WEEKLY REPORT – WASTEWATER-BASED EPIDEMIOLOGICAL SURVEILLANCE OF THE SARS-COV-2

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RESULTS OF 12/01/2022

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In collaboration with:

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1. Summary

The circulation of the SARS-CoV-2 virus in the environment is assessed in the present work based on three indicators. The analysis of wastewater samples collected in 42 wastewater treatment plants covers 45% of the Belgian population, with increased accuracy in the urban areas. The results of the wastewater surveillance is a source of complementary information to the infection cases number as the populations represented are different. Indeed, the wastewater results do notably include all asymptomatic persons, and are independent of the testing strategy.

Here are the conclusions based on the latest results of January 12th 2022:

- As a reminder, the three samples related to the preceding weeks (December 27th, January 3rd and 5th) were diluted due to rainy events causing an underestimation of the number of areas in which the indicators were fulfilled. However, results of the last week were not diluted by the rain. These results indicate that the number of areas which are positive to the three alerting indicators has recently strongly increased.
- At the provincial level: Antwerpen, Brabant Wallon, Brussels, Hainaut, Liège, Limburg, Luxembourg, Namur, Oost-Vlaanderen, Vlaams-Brabant, and West-Vlaanderen are the provinces positive to at least one of the three alerting indicators.
- Also, the provinces of Brussels and Vlaams-Brabant are of particular concern as the conditions for 3 indicators are met in these provinces.
- At the covered areas level: among the 41 areas covered[1], the number of treatment plants with at least one alerting indicator positive is 37, 29 belonging to the High circulation indicator, 17 belonging to the "Fast increase" indicator, and 20 belonging to the "Increasing trend" indicator.
- An alerting situation is evidenced for the covered areas of Beersel, Brugge, Brussels-North, Brussel-South, Gent, Grimbergen, Harelbeke, Houthalen-Centrum, and Leuven as all three indicators are fulfilled.
- The impact of the variant of concern Omicron on the wastewater surveillance was assessed to be negligible.

The wastewater situation can be followed on a weekly basis on:

- The graphics available on the public COVID-19 dashboard
- The Risk Assessment Group (RAG) updating the weekly epidemiological situation through a report validated by the Risk Management Group (RMG) and published every Friday in French and Dutch.
- Further details on the methodology applied for the wastewater surveillance can be found in the Appendix Methodology document (access online).

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[1] Due to the recent flooding events, the treatment plants from Wegnez (Verviers) and Grosses-Battes (Liège) are temporarily out of order. These two areas had therefore not been screened for SARS-CoV-2. Liège is still well represented within this surveillance, however Verviers is not. Since the 13th of October, the covered area of Soumagne is added to the surveillance.

2. Introduction

In mid-September 2020 started the SARS-CoV-2 national wastewater surveillance project. The present report is an outcome of this project aiming to assess weekly the wastewater-based epidemiological situation of Belgium.
The surveillance is based on the analysis of water samples collected twice per week from the influent of 42 WasteWater Treatment Plants (WWTPs) spread over Belgium. The evolution of the SARS-CoV-2 viral concentrations measured over time in the different treatment plants is analyzed at different levels: regional, provincial, and the catchment area covered by the individual treatment plants. Also, alerting indicators were developed to highlight areas of concern regarding the high circulation, the fast evolution, and the increasing trend of the observed viral concentrations.

In this report, the weekly wastewater-based epidemiological situation is presented and discussed at the above-mentioned levels based on the three categories of alerting indicators. Moreover, the remaining sources of uncertainties are discussed together with their expected impacts on the wastewater results interpretation.

3. Methodology

3.1. SAMPLE COLLECTION AND ANALYSIS

The surveillance project, which started in mid-September 2020 covers around 45% of the Belgian population. The population covered is 40% in the Flemish region, 35% in the Walloon region, and nearly 100% in the Brussels region. Figure 1 shows the catchment areas covered by the 42 WWTPs included in the project, which are located in high population density areas. A catchment area is defined by the area delimiting the population covered by a specific wastewater sample, collected at the inlet of the WWTPs. Further coverage details can be found in Table 1 by province (see also Table A1 in the Appendix Methodology document (access online)) and on the Sciensano public dashboard.
In practice, 24-hour composite samples are collected twice a week on Mondays and Wednesdays from the influent of WWTP and are analysed for the presence of SARS-CoV-2 RNA by three different laboratories. The resulting SARS-CoV-2 concentrations (3 targeted genes) are delivered to Sciensano within 2 days for data analysis purpose. Concretely, the results which are representative of Mondays and Wednesdays are respectively available on Wednesdays and Fridays.

