



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

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

**SARS-COV-2 VARIANTS OF CONCERN
SITUATIONAL REPORT # 12
MAY 01, 2021 TO JULY 05, 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, France, Germany, Italy and United Kingdom.
- 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 July 05, 2022, 6,868 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 July 05, 2022)	500	100	1	1,300	694	2,595
2	Partial Sequences (as of July 05, 2022)	30	2	0	8	58	98
3	PCR based VOCs genotyping (May 2021 to Jun 30, 2022)	2,889	196	42	7,042	6,868	17,037

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, 22C, 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	1,185,818	42,446	126,454	4,406,520	4,412,363	193,750	30,144	52,156
Cumulative prevalence worldwide	10%	< 0.5%	1%	39%	37%	< 0.5%	< 0.5%	1%
Available sequences Pakistan	500	100	1	1,300	694	4	14	87
*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	18%	4%	< 0.5%	50%	37%	5%	10%	30%

*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 July 05, 2022)



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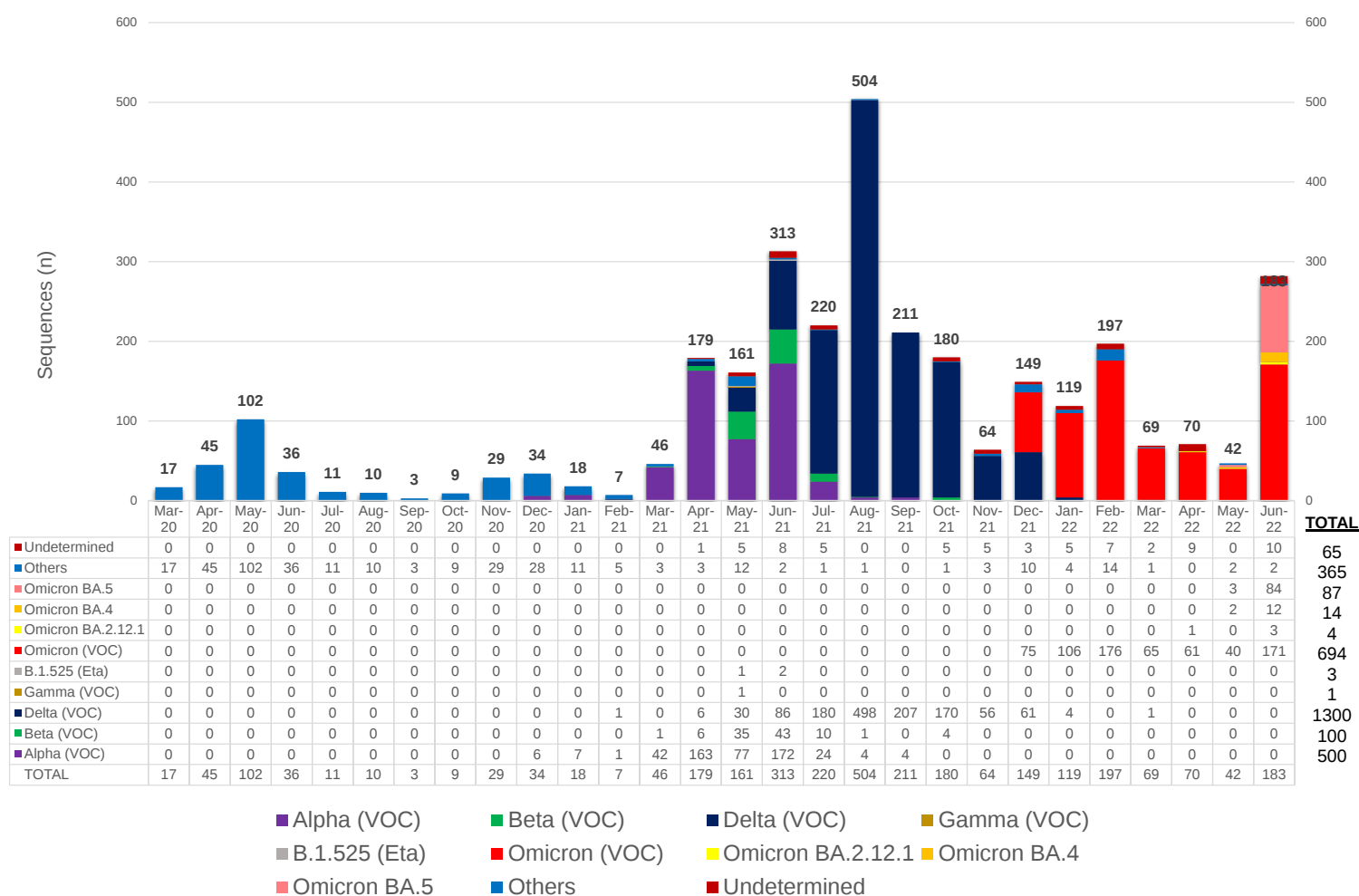
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SARS-CoV-2 Whole-Genome sequences from Pakistan (n=3,028)

