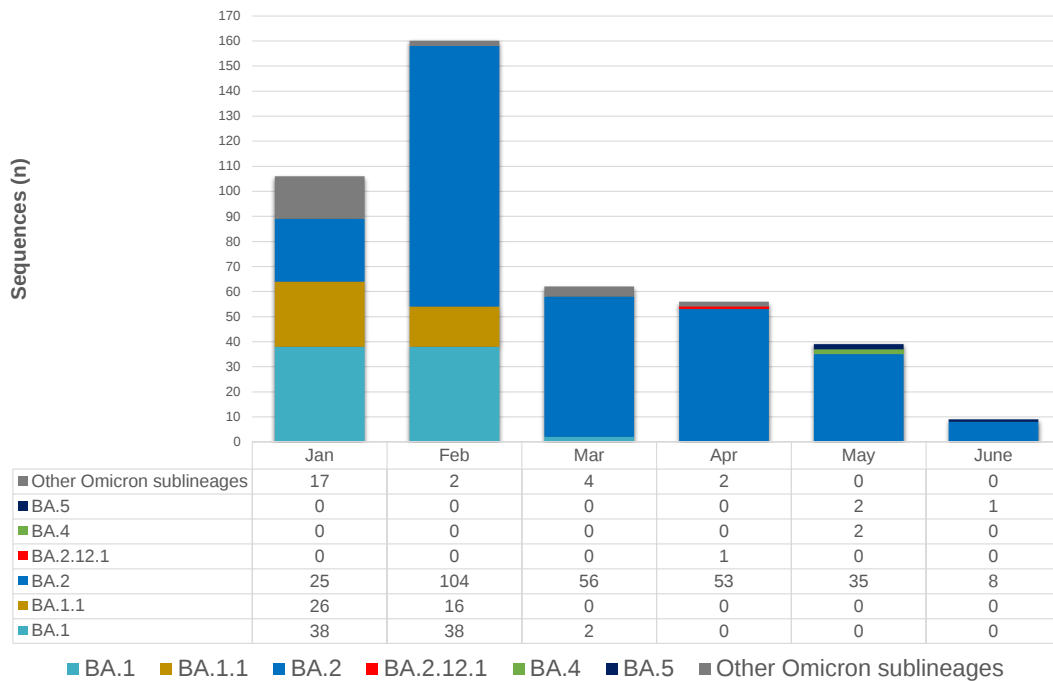
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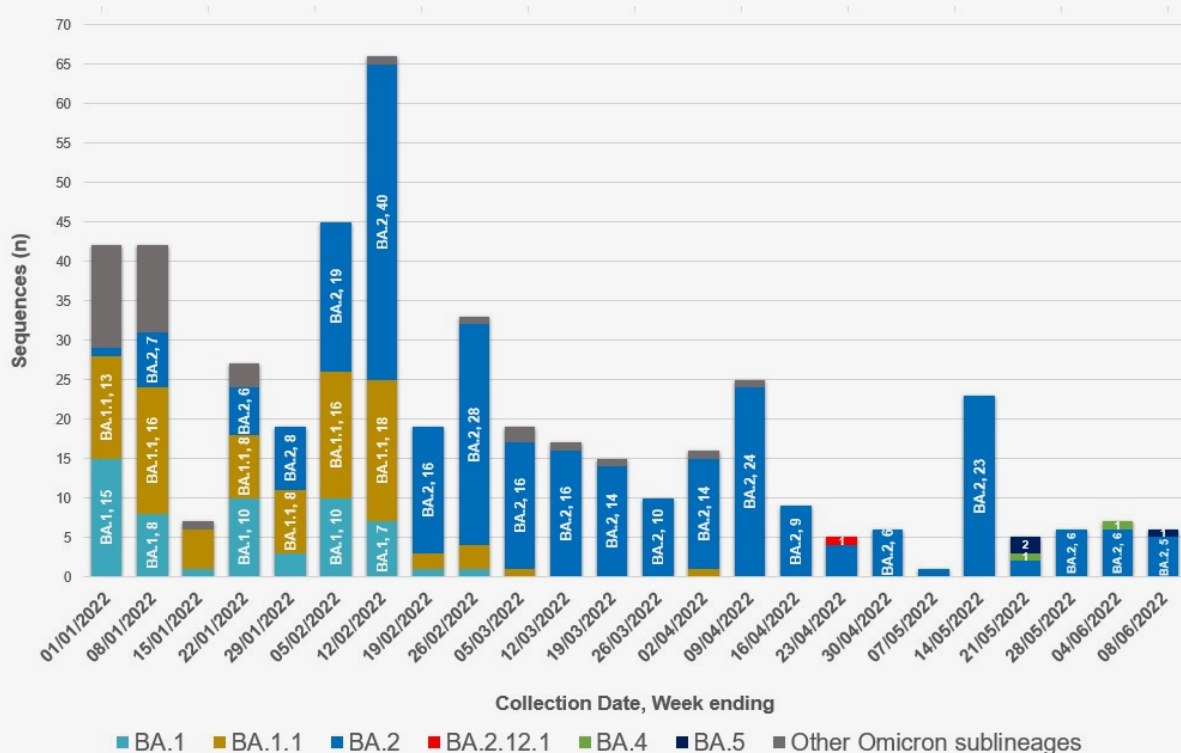