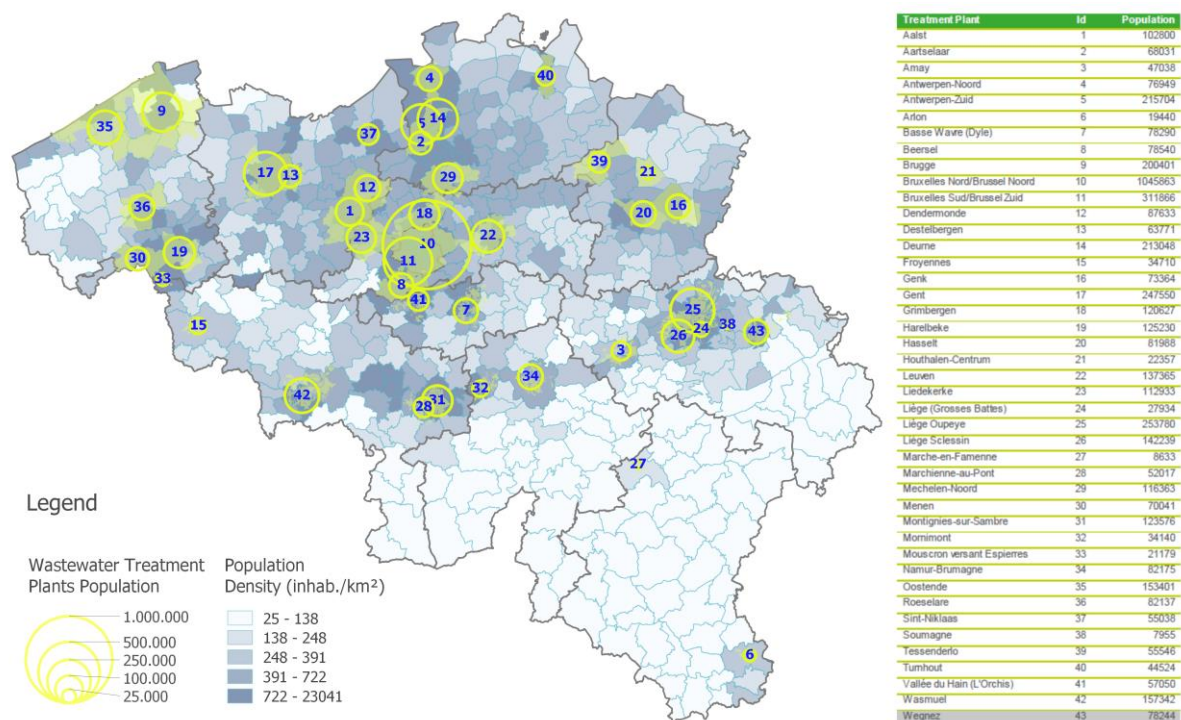| Treatment Plant	Id	Population
Aalst	1	102800
Aartselaar	2	68031
Amay	3	47038
Antwerpen-Noord	4	76949
Antwerpen-Zuid	5	215704
Arlon	6	19440
Basse Wavre (Dyle)	7	78290
Beersel	8	78540
Brugge	9	200401
Bruxelles Nord/Brussel Noord	10	1045863
Bruxelles Sud/Brussel Zuid	11	311866
Dendermonde	12	87633
Destelbergen	13	63771
Deurne	14	213048
Froyennes	15	34710
Genk	16	73364
Gent	17	247550
Grimbergen	18	120627
Harelbeke	19	125230
Hasselt	20	81988
Houthalen-Centrum	21	22357
Leuven	22	137365
Liedekerke	23	112933
Liège (Grosses Battes)	24	27934
Liège Oupeye	25	253780
Liège Sclessin	26	142239
Marche-en-Famenne	27	8633
Marchienne-au-Pont	28	52017
Mechelen-Noord	29	116363
Menen	30	70041
Montignies-sur-Sambre	31	123576
Mornimont	32	34140
Mouscron versant Espierres	33	21179
Namur-Brumagne	34	82175
Oostende	35	153401
Roeselare	36	82137
Sint-Niklaas	37	55038
Soumagne	38	7955
Tessenderlo	39	55548
Turnhout	40	44524
Vallée du Hain (L'Orchis)	41	57050
Wasmuel	42	157342
Wegnez	43	78244

Figure 1: The population located in the areas covered by the wastewater treatment plants (highlighted in yellow) and the population density for each municipality (indicated by the blue scale). Note that due to the recent flooding, the treatment plant of Wegnez is out of order. This area is, hence, not considered anymore in the wastewater surveillance and has been replaced by the treatment plant of Soumagne.

