GECO Philippines SARS-CoV-2 Situation Report - 2022 July

Highlights

- Omircon BA.5 accounts for most current isolates and likely leads to ongoing case surge

SARS-CoV-2 variants detected in the Philippines

WHO label	Pango lineage	Classification	New submission	Isolated in 3 months	Total
Alpha	B.1.1.7/Q.x	VOC	1 (0.2)	1 (0.2)	2801
Beta	B.1.351	VOC	0	0	3280
Delta	B.1.617.2/AY.x	VOC	11 (2.3)	1 (0.2)	3476
Gamma	P.1	VOC	0	0	5
Omicron	B.1.1.529/BA.x	VOC	403 (82.6)	547 (88.9)	7433
Eta	B.1.525	VUM	0	0	8
Theta	P.3	VUM	0	0	523

Table 1. Number of available sequences by variant in the Philippines as of 26 July 2022. The variants (VOC/VUM) here only include sequences that present in the GISAID or GECO data base and fulfill the definitions of WHO at the time the report is prepared. *New submission*, new sequences submitted from the last report. *Isolated in 3 months*, sequences isolated from 1 May 2022 to 26 July 2022. Numbers in the parentheses are percentage of the category (%).

- **VOC (Variant of Concern):** A SARS-CoV-2 variant that meets the definition of a VOI (see below) and, through a comparative assessment, has been demonstrated to be associated with (a) increase in transmissibility, (b) increase in clinical disease presentation or (c) decrease in effectiveness of public health measures including diagnostics, vaccines, therapeutics.
- **VOI (Variant of Interest):** A SARS-CoV-2 variant: (a) with genetic changes that are predicted or known to affect virus characteristics such as transmissibility, disease severity, immune escape, diagnostic or therapeutic escape; AND (b) identified to cause significant community transmission or multiple COVID-19 clusters, in multiple countries with increasing relative prevalence alongside increasing number of cases over time.
- **VUM (Variant Under monitoring):** A SARS-CoV-2 variant with genetic changes that are suspected to affect virus characteristics with some indication that it may pose a future risk, but evidence of phenotypic or epidemiological impact is currently unclear, requiring enhanced monitoring and repeat assessment pending new evidence.
- **Pango lineage:** A dynamic SARS-CoV-2 naming system that uses a phylogenetic framework (methods that involve a tree-like structure inferred based on genetic information of viruses) to identify actively

spreading lineages. The Pango system is designed to track the transmission and spread of SARS-CoV-2, but does not attempt to identify or define VOCs or VOIs.

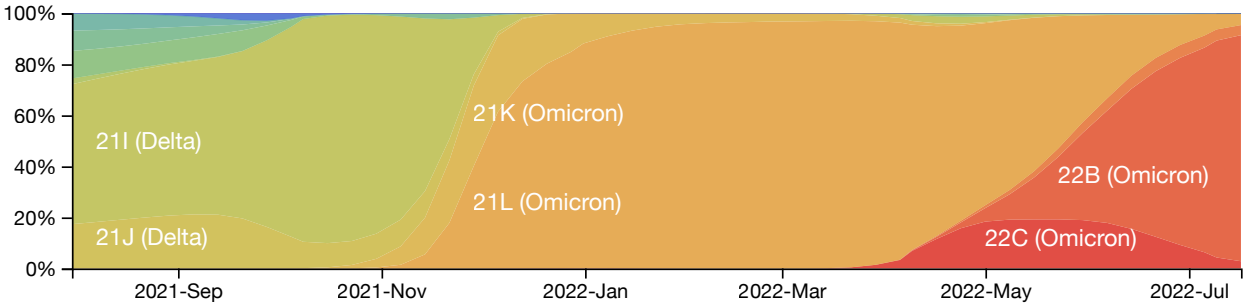

Figure 1. Temporal frequencies of SARS-CoV-2 variants in the Philippines. The figure is constructed with a subsampled genomic data set from all available sequences (methods). A more detailed illustration of SARS-CoV-2 lineages isolated in the country can be visualised by selecting Pango Lineage as the option for coloring in the control panel (icon on top left/right). **Note** that the latest available Philippine sequences were isolated on 9 July, 2022, thus the frequencies after the time point could harbor great uncertainty.

