Respiratory Viruses in Luxembourg (ReViLux)

Report – Sentinel Week 41 and Sequencing Update

Summary

At the end of week (2025/41), the sentinel network detected a baseline epidemic activity with increasing trend, based on **4.0%** of consultations being associated with influenza-like illness. The LNS received 77 samples from the sentinel doctors, representing all age-groups.

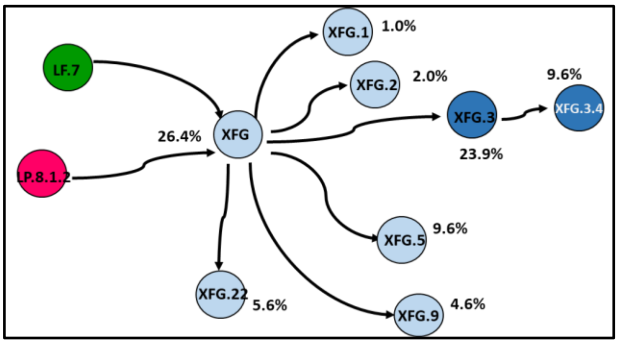
Among the specimens collected by the sentinel network during the last week (**2025/41**), the percentage of positive tests for **human rhinovirus** was **44.7%**, followed by **SARS-CoV-2 (15.6%),** while the positivity rate for **RSV** and **influenza** A(H1)pdm09 was each **1.3%.**

Regarding SARS-CoV-2 genomic surveillance, several sub-lineages and recombinant lineages of JN.1 have circulated in Luxembourg over the past few months, but **XFG** with its sub-variants has emerged as dominant variant in Luxembourg and Europe.

The estimated distribution for **XFG** was **49.2%** (95%CI: 42.1 – 56.4%), **33.5%** (95%CI: 27.0 – 40.6%) for **XFG.3** and **11.2%** (95%CI: 7.1– 16.4%) for **NB.1.8.1** in weeks 2025/35-38. Other variants circulated at levels (≤5%) in Luxembourg during the same period.

Variants under monitoring

XFG is a recombinant variant of the lineages LF.7 and LP.8.1.2. The sub-variant was designated by the World Health Organisation as variant under monitoring on the 25/06/2025. In Luxembourg, XFG was first detected in March 2025 and the estimated proportion and diversity increased over the last few weeks. From the selected samples, we estimate that at the end of August to the middle of September (weeks 2025/35-2025/38) the proportion was around **83**%. The WHO assessed that current vaccines remain effective to XFG against severe disease.



Recombinant XFG with distribution of sub-variants (weeks 2025/35-38)

Sentinel Surveillance Network

The Sentinel Surveillance aims at monitoring the circulating respiratory viruses, from traditional ones like Influenza to more recent ones like SARS-CoV-2, and hence underpin public health actions. The Sentinel Network is a group of general practitioners and paediatricians spread across the country. They report the weekly number of patients showing symptoms suggestive of acute respiratory infection (ARI) and influenza-like illness (ILI), and those patients are then sampled and tested for a panel of respiratory viruses. The circulation of respiratory viruses in the north hemisphere is generally monitored by seasons that go from week 40 to week 20. The period between weeks 20 and 40 is called inter-season and monitoring is done on a voluntary basis.

