

Weekly Report for Influenza, Enterovirus, Respiratory Syncytial Virus (RSV), Norovirus, SARS-CoV-2 and Poliovirus in Wastewater: 20 February 2024

Samples taken up to and including: 14 February 2024

Background

Wastewater samples are collected from 11 wastewater treatment works located across Wales (Monday to Wednesday) each week. Samples are representative of communities in each of the Welsh Health Boards. The concentrations of SARS-CoV-2 and other viruses are then quantified in the samples, as well as SARS-CoV-2 variants detected.

Guidance

In this report, Cardiff & Vale, Aneurin Bevan, Cwm Taf Morgannwg and Swansea Bay University Health Boards are grouped together. Signal for all markers is given as a daily rate of gene copies per 100,000 people (gc/day per 100k individuals). Please check site level plots for greater detail. For plots showing enterovirus signal, the beige block represents a period where two enterovirus assays were being used (EV1 and EV2), with two lines being displayed. Currently, only the EV2 assay is being used as it provides better sensitivity. No samples were taken in the period between July 2023 and November 2023.

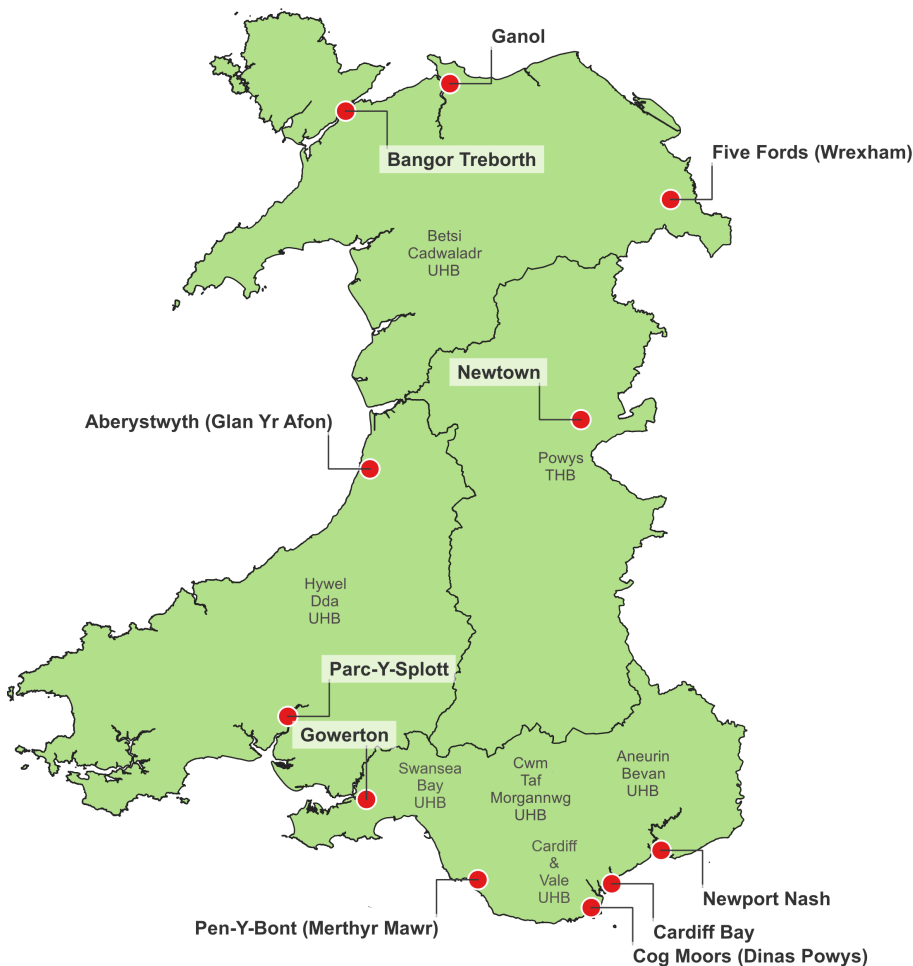
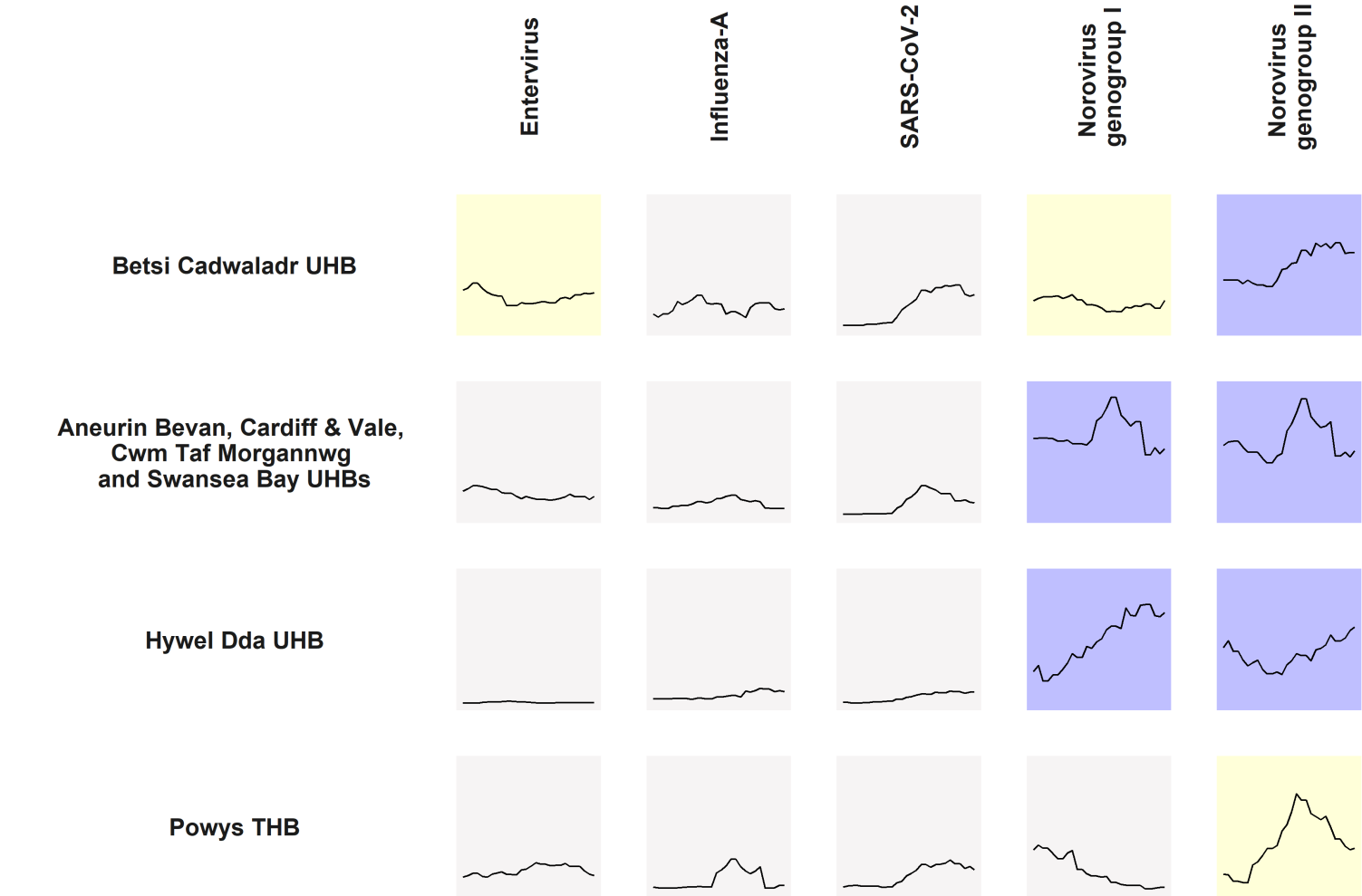


Figure 1. Map showing the 11 wastewater treatment plants (WwTPs) monitored by the programme, along with their respective health boards.



Graphic 1. Plot backgrounds are shaded according to the average actual signal (%) during the most recent week. Lines represent the smoothed signal during the most recent 4 week period.

All values are a percentage of the highest observed value per virus per area since wastewater monitoring commenced. The background shades are divided into 3 categories, light grey: average actual signal < 20%, mid yellow: $20\% \leq$ average actual signal < 40%, and dark blue: $40\% \leq$ average actual signal. The smoothed signal is a 10 day rolling average.

Poliovirus

No poliovirus was detected in this sampling period. Poliovirus assays are run on samples from the first week of each month.

SARS-CoV-2

National Summary

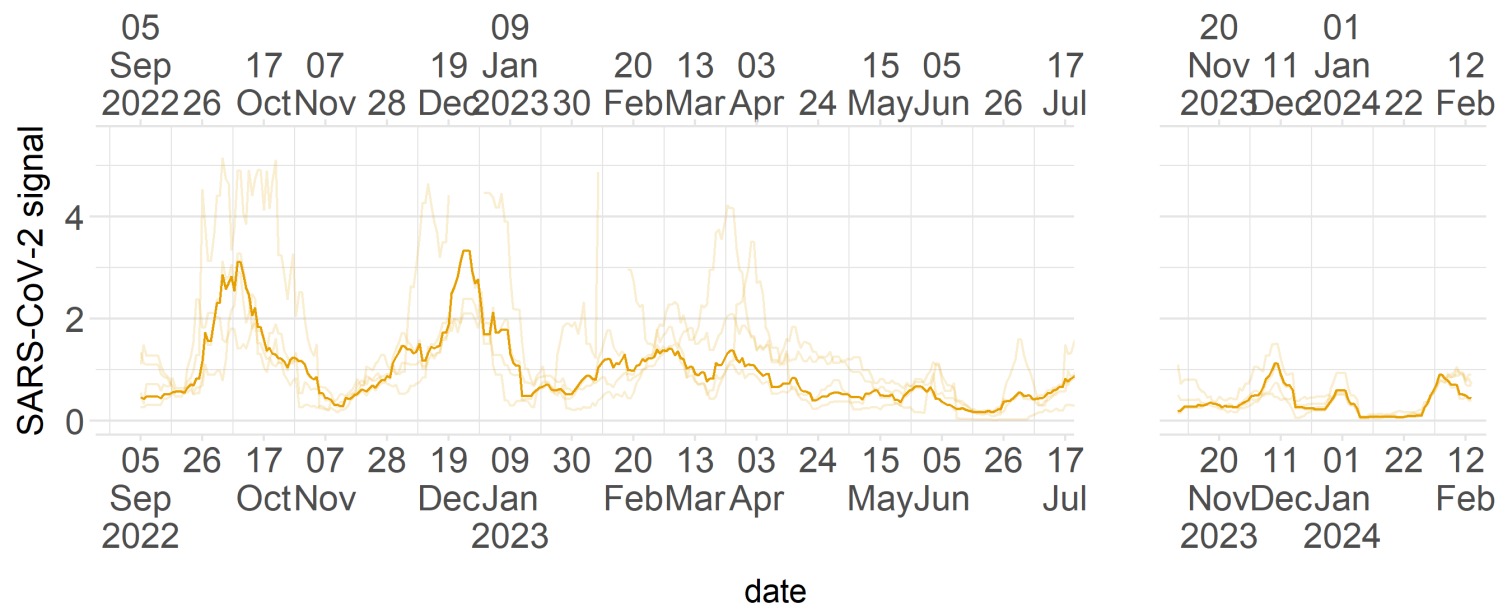


Figure 2. Level of SARS-CoV-2 given as a 10 day rolling mean at the national (bold line) and healthboard (faint lines) level. An upper limit has been placed on the y axis, which obscures a high healthboard value but, allows better visualisation of the national trend.