Distribution of Omicron sublineages based on Whole-Genome sequences from Pakistan

(JAN 2022 TO JUNE 7, 2022)



*Based on date of sample collection





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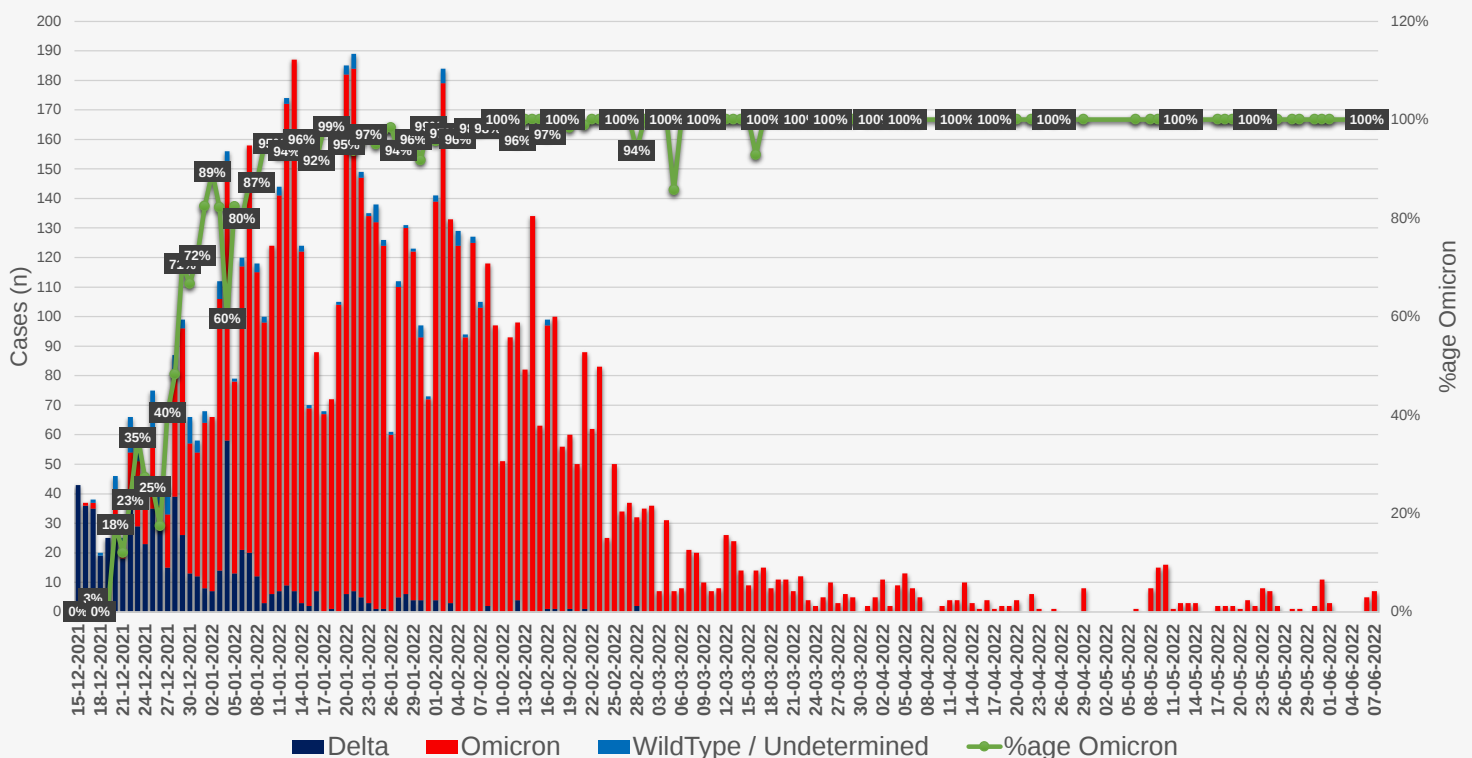
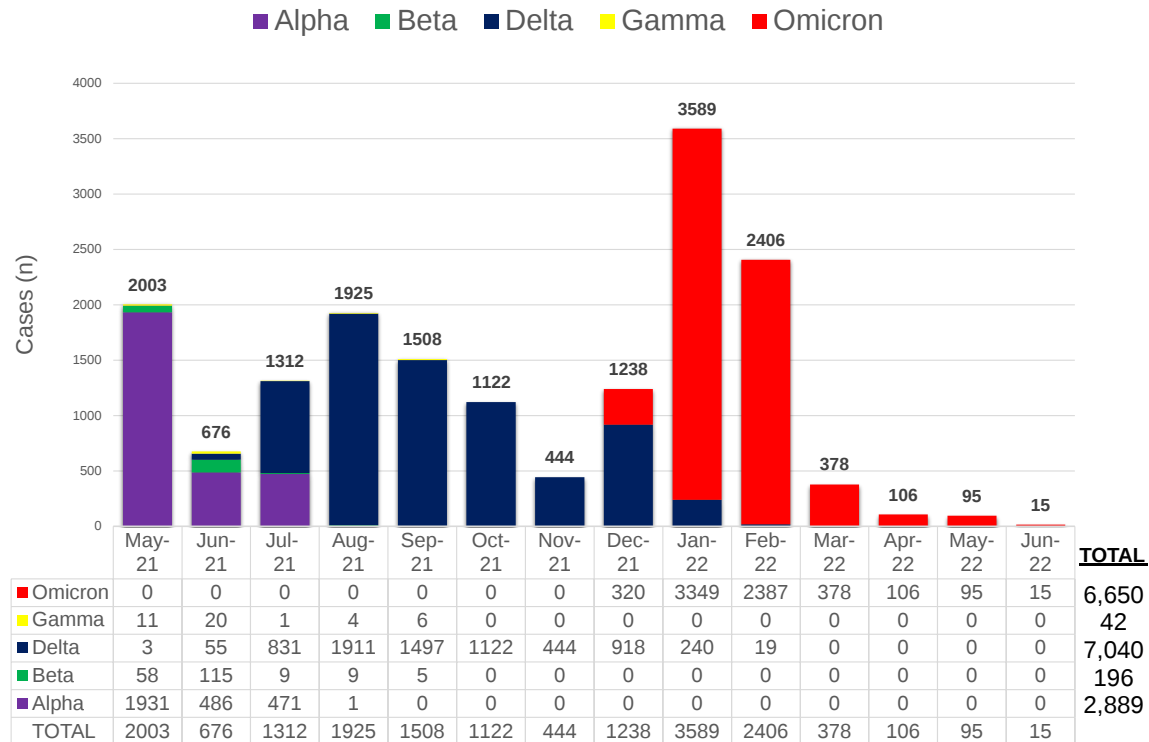
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PCR-based Genotyping of VOCs from Pakistan (n=16,817)