Clinical results

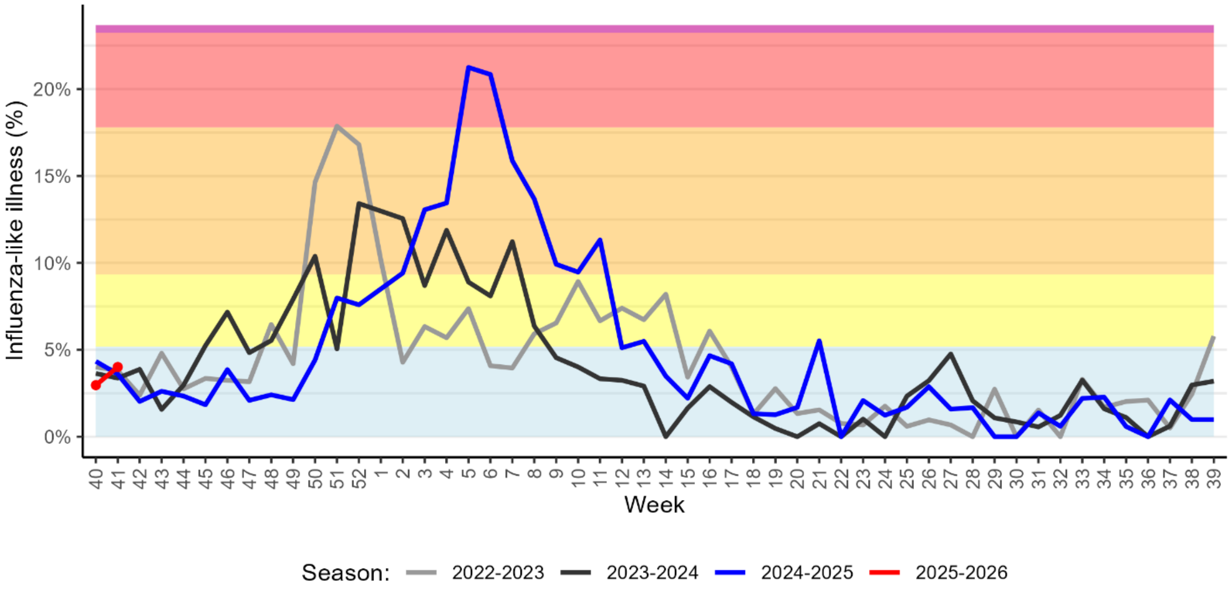
Last week **(end of week 2025/41)**, **4.0%** of the consultations were reported as ILI, representing a baseline activity for Luxembourg, according to ECDC and the Moving Epidemic Method. ILI and ARI rates have increased continuously over the past three weeks, meaning the number of patients reporting respiratory symptoms has increased, but ILI rates have remained below the 5.2% threshold. Similar trends have been observed in previous seasons. The history of ILI consultations is displayed in figure 2, and a detailed summary of the number of ARI and ILI cases during the last four weeks is included in table 1.

Table 1. Syndromic surveillance over the last 4 weeks

Week	ARI		ILI		Total consultations
	N	%	N	%	
2025/38	18	8.87	2	0.99	203
2025/39	31	10.16	3	0.98	305
2025/40	54	14.56	11	2.96	371
2025/41	59	15.78	15	4.01	374

ARI: Acute Respiratory Infections; ILI: Influenza-Like Illness.

Figure 1. Percentage of patients with Influenza-like illness over the last three seasons and 2025-2026 (red); Background colours according to intensity of circulation: baseline, low, medium, high, very high.



Laboratory results

During the second week (2025/41), the LNS received 77 samples with a median age of 25 years (range: 0-75 years). Overall, 54.6% (N=42) were female and 45.4% (N=35) male patients. Symptoms were reported in 75% (N=45) of patients, of whom 64% (N=29) reported fever and 58% (N=26) systemic symptoms such as headaches or muscle aches in addition to respiratory symptoms. Furthermore, influenza vaccine records were available in 55 cases (71%), of which approximately 5% reporting vaccination during the previous season. RSV vaccination records were available for 79% of children under 2 years of age (N = 15), none of whom had been vaccinated with long acting monoclonal antibodies. However, two infants were protected through maternal vaccination.

In week 2025/41, the LNS identified respiratory viruses in a total of 50 (64.9%) of the 77 sentinel samples, mainly **human rhinovirus (44.7%)**, followed by **SARS-CoV-2 (15.6%)** and **parainfluenza (5.3%)**. Furthermore, the sentinel network detected low level **influenza A(H1)pdm09** and **RSV** circulation **(1.3% each)**. RSV subtyping from this case is still pending, but the case from week 2025/40 is reported as subtype B. Human rhinovirus has been detected in all age-groups, while SARS-CoV-2 have been detected in school children and adults.

Similar trends were also observed in neighbouring countries with widespread SARS-CoV-2 circulation and low RSV/ influenza circulation.