- **Nextstrain clade:** 22B = BA.5, 22C = BA.2.12.1, 22A = BA.4, 21L = BA.2, 21K = BA.1

Diversity within the Omicron variant

Pango lineage	New submission	Isolated in 3 months	Total
BA.1	2 (0.4)	0	593
BA.2.12.1	43 (8.8)	71 (11.5)	88
BA.2.75	0	0	0
The other BA.2	92 (18.9)	172 (28)	6431
BA.4	16 (3.3)	18 (2.9)	18
BA.5	211 (43.2)	245 (39.8)	246

Table 1b. Number of available Omicron sequences in the Philippines as of 26 July 2022. *New submission*, new sequences submitted from the last report. *Isolated in 3 months*, sequences isolated from 1 May 2022 to 26 July 2022. Numbers in the parentheses are percentage of the category (%).

Diversity within the Delta variants

More than 70 Pango lineages have been found among Delta variants isolated in the Philippines, with >40 sublineages that have more than 2 isolated sequences as of March 2022. Phylogenetic relationship of the sublineages of Delta variant is available here.

SARS-CoV-2 variants detected by administrative region

Region	New submission	Dominant variant in 3 months	Isolated in 3 months	Total
NCR	113 (23.2)	Omicron (90.1)	181 (29.4)	5699
Ilocos	16 (3.3)	Omicron (80)	25 (4.1)	644
CAR	27 (5.5)	Omicron (86.5)	37 (6)	1292
Cagayan Valley	51 (10.5)	Omicron (94.9)	59 (9.6)	1546
Central Luzon	13 (2.7)	Omicron (87)	23 (3.7)	1594
Calabarzon	75 (15.4)	Omicron (82.8)	93 (15.1)	3038
Mimaropa	34 (7)	Omicron (95.8)	48 (7.8)	485
Bicol	40 (8.2)	Omicron (89.1)	46 (7.5)	581
Western Visayas	32 (6.6)	Omicron (86.8)	38 (6.2)	1234
Central Visayas	40 (8.2)	Omicron (86.7)	15 (2.4)	1161
Eastern Visayas	4 (0.8)	Omicron (100)	6 (1)	232
Zamboanga Peninsula	6 (1.2)	Omicron (91.7)	12 (2)	762
Northern Mindanao	1 (0.2)	Omicron (100)	2 (0.3)	514
Davao	27 (5.5)	Omicron (85)	20 (3.3)	1396
Soccsksargen	8 (1.6)	Omicron (100)	9 (1.5)	387
Caraga	0	-	0	498
BARMM	1 (0.2)	Omicron (100)	1 (0.2)	119

Table 2. Number of available sequences by administrative region in the Philippines as of 26 July 2022. The variant definition is identical to Table 1 based on the WHO website. *New submission*, new sequences submitted from the last report. *Dominant variant in 3 months*, the major variant isolated from 1 May 2022 to 26 July 2022. A dash indicates no sequence isolated. *Isolated in 3 months*, sequences isolated from 1 May 2022 to 26 July 2022. Numbers next to the dominant variant indicate percentage of the variant in the region, whereas other numbers in the parentheses are percentage of the category.

NCR, National Capital Region; CAR, Cordillera Administrative Region; BARMM, Bangsamoro Autonomous Region in Muslim Mindanao.