Variants of Concern and/or Interest

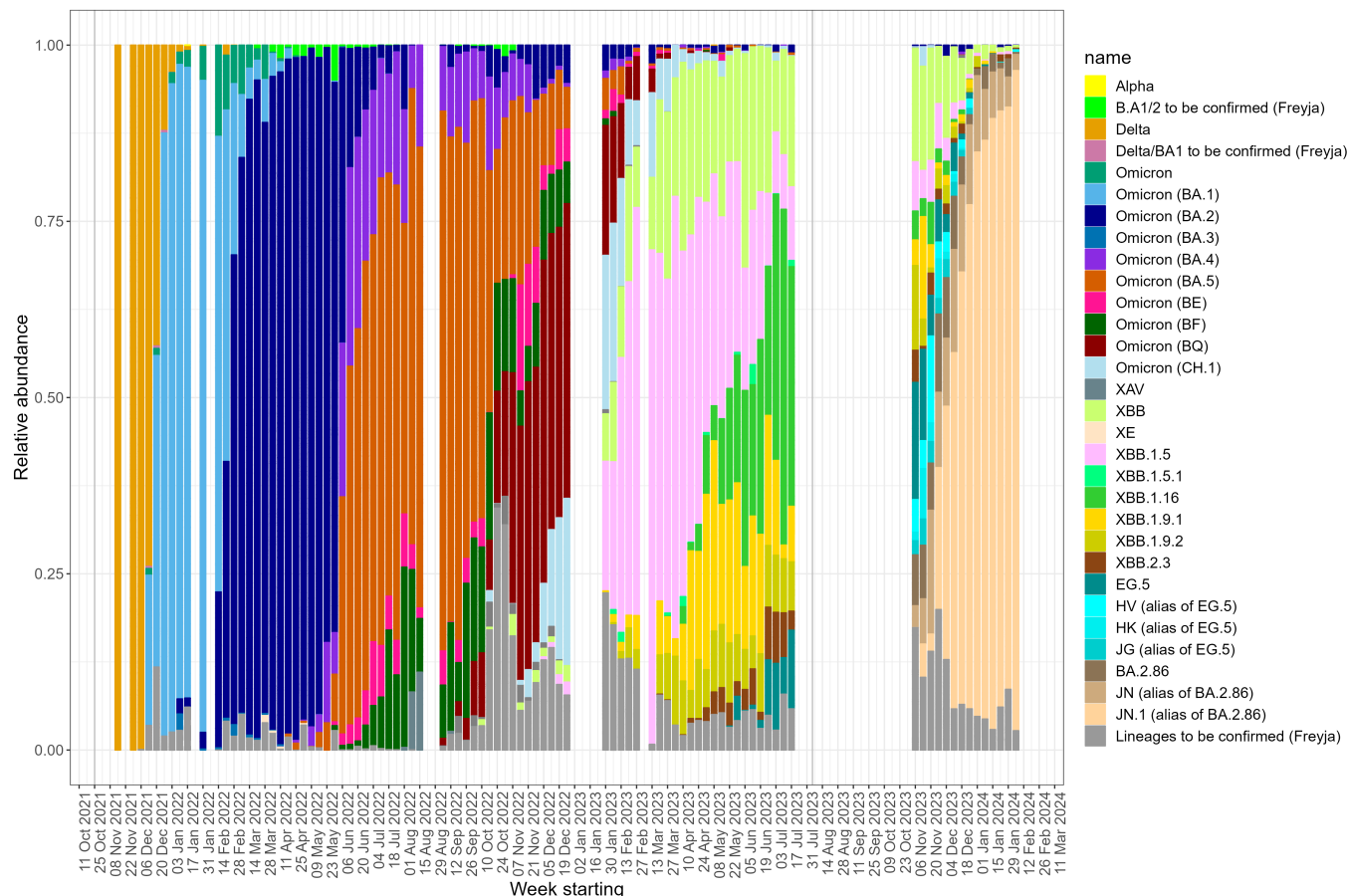


Figure 3. SARS-CoV-2 variants identified at the national level (plotting proportion of sequence reads assigned to each variant lineage using the **Freyja programme**; see figure legend). Limitations of the Freyja tool in reconstructing and quantifying SARS-CoV-2 lineages from wastewater metabarcode sequencing should be considered. All sites contribute equally to the national lineage proportions, but a weighted national lineage plot can be found in the assets archive.

Heat Map

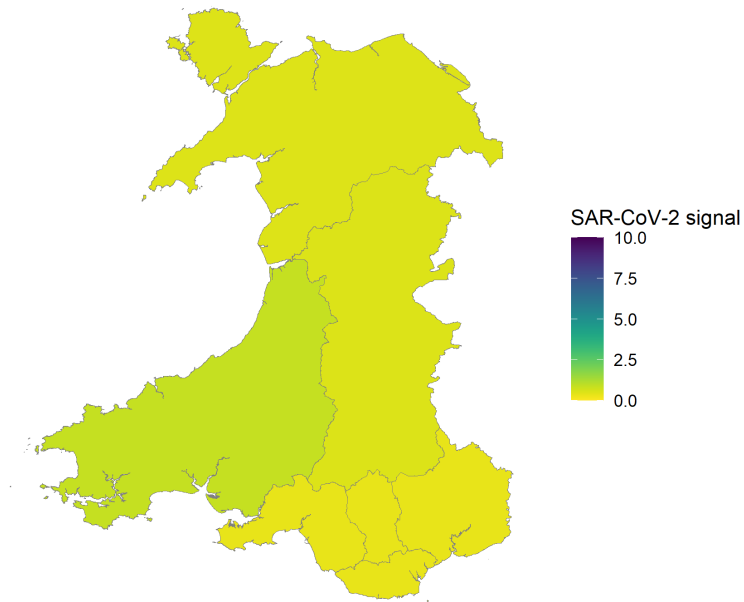


Figure 4. National heat map showing mean SARS-CoV-2 gc/day per 100k for each healthboard in the most recent sampling week.

Healthboard Summaries

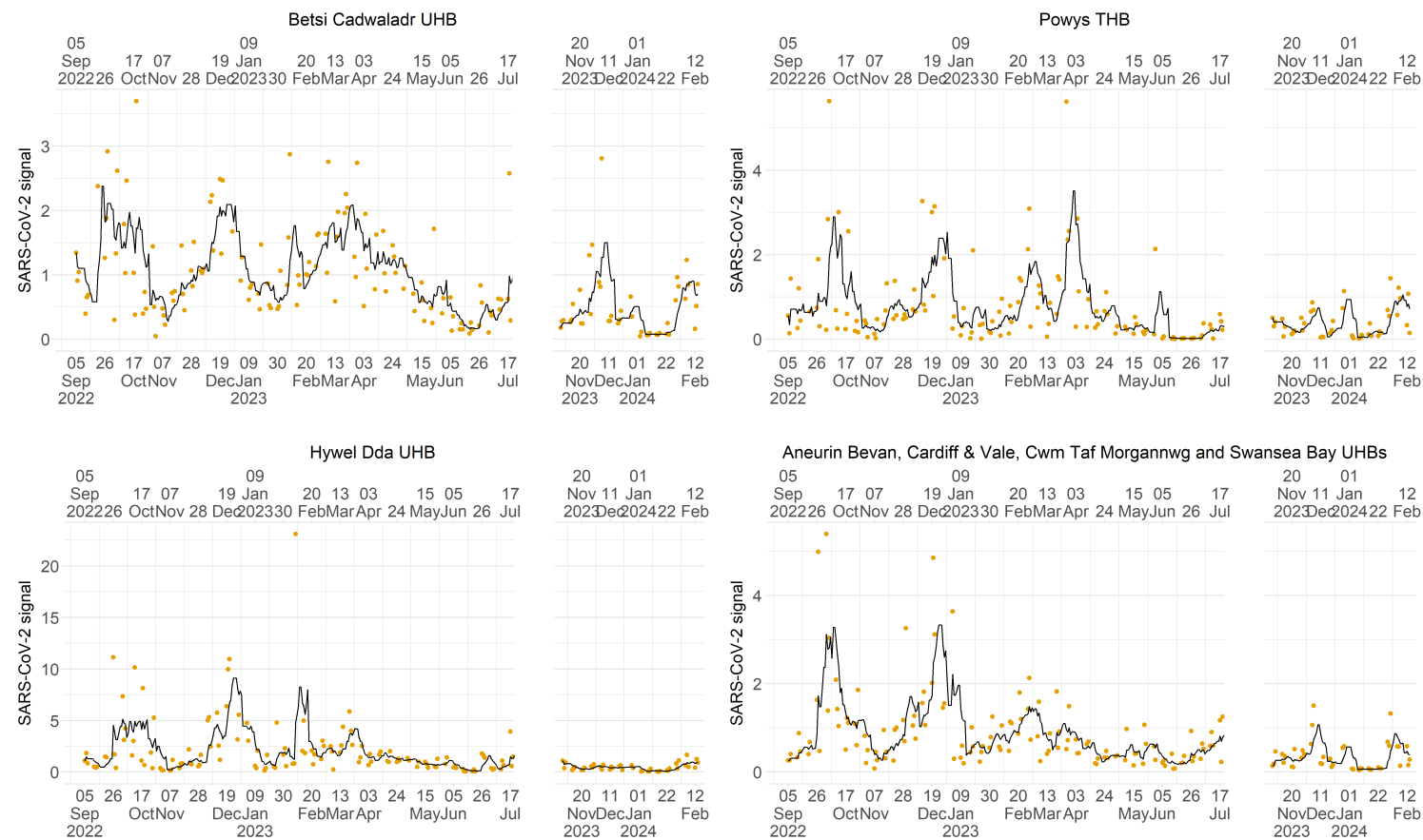


Figure 5. Level of SARS-CoV-2 given as a 10 day rolling mean at the healthboard level (bold line) and per day (dots).

Norovirus genogroup I (NoVGI)

National Summary

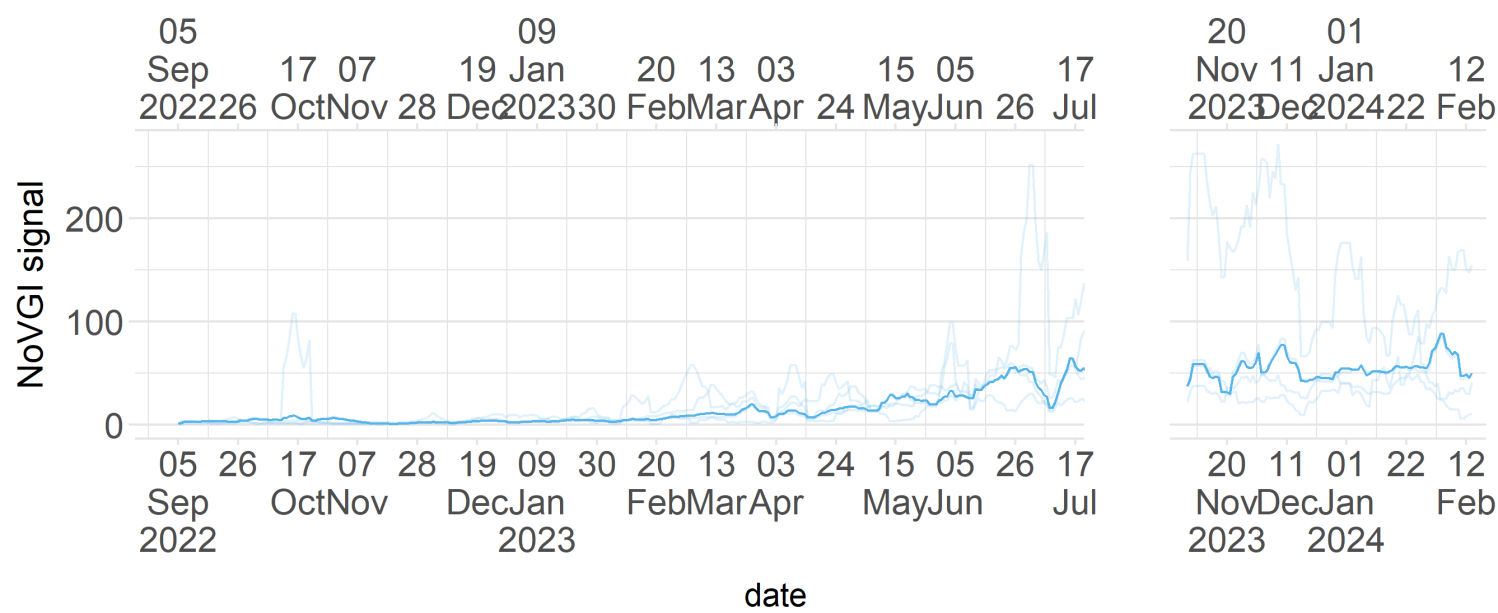


Figure 6. Level of norovirus genogroup I (NoVGI) given as a 10 day rolling mean at the national (bold line) and healthboard (faint lines) level.