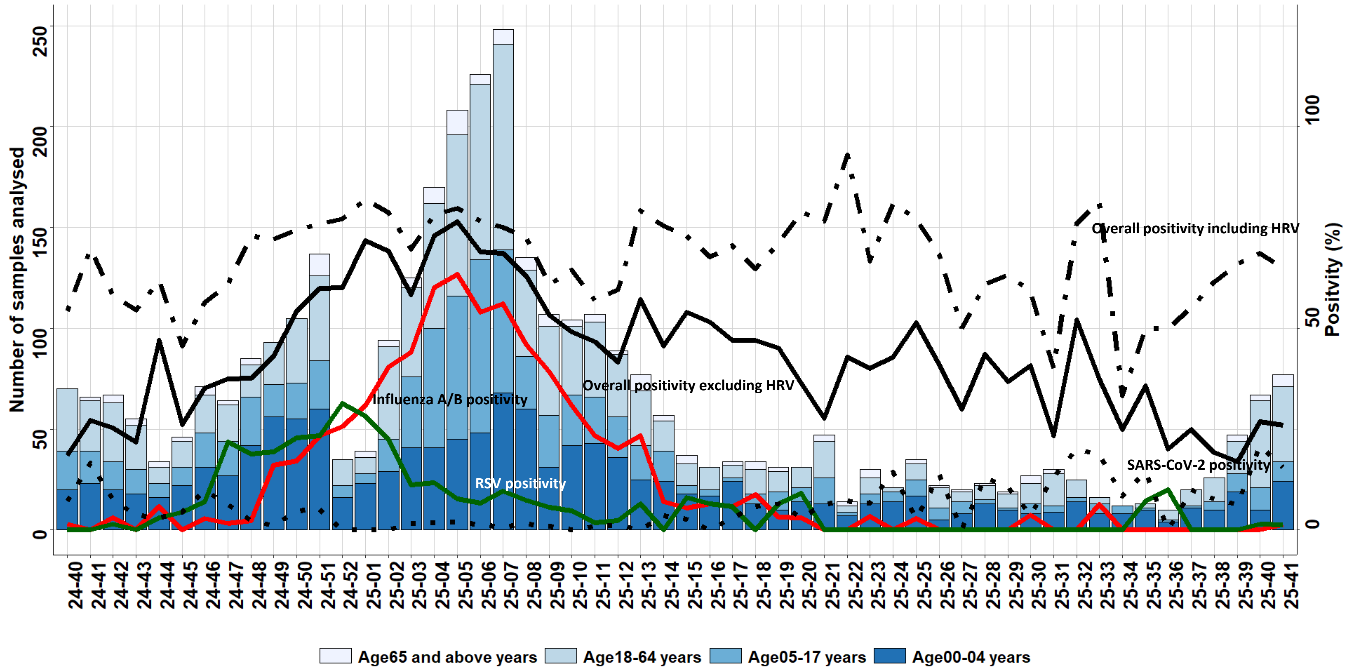
An overview of the circulating viral pathogens in the sentinel network in Luxembourg during the current and previous (inter)- season is presented in figure 2, 3 and table 2.

Table 2. Distribution of respiratory viruses detected within the Sentinel Network over the past 5 weeks compared to previous season; Weeks 37/38 have been combined due to low numbers.

Virus	inter-season 24/25 and season 25/26				season 24/25	
	Positivity Rate in %					
	W37/38	**W39**	**W40**	**W41**	**W40**	**W41**
Human rhinovirus	39.1	61.7	47.8	44.7	38.6	52.3
SARS-CoV-2	8.7	6.4	20.9	15.6	7.1	16.7
Parainfluenzavirus	8.7	4.3	3.0	5.3	1.9	8.6
Respiratory syncytial virus	0.0	0.0	1.5	1.3	0.0	0.0
Metapneumovirus	0.0	0.0	1.5	0.0	0.0	0.0
Adenovirus	4.3	6.4	0.0	3.9	2.9	7.7
Influenzavirus A	0.0	0.0	0.0	1.3	0.0	0.0
Influenzavirus B	0.0	0.0	0.0	0.0	1.4	0.0

**Co-detection is counted once for each virus detected. Data is displayed in two-week intervals due to low case count during inter-season. All data is provisional, taking into account possible late reporting*