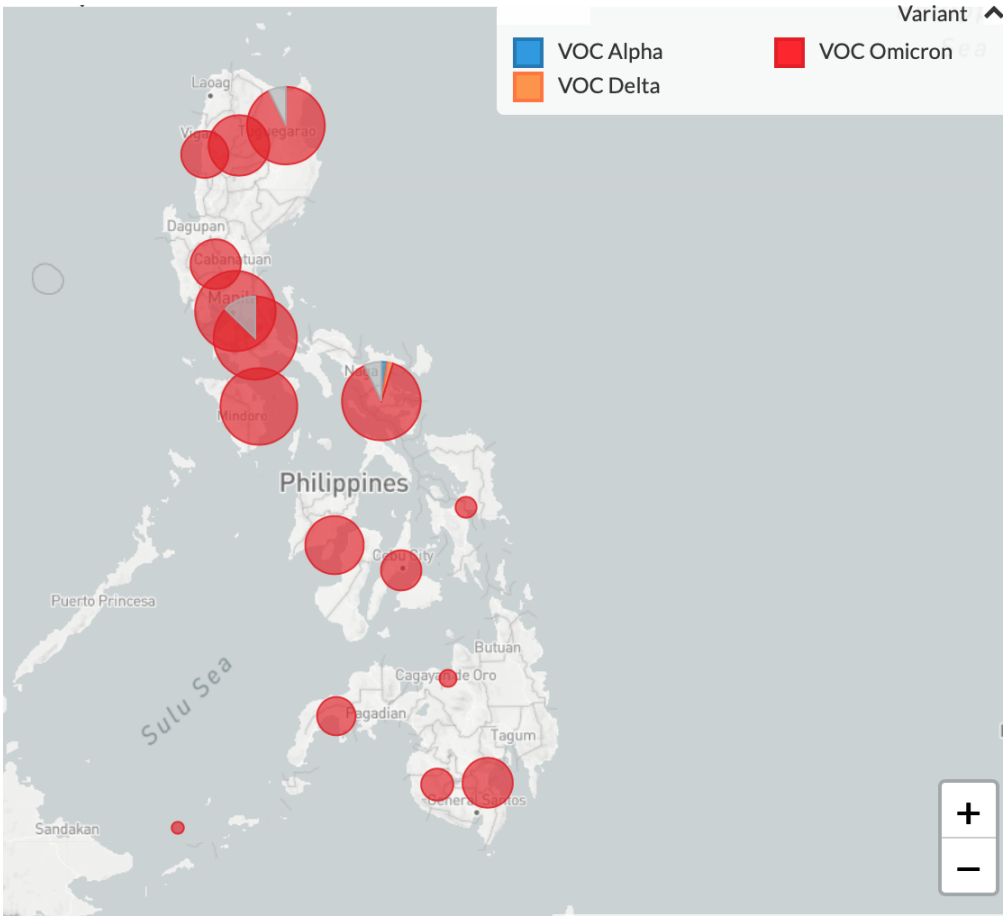

Figure 2. Frequencies of SARS-CoV-2 variants by administrative region in the Philippines since May 2022. The figure is constructed with a subsampled genomic data set from all available sequences as Figure 1. Frequencies of isolates in a particular time frame and frequencies classified with the Pango linage can be adjusted with the control panel (icon on top left/right).

Philippines specific SARS-CoV-2 lineages

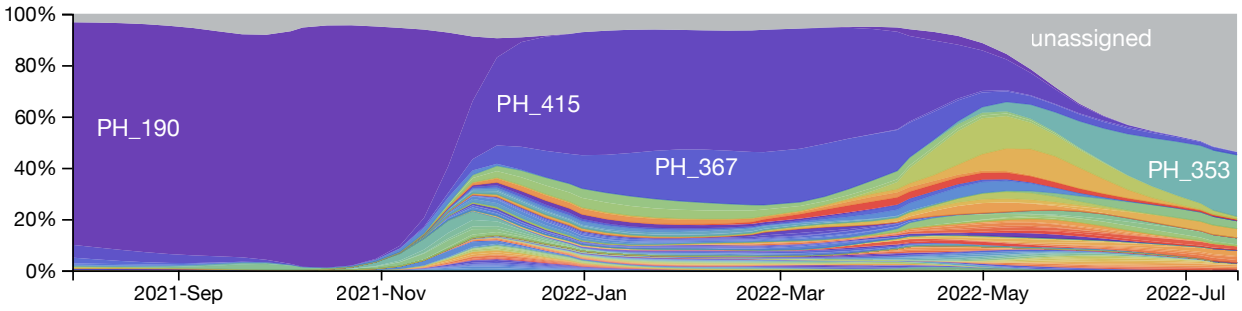

Figure 3. Temporal frequencies of Philippine lineages (clusters) identified by Grapevine-anywhere. Each sequence submitted to GECO database would undergo *Grapevine-anywhere* pipeline to detect sustain local transmission. A cluster is defined based on multiple sequences isolated in the Philippines

that appeared to descend from the same introductory event on a phylogenetic tree. Phylogenetic relationships of these lineages can be found here.