(MAY 2021 TO JUN 7, 2022)



Distribution of VOCs from Pakistan during Dec 15, 2021, to June 07, 2022



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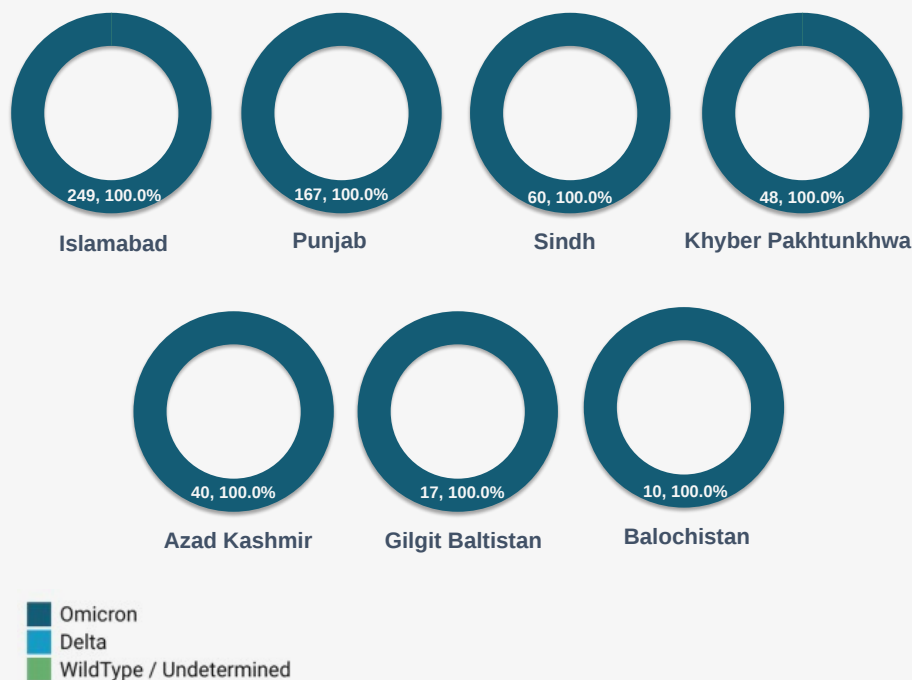
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Distribution of VOCs from Pakistan

(MAR 2022 TO JUN 7, 2022)



■ Omicron
■ Delta
■ WildType / Undetermined