*Figure 2. Presents number of sentinel samples received per week by age-group (weeks 2024/40 to 2025/41) including overall sample positivity- including human rhinovirus (HRV, dot-dash line), excluding HRV (black line), SARS-CoV-2 (dotted line), influenza **combined** (red) and RSV (green). Secondary axis corresponds to positivity*



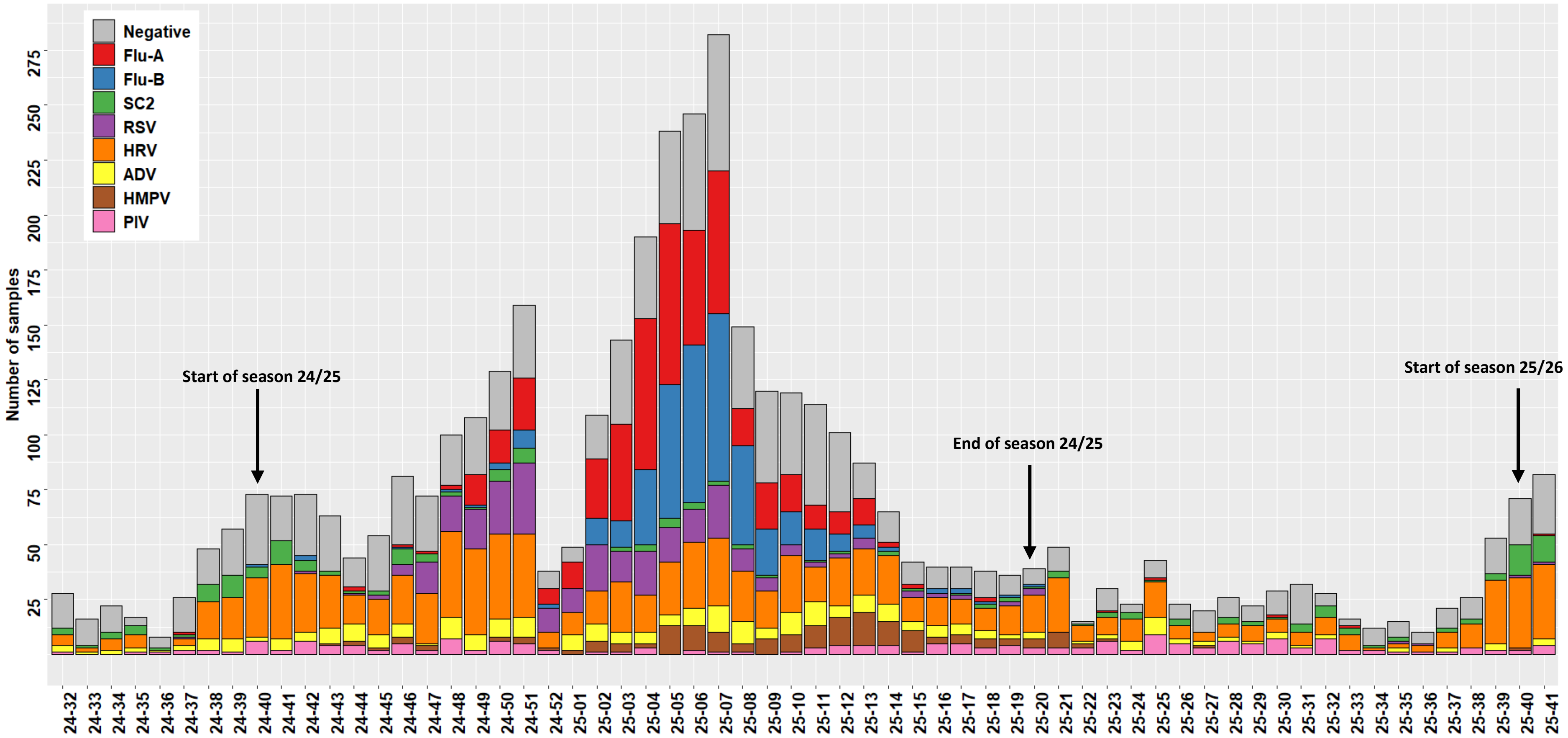


Figure 3. Circulation of respiratory viruses detected within the Sentinel Network by calendar week (seasons 24/25 and 25/26). FLU-A: influenzavirus A; FLU-B: influenzavirus B; PIV:parainfluenzavirus; RSV: respiratory syncytial virus; ADV: adenovirus; HMPV: metapneumovirus; HRV: human rhinovirus; SC2: SARS-CoV-2.