Cluster name	Date first identified	Pango lineage	Distribution	New submission	Isolated in 3 months	Total
PH_353	2022-05-15	BA.5.2	>3 regions	67	81	81
PH_326	2022-04-22	BA.2.12.1	>3 regions	10	22	37
PH_273	2021-12-29	BA.2	>3 regions	0	21	47
PH_347	2022-06-08	BA.5	>3 regions	13	13	13
PH_415	2021-12-02	BA.2.3	>3 regions	0	13	3122
PH_367	2021-12-19	BA.2.3	>3 regions	6	11	1014
PH_299	2022-03-24	BA.2	NCR; Calabarzon; Davao	0	10	18
PH_348	2022-06-15	BA.5.2.1	Bicol; Cagayan Valley	7	7	7
PH_351	2022-05-31	BA.5.2.1	Calabarzon; NCR; Central Luzon	1	7	7
PH_355	2022-05-12	BA.5.2	NCR; CAR; Mimaropa	5	7	7
PH_480	2022-05-04	BA.2	Cagayan Valley; NCR	0	7	7
PH_448	2022-01-09	BA.2.3	>3 regions	2	7	27
PH_456	2022-01-02	BA.2.3	>3 regions	0	7	14
PH_359	2022-06-03	BA.4	Bicol; NCR	5	5	5
PH_379	2022-02-22	BA.2.3	>3 regions	1	4	5
PH_350	2022-01-07	BA.5.2.1	Calabarzon; NCR; Mimaropa	5	4	5
PH_318	2022-01-30	BA.2.10	>3 regions	0	2	8
PH_366	2021-12-27	BA.2.3	>3 regions	1	2	14
PH_466	2021-12-23	BA.2.3	>3 regions	0	2	190
PH_308	2022-01-16	BA.2	>3 regions	0	1	10
PH_439	2022-01-04	BA.2.3	>3 regions	0	1	15
PH_474	2021-12-28	BA.2	>3 regions	0	1	63
PH_461	2021-12-27	BA.2.3	>3 regions	0	1	150
PH_419	2021-12-25	BA.2.3	>3 regions	0	1	206
PH_36	2021-01-20	B.1.1.7	>3 regions	1	1	1033
PH_172	2021-01-06	B.1.1.28	>3 regions	0	1	45
PH_190	2020-07-10	B.1.351	>3 regions	2	1	6258
PH_268	2022-02-13	BA.2	NCR; Calabarzon; Western Visayas	0	0	5
PH_418	2022-02-03	BA.2.3	Central Luzon; CAR	0	0	5
PH_570	2022-01-27	BA.1.1	NCR; Davao	0	0	6
PH_287	2022-01-15	BA.2	NCR; Central Visayas	0	0	7
PH_591	2022-01-14	BA.1.17.2	Central Visayas	0	0	5
PH_539	2022-01-12	BA.1	NCR; Central Luzon; Central Visayas	0	0	12
PH_424	2022-01-08	BA.2.3	>3 regions	0	0	6
PH_521	2022-01-08	BA.1.1	Central Visayas	0	0	6
PH_406	2022-01-07	BA.2.3	>3 regions	0	0	8
PH_446	2022-01-06	BA.2.3	>3 regions	0	0	14
PH_409	2022-01-05	BA.2.3	>3 regions	0	0	6
PH_431	2022-01-04	BA.2.3	>3 regions	0	0	12
PH_442	2022-01-04	BA.2.3	>3 regions	0	0	12
PH_450	2022-01-03	BA.2.3	>3 regions	0	0	14
PH_459	2022-01-03	BA.2.3	>3 regions	0	0	9
PH_294	2021-12-31	BA.2	>3 regions	0	0	6

Cluster name	Date first identified	Pango lineage	Distribution	New submission	Isolated in 3 months	Total
PH_598	2021-12-30	BA.1.17.2	Central Visayas; NCR; Calabarzon	0	0	15
PH_314	2021-12-29	BA.2	Central Luzon; Central Visayas; NCR	0	0	8
PH_425	2021-12-29	BA.2.3	>3 regions	0	0	6
PH_377	2021-12-28	BA.2.3	>3 regions	0	0	21
PH_508	2021-12-28	BA.1	>3 regions	0	0	7
PH_542	2021-12-28	BA.1	Central Visayas; NCR	0	0	6
PH_595	2021-12-28	BA.1	NCR; Davao; Central Luzon	0	0	6
PH_416	2021-12-27	BA.2.3	>3 regions	0	0	19
PH_417	2021-12-27	BA.2.3	>3 regions	0	0	12
PH_437	2021-12-27	BA.2.3	>3 regions	0	0	36
PH_462	2021-12-27	BA.2.3	>3 regions	0	0	59
PH_468	2021-12-27	BA.2.3	>3 regions	0	0	145
PH_469	2021-12-26	BA.2.3	>3 regions	0	0	36
PH_506	2021-12-25	BA.1	NCR; Central Visayas; Davao	0	0	5
PH_504	2021-12-24	BA.1.1	Central Visayas; NCR; Davao	0	0	7
PH_436	2021-12-23	BA.2.3	>3 regions	0	0	14
PH_463	2021-12-22	BA.2.3	>3 regions	0	0	58
PH_513	2021-12-22	BA.1.1	>3 regions	0	0	75
PH_614	2021-12-22	BA.1	>3 regions	0	0	5
PH_568	2021-12-21	BA.1.1	>3 regions	0	0	45
PH_571	2021-12-20	BA.1.1	>3 regions	0	0	26
PH_525	2021-12-18	BA.1.1	>3 regions	0	0	5
PH_579	2021-12-16	BA.1	Central Luzon; Central Visayas; NCR	0	0	5
PH_613	2021-12-16	BA.1	>3 regions	0	0	16
PH_588	2021-12-14	BA.1.17.2	Central Visayas; NCR	0	0	12
PH_599	2021-12-13	BA.1.15	Central Luzon; Central Visayas	0	0	7
PH_541	2021-11-20	BA.1	>3 regions	0	0	12
PH_102	2021-05-06	B.1.1.7	>3 regions	0	0	7
PH_100	2021-04-30	B.1.1.7	Davao; Caraga; NCR	0	0	19
PH_111	2021-04-19	B.1.1.7	Davao; Soccsksargen	0	0	18
PH_103	2021-04-14	B.1.1.7	>3 regions	0	0	21
PH_99	2021-04-13	B.1.1.7	Davao; Caraga; Central Luzon	0	0	13
PH_71	2021-04-12	B.1	>3 regions	0	0	8
PH_254	2021-04-02	B.1.1.519	NCR	0	0	5
PH_98	2021-03-25	B.1.1.7	>3 regions	0	0	29
PH_115	2021-03-22	B.1.1.7	>3 regions	0	0	31
PH_116	2021-03-19	B.1.1.7	>3 regions	0	0	12
PH_120	2021-03-15	B.1.1.7	Bicol; NCR; Calabarzon	0	0	13
PH_117	2021-03-08	B.1.1.7	>3 regions	0	0	26
PH_105	2021-03-06	B.1.1.7	>3 regions	0	0	31
PH_106	2021-03-05	B.1.1.7	>3 regions	0	0	24
PH_110	2021-03-05	B.1.1.7	>3 regions	0	0	32
PH_141	2021-03-05	B.1.1.7	>3 regions	0	0	32