Heat Map

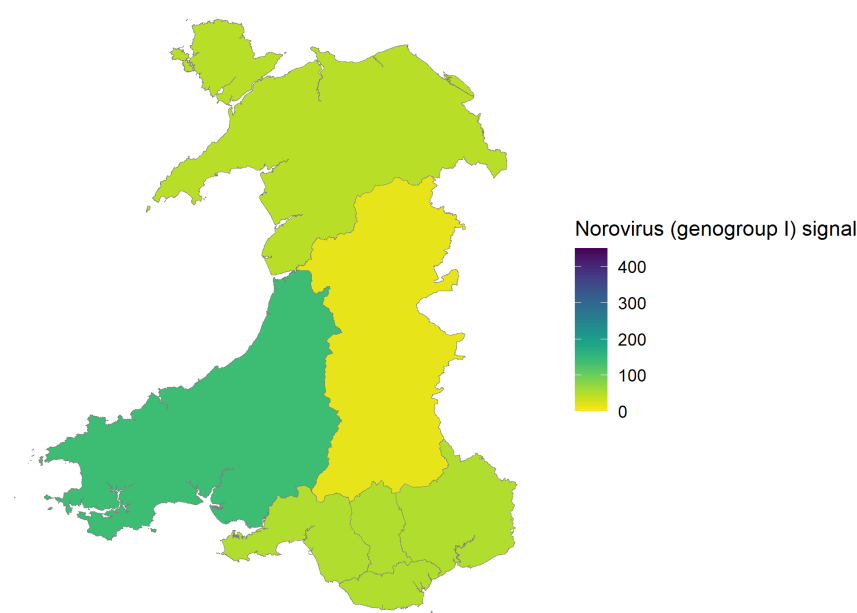


Figure 7. National heat map showing mean norovirus genogroup I gc/day per 100k for each healthboard in the most recent sampling week.

Healthboard Summaries

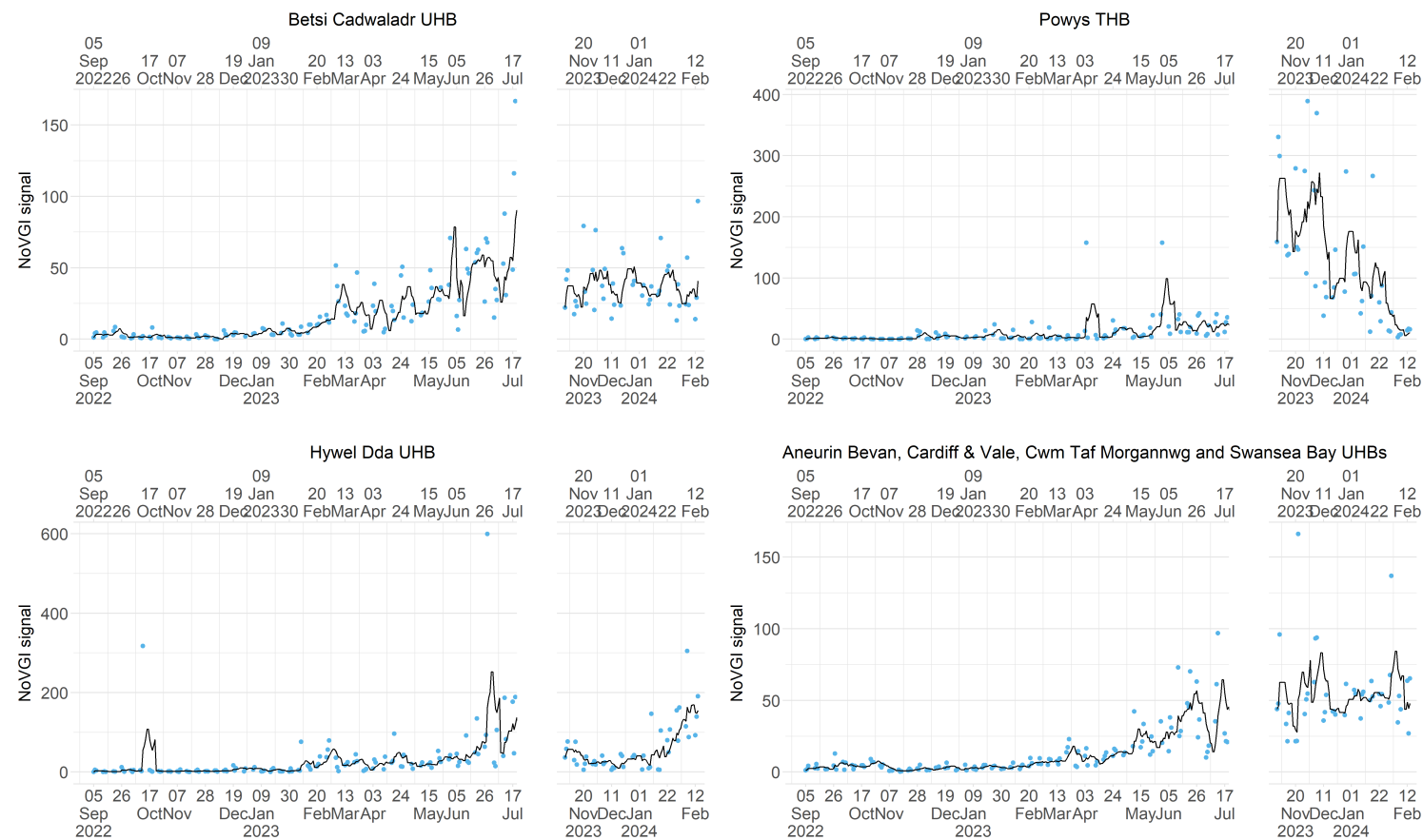


Figure 8. Level of norovirus genogroup I (NoVG1) given as a 10 day rolling mean at the healthboard level (bold line) and per day (dots).

Norovirus genogroup II (NoVGII)

National Summary

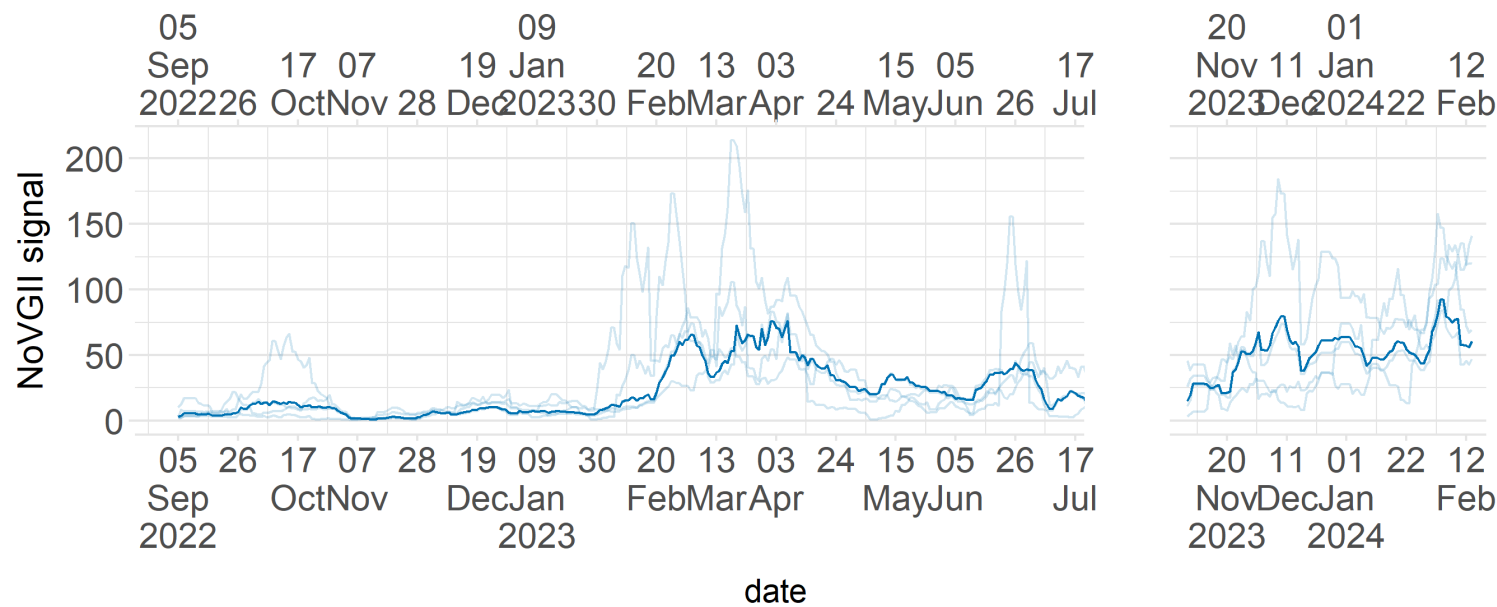


Figure 9. Level of norovirus genogroup II (NoVGII) given as a 10 day rolling mean at the national (bold line) and healthboard (faint lines) level.

Heat Map

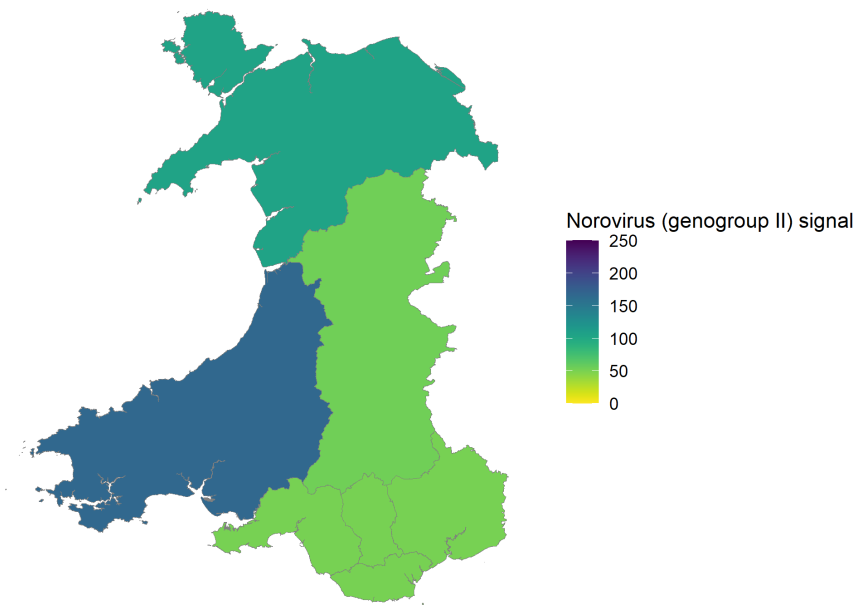


Figure 10. National heat map showing mean norovirus genogroup II gc/day per 100k for each healthboard in the most recent sampling week.

Healthboard Summaries

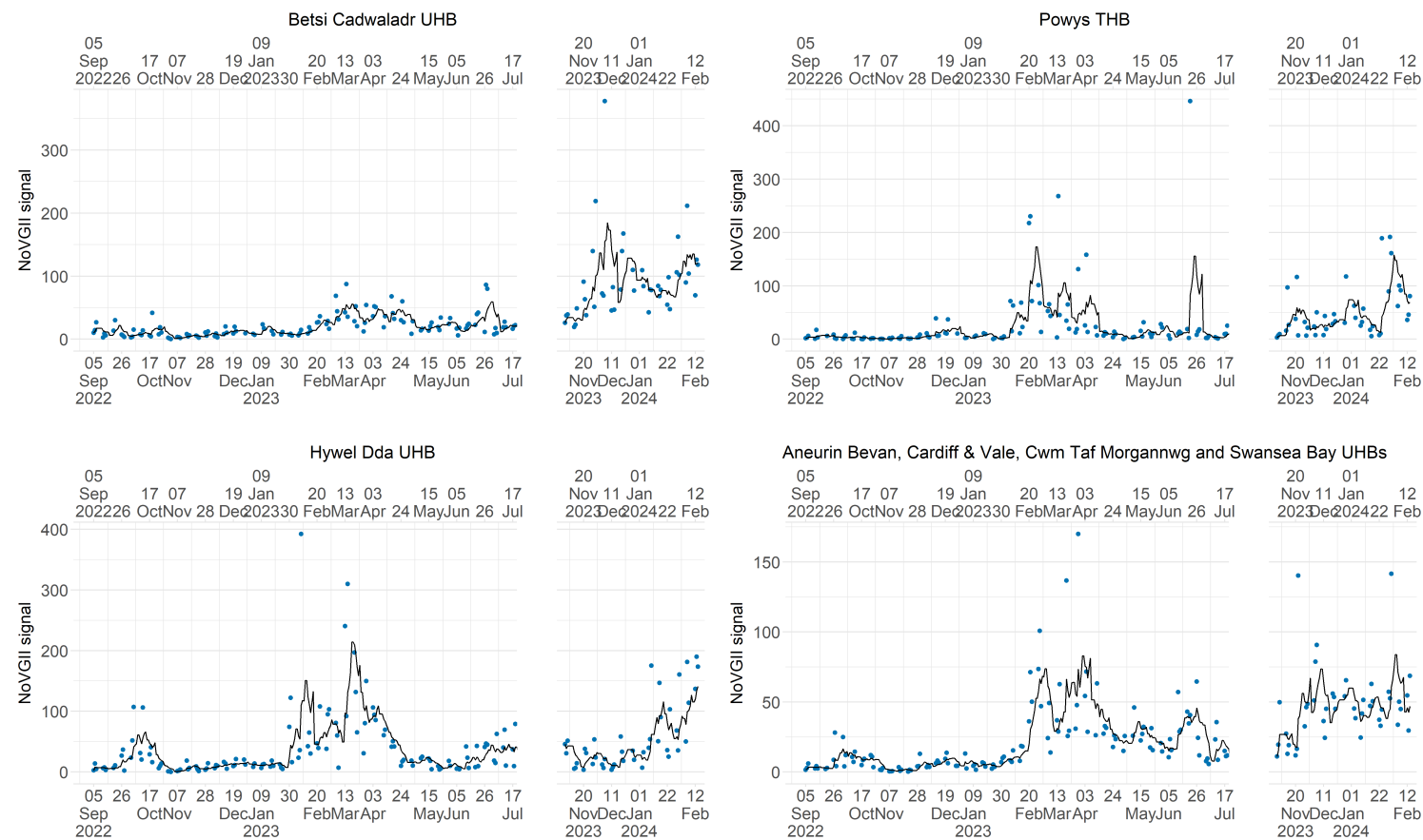


Figure 11. Level of norovirus genogroup I (NoVGII) given as a 10 day rolling mean at the healthboard level (bold line) and per day (dots).

