GECO Philippines SARS-CoV-2 Situation Report - 2023 January

Highlights

- BA.2.3.20, including the sublineages CM.*, continues to dominate recent (November-December, 2022) isolates.
- Compared to 2022, case numbers in January 2023 remain stable after the holiday season.

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	0	0	2808
Beta	B.1.351	VOC	0	0	3282
Delta	B.1.617.2/AY.x	VOC	1 (0.3)	1 (0.2)	3497
Gamma	P.1	VOC	0	0	5
Omicron	B.1.1.529/BA.x	VOC	291 (81.7)	469 (81.6)	12665
Eta	B.1.525	VUM	0	0	8
Theta	P.3	VUM	0	0	528

Table 1. Number of available sequences by variant in the Philippines as of 31 January 2023. 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 November 2022 to 31 January 2023. Numbers in the parentheses are percentage of the category (%). Note that recombinant strains involving Omicron sublineages (e.g. XBB, XBC) are provisionally classified as "Omicron".

- **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.

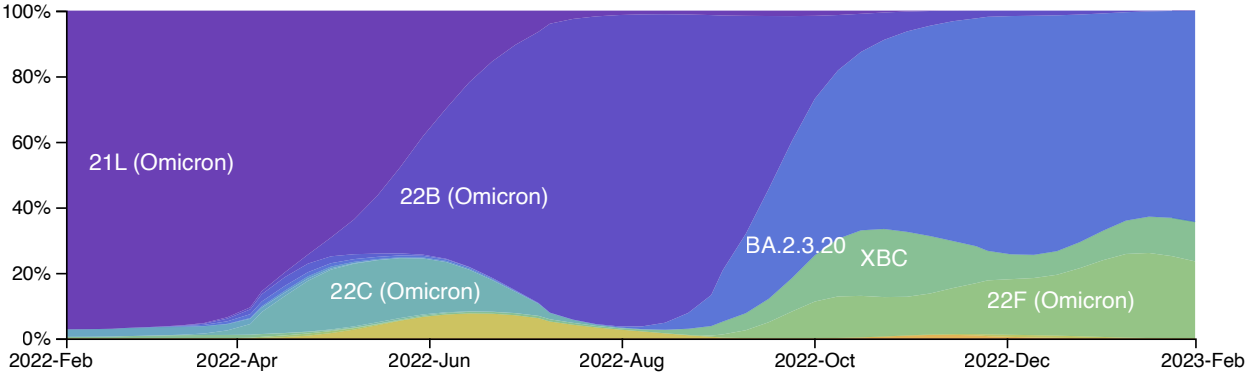

Figure 1. Temporal frequencies of SARS-CoV-2 variants in the Philippines. The figure is constructed with a subsampled genomic data set from all available sequences (methods). Different ways of classification of SARS-CoV-2 lineages isolated in the country can be visualised by selecting options for coloring in the control panel (icon on top left/right). **Note** that the latest available Philippine sequences were isolated on 9 January 2023, thus the frequencies after the time point could harbor great uncertainty.

- **Nextstrain clade** and the corresponding Pango lineage name: **21L** = BA.2, **22B** = BA.5, **22C** = BA.2.12.1, **22A** = BA.4, **22F** = XBB.

Diversity within the Omicron variant

Pango lineage	New submission	Isolated in 3 months	Total
BA.1.*	0	0	598
BA.2	14 (3.9)	17 (3)	491
BA.2.3	7 (2)	29 (5)	6011
BA.2.3.20.*	143 (40.2)	236 (41)	709
BA.2.12.1	0	0	119
BA.2.75.*	0	0	5
Other BA.2.*	0	1 (0.2)	243
BA.4.*	0	0	120
BA.5	0	0	14
BA.5.2.*	2 (0.6)	5 (0.9)	3121
Other BA.5.*	6 (1.7)	2 (0.3)	414
BE.1.*	0	0	19
BQ.1.*	1 (0.3)	2 (0.3)	2
XBB.*	36 (10.1)	59 (10.3)	416
XBC.*	50 (14)	79 (13.7)	183

Table 1b. Number of available Omicron sequences in the Philippines as of 31 January 2023. *New submission*, new sequences submitted from the last report. *Isolated in 3 months*, sequences isolated from 1 November 2022 to 31 January 2023. Numbers in the parentheses are percentage of the category (%). Phylogenetic relationship of the sublineages of Omicron variant is available here.