3.2. WASTEWATER RESULTS

The quantification of SARS-CoV-2 in RNA copies/ ml (concentration) was generalized in mid-February 2021 to all the treatment plants investigated. Before this date, the quantitative values were estimated based on the retrospective application of the quantification method (see details in Appendix) from mid-September 2020 to mid-February 2021 for Flanders and Brussels. In Wallonia, the quantitative results were available since the start.

Preliminary results allowed for estimating the limit of quantification of the analytical method at 20 copies/ml.

3.3. ALERTING INDICATORS

To highlight the areas of possible concerns, the three following types of alerting indicators are assessed twice a week, based on the viral concentration (RNA copies/ml) measured for the three targeted gene fragments (E, N1, and N2):

1. The **High circulation** indicator highlights the catchment areas where the viral concentrations are high. It corresponds to a situation where the viral concentrations exceed half of the highest value recorded during the third wave (i.e. from mid-February 2021 till begin of May).

2. The **Fast increase** indicator highlights the catchment areas where the viral concentrations have rapidly increased for the last week. It corresponds to a situation where the moving average on the past 7 days of the viral concentration has increased faster than 70% per week if being above the estimated limit of quantification. The increasing slope is normalized for each treatment plant.

3. The **Increasing trend** indicator highlights the catchment areas where the viral concentrations have been increasing for more than 6 days. The indicator is computed based on the moving average on the past two weeks of the viral concentration.

The indicators were developed in order to be able to track the different phases of an outbreak. Typically, when the viral concentrations in wastewaters start to increase in an area, the indicator Increasing trend will be the first fulfilled. If the concentrations increase quickly, the Fast increase indicator will then be fulfilled. Finally, after the initial increasing phase, the concentrations in an area will be sufficiently high to result in the High circulation to be fulfilled.

3.4. CASES RESULTS

The cases number data presented in this report come from the COVID-19 laboratory-confirmed cases database centralized by Sciensano. The cases number, used to compute the 14 days-incidence, only accounts for the physical areas covered by the wastewater project (see Figure 1).

3.5. CAUTION POINTS FOR THE RESULTS INTERPRETATION

Only the trends, observed through the alerting indicators, should be assessed for the comparison of different areas. Absolute values should not be compared as the concentration values differ from an WWTP to another, notably due to the differences in population sizes covered. Additionally, the situation comparison between the regions should be considered with caution. The degree of comparability is not yet known and depends on the comparability of the results between the different laboratories performing the analysis (see the Appendix Methodology document (access online)).

Moreover, the wastewater concentrations and the cases numbers presented in this report do not originate from the same population, even though the positive cases are selected only for the municipalities covered by the wastewater surveillance. For instance, the wastewater results account for all infected persons (whatever age or symptomatic condition) while the cases include only the persons tested clinically positive. Likewise, an infected person covered by the wastewater results could be associated with another area in the clinical surveillance as the person's postal code is used for clinical statistics (mobility bias). Therefore, the correlation between the wastewater concentrations and the cases number varies according to the area considered. The wastewater results are thus complementary and independent information to the results of the cases.

The correlation between the wastewater viral concentrations and the cases numbers could also be influenced by the vaccination campaign and the circulation of variants.

Finally, all values below the limit of quantification (< 20 RNA copies/ml) should be considered as non-quantitatively reliable values. A reported value lower than 20 copies/ml only shows that SARS-CoV-2 has been detected in the sample at an undetermined concentration.