(MAY 2020 TO JULY 05, 2022)



*Based on date of sample collection



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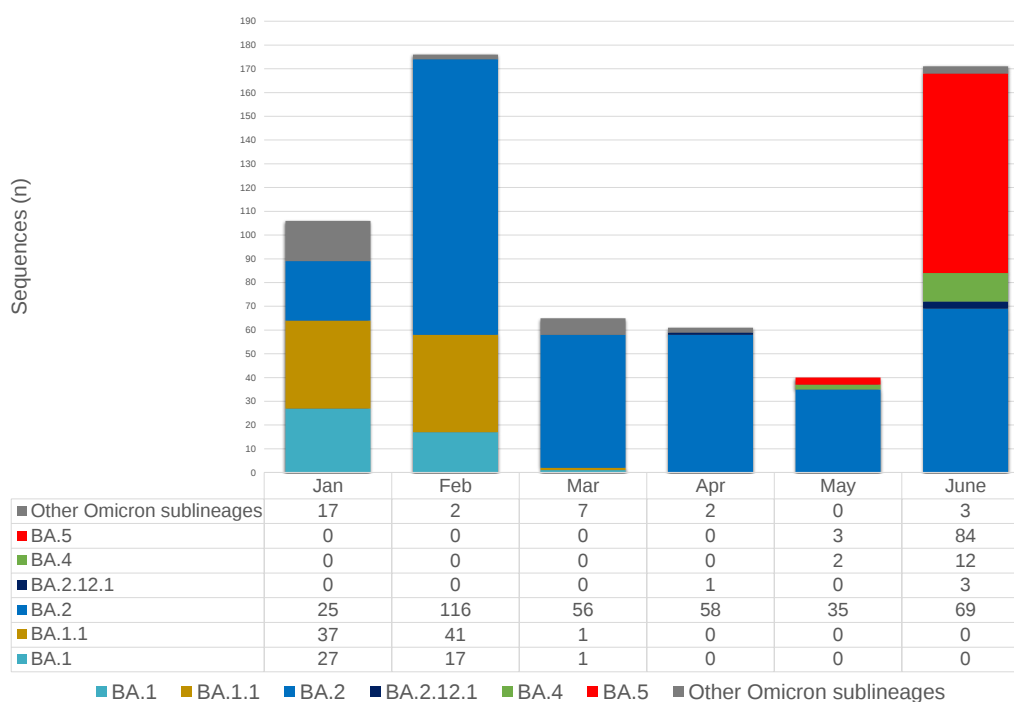
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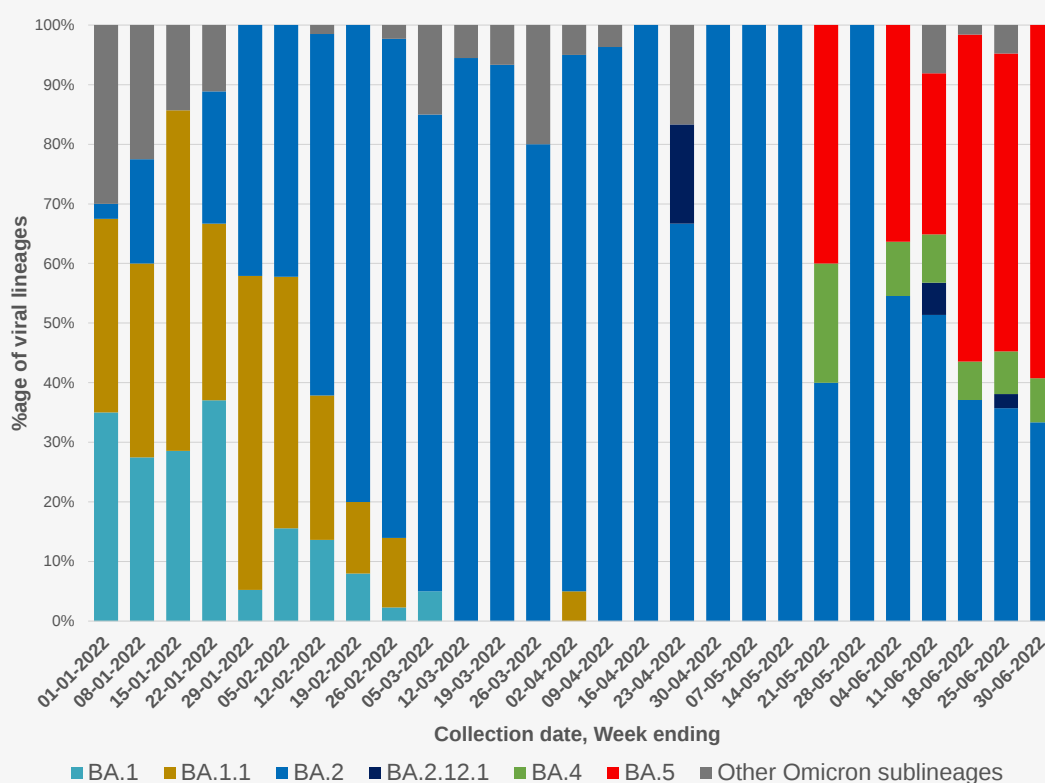