Cluster name	Date first identified	Pango lineage	Distribution	New submission	Isolated in 3 months	Total
PH_240	2021-03-05	B.1.1.63	NCR; Calabarzon	0	0	5
PH_114	2021-03-04	B.1.1.7	>3 regions	0	0	18
PH_112	2021-02-22	B.1.1.7	NCR; Calabarzon; Central Luzon	0	0	13
PH_150	2021-02-15	B.1.1.7	>3 regions	0	0	55
PH_156	2021-02-12	B.1.1.7	>3 regions	0	0	72
PH_140	2021-02-11	B.1.1.7	>3 regions	0	0	14
PH_108	2021-02-10	B.1.1.7	>3 regions	0	0	393
PH_202	2021-01-27	B.1.1.63	NCR; Calabarzon	0	0	7
PH_151	2021-01-26	B.1.1.7	>3 regions	0	0	48
PH_229	2021-01-25	B.1.1.63	Calabarzon	0	0	5
PH_38	2021-01-21	B.1.466.1	Calabarzon; NCR	0	0	21
PH_186	2021-01-19	B.1.1	>3 regions	0	0	29
PH_165	2021-01-15	B.1.1.28	Davao; NCR; Soccsksargen	0	0	9
PH_93	2021-01-14	B.1.1.7	NCR; Central Visayas; CAR	0	0	5
PH_39	2021-01-12	B.1.441	NCR; Central Visayas	0	0	5
PH_169	2021-01-11	B.1.1.28	Davao	0	0	14
PH_164	2021-01-09	B.1.1.28	Soccsksargen; Davao; Calabarzon	0	0	15
PH_258	2021-01-08	B.1.1	Calabarzon; Central Visayas; NCR	0	0	6
PH_630	2021-01-08	P.3	>3 regions	0	0	457
PH_125	2021-01-07	B.1.1.7	>3 regions	0	0	343
PH_129	2021-01-07	B.1.1.7	NCR; Calabarzon; Central Visayas	0	0	12
PH_130	2021-01-07	B.1.1.7	NCR; Central Luzon; Central Visayas	0	0	6
PH_149	2021-01-05	B.1.1.7	>3 regions	0	0	134
PH_173	2021-01-03	B.1.1.28	Davao; Soccsksargen	0	0	17
PH_95	2020-12-29	B.1.1.7	NCR; Central Luzon; Eastern Visayas	0	0	5
PH_58	2020-12-28	B.1.524	>3 regions	0	0	10
PH_217	2020-12-18	B.1.1.63	Cagayan Valley; NCR	0	0	7
PH_199	2020-12-17	B.1.1.263	CAR; Cagayan Valley; Central Luzon	0	0	65
PH_224	2020-12-15	B.1.1.63	NCR; Calabarzon; CAR	0	0	11
PH_225	2020-12-10	B.1.1.63	Calabarzon; NCR	0	0	5
PH_27	2020-12-08	B.1.1.7	Calabarzon; Cagayan Valley; Mimaropa	0	0	7
PH_244	2020-12-04	B.1.1.63	NCR; Central Luzon	0	0	10
PH_161	2020-12-02	B.1.1.28	>3 regions	0	0	36
PH_162	2020-12-02	B.1.1.28	NCR; Calabarzon; Caraga	0	0	20
PH_178	2020-11-25	B.1.1	Calabarzon; NCR	0	0	11
PH_206	2020-11-22	B.1.1.63	Calabarzon; NCR	0	0	9
PH_73	2020-11-19	B.1.1.7	>3 regions	0	0	9
PH_193	2020-11-15	B.1.1.263	CAR; Cagayan Valley; Calabarzon	0	0	9
PH_19	2020-11-10	B.6	NCR; Calabarzon	0	0	5