4. Results

4.1. REGIONS

Figure 2 presents the quantitative SARS-CoV-2 RNA concentration in the wastewaters and the 14 days incidence for each region, compiling the incidence data of the area covered by the wastewater surveillance. The estimated viral concentrations can also be seen for the period before mid-February (see 2.2. in the Appendix Methodology document (access online) for more details).
The second wave peak occurring in November 2020 can be seen in the three regions in Figure 2 below. This remains true for the third wave, but to a lower extend in Wallonia. Several hypotheses could explain this: (1) the sizes of the treatment plants in Wallonia are smaller than the ones located in the two other regions, affecting the viral concentrations measured; (2) the extent to which the results are comparable between the different laboratories is unknown (see Methodology for more details)

Since the beginning of October, the viral concentrations in the wastewater were increasing, illustrating the fourth wave (Figure 2). The last results indicate that the viral concentrations in Wallonia are decreasing, while increasing again in Flanders and Brussels.

It should be noted that the last viral concentrations in wastewaters are not displayed in the figure as the regional corresponding trends are still to be validated with the next week results[2]. For the assessment of the very last trends, refer to sections 4.2 and 4.3.

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[2] The trends of SARS-CoV-2 circulation in wastewater, given by the dark line on the graphs, corresponds to a 14 days centred mean of the concentrations measured.

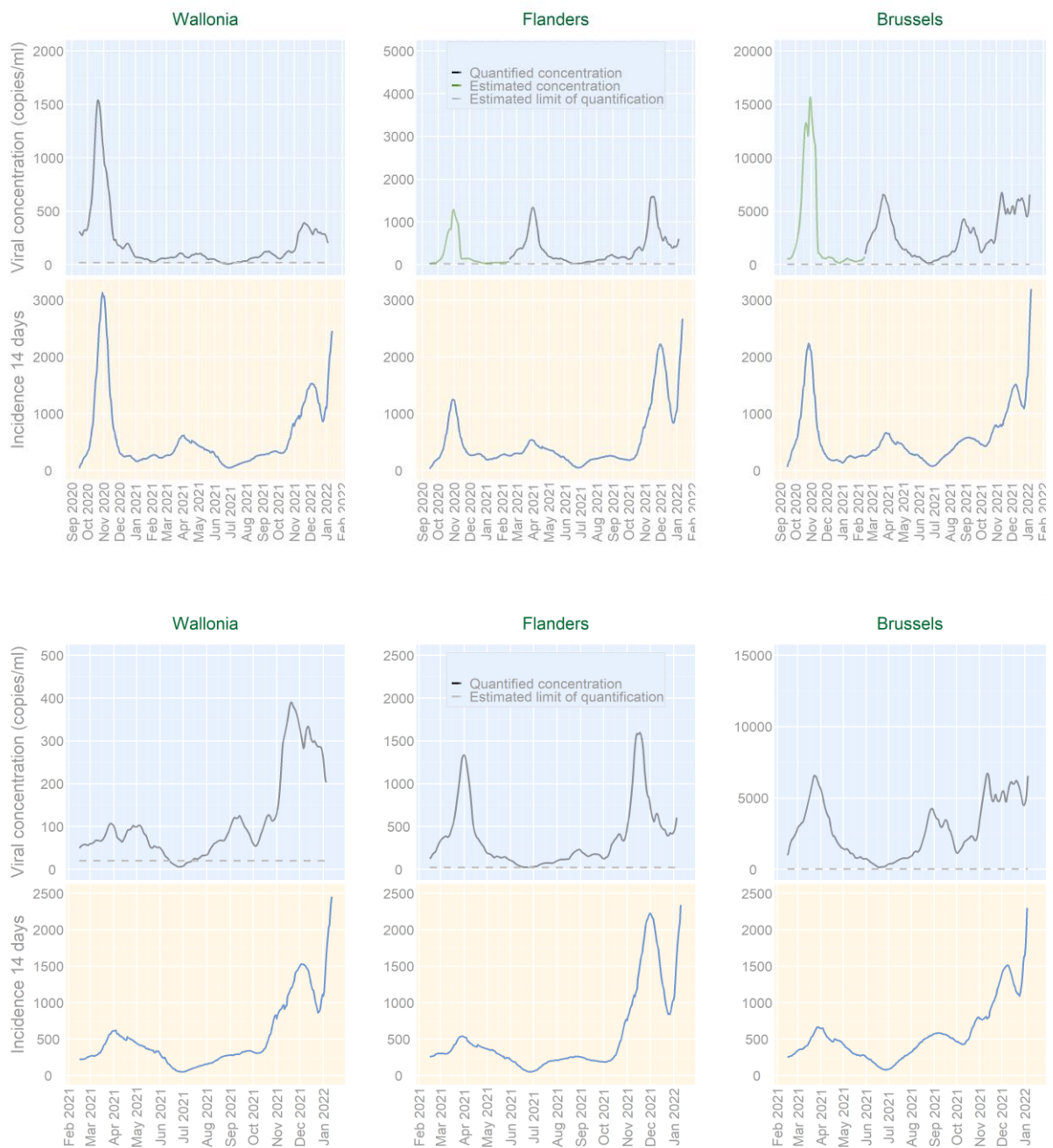**Figure 2: The SARS-CoV-2 RNA estimated and quantified concentrations expressed as copies/ml (two weeks centered moving average applied on the linear interpolation), the estimated limit of quantification of 20 SARS-CoV-2 RNA copies/ ml, and the 14 days incidence in the population covered by the wastewater surveillance since the surveillance starting date (graph set above) and mid-February 2021 (graph set below).**