Distribution of Omicron sublineages based on Whole-Genome sequences from Pakistan

(JAN 2022 TO JUN 05, 2022)



*Based on date of sample collection





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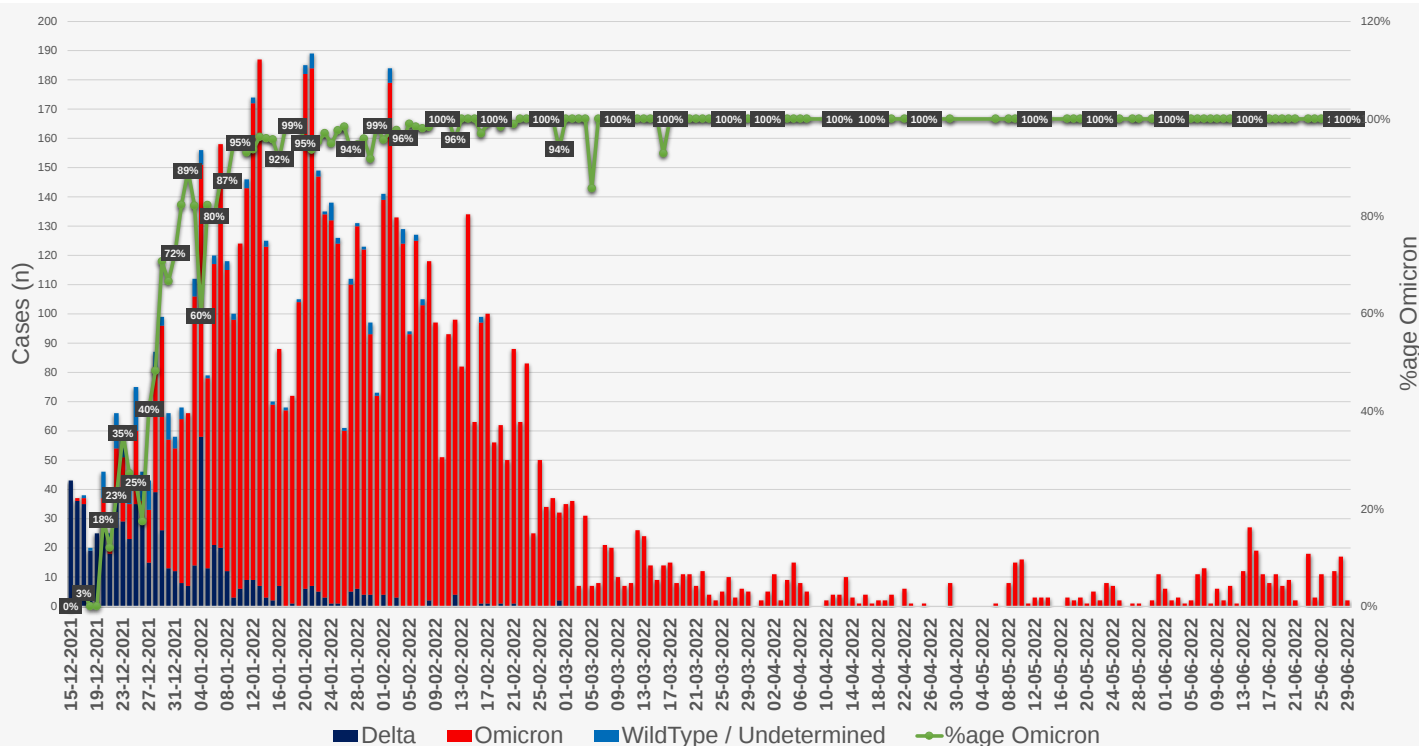
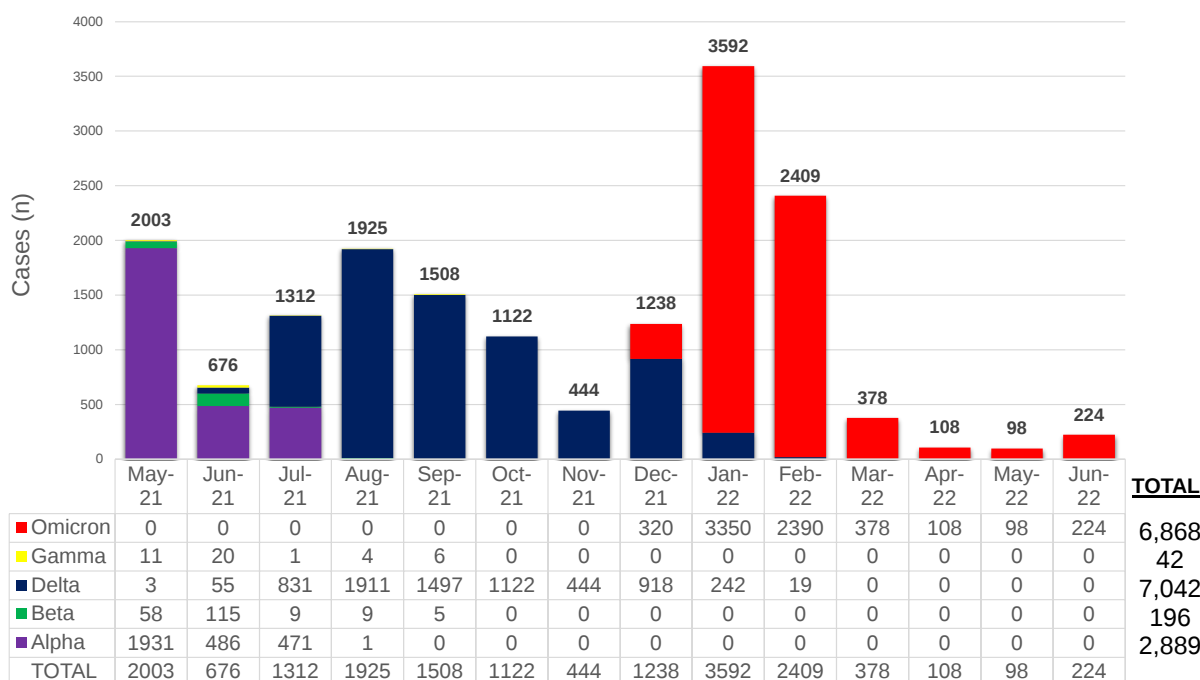
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PCR-based Genotyping of VOCs from Pakistan (n=17,037)