Cluster name	Date first identified	Pango lineage	Distribution	New submission	Isolated in 3 months	Total
PH_174	2020-11-07	B.1.1.28	Calabarzon; NCR; Central Luzon	0	0	6
PH_42	2020-11-06	B.1.36	Calabarzon; NCR	0	0	10
PH_205	2020-11-03	B.1.1.63	Calabarzon	0	0	6
PH_211	2020-11-02	B.1.1.63	>3 regions	0	0	35
PH_238	2020-11-01	B.1.1.63	>3 regions	0	0	14
PH_160	2020-10-30	B.1.1.28	Central Visayas; NCR	0	0	45
PH_194	2020-10-11	B.1.1.263	>3 regions	0	0	70
PH_168	2020-08-24	B.1.1.28	>3 regions	0	0	15
PH_59	2020-08-22	B.1	NCR; Calabarzon; Davao	0	0	12
PH_204	2020-08-13	B.1.1.63	>3 regions	0	0	189
PH_182	2020-08-07	B.1.1	NCR	0	0	5
PH_243	2020-08-07	B.1.1.63	>3 regions	0	0	20
PH_20	2020-08-06	B.6	>3 regions	0	0	40
PH_167	2020-08-05	B.1.1.28	>3 regions	0	0	178
PH_179	2020-08-05	B.1.1	Calabarzon; NCR	0	0	5
PH_189	2020-08-04	B.1.1	>3 regions	0	0	102
PH_92	2020-07-22	B.1.1.63	>3 regions	0	0	127
PH_203	2020-07-19	B.1.1.63	Calabarzon; NCR; Western Visayas	0	0	24
PH_25	2020-07-15	B.1	>3 regions	0	0	34
PH_188	2020-07-12	B.1.1	NCR; Calabarzon; Mimaropa	0	0	12
PH_216	2020-07-09	B.1.1.63	>3 regions	0	0	121
PH_183	2020-07-08	B.1.1	>3 regions	0	0	160
PH_214	2020-07-08	B.1.1.63	>3 regions	0	0	29
PH_231	2020-07-08	B.1.1.63	>3 regions	0	0	79
PH_60	2020-07-08	B.1	Mimaropa; NCR; Central Visayas	0	0	9
PH_235	2020-07-07	B.1.1.63	NCR; Calabarzon; Cagayan Valley	0	0	12
PH_171	2020-07-05	B.1.1.28	>3 regions	0	0	6
PH_201	2020-07-01	B.1.1.63	Calabarzon; NCR; CAR	0	0	9
PH_227	2020-07-01	B.1.1.63	>3 regions	0	0	234
PH_220	2020-06-29	B.1.1.63	>3 regions	0	0	133
PH_232	2020-06-23	B.1.1.63	NCR	0	0	5
PH_191	2020-06-16	B.1.1.263	>3 regions	0	0	140
PH_61	2020-06-11	B.1	NCR; Western Visayas	0	0	9
PH_17	2020-03-11	B.6	NCR; Cagayan Valley	0	0	6
PH_2	2020-03-10	B.6	>3 regions	0	0	20

Table 3. Number of sequences by cluster identified with the Grapevine-anywhere as of 26 July 2022. A cluster is defined based on multiple sequences isolated in the Philippines that appeared to descend from the same introductory event on a phylogenetic tree. *Date first identified*, the isolation date of the first identified sequence. *Pango lineage*, the major Pango lineage of the sequences that belong to the same cluster. *New submission*, new sequences submitted from the last report. *Isolated in 3 months*, sequences isolated from 1 May 2022 to 26 July 2022.