4.2. PROVINCES

Table 1 shows, for each Province, the results associated with the samples of Wednesday January 12th 2022, for the three alerting indicators:

- This week on Wednesday January 12th 2022, 11 provinces had at least one alerting indicator positive: Antwerpen, Brabant Wallon, Brussels, Hainaut, Liège, Limburg, Luxembourg, Namur, Oost-Vlaanderen, Vlaams-Brabant, and West-Vlaanderen. The region of Brussels and the province of Vlaams-Brabant are of particular concern as 3 indicators are fulfilled in these regions.
- It should be noted that although the 50% threshold of viral circulation is not exceeded (in comparison of the highest level observed during the 3rd wave), the viral concentrations in the province of Antwerpen are still high (47%).

Table 1 allows to track the changes between the situation as of today (December 15th 2021) and the situation as of last week (December 08th 2021). Hereby, two distinct situations are taken into account:

1. If a province has at least one indicator fulfilled this week and it was not the case last week, its **name is displayed in bold in the table**;
2. If a province has at least one indicator fulfilled this week and if this also was the case last week, any change in indicator fulfilment (i.e. if the value for any indicator has changed from 0 to 1 or from 1 to 0) is indicated **in coloured bold text**.

Table 1: Alerting indicators fulfilled (1) or not (0) on January 12th 2022 and the percentage of population covered by the provinces. Columns represent the population coverage of the WWTP within the Province (Pop. coverage), the High Circulation indicator (High), the Fast increase indicator (Fast) and the Increasing trend indicator (Incr.). The specifications of the four last columns are explained in the footnotes 1-4 below the table. Missing data is indicated with a "/".

Province	Pop. coverage	High	Fast	Incr.	Norm. viral cc. (%)[1]	Mean viral. cc. (c./ml)[2]	Norm. evol. (%/w)[3]	Incr. days[4]
Antwerpen	41%	0	**0**	**1**	47	463	55	9
Brabant Wallon	33%	1	**1**	0	219	286	114	1
Brussels	100%	1	1	1	212	17540	630	7
Hainaut	29%	1	0	0	86	157	11	2
Liège	50%	1	0	0	180	398	-4	0
Limburg	26%	1	1	0	106	219	149	5
Luxembourg	10%	1	0	0	100	194	-8	1
Namur	23%	1	0	0	69	187	-16	1
Oost-Vlaanderen	38%	1	1	0	99	1668	386	6
Vlaams-Brabant	61%	1	1	1	89	3014	571	8
West-Vlaanderen	52%	1	1	0	64	1567	212	6

[1] : the viral concentration normalized with the maximum viral concentration measured in the corresponding catchment area during the third wave (i.e. from mid-February 2021 till begin of July).

[2] : the viral concentration computed on the replicate of the three targeted gene fragments.

[3] : the slope (%/week) of the past 7 days moving average of the viral concentration if being above the estimated limit of quantification.

[4] : the cumulative number of days of increase of the past 14 days moving average of the viral concentration

4.3. CATCHMENT AREAS

Table 2 shows, for each catchment area, the values of the three alerting indicators obtained based on the results of last Wednesday's sample. The number of treatment plants with at least one alerting indicator positive is 37 (out of 41 areas covered).