(MAY 2021 TO JUN 30, 2022)

Alpha Beta Delta Gamma Omicron



Distribution of VOCs from Pakistan during Dec 15, 2021, to June 30, 2022



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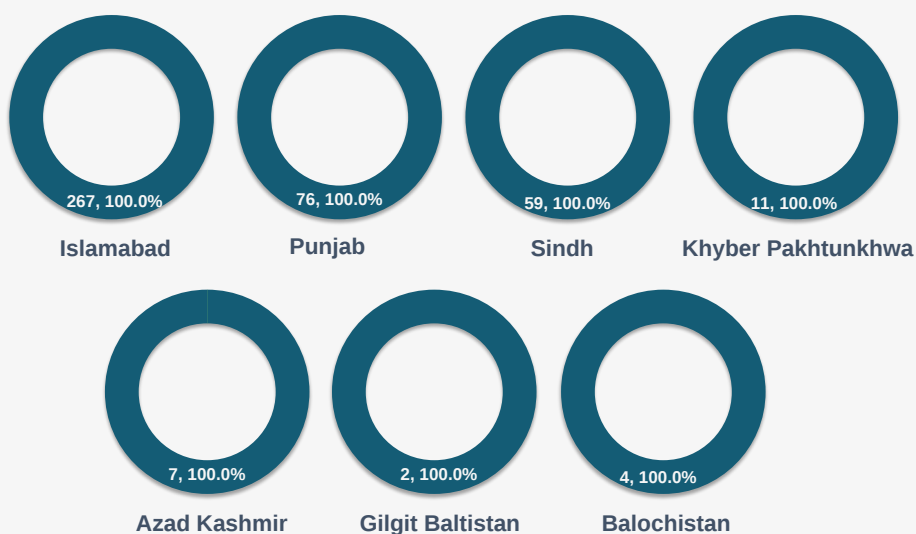
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Distribution of VOCs from Pakistan

(APR 2022 TO JUN 7, 2022)



■ Omicron
■ Delta
■ WildType / Undetermined



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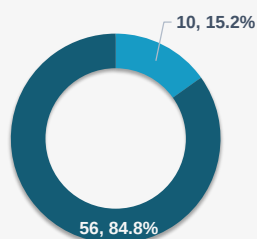
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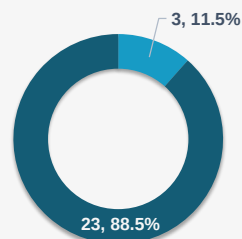


Distribution of BA.4/BA.5 from Pakistan

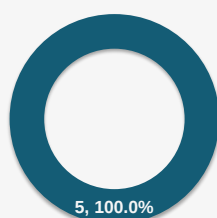
(MAY 2022 TO JUL 05, 2022)



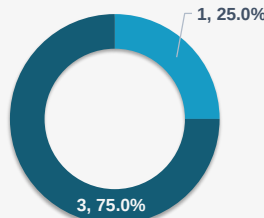
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