Influenza A (flu-A) virus

National Summary

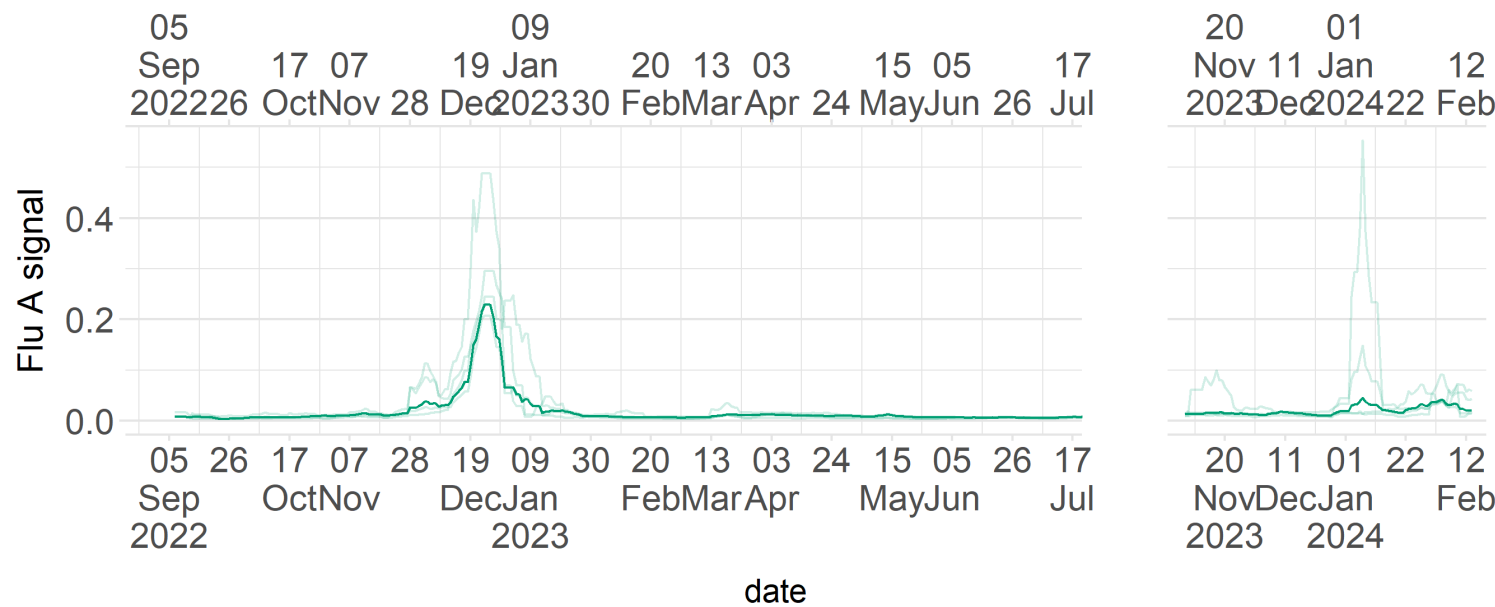


Figure 12. Level of influenza A (flu-A) virus given as a 10 day rolling mean at the national (bold line) and healthboard (faint lines) level.

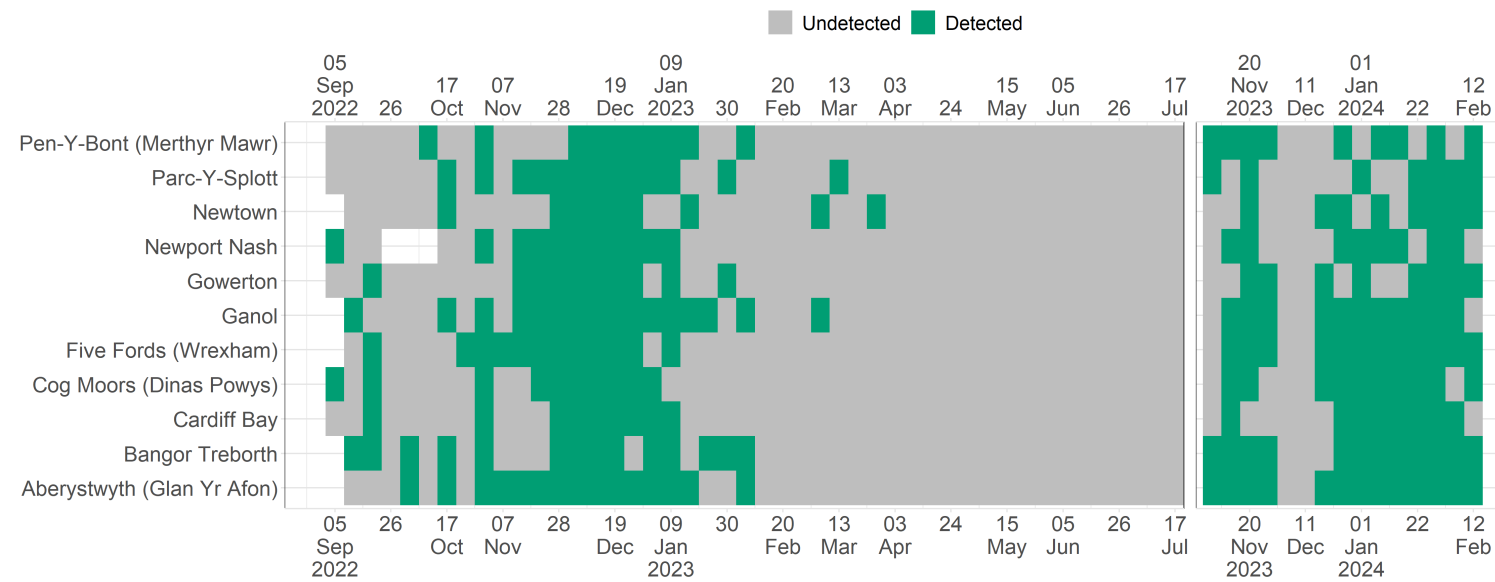


Figure 13. Weekly aggregated presence and absence of influenza A (flu-A) virus. The limit of detection for the flu-A assay is 303 gene copies per litre of wastewater.

Heat Map

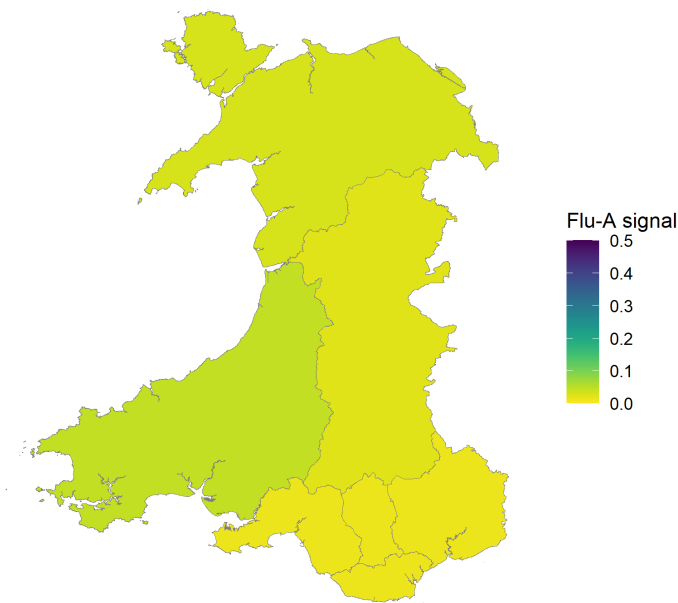


Figure 14. National heat map showing mean flu-A virus gc/day per 100k for each healthboard in the most recent sampling week.

Healthboard Summaries

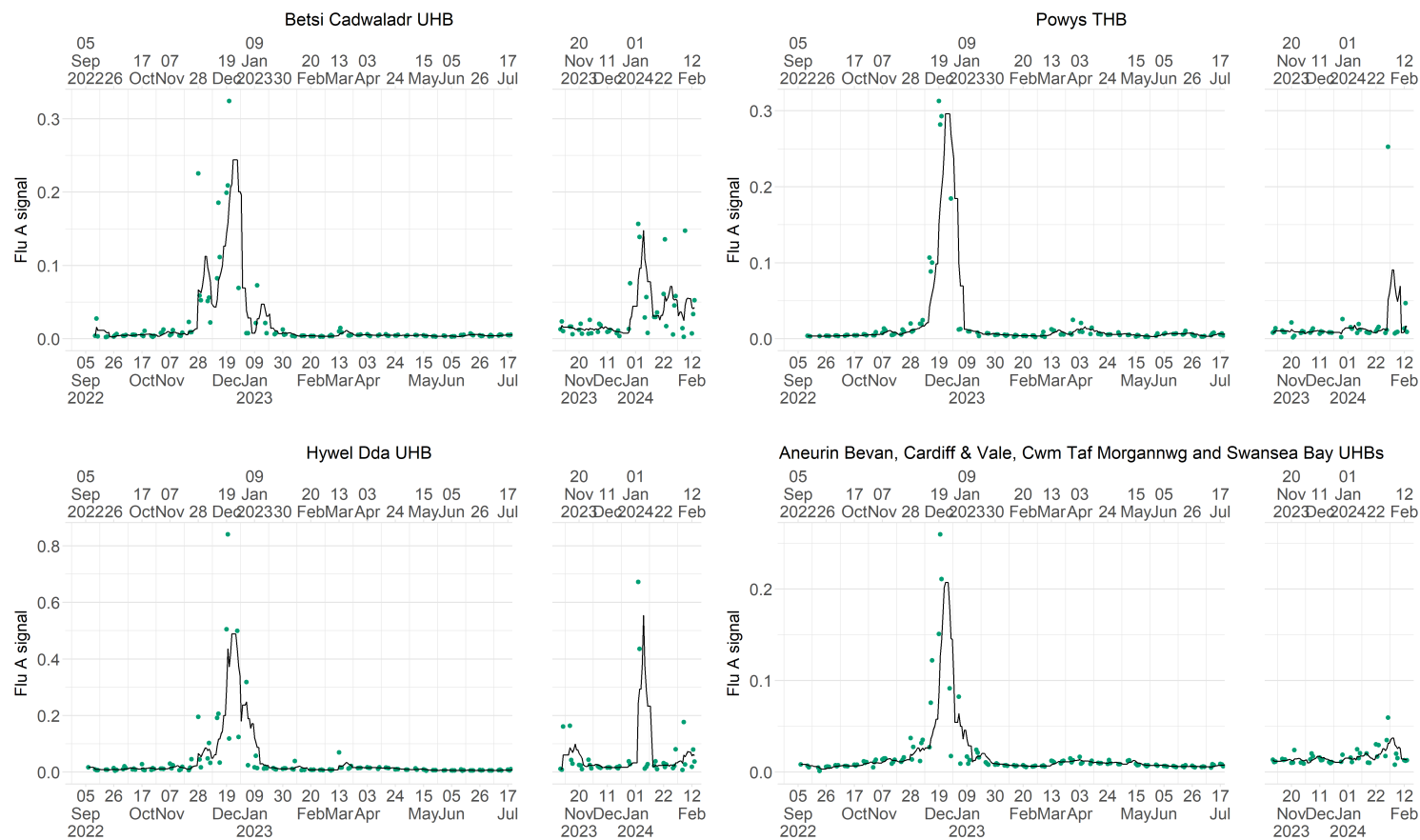


Figure 15. Level of influenza A (flu-A) virus given as a 10 day rolling mean at the healthboard level (bold line) and per day (dots).