- The indicator High circulation is fulfilled in 29 covered areas. The full list of these stations can be found in Table 2 and in Appendix A1. In several areas, the measured viral concentration exceeded the maximal concentration registered during the 3rd wave. The list of these stations can be found in the tables of the different Appendices.
- The indicator "Fast increase" is fulfilled in 17 covered areas. Further details can be found in Appendix A2.
- The indicator "Increasing trend" is fulfilled in 20 covered areas. Among these areas, the viral concentration is continually increasing since two weeks in 2 covered areas: Antwerpen-North (16 days) and Deurne (16 days). Further details can be found in Appendix A3.
- An alerting situation is evidenced for the covered areas of Beersel, Brugge, Brussels-North, Brussel-South, Gent, Grimbergen, Harelbeke, Houthalen-Centrum, and Leuven as all three indicators are fulfilled.

The wastewater results can be accessed online for each area on the COVID-19 dashboard.
Table 2 is a snapshot of the number of areas highlighted by the indicators for the last results obtained, which correspond to the 24h-representative samples of last Wednesday January 12th 2022.

Table 2 allows to track the changes between the situation as of today (December 15th 2021) and the situation as of last week (December 08th 2021). Hereby, three distinct cases are taken into account:
1. If an area has at least one indicator fulfilled this week and it was not the case last week, its name is displayed **in bold in the table**;
2. If an area has at least one indicator fulfilled this week and if it also was the case last week, any change in indicator fulfilment (i.e. if the value for any indicator has changed from 0 to 1 or from 1 to 0) is indicated **in coloured bold text**;
3. Any area which had at least one indicator fulfilled last week but not this week is listed below Table 1.

Table 2: Alerting indicators fulfilled (1) or not (0) on January 12th 2022 for the catchment areas covered by the wastewater treatment plants. Columns represent the population coverage of the WWTP within the Province (Pop. coverage), the High circulation indicator(High), the Fast increase indicator (Fast) and the Increasing trend indicator (Incr.). The specifications of the four last columns are explained in the footnotes 1-4 below the table. Missing data is indicated with a "/".

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml)[2]	Norm evol. (%/w)[3]	Incr days[4]
Oost-Vlaanderen	**Aalst**	0	0	1	47	965	41	7
Antwerpen	Aartselaar	0	**0**	**1**	29	175	-30	7
Liège	**Amay**	1	0	0	58	84	-57	0
Antwerpen	Antwerpen-North	1	**0**	1	108	340	-8	16
Antwerpen	Antwerpen-South	0	**0**	**1**	23	481	0	7
Luxembourg	Arlon	1	0	0	143	275	-12	2
Brabant Wallon	Basse Wavre (Dyle)	1	0	0	237	326	7	0
Vlaams-Brabant	**Beersel**	1	1	1	83	5384	870	7
West-Vlaanderen	Brugge	**1**	1	**1**	90	850	142	7

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml)[2]	Norm evol. (%/w)[3]	Incr days[4]
Brussels	**Brussels-North**	1	1	1	230	18101	627	7
Brussels	**Brussel-South**	1	1	1	149	15656	640	7
Oost-Vlaanderen	**Destelbergen**	0	1	1	28	1469	2,797	7
Antwerpen	Deurne	0	0	1	12	713	0	16
Hainaut	**Froyennes**	1	1	0	85	111	131	0
Limburg	Genk	**1**	**0**	**1**	56	210	58	9
Oost-Vlaanderen	Gent	**1**	1	**1**	169	2780	134	7
Vlaams-Brabant	**Grimbergen**	1	1	1	134	3497	586	7
West-Vlaanderen	**Harelbeke**	1	1	1	99	2423	479	7
Limburg	**Hasselt**	1	0	0	177	205	/	2
Limburg	Houthalen-Centrum	**1**	1	**1**	122	260	447	7
Vlaams-Brabant	**Leuven**	1	1	1	85	2579	423	7
Vlaams-Brabant	**Liedekerke**	0	1	1	48	1380	525	9
Liège	Liège Oupeye	1	0	0	130	294	2	0
Liège	Liège Sclessin	1	0	0	315	688	-5	0
Antwerpen	**Mechelen-Noord**	1	1	0	116	298	175	2
West-Vlaanderen	**Menen**	0	0	1	11	2398	0	7
Hainaut	Montignies-sur-Sambre	1	**0**	**1**	57	145	-43	7
Hainaut	Mouscron versant Espierres	1	0	0	113	206	23	2
Namur	**Namur-Brumagne**	1	0	0	88	248	-23	2
West-Vlaanderen	**Oostende**	1	1	0	53	1412	296	2
West-Vlaanderen	**Roeselare**	0	0	1	12	1595	0	7
Oost-Vlaanderen	Sint-Niklaas	**1**	**0**	0	59	647	-1	2
Liège	**Soumagne**	1	1	0	84	366	170	2
Limburg	**Tessenderlo**	1	0	0	60	236	/	2
Antwerpen	**Turnhout**	1	1	0	68	267	504	2
Brabant Wallon	Vallée du Hain (L'Orchis)	1	**1**	0	194	230	261	2
Hainaut	**Wasmuel**	1	0	0	123	197	54	0