- **BA.2.3.20** includes its descending sulbineages CM. **BE.1** = BA.5.3.1.1, a sublineage of BA.5.3; **BQ.1** = BE.1.1.1.1, a sublineage of BE.1 (and also a sublineage of BA.5.3). **XBB** sublineages are recombinant viruses between BJ.1 (BA.2.10.1.1) and BA.2.75, whereas **XBC** are recombinant viruses between BA.2 and Delta.

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	8 (2.2)	CM.8.1 (22.2)	9 (1.6)	5803
Ilocos	15 (4.2)	BA.2.3.20 (42.4)	33 (5.7)	758
CAR	15 (4.2)	BA.2.3.20 (20)	30 (5.2)	1349
Cagayan Valley	1 (0.3)	CM.4.1 (33.3)	3 (0.5)	1562
Central Luzon	10 (2.8)	CM.8.1 (39.1)	23 (4)	1684
Calabarzon	41 (11.5)	CM.8.1 (22.7)	88 (15.3)	3518
Mimaropa	18 (5.1)	BA.2.3.20 (19)	21 (3.7)	637
Bicol	37 (10.4)	CM.8.1 (23.8)	63 (11)	738
Western Visayas	2 (0.6)	CM.5 (16.7)	6 (1)	3648
Central Visayas	2 (0.6)	XBB.1 (28.6)	7 (1.2)	1194
Eastern Visayas	1 (0.3)	BA.2.3 (33.3)	3 (0.5)	238
Zamboanga Peninsula	0	-	0	778
Northern Mindanao	4 (1.1)	BA.2.3 (12.5)	8 (1.4)	530
Davao	114 (32)	XBC.1 (28.7)	150 (26.1)	2648
Soccsksargen	25 (7)	XBC.1 (22.8)	79 (13.7)	803
Caraga	61 (17.1)	XBC.1 (25)	48 (8.3)	625
BARMM	2 (0.6)	BA.2.3 (50)	4 (0.7)	138

Table 2. Number of available sequences by administrative region in the Philippines as of 31 January 2023. *New submission*, new sequences submitted from the last report. *Dominant variant in 3 months*, the major variant isolated from 1 November 2022 to 31 January 2023. A dash indicates no sequence isolated. *Isolated in 3 months*, sequences isolated from 1 November 2022 to 31 January 2023. 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.