SARS-CoV-2 sequencing in the Philippines

Total available SARS-CoV-2 sequences in the Philippines: 21200

SARS-CoV-2 sequences from GECO project: 2136

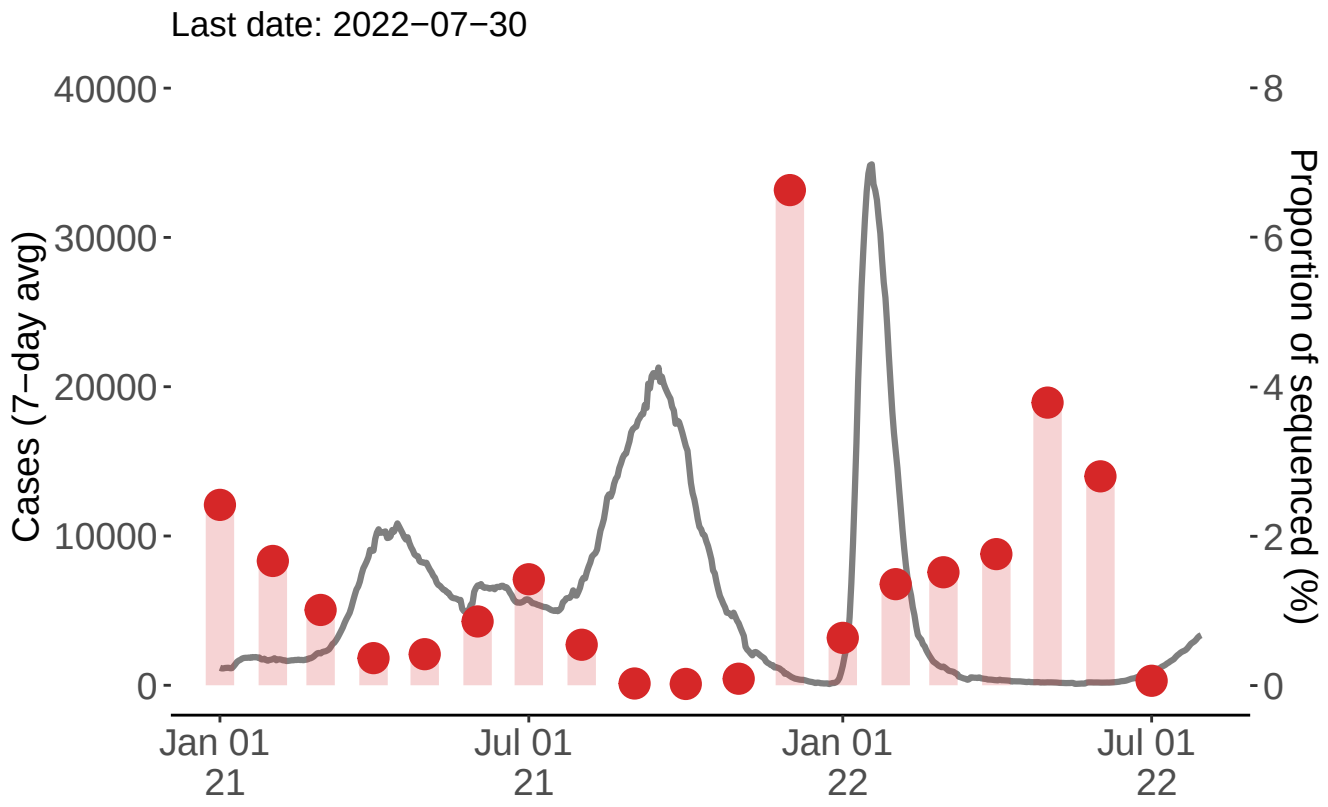

Figure 4. Number of COVID-19 cases and the proportion of sequenced samples in the Philippines from January 2021. The gray line indicates the mean cases in a 7 days window based on the JHU data base, whereas the red bars indicate the estimated percentage of sequenced samples among cases in a month.