Enterovirus spp.

National Summary

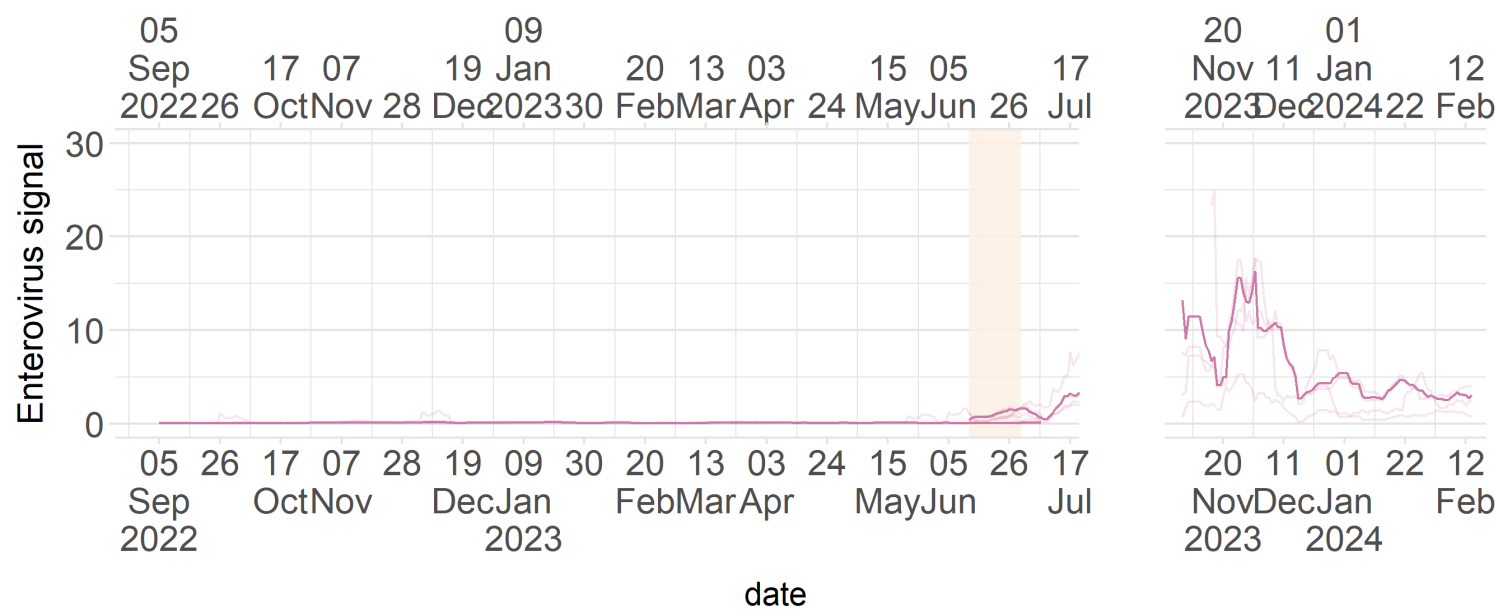


Figure 16. Level of Enterovirus *spp.* (EV1 & EV2) given as a 10 day rolling mean at the national (bold line) and healthboard (faint lines) level. An upper limit has been placed on the y axis, which obscures a high healthboard value, but allows better visualisation of the national trend.

Heat Map

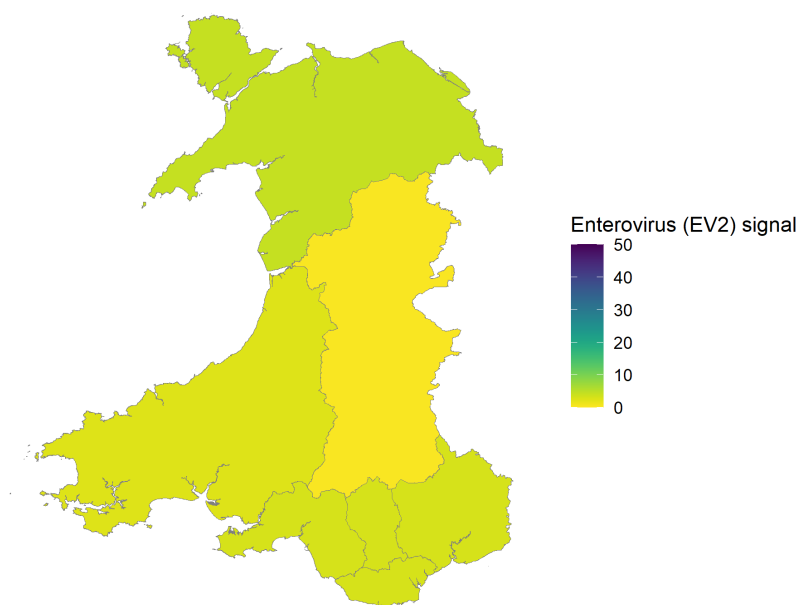


Figure 17. National heat map showing mean Enterovirus *spp.* gc/day per 100k for each healthboard in the most recent sampling week.

Healthboard Summaries

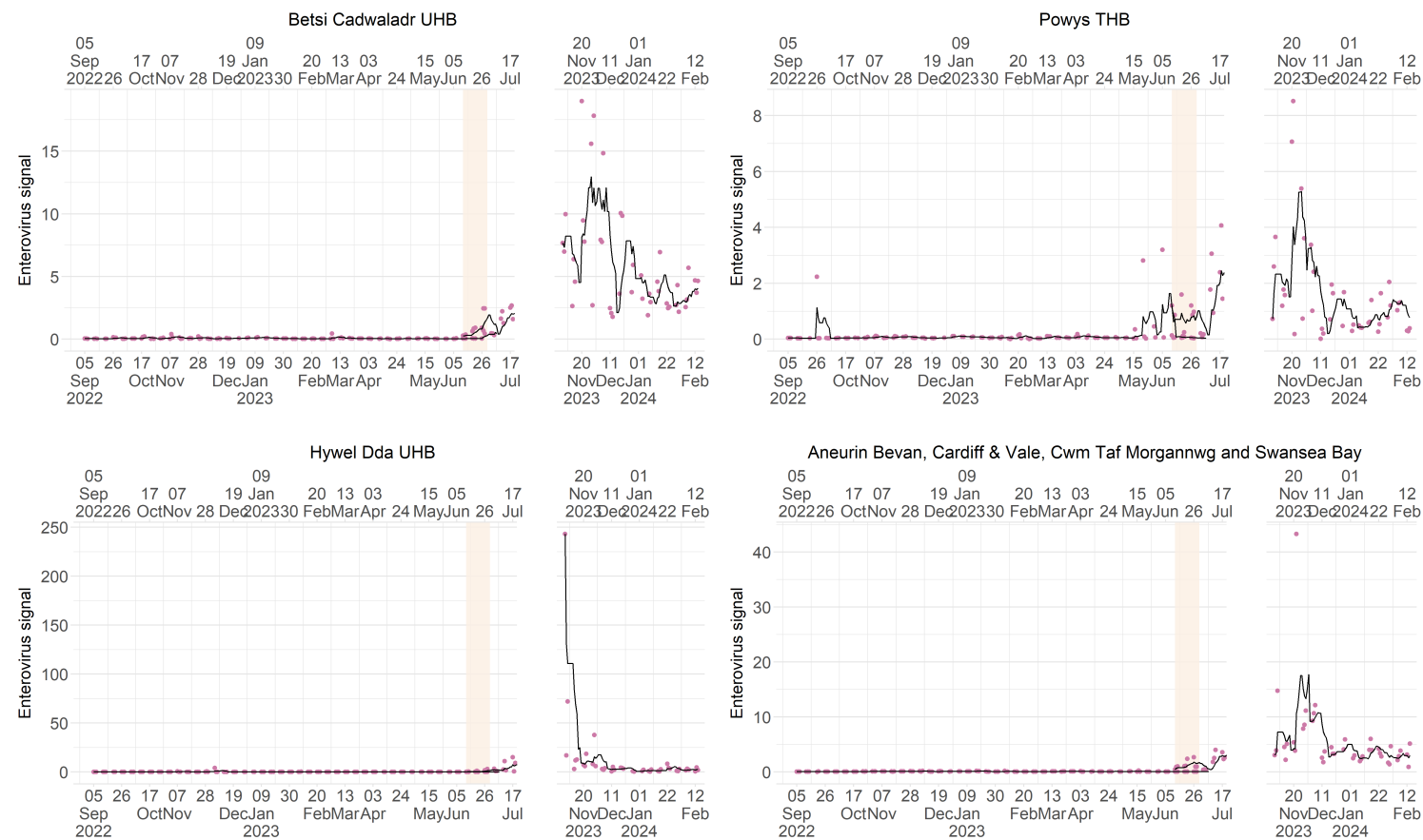


Figure 18. Level of Enterovirus spp. given as a 10 day rolling mean at the healthboard level (bold line) and per day (dots).

Respiratory Syncytial Virus (RSV)

National Summary

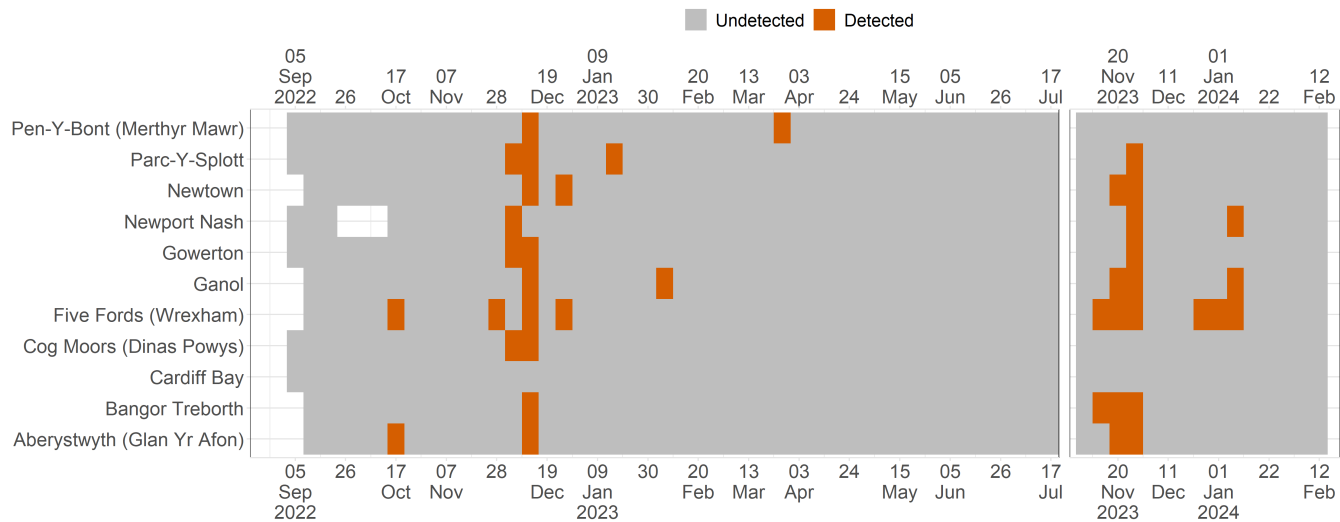


Figure 19. Weekly aggregated presence and absence of Respiratory Syncytial Virus (RSV). The limit of detection for the RSV assay is 703 gene copies per litre of wastewater.

Heat Map

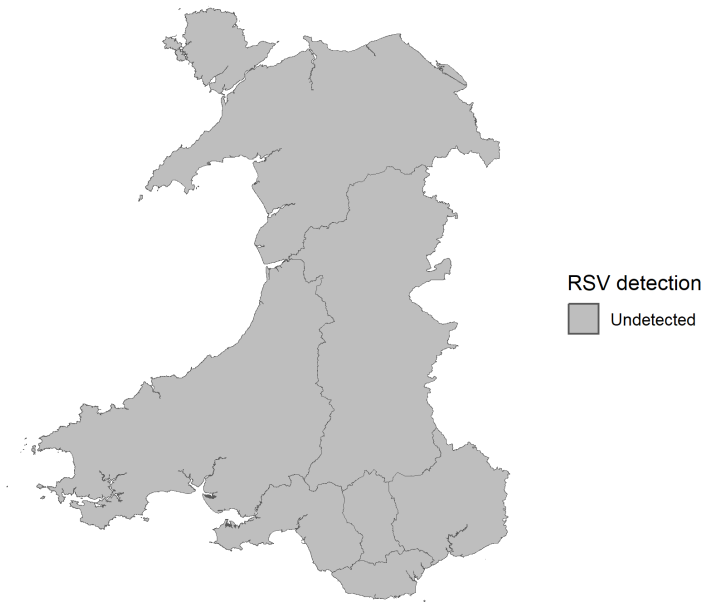


Figure 20. National weekly aggregated presence and absence of Respiratory Syncytial Virus (RSV) for each healthboard in the most recent sampling week.