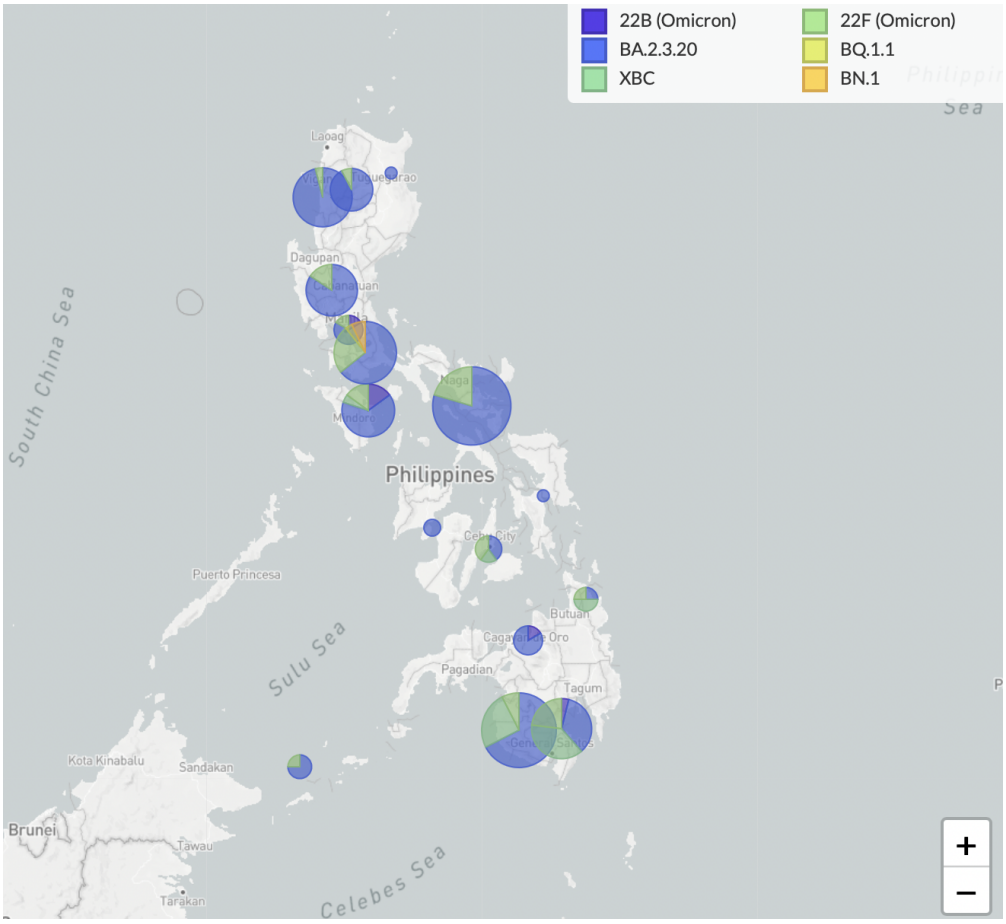

Figure 2. Frequencies of SARS-CoV-2 variants by administrative region in the Philippines since 1 November 2022. The figure is constructed with a subsampled genomic data set from all available sequences as Figure 1. Frequencies of isolates in a particular time frame and frequencies classified with the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

- **Nextstrain clade** and the corresponding Pango lineage name: **22B** = BA.5, **22F** = XBB.

Philippines specific SARS-CoV-2 lineages

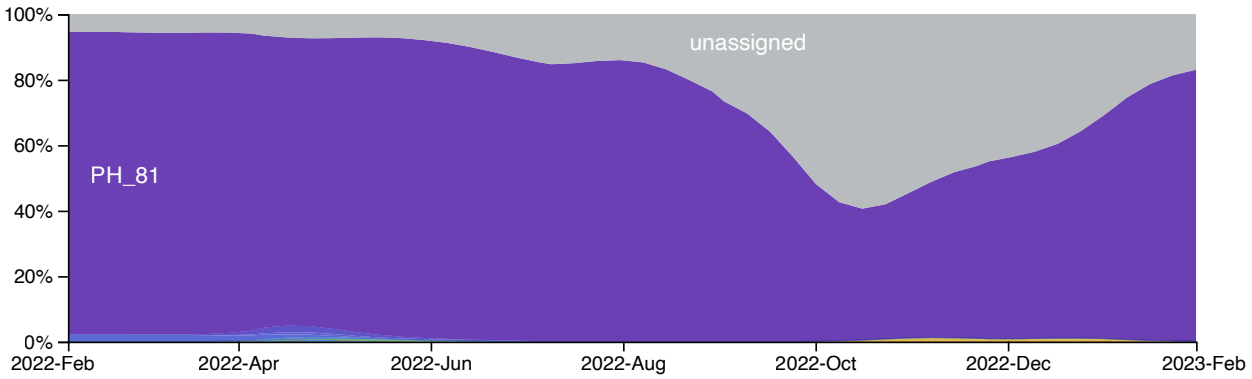

Figure 3. Temporal frequencies of Philippine lineages (clusters) identified by Grapevine-anywhere. Each sequence submitted to GECO database would undergo *Grapevine-anywhere* pipeline to detect sustain local transmission. A cluster is defined based on multiple sequences isolated in the Philippines that appeared to descend from the same introductory event on a phylogenetic tree. Phylogenetic relationships of these lineages can be found here. **We are currently looking into the issue in which imbalanced amount of PH/non-PH genomic data caused the base of most lineages to be inferred as Philippines-originated**.