SARS-CoV-2 Genomic Surveillance

The LNS receives positive specimens (nasopharyngeal or oropharyngeal swabs analysed by RT-PCR) from the national network of laboratories. A selection of hospital specimens are sequenced, as well as a representative selection of community specimens. Illumina devices are used. Bioinformatic analyses are based on a standardised pipeline and lineage assignment is performed through the Pangolin software (Pangolin: 4.3.1; 1.35 mode UShER).

Sequencing activity

197 samples from 489 cases (40.3%) reported in Luxembourg were sequenced with specimen dates between weeks 2025/35 and 2025/38. About 36.0 % (N=71) were hospital samples and the remaining samples were community samples (64.0%; N=126). We prioritized sequencing the most recent samples and hospital samples. Any low coverage will be addressed in future sequencing runs.

Variant circulation

In recent months, several SARS-CoV-2 variants have co-circulated in Luxembourg and worldwide. Multiple JN.1 sub-variants such as **NB.1.8.1**, **XFG and XFG.3** have emerged. All three exhibit a growth advantage over other sub-lineages from JN.1 and have been classified as variant under monitoring (XFG.3 under XFG) by the World Health Organisation.

Over the past 4 weeks (2025/35-38), the estimated proportion of **XFG** and **XFG.3** remained stable at approximately **49%** and **34%,** respectively. The **two variants** represent **83%** of all sequenced cases in Luxembourg and have been detected in all age-groups (figure 5). Of note, in recent weeks, the genetic diversity within XFG has increased and multiple sub-variants have appeared (figure 7). In addition, the proportion of **NB.1.8.1** remained also stable (**11%**), indicating limited spread in Luxembourg. Other European countries observed similar trends. Dominant variants from earlier this year, such as XEC or KP.3 were not detected**.** All circulating variants identified in the selected sample or variants under monitoring are presented in table 4 and figure 6.

During weeks 2025/35 to 2025/38, 71 (36.0%) samples from hospital laboratories and 126 (64.0%) specimens from private laboratories/ sentinel practitioners were sequenced. Table 3 compares sampling setting and prevalence of the two dominant variants.

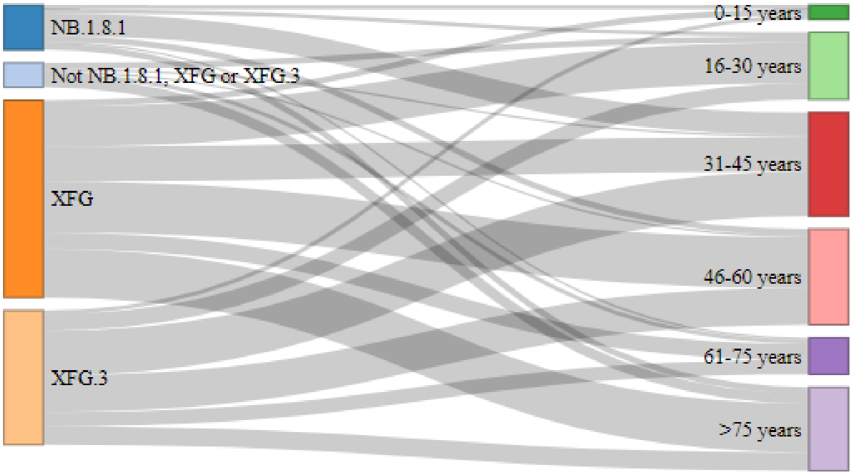
Table 3. Comparison of the two dominant sub-variants by sampling setting (weeks 2025/35-2025/38);

Lineage	Community			Hospital		
	Women	Men	**Total**	Women	Men	**Total**
XFG	47.3%	51.5%	**49.4%**	58.6%	47.1%	**54.4%**
XFG.3	52.7%	48.5%	**50.6%**	41.4%	52.9%	**45.7%**
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 4. Distribution of SARS-CoV-2 lineages detected during weeks 2025/31 to 2025/38; Previously reported cases might be updated by retrospective analysis;
**JN.1 and XFG* excludes sub-variants listed in table.*