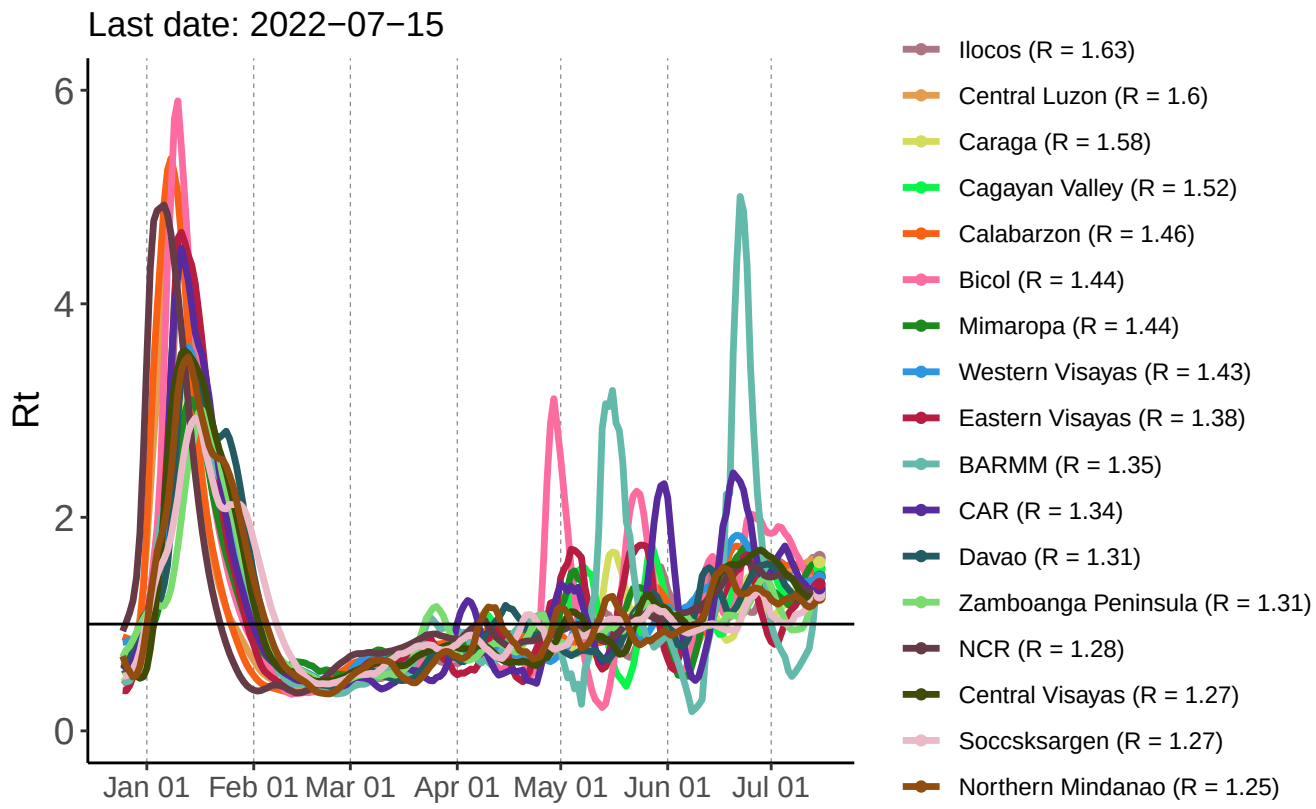

Figure 5. Mean effective reproductive number (Rt) of COVID-19 in the Philippines by region from December 2021 to July 2022. The reproductive number (R) is defined as the number of new infections that one infected patient can cause in a susceptible population. Here, *the mean effective reproductive number* (Rt) was inferred by daily number of cases reported in MOH, Philippines in a window of seven days. The horizontal line indicates one. If Rt is greater than 1, the case number in the region will likely continue to grow. If the Rt is below 1, the new cases may continue to appear at a slower rate. The R values denoted with the region name represent the most recent estimates. More regional epidemiological statistics can be found here.

SARS-CoV-2 mutations of interest

Spike protein

- **69-70Del** (Alpha, Omicron): Distribution on the Philippine isolates
- **T95I** (Mu, Omicron): Distribution on the Philippine isolates
- **144-** (Alpha, Eta, Omicron): Distribution on the Philippine isolates
- **K417N** (Beta, Omicron): Distribution on the Philippine isolates
- **L452R*** (Delta, BA.4/BA.5): Distribution on the Philippine isolates

- **T478K** (Delta, Omicron): Distribution on the Philippine isolates
- **E484K** (Beta, Gamma, Eta, Mu): Distribution on the Philippine isolates
- **F486V*** (BA.4/BA.5): Distribution on the Philippine isolates
- **N501Y** (Alpha, Beta, Gamma, Mu, Omicron): Distribution on the Philippine isolates
- **H655Y** (Gamma, Omicron): Distribution on the Philippine isolates

Relevant functions including antibody escape (S 69-70Del, S 144, S 417, S 484) and receptor binding (S 417, S 484, S 501). 69-70Del, deletions at positions 69-70. *: mutations relevant to emerging lineages (S 452, S 486).

Data sources and references

Data

- GECO website
- DOH Data drop
- GISAID (EPI-SET: EPI_SET_20220729rm)
- JHU COVID data

Methods

- Analyses in this report
- Nextstrain (build for GECO project)
- Grapevine-anywhere

References

- WHO
- Pango lineage list

Online version and previous reports

GECO Monthly Report

2022-06 pdf

Genomic Epidemiology of COVID in the Philippines (GECO PH)