Cluster name	Date first identified	Pango lineage	Distribution	New submission	Isolated in 3 months	Total
PH_81	2021-03-05	BA.2.3	>3 regions	130	210	9757
PH_250	2021-08-02	B.1.617.2	>3 regions	12	14	20
PH_453	2021-11-20	BA.1.1	>3 regions	0	0	475
PH_147	2021-08-15	AY.122	Mimaropa; Calabarzon; Bicol	0	0	6
PH_140	2021-08-10	B.1.617.2	Calabarzon	0	0	7
PH_225	2021-08-07	B.1.617.2	Caraga	0	0	10
PH_144	2021-08-04	AY.122	>3 regions	0	0	10
PH_168	2021-07-31	AY.1	>3 regions	0	0	5
PH_166	2021-07-29	AY.1	>3 regions	0	0	5
PH_224	2021-07-27	B.1.617.2	>3 regions	0	0	23
PH_134	2021-07-24	AY.98.1	NCR	0	0	6
PH_167	2021-07-23	AY.1	>3 regions	0	0	7
PH_215	2021-07-22	B.1.617.2	Calabarzon; Bicol	0	0	9
PH_217	2021-07-22	B.1.617.2	Calabarzon; Bicol; NCR	0	0	7
PH_234	2021-07-21	B.1.617.2	Calabarzon; NCR	0	0	9
PH_237	2021-07-20	B.1.617.2	>3 regions	0	0	6
PH_138	2021-07-18	B.1.617.2	NCR	0	0	5
PH_159	2021-07-16	AY.107	>3 regions	0	0	27
PH_163	2021-07-14	AY.1	NCR; Ilocos; Central Luzon	0	0	14
PH_160	2021-07-13	AY.107	Central Luzon; NCR	0	0	6
PH_188	2021-07-12	AY.125	NCR; Calabarzon	0	0	12
PH_125	2021-07-10	AY.23	Calabarzon	0	0	5
PH_155	2021-07-08	AY.102	Northern Mindanao; Cagayan Valley; BARMM	0	0	8
PH_139	2021-07-07	AY.102	>3 regions	0	0	21
PH_151	2021-07-07	AY.122	>3 regions	0	0	17
PH_154	2021-07-07	AY.122	>3 regions	0	0	7
PH_123	2021-07-05	AY.23	>3 regions	0	0	23
PH_211	2021-07-04	AY.65	NCR; Calabarzon	0	0	11
PH_108	2021-07-03	B.1.617.2	Western Visayas; Central Luzon	0	0	15
PH_243	2021-07-01	B.1.617.2	>3 regions	0	0	72
PH_245	2021-06-30	B.1.617.2	>3 regions	0	0	24
PH_145	2021-06-28	AY.122	>3 regions	0	0	65
PH_221	2021-06-28	B.1.617.2	Calabarzon; NCR	0	0	13
PH_222	2021-06-28	B.1.617.2	>3 regions	0	0	134
PH_177	2021-06-27	AY.106	>3 regions	0	0	92
PH_181	2021-06-27	AY.102	>3 regions	0	0	36
PH_162	2021-06-23	AY.1	>3 regions	0	0	179
PH_170	2021-06-23	AY.1	>3 regions	0	0	62
PH_182	2021-06-21	AY.122	>3 regions	0	0	134
PH_214	2021-06-19	B.1.617.2	>3 regions	0	0	207

