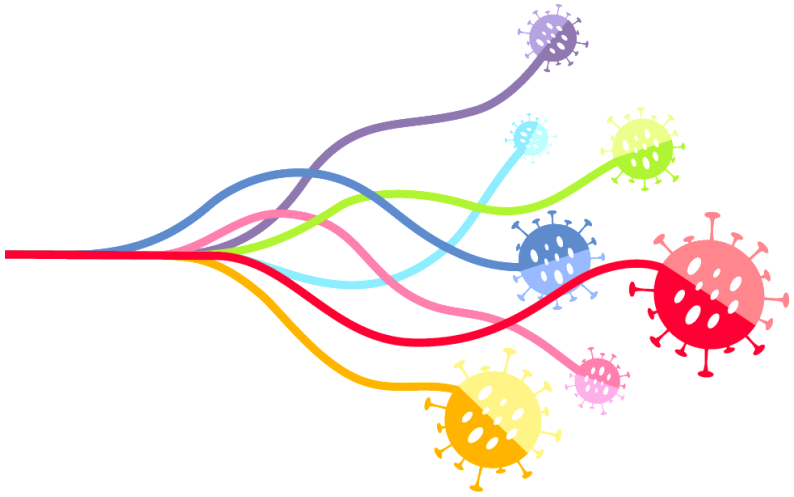
SARS-CoV-2 Variants in Bangladesh

Technical briefing 1

November 2021

This briefing provides an update on variants identified from 1 to 30 November 2021



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SUMMARY

According to WHO, 5 variants of concern (VOC) and 6 variants under investigation (VUI) have been reported globally. The Omicron variant is the latest addition which has been designated as VOC (Fig.1) because of its transmissibility, immune system evasion, and vaccine resistance. It has already spread to 92 countries and territories (Table 1).

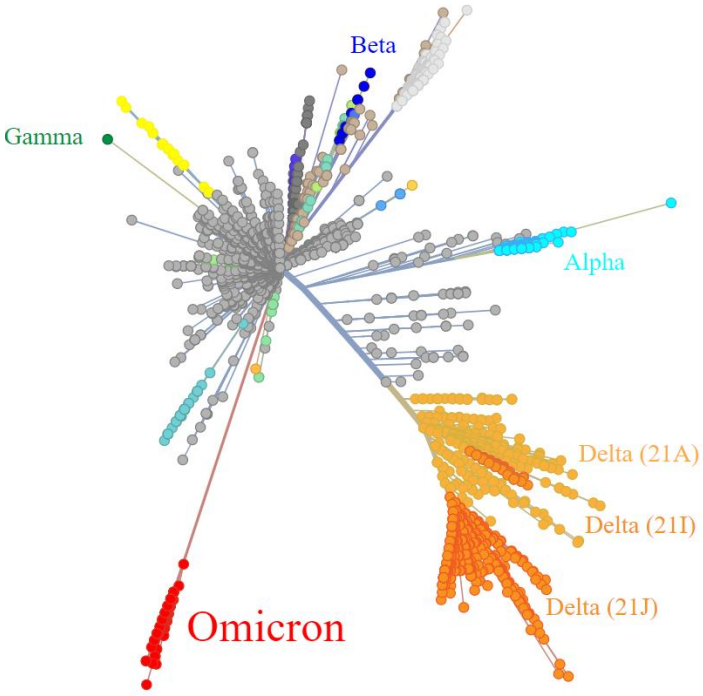

Figure 1. Omicron variant and other major or previous VOCs of SARS-CoV-2 depicted in a tree scaled radially by genetic distance, derived from Nextstrain on 1 December 2021

Country/Territory	Confirmed cases (GISAID) as of 20 December
United Kingdom	10,866
United States	1,485
South Africa	1,444
Canada	482
Australia	397
Botswana	291
Denmark	273
Germany	257
Bangladesh	2
World total (92 countries and territories)	**11,206**

Table 1. Confirmed Omicron variant cases by country

Principal findings are:

- The Delta variant accounted for 100% from 1 to 30 November 2021.
- We have identified different lineages of Delta variants.
- Delta B.1.617.2-like (28%), Delta AY.102 (23%) and Delta AY.127 (20%) were the most prominent lineages in November 2021.
- Delta AY.127 emerged in November 2021 and became one of the leading Delta lineages (20%).
- No variant unique to Bangladesh has been detected.
- No Omicron was identified through our variant surveillance. However, two complete sequences have been submitted to GISAID by IEDCR, which were identified from the National Women Cricket Team members returned from Zimbabwe.