Health Board Summaries

Betsi Cadwaladr UHB

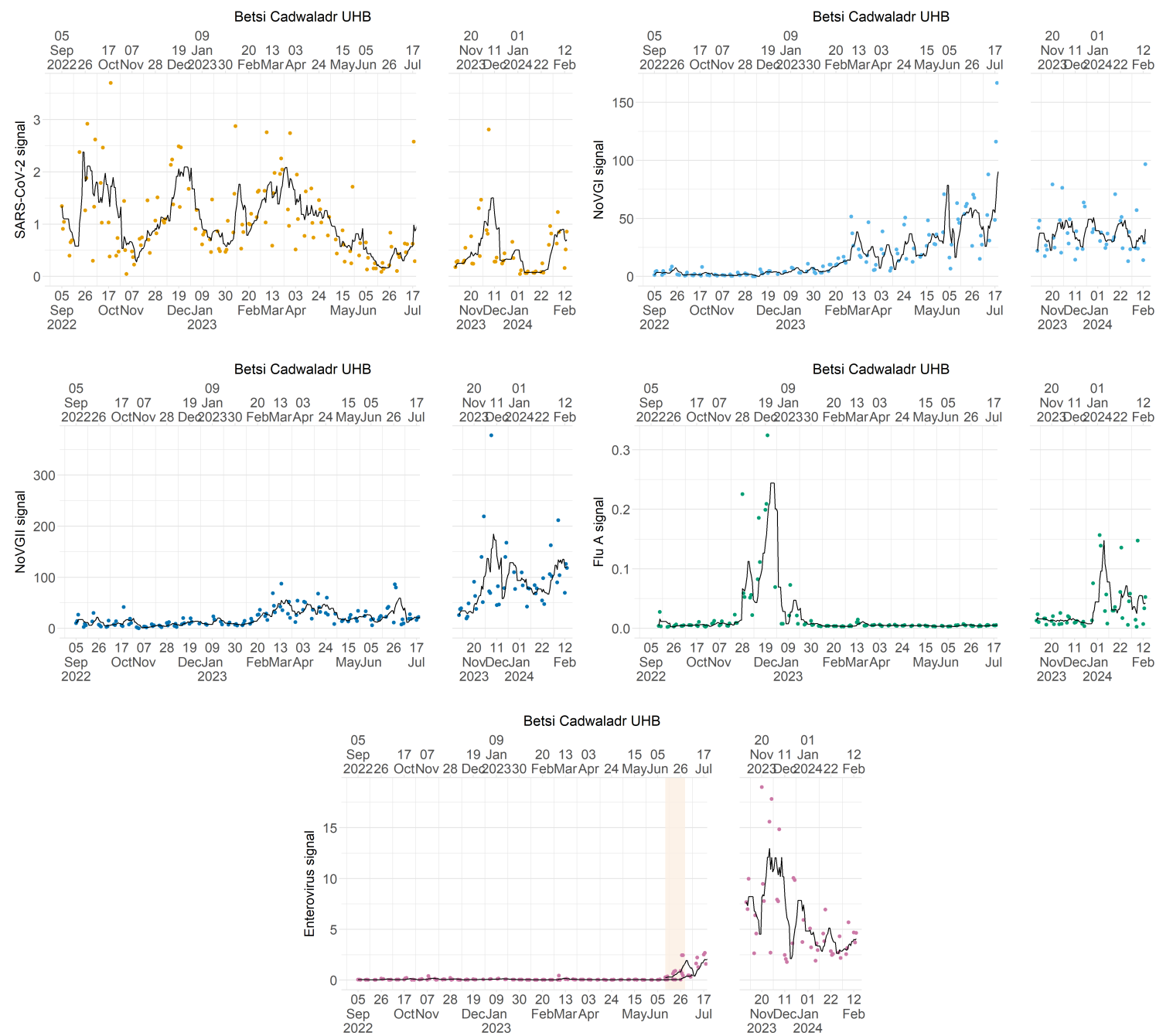


Figure 21. Viral levels (gc/day per 100k) given as a 10 day rolling mean for Betsi Cadwaladr UHB.

Cardiff & Vale, Aneurin Bevan, Cwm Taf Morgannwg and Swansea Bay UHBs

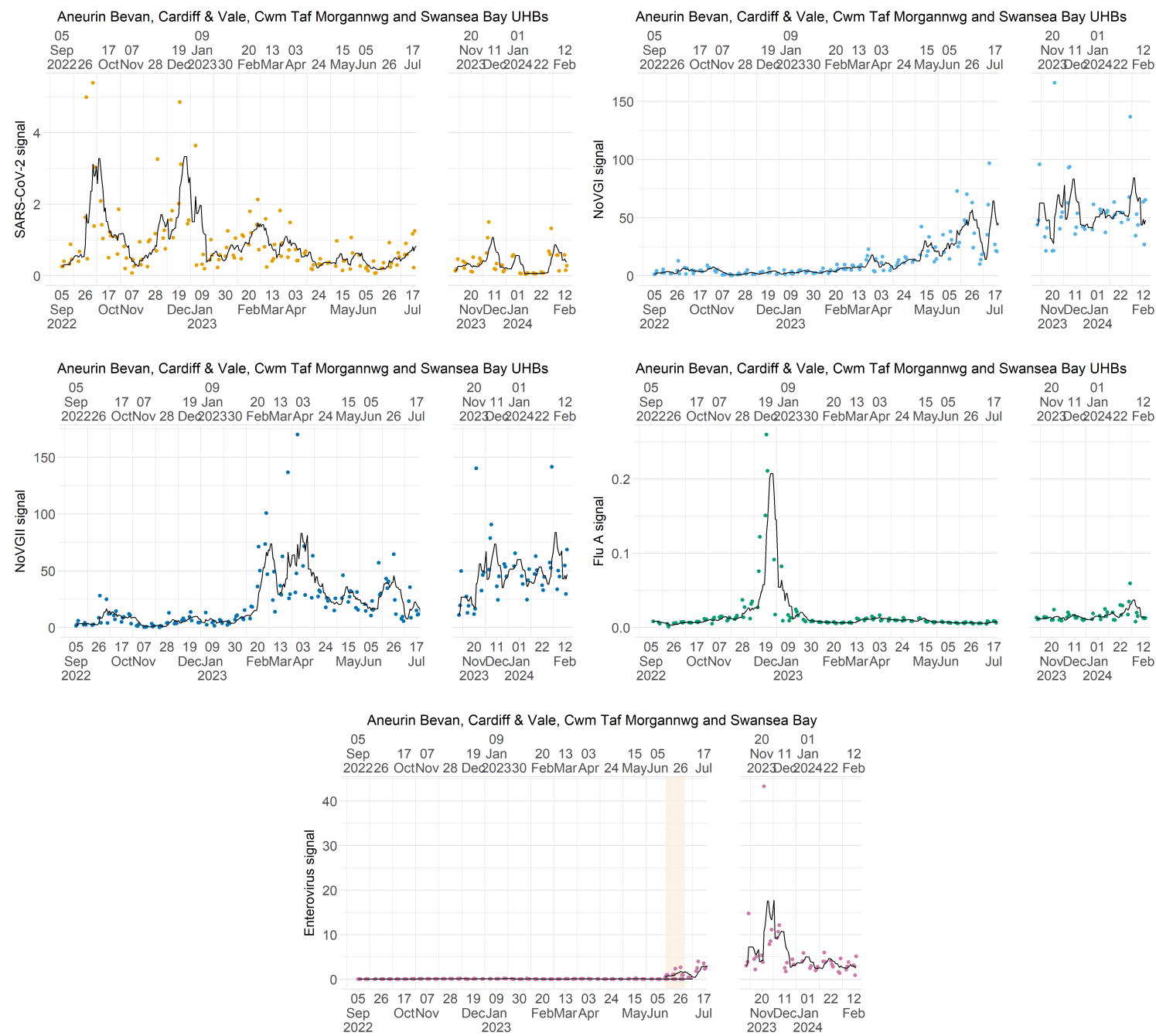


Figure 22. Viral levels (gc/day per 100k) given as a 10 day rolling mean for Cardiff & Vale, Aneurin Bevan, Swansea Bay and Cwm Taf Morgannwg UHBs.

Hywel Dda UHB

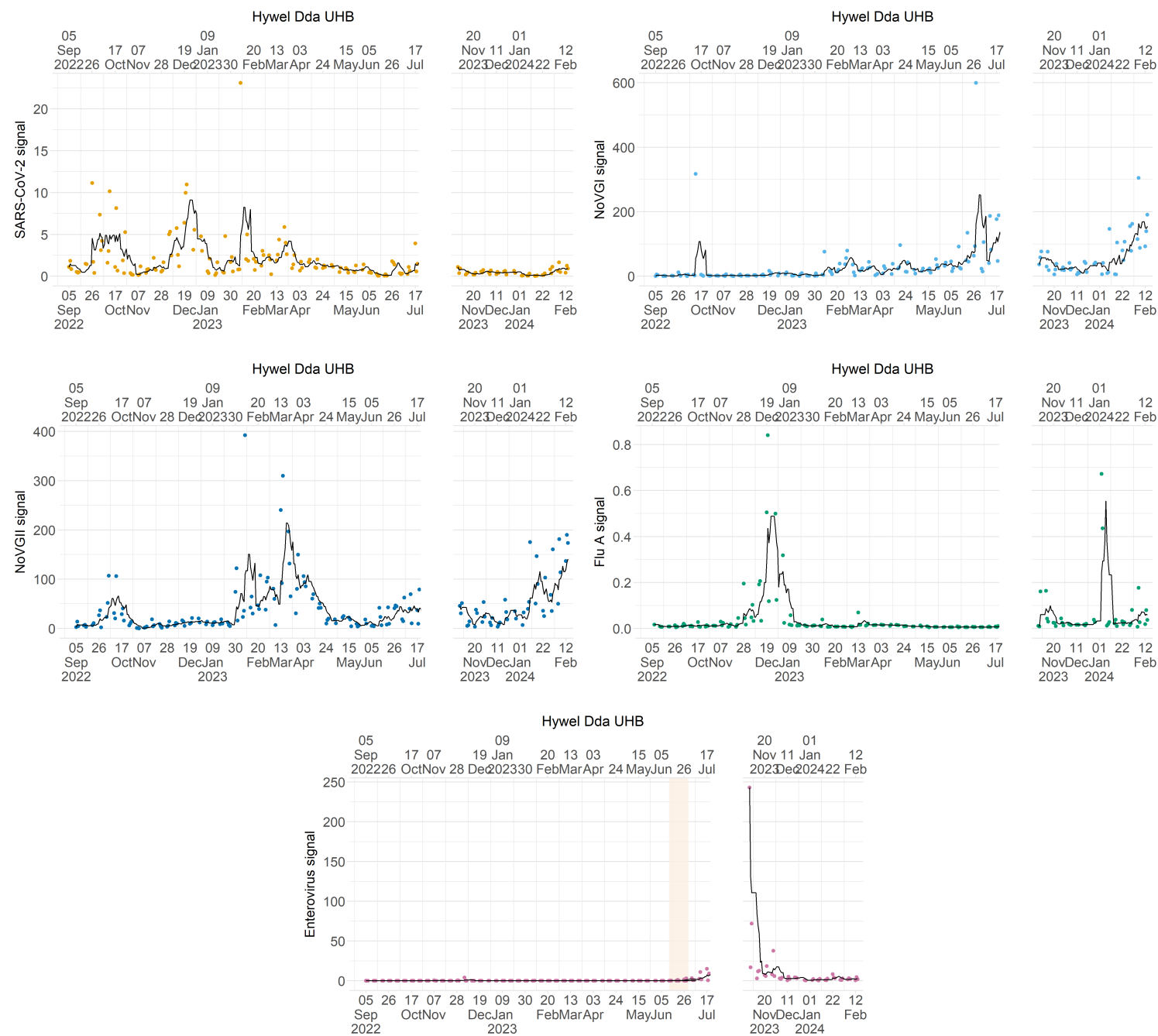


Figure 23. Viral levels (gc/day per 100k) given as a 10 day rolling mean for Hywel Dda UHB.