Cluster name	Date first identified	Pango lineage	Distribution	New sub-mission	Isolated in 3 months	Total
PH_204	2021-06-16	AY.75.2	>3 regions	0	0	259
PH_107	2021-05-29	B.1.617.2	>3 regions	0	0	153
PH_249	2021-05-08	B.1.617.2	>3 regions	0	0	1216
PH_111	2021-05-07	B.1.617.2	NCR	0	0	8
PH_277	2021-05-06	B.1.1.7	>3 regions	0	0	7
PH_293	2021-04-30	B.1.1.7	Davao; Caraga; NCR	0	0	19
PH_104	2021-04-29	AY.14	>3 regions	0	0	150
PH_109	2021-04-24	AY.31	>3 regions	0	0	5
PH_279	2021-04-19	B.1.1.7	Davao; Soccsksargen	0	0	18
PH_300	2021-04-19	B.1.1.7	>3 regions	0	0	16
PH_280	2021-04-14	B.1.1.7	>3 regions	0	0	21
PH_292	2021-04-13	B.1.1.7	Davao; Caraga; Central Luzon	0	0	13
PH_414	2021-04-02	B.1.1.519	NCR	0	0	5
PH_84	2021-03-28	B.1.351.3	NCR; Central Visayas	0	0	14
PH_291	2021-03-25	B.1.1.7	>3 regions	0	0	29
PH_289	2021-03-22	B.1.1.7	>3 regions	0	0	32
PH_297	2021-03-19	B.1.1.7	>3 regions	0	0	12
PH_93	2021-03-18	B.1.351	Central Luzon; NCR	0	0	5
PH_298	2021-03-15	B.1.1.7	Bicol; NCR; Calabarzon	0	0	13
PH_274	2021-03-06	B.1.1.7	>3 regions	0	0	31
PH_275	2021-03-05	B.1.1.7	>3 regions	0	0	24
PH_278	2021-03-05	B.1.1.7	>3 regions	0	0	32
PH_301	2021-03-05	B.1.1.7	>3 regions	0	0	24
PH_329	2021-03-05	B.1.1.7	>3 regions	0	0	33
PH_378	2021-03-05	B.1.1.63	NCR; Calabarzon	0	0	5
PH_299	2021-03-04	B.1.1.7	>3 regions	0	0	18
PH_295	2021-02-22	B.1.1.7	NCR; Calabarzon; Central Luzon	0	0	13
PH_320	2021-02-15	B.1.1.7	>3 regions	0	0	55
PH_316	2021-02-12	B.1.1.7	>3 regions	0	0	72
PH_330	2021-02-11	B.1.1.7	>3 regions	0	0	14
PH_190	2021-01-31	B.1.351	>3 regions	0	0	2964
PH_361	2021-01-27	B.1.1.63	NCR; Calabarzon	0	0	7
PH_312	2021-01-26	B.1.1.7	>3 regions	0	0	48
PH_36	2021-01-25	B.1.1.7	>3 regions	0	0	1410
PH_381	2021-01-25	B.1.1.63	Calabarzon	0	0	5
PH_37	2021-01-21	B.1.466.1	Calabarzon; NCR	0	0	20
PH_416	2021-01-19	B.1.1	>3 regions	0	0	29
PH_450	2021-01-15	B.1.1.28	Davao; NCR; Soccsksargen	0	0	9
PH_41	2021-01-12	B.1.441	NCR; Central Visayas	0	0	5
PH_445	2021-01-11	B.1.1.28	Davao	0	0	14
PH_449	2021-01-11	B.1.1.28	Soccsksargen; Davao; Calabarzon	0	0	14
PH_348	2021-01-08	B.1.1	Calabarzon; Central Visayas; NCR	0	0	6
PH_441	2021-01-08	P.3	>3 regions	0	0	452
PH_267	2021-01-07	B.1.1.7	NCR; Central Luzon; Central Visayas	0	0	7
PH_271	2021-01-07	B.1.1.7	NCR; Calabarzon; Central Visayas	0	0	12