2. Variants in Bangladesh: 1-30 November, 2021

The consortium has sequenced 163 samples collected between 1 to 30 November 2021. These samples were collected from all 8 divisions. Table 1 shows the total number of variants sequenced by region.

Table 1. Total number of confirmed cases by variant and region, 1-30 Nov, 2021

Division	Delta-like	AY.4.4	AY.9.2	AY.20	AY.33	AY.39	AY.43	AY.44	AY.65	AY.84	AY.91	AY.102	AY.116	AY.118	AY.121	AY.122	AY.125	AY.126	AY.127	TOTAL
Dhaka	23	1	1	1		9	2	1		1	2	12	1		2	2			12	**70**
Chattogram	3	1										4				2	1		3	**14**
Rajshahi	13				1		1	1				6		1		6		1	4	**34**
Khulna	1	1							2			8				3			6	**21**
Barishal	2											6								**8**
Sylhet												1							4	**5**
Rangpur	2	2				1			1			1							3	**10**
Mymensingh	1																			**1**
TOTAL	**45**	**5**	**1**	**1**	**1**	**10**	**3**	**2**	**3**	**1**	**2**	**38**	**1**	**1**	**2**	**13**	**1**	**1**	**32**	**163**

All 163 samples were Delta (100%). Among those, Delta B.1.617.2-like (28%), Delta AY.102 (23%) and Delta AY.127 (20%) were the most prominent lineages. We have also identified other lineages of Delta variants such as Delta AY.4.4, AY.9.2, AY.20, AY.33, AY.39, AY.43, AY.44, AY.65, AY.84, AY.91, AY.116, AY.118, AY.121, AY.122, AY.125 and AY.126. Figure 1 shows the percentage of the geographical distribution of different SARS-CoV-2 variants between 1 to 30 November 2021.

AY.127 emerged in November in Bangladesh and became one of the most predominant Delta-lineages. This lineage spreads across the country. It was already circulating in Europe, Asia (including India) and North America.

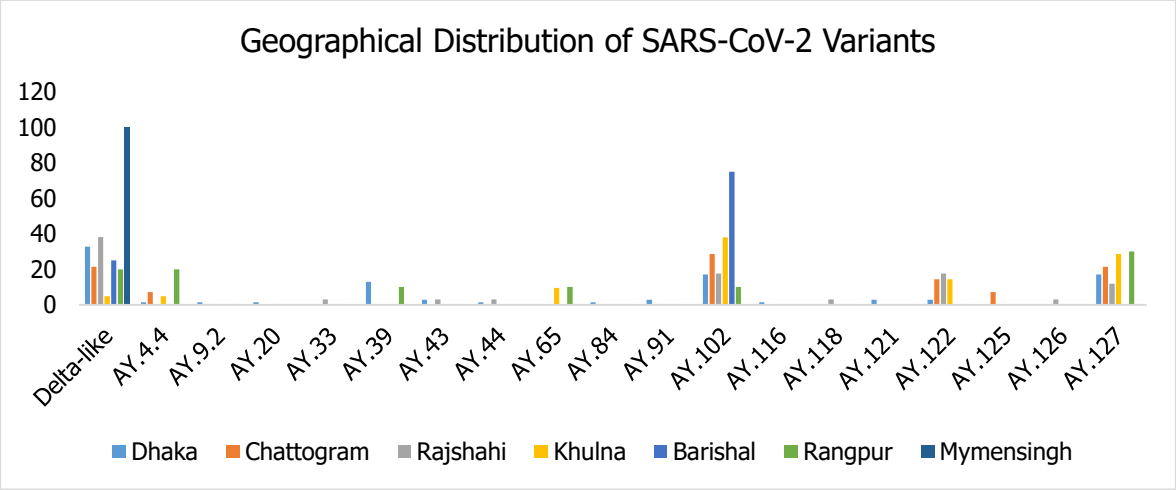

Figure 1. Geographical distribution percentage of SARS-CoV-2 variants in Bangladesh, November 2021

3. Cumulative Variants in Bangladesh: July-November 2021

The consortium has sequenced 867 samples collected between 1 July to 30 November 2021. These samples were collected from all 8 divisions of Bangladesh. Table 2 shows the total number of variants sequenced by region.