Lineage	First detection in Luxembourg	Under WHO monitoring	weeks 31-34 (N=155)		weeks 35-38 (N=197)	
			%	CI %	%	CI %
XFG*	13.03.2025	yes	47.1	39.0 – 55.3	49.2	42.1 – 56.4
XFG.3	22.04.2025	under XFG	31.0	23.8 – 38.9	33.5	27.0 – 40.6
NB.1.8.1	07.04.2025	yes	9.7	5.5 – 15.5	11.2	7.1 – 16.4
Other	not applicable	no	3.9	1.4 – 8.2	3.0	1.1 – 6.5
LP.8.1	05.11.2024	yes	5.2	2.3 – 9.9	1.5	0.3 – 4.4
JN.1*	25.08.2023	yes	3.2	1.1 – 7.4	1.5	0.3 – 4.4
KP.3	03.04.2024	yes	0		0	
XEC	19.07.2024	yes	0		0	

Figure 5. Distribution of XFG, XFG.3, NB.1.8.1 and Others detected during weeks 2025/35 to 2025/38 (N=197) by age groups; Other variants are grouped into one class ("Not NB.1.8.1, XFG or XFG.3")-due to low frequency



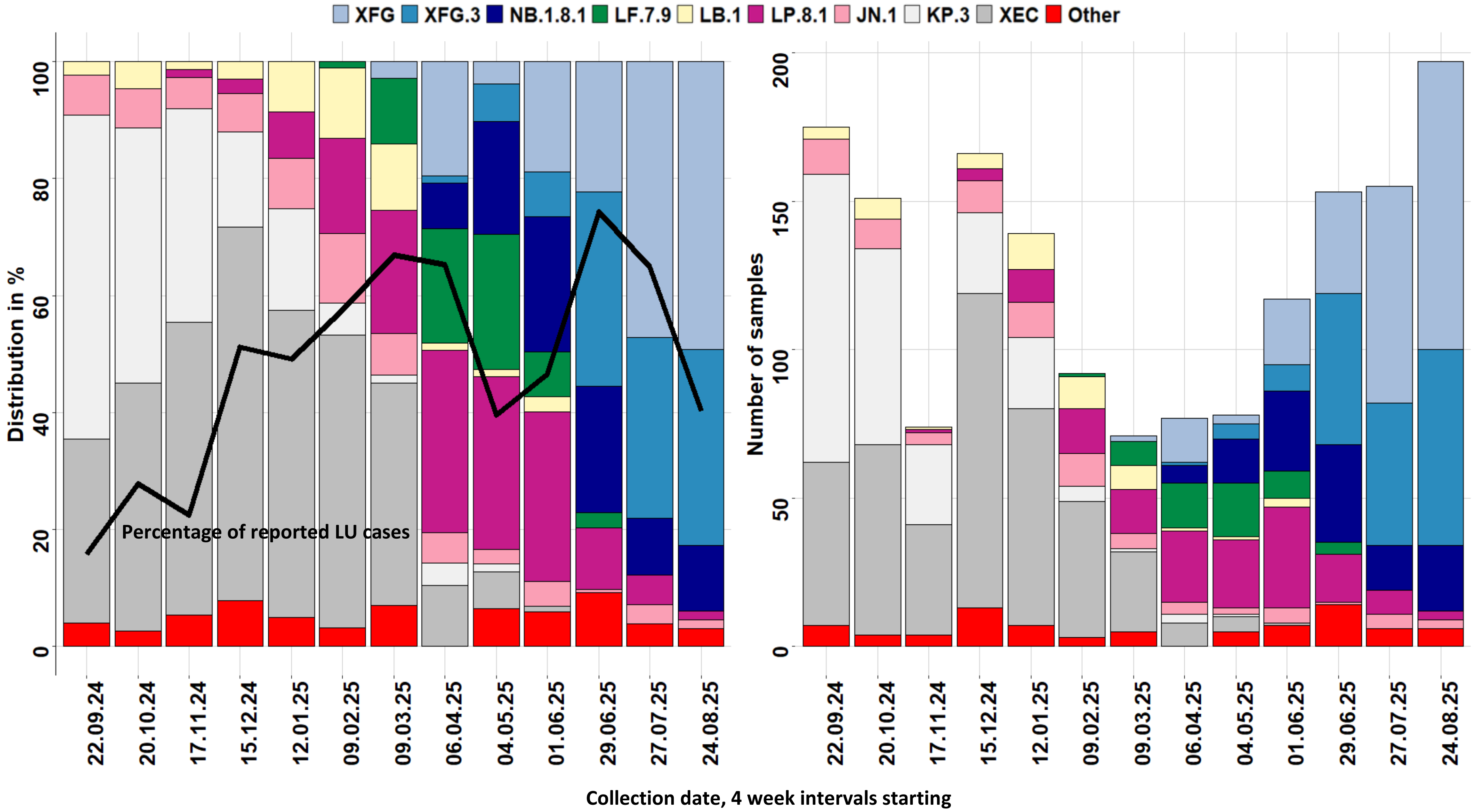
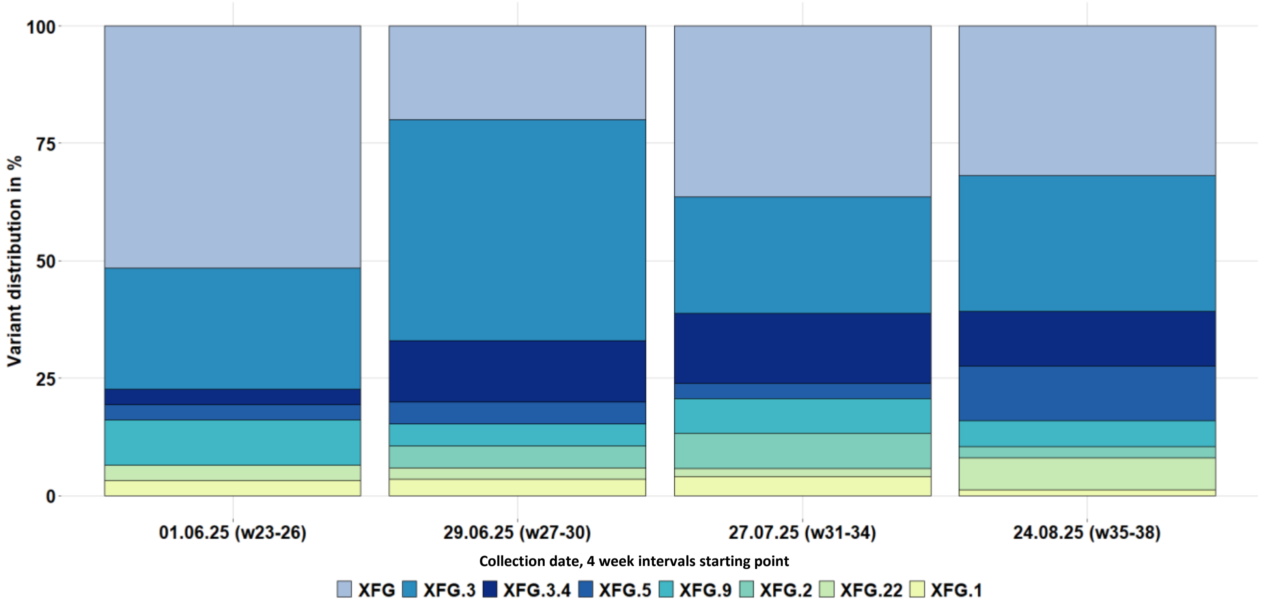


Figure 6. Lineage distribution and sequencing coverage from week 2024/39 (22.9.2024) to week 2025/38 (21.09.2025) in 4 week intervals; for example: collection date 24.08.25 covers all samples sequenced until 21.09.205; All displayed variants include descendant lineages- except those specified on the legend. Other: recent cases-recombinant XFJ, and XFT

Figure 7. Proportion of selected XFG sub-variants circulating in Luxembourg over the past 16 weeks shown; illustrating the diversity within XFG.



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