Powys THB



Figure 24. Viral levels (gc/day per 100k) given as a 10 day rolling mean for Powys THB.

Appendices

Appendix 1

Health Board	Sampling Sites	Major City/Town
Aneurin Bevan, Cardiff & Vale, Cwm Taf Morgannwg, Swansea Bay UHBs	Newport Nash	Newport
	Cardiff Bay	Cardiff
	Cog Moors (Dinas Powys)	Barry and Vale of Glamorgan
	Pen-Y-Bont (Merthyr Mawr)	Bridgend
	Gowerton	Swansea
Betsi Cadwaladr UHB	Bangor Treborth	Bangor
	Five Fords (Wrexham)	Wrexham
	Ganol	Llandudno
Hywel Dda UHB	Aberystwyth (Glan Yr Afon)	Aberystwyth
Powys THB	Parc-Y-Splott	Carmarthen
	Newtown	Newtown

Appendix 2: Site-level summaries

SARS-CoV-2

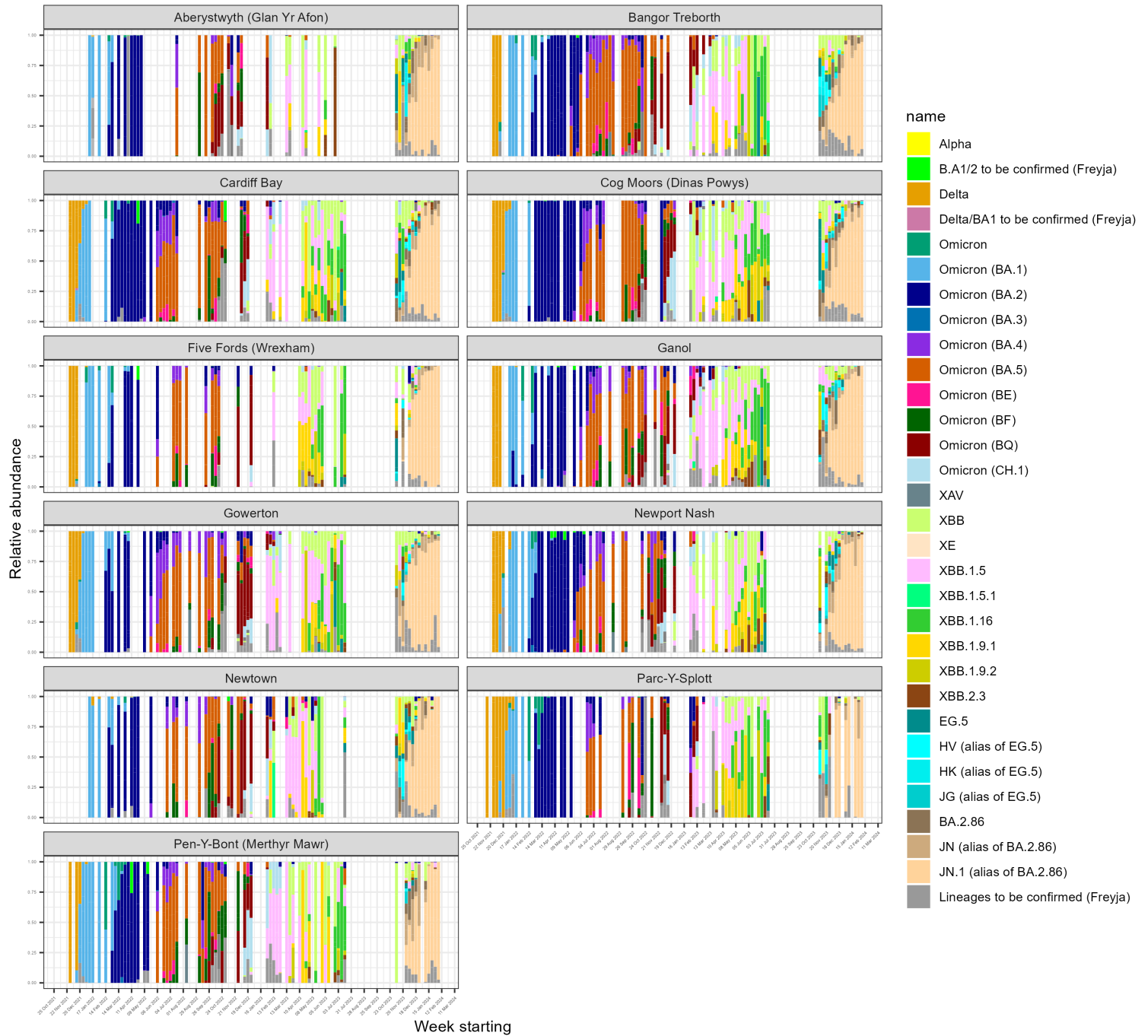


Figure 25. Proportions of SARS-CoV-2 variants identified at the site level (across 11 WwTPs covered by the Programme).

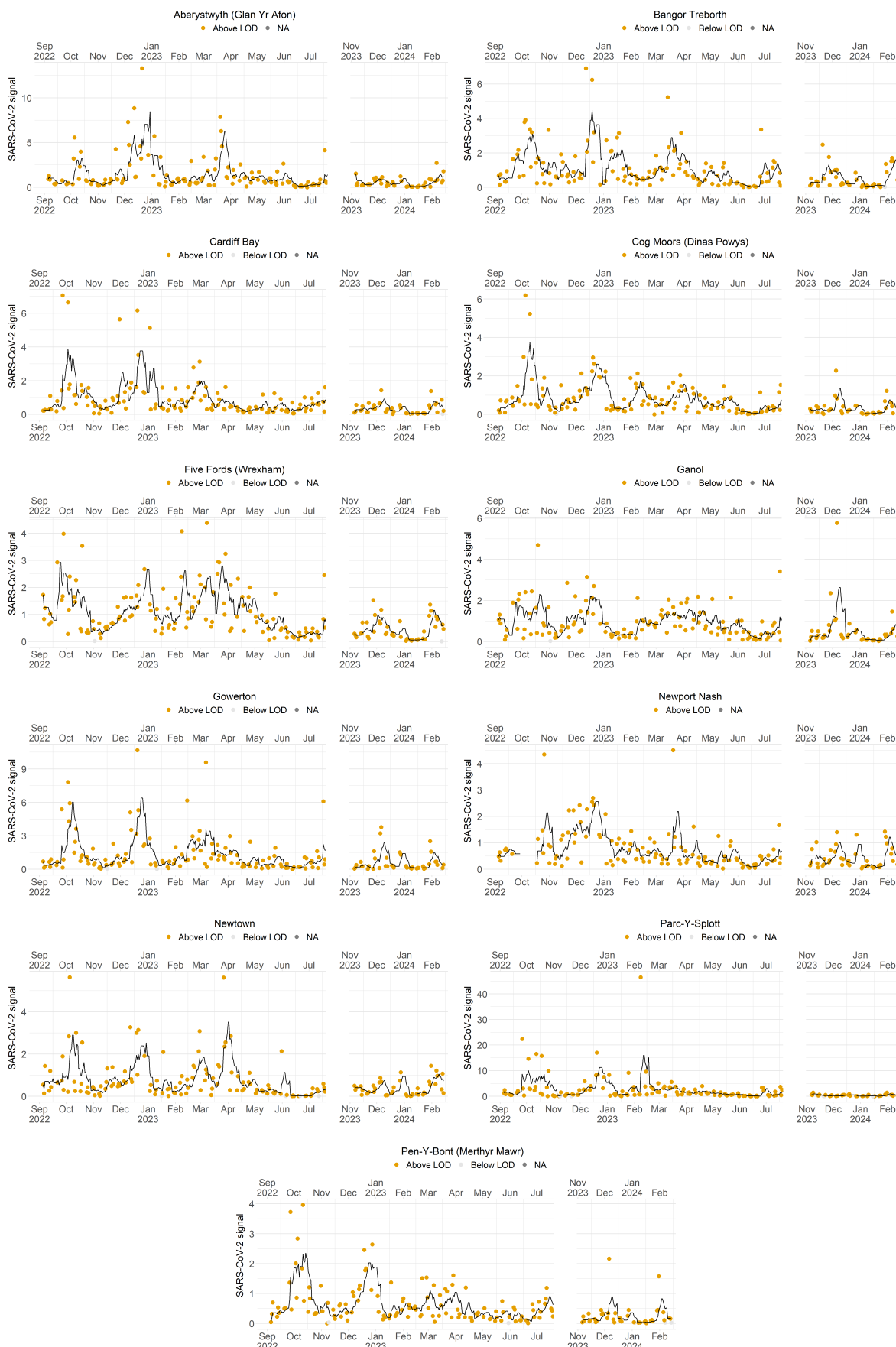


Figure 26. Levels of SARS-CoV-2 identified at the site level (across 11 WwTPs covered by the Programme). Each point represents a sample and the line is a 10 day rolling average.

Norovirus genogroup I

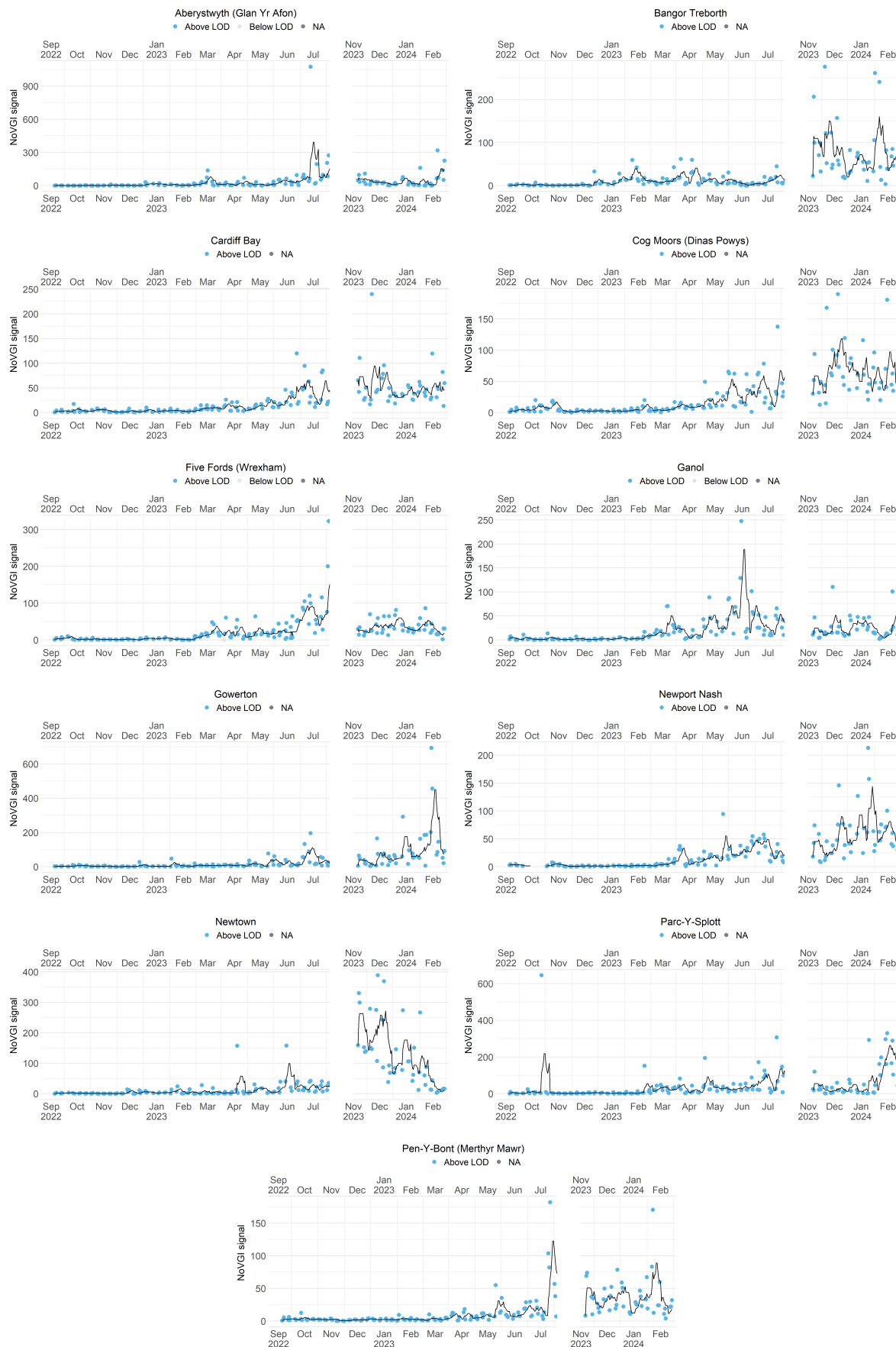


Figure 27. Levels of norovirus genogroup I (NoVG1) identified at the site level (across 11 WwTPs covered by the Programme). Each point represents a sample and the line is a 10 day rolling average.