Table 2. Total number of confirmed cases by variant and region, July-November 2021

	Beta	Delta-like	AY.4.4	AY.39	AY.43	AY.102	AY.122	AY.127	Others	TOTAL
Dhaka		109	12	44	16	24	24	21	56	**306**
Chattogram		29	9		10	19	19		37	**123**
Rajshahi		78	3	2	4	16	26		32	**161**
Khulna		48	13	2	7	30	20	9	11	**140**
Sylhet		7	2	1	5	2	3	10	6	**36**
Barishal		15	6		2	13	3		7	**46**
Rangpur		8	2	1	3	3	3	3	4	**27**
Mymensingh	1	10	1	1	1	4	5	1	4	**28**
TOTAL	**1**	**304**	**48**	**51**	**48**	**111**	**103**	**44**	**157**	**867**

All SARS-CoV-2 strains were Delta variants except one Beta variant (identified in July). The most predominant was Delta B.1.617.2-like (35%) (Figure 2).

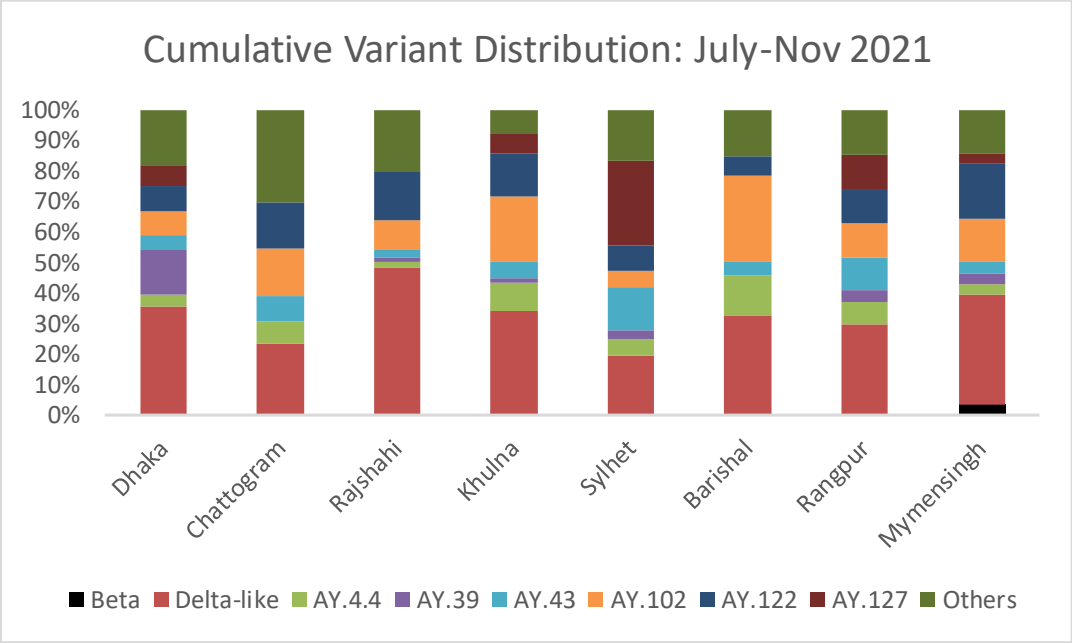

Figure 2. Geographical distribution percentage of SARS-CoV-2 variants in Bangladesh, July-November 2021

6. Metadata Analysis: July-November 2021

We have analyzed 590 metadata available by specific variables e.g. age, sex, blood group, comorbidity, vaccination, hospitalization, and death (Table 3). Out of 590, 49% of patients were between 36-64 years, and 33% were between 18-35 years. Out of 474 patients, 96% reported positive blood groups: notably 35% B+ and 34% O+. 35% of patients were co-morbid, 60% 1st dose vaccinated, 47% fully vaccinated, 13% hospitalized, and 3% deceased. Only 1 vaccinated patient (0.2%) and 19 unvaccinated patient had died. When compared metadata with sequencing data, no specific Delta lineage was found to be responsible for hospitalization or death.