Cluster name	Date first identified	Pango lineage	Distribution	New sub-mission	Isolated in 3 months	Total
PH_309	2021-01-07	B.1.1.7	>3 regions	0	0	342
PH_319	2021-01-05	B.1.1.7	>3 regions	0	0	133
PH_273	2020-12-29	B.1.1.7	>3 regions	0	0	8
PH_70	2020-12-28	B.1.524	>3 regions	0	0	10
PH_418	2020-12-18	B.1.1.63	Cagayan Valley; NCR	0	0	7
PH_403	2020-12-17	B.1.1.263	CAR; Cagayan Valley; Central Luzon	0	0	65
PH_428	2020-12-15	B.1.1.63	NCR; Calabarzon; CAR	0	0	11
PH_331	2020-12-10	B.1.1.7	NCR; Calabarzon; Central Visayas	0	0	5
PH_429	2020-12-10	B.1.1.63	Calabarzon; NCR	0	0	5
PH_371	2020-12-04	B.1.1.63	NCR; Central Luzon	0	0	10
PH_447	2020-12-02	B.1.1.28	>3 regions	0	0	36
PH_448	2020-12-02	B.1.1.28	NCR; Calabarzon; Caraga	0	0	20
PH_384	2020-11-25	B.1.1	Calabarzon; NCR	0	0	11
PH_434	2020-11-22	B.1.1.63	Calabarzon; NCR	0	0	9
PH_23	2020-11-20	B.6	Cagayan Valley; Calabarzon	0	0	6
PH_398	2020-11-15	B.1.1.263	CAR; Cagayan Valley; Calabarzon	0	0	9
PH_25	2020-11-10	B.6	NCR; Calabarzon	0	0	5
PH_443	2020-11-07	B.1.1.28	Calabarzon; NCR; Central Luzon	0	0	6
PH_43	2020-11-06	B.1.36	Calabarzon; NCR	0	0	9
PH_433	2020-11-03	B.1.1.63	Calabarzon	0	0	6
PH_362	2020-11-02	B.1.1.63	>3 regions	0	0	34
PH_376	2020-11-01	B.1.1.63	>3 regions	0	0	14
PH_405	2020-10-11	B.1.1.263	>3 regions	0	0	67
PH_444	2020-08-24	B.1.1.28	>3 regions	0	0	15
PH_71	2020-08-22	B.1	NCR; Calabarzon; Davao	0	0	12
PH_432	2020-08-13	B.1.1.63	>3 regions	0	0	190
PH_370	2020-08-07	B.1.1.63	>3 regions	0	0	20
PH_386	2020-08-07	B.1.1	NCR	0	0	5
PH_21	2020-08-06	B.6	>3 regions	0	0	33
PH_385	2020-08-05	B.1.1	Calabarzon; NCR	0	0	5
PH_92	2020-07-22	B.1.1.63	>3 regions	0	0	129
PH_431	2020-07-19	B.1.1.63	Calabarzon; NCR; Western Visayas	0	0	24
PH_391	2020-07-12	B.1.1	NCR; Calabarzon; Mimaropa	0	0	13
PH_57	2020-07-10	B.1	>3 regions	0	0	33
PH_417	2020-07-09	B.1.1.63	>3 regions	0	0	121
PH_356	2020-07-08	B.1.1	>3 regions	0	0	268
PH_367	2020-07-08	B.1.1.63	>3 regions	0	0	80
PH_72	2020-07-08	B.1	Mimaropa; NCR; Central Visayas	0	0	9
PH_369	2020-07-07	B.1.1.63	NCR; Calabarzon; Cagayan Valley	0	0	13
PH_419	2020-07-07	B.1.1.63	>3 regions	0	0	29
PH_442	2020-07-05	B.1.1.28	>3 regions	0	0	296
PH_360	2020-07-01	B.1.1.63	Calabarzon; NCR; CAR	0	0	9
PH_364	2020-07-01	B.1.1.63	>3 regions	0	0	233

Cluster name	Date first identified	Pango lineage	Distribution	New submission	Isolated in 3 months	Total
PH_424	2020-06-29	B.1.1.63	>3 regions	0	0	131
PH_373	2020-06-23	B.1.1.63	NCR	0	0	5
PH_395	2020-06-16	B.1.1.263	>3 regions	0	0	146
PH_64	2020-06-11	B.1	NCR; Western Visayas	0	0	9
PH_20	2020-03-11	B.6	NCR; Cagayan Valley	0	0	6
PH_2	2020-03-10	B.6	>3 regions	0	0	19
PH_27	2020-03-10	B.1.1.7	Calabarzon; Mimaropa; Soccsksargen	0	0	7

Table 3. Number of sequences by cluster identified with the Grapevine-anywhere as of 31 January 2023. 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 November 2022 to 31 January 2023. **We are currently looking into the issue in which imbalanced amount of PH/non-PH genomic data caused the base of most lineages to be inferred as Philippines-originated**.