[1] : the viral concentration normalized with the maximum viral concentration measured in the corresponding catchment area during the third wave (i.e. from mid-February 2021 till begin of July).

[2] : the viral concentration computed on the replicate of the three targeted gene fragments.

[3] : the slope (%/week) of the past 7 days moving average of the viral concentration if being above the estimated limit of quantification.

[4] : the cumulative number of days of increase of the past 14 days moving average of the viral concentration.

Figure 3 was developed to offer a dynamic view of the three indicators over time. For further insights on the dynamic of the different indicators, see Section 3.3.

As a reminder, the three samples related to the preceding weeks (December 27th, January 3rd and 5th) were diluted due to rainy events causing an underestimation of the number of areas in which the indicators were fulfilled.

However, results of the last week were not diluted by the rain. These results indicate that the number of areas which are positive to the three alerting indicators has recently strongly increased. From 16, 0, 3 areas on the 22/12/2020 to 29, 17, 20 on the 10/01/2021 respectively for the high circulation, fast increase and increasing trend indicators.
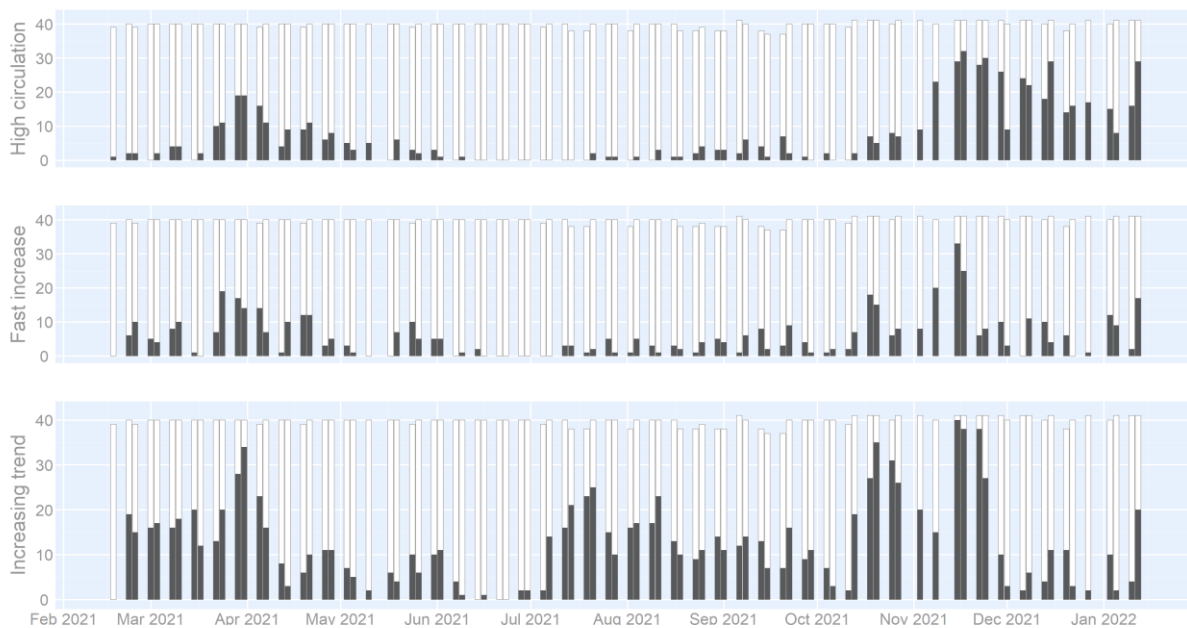

Figure 3: The number of areas (among the 41 covered by the wastewater surveillance this week and the 42 normally considered), with positive alerting indicators (black bars, latest results on January 12th 2022). The white bars represent the total number of areas considered every week in the wastewater surveillance.