Table 3. Metadata for specific variables (n=590 available), July-November 2021

Variables	Delta variants (%)
Age groups (years)	
=>65	55 (9%)
36-64	287 (49%)
18-35	194 (33%)
<18	54 (9%)
Male	307 (52%)
Blood group (n=474)	
A+	93 (20%)
B+	167 (35%)
AB+	36 (8%)
O+	160 (34%)
A-	5 (1%)
B-	3 (1%)
O-	7 (1%)
AB-	3 (1%)
Co-morbidity present	204 (35%)
Asthma	30 (5%)
Hypertension	97 (16%)
Diabetes	101 (17%)
Smoker	45 (8%)
1st dose vaccinated	353 (60%)
Fully vaccinated	276 (47%)
Hospitalized	77 (13%)
Vaccinated and hospitalized	32 (5%)
Deaths	20 (3%)
Comorbidity present and deceased	16 (3%)
Vaccinated and deceased	1 (0.2%)
Hospitalized and deceased	15 (3%)

7. NextStrain build of SARS-CoV-2 variant distribution in Bangladesh (1 July-30 November 2021)

A phylogenetic tree of the 867 complete genomes of Bangladesh variants (collected between 1 July-30 November 2021) sequenced by the consortium was constructed using NextClade (clades.nextsrain.org). Phylogenetic analysis reveals that there have been multiple introductions of Delta variants (clade 21A, 21J and 21I) across the country (Figure 3). From 1 July to 30 November 2021, no variant unique to Bangladesh has been detected. Only a single Beta (clade 20H) was identified in July 2021. No Omicron variant was identified through our surveillance.

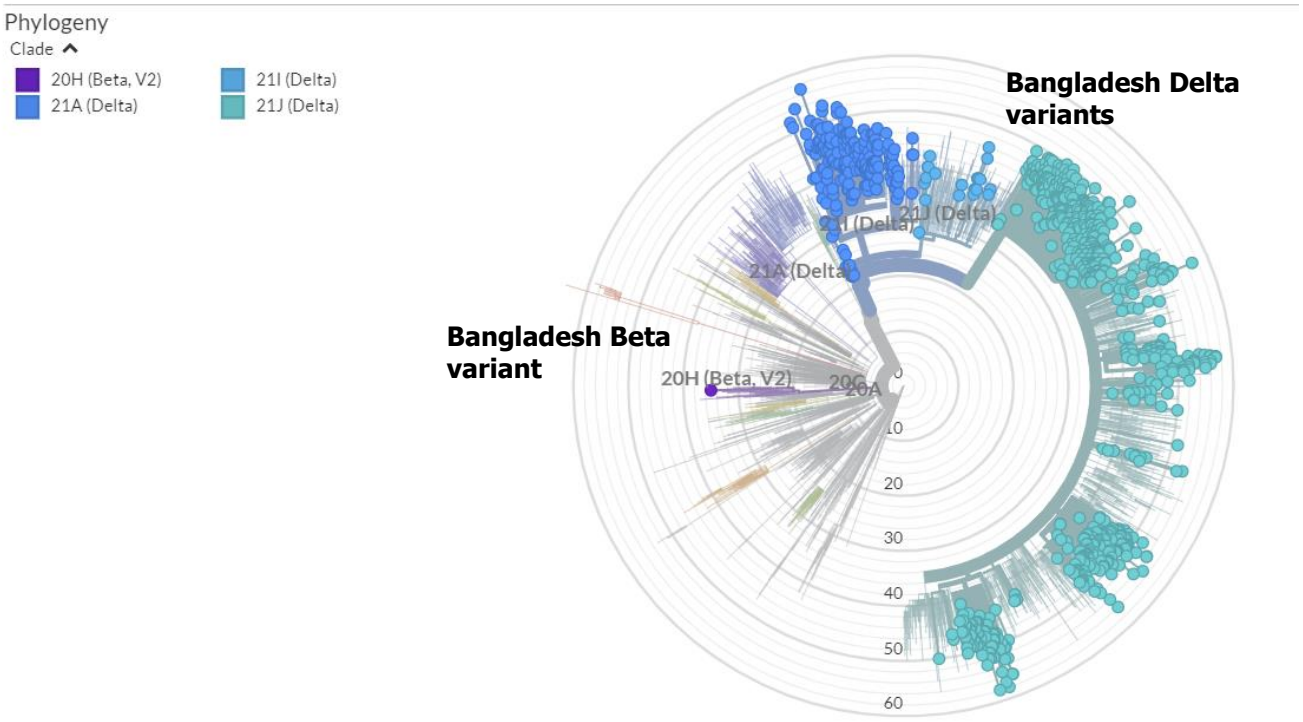

Figure 3. Phylogenetic tree of the 867 SARS-CoV-2 Bangladeshi variants in closed circle (collected 1 July-30 November 2021) sequenced by the consortium.