SARS-CoV-2 sequencing in the Philippines

Total available SARS-CoV-2 sequences in the Philippines: 26678

SARS-CoV-2 sequences from GECO project: 3637

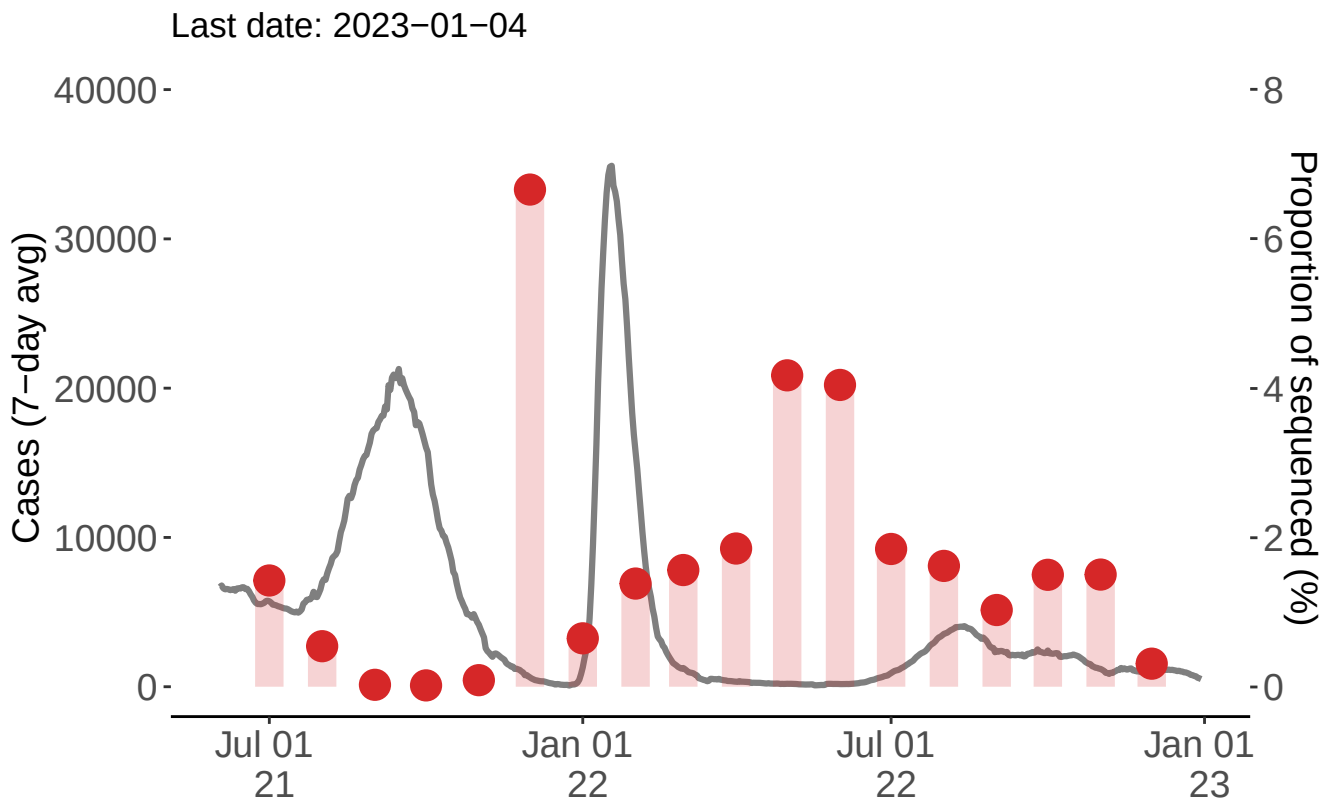

Figure 4. Number of COVID-19 cases and the proportion of sequenced samples in the Philippines from January 2021. The gray line indicates the mean cases in a 7 days window based on the JHU data base, whereas the red bars indicate the estimated percentage of sequenced samples among cases in a month.