Norovirus genogroup II

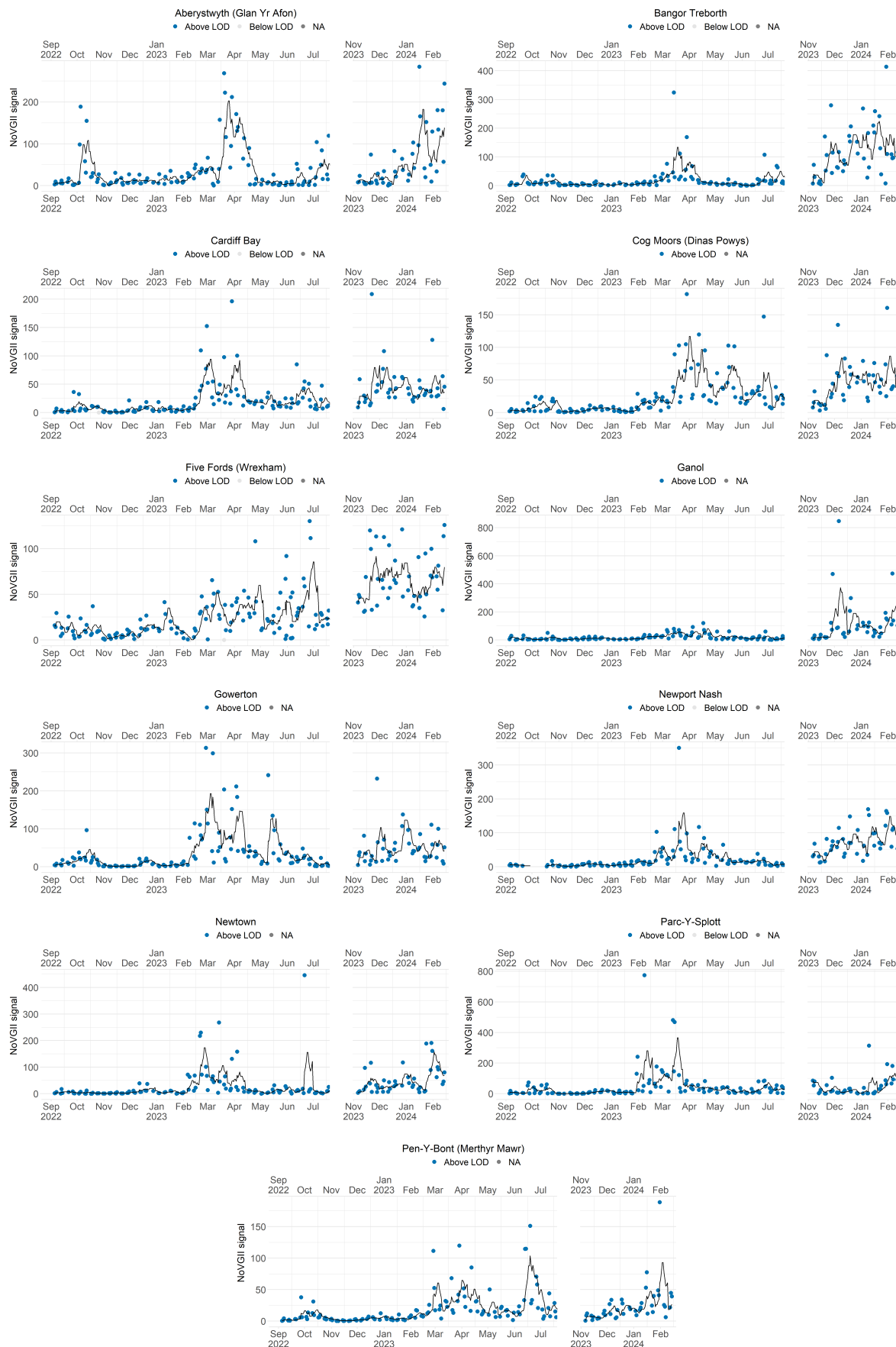


Figure 28. Levels of norovirus genogroup II (NoVGII) identified at the site level (across 11 WwTPs covered by the Programme). Each point represents a sample and the line is a 10 day rolling average.

Influenza A (flu-A) virus

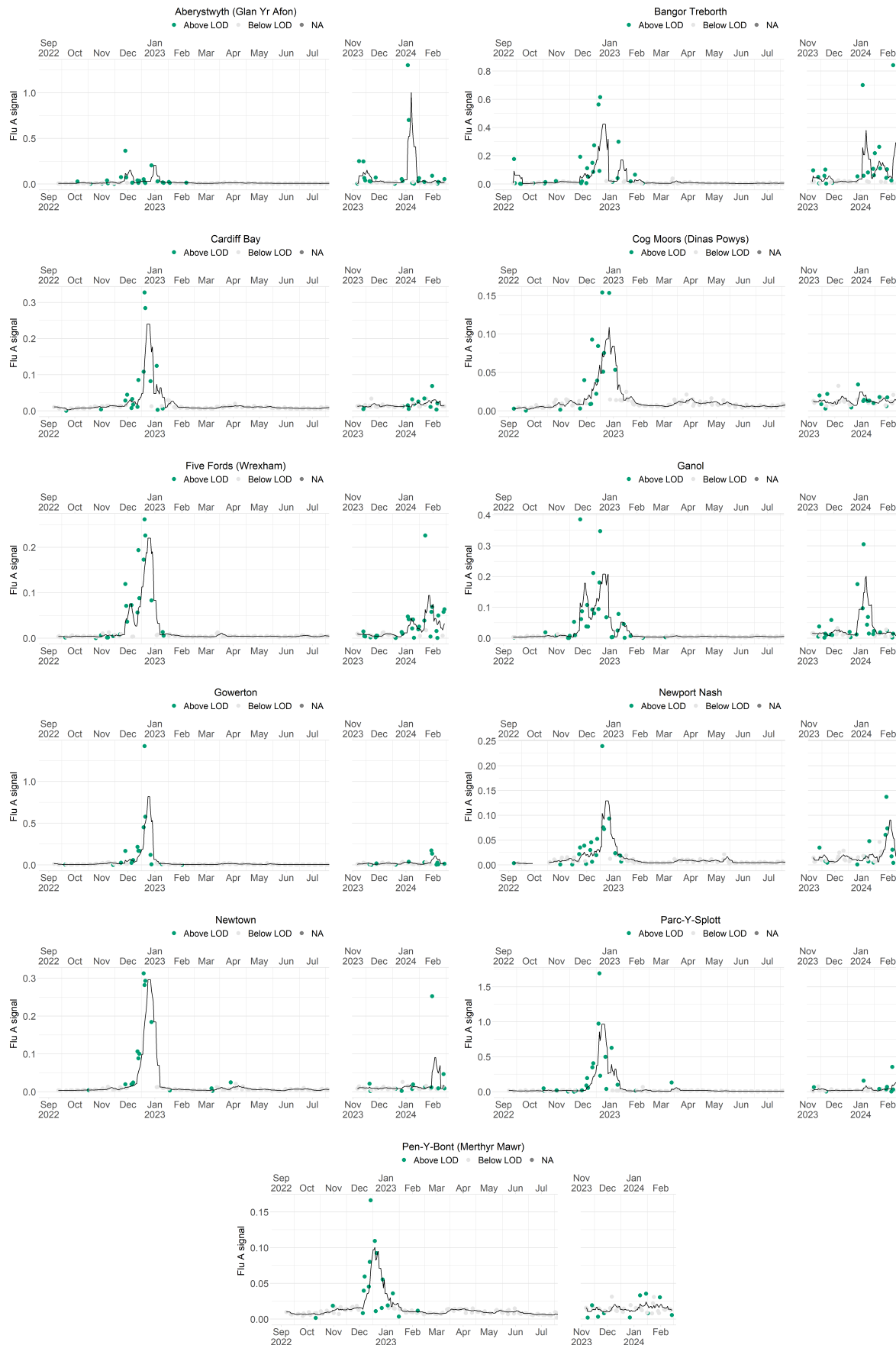


Figure 29. Levels of influenza A (flu-A) virus identified at the site level (across 11 WwTPs covered by the Programme). Each point represents a sample and the line is a 10 day rolling average.

Enterovirus spp.

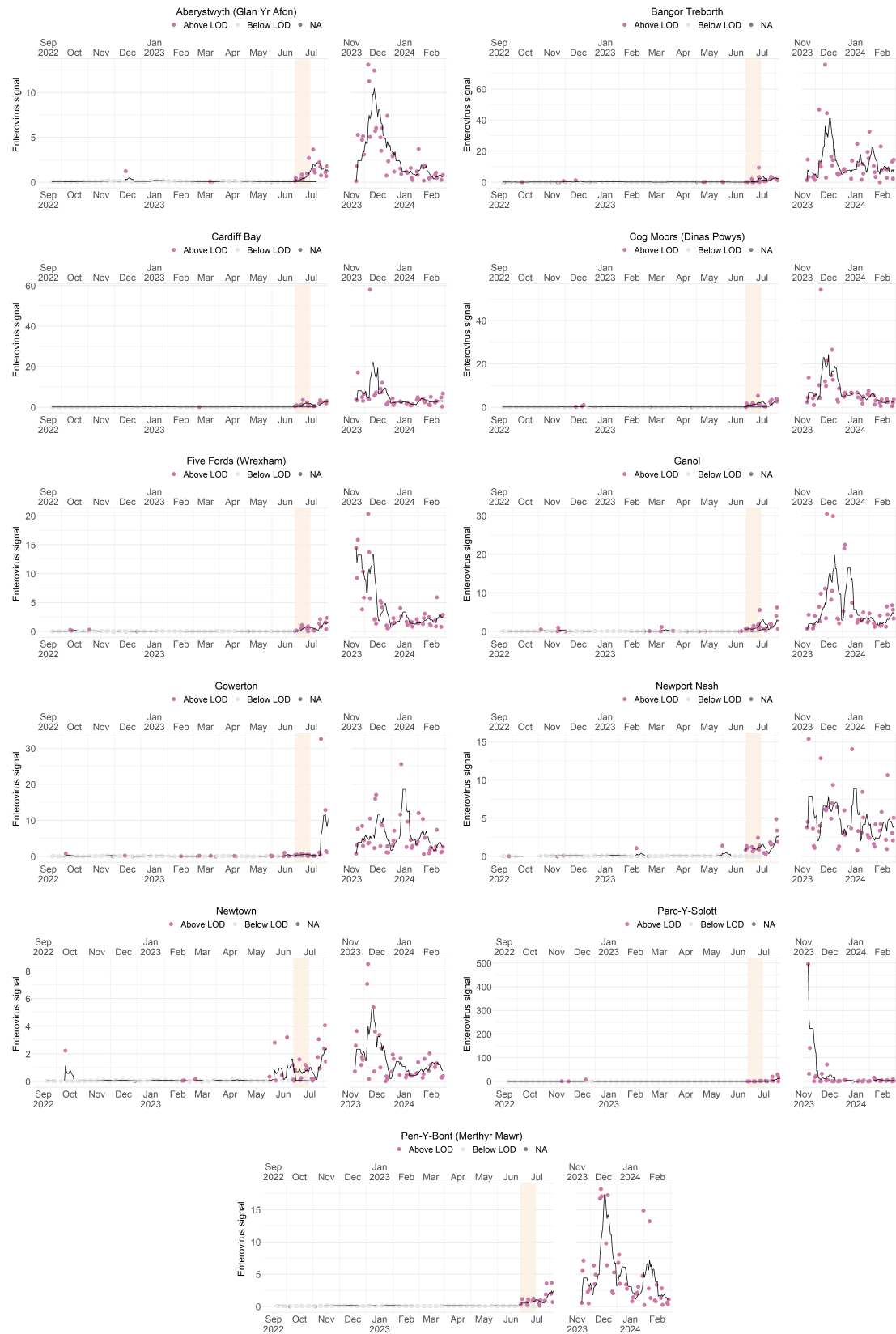


Figure 30. Levels of enterovirus (EV1 & EV2) identified at the site level (across 11 WwTPs covered by the Programme). Each point represents a sample and the line is a 10 day rolling average.