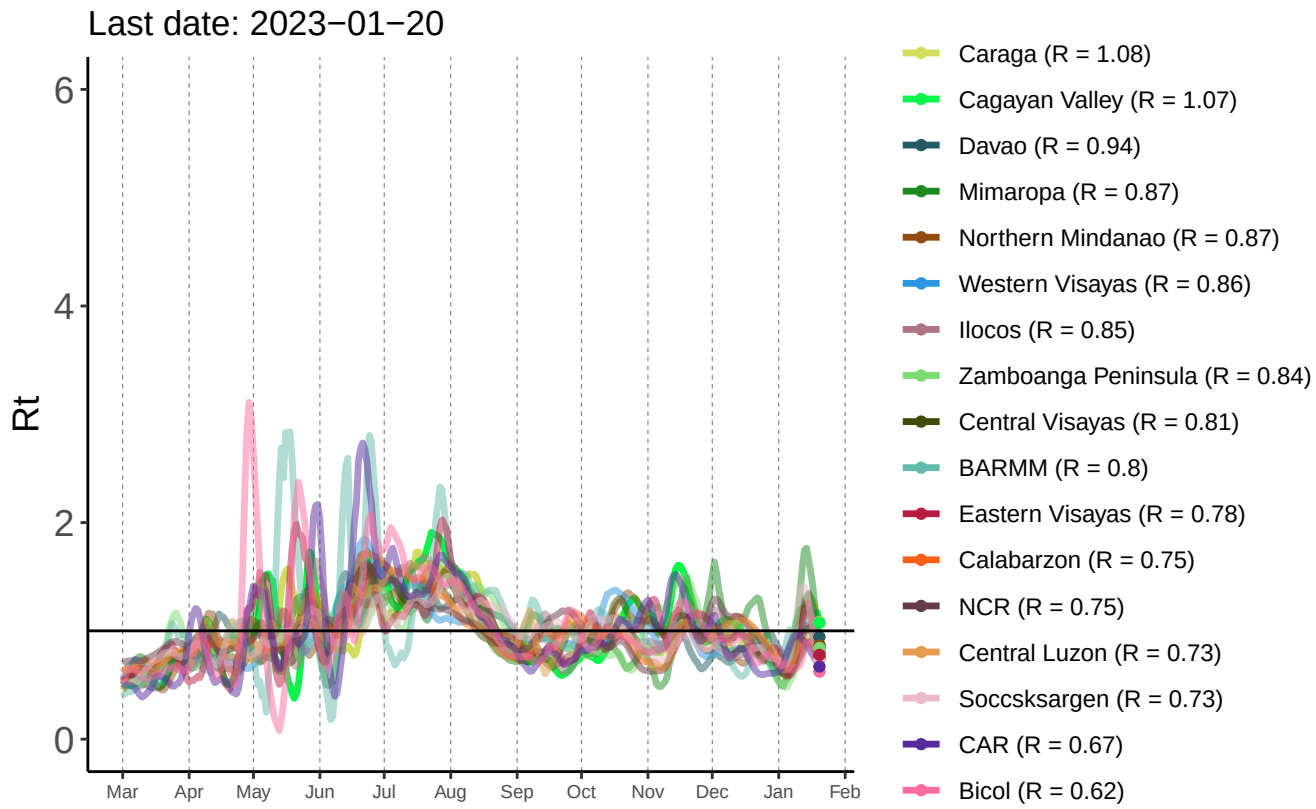

Figure 5. Mean effective reproductive number (Rt) of COVID-19 in the Philippines by region from March 2021. The reproductive number (R) is defined as the number of new infections that one infected patient can cause in a susceptible population. Here, *the mean effective reproductive number* (Rt) was inferred 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

Omicron sublineage convergent sites

- **R346X** (K: BA.1.1; T: BA.5.2, BA.2.75.2): Distribution on the Philippine isolates
- **K444X** (R: BA.2.3.20; M: BR.1 [a BA.2.75.4.*]; T: BQ.1): Distribution on the Philippine isolates
- **L452X** (R: BA.4/BA.5, BA.2.35; M: BA.2.3.20): Distribution on the Philippine isolates
- **N460X** (K: BA.2.75, BQ.1 [a BA.5.3.*], BA.2.3.20): Distribution on the Philippine isolates
- **F486X** (V: BA.4/BA.5, S: BA.2.75.2, XBB.1.5): Distribution on the Philippine isolates

- **R493X** (Q: BA.4/BA.5, BA.2.75, BA.2.3.20): Distribution on the Philippine isolates

Other 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
- **T478K** (Delta, Omicron): Distribution on the Philippine isolates
- **E484K** (Beta, Gamma, Eta, Mu): 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 346, S 417, S 484) and receptor binding (S 417, S 484, S 501). 69-70Del, deletions at positions 69-70.

Data sources and references

Data

- GECO website
- DOH Data drop
- GISAID (EPI-SET: EPI_SET_230205bz)
- 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

2022-12 pdf