4.4. VARIANTS

The Omicron variant represents a substantial proportion of all sequences reported in Belgium[3]. The impact of the variant of concern Omicron was assessed to be negligible for the following reason: Mutations are present in the Omicron variant on the N1 and E genes which could have potentially led to a drop out of those two genes leading to an underestimation of the viral concentrations in wastewaters. Preliminary experimental results indicate that no drop out of the genes were observed. Hence, the sensitivity of the analytical methods used was not impacted. Therefore, the circulation of the Omicron variant is not underestimated in wastewaters.
However, the Omicron variant might have an impact on the faecal shedding load if infected people would excrete less in their faeces than for Delta. That stays hypothetical as we do not have strong evidence on it yet.
A regular investigation of the possible impact of variants of concern is done in order to screen their evolution in time.

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[3] Source : COVID-19 dashboard

5. Appendix – Areas classified by alerting indicator

A 1: Covered areas (29 out of 41 on January 12th 2022) characterized as High circulation sorted in the descending order of importance.

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml)[2]	Norm evol. (%/w)[3]	Incr days[4]	Date Max cc[5]
Liège	Liège Sclessin	1	0	0	315	688	-5	0	24/11/2021
Brabant Wallon	Basse Wavre (Dyle)	1	0	0	237	326	7	0	29/11/2021
Brussels	Brussels-North	1	1	1	230	18101	627	7	12/01/2022
Brabant Wallon	Vallée du Hain (L'Orchis)	1	1	0	194	230	261	2	15/12/2021
Limburg	Hasselt	1	0	0	177	205	/	2	08/11/2021
Oost-Vlaanderen	Gent	1	1	1	169	2780	134	7	17/11/2021
Brussels	Brussel-South	1	1	1	149	15656	640	7	12/01/2022
Luxembourg	Arlon	1	0	0	143	275	-12	2	22/11/2021
Vlaams-Brabant	Grimbergen	1	1	1	134	3497	586	7	15/11/2021
Liège	Liège Oupeye	1	0	0	130	294	2	0	15/11/2021
Hainaut	Wasmuel	1	0	0	123	197	54	0	27/12/2021
Limburg	Houthalen-Centrum	1	1	1	122	260	447	7	10/01/2022
Antwerpen	Mechelen-Noord	1	1	0	116	298	175	2	24/11/2021
Hainaut	Mouscron versant Espierres	1	0	0	113	206	23	2	06/12/2021
Antwerpen	Antwerpen-North	1	0	1	108	340	-8	16	29/11/2021
West-Vlaanderen	Harelbeke	1	1	1	99	2423	479	7	18/10/2021
West-Vlaanderen	Brugge	1	1	1	90	850	142	7	17/11/2021
Namur	Namur-Brumagne	1	0	0	88	248	-23	2	15/11/2021
Hainaut	Froyennes	1	1	0	85	111	131	0	08/12/2021
Vlaams-Brabant	Leuven	1	1	1	85	2579	423	7	17/11/2021
Liège	Soumagne	1	1	0	84	366	170	2	15/11/2021
Vlaams-Brabant	Beersel	1	1	1	83	5384	870	7	3rd wave
Antwerpen	Turnhout	1	1	0	68	267	504	2	24/11/2021
Limburg	Tessenderlo	1	0	0	60	236	/	2	22/11/2021
Oost-Vlaanderen	Sint-Niklaas	1	0	0	59	647	-1	2	3rd wave
Liège	Amay	1	0	0	58	84	-57	0	06/12/2021
Hainaut	Montignies-sur-Sambre	1	0	1	57	145	-43	7	15/11/2021

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml) [2]	Norm evol. (%/w) [3]	Incr days[4]	Date Max cc[5]
Limburg	Genk	1	0	1	56	210	58	9	15/11/2021
West-Vlaanderen	Oostende	1	1	0	53	1412	296	2	17/11/2021

[1] : the viral concentration normalized with the maximum viral concentration measured in the corresponding catchment area during the third wave (i.e. from mid-February 2021 till begin of July).

[2] : the viral concentration computed on the replicate of the three targeted gene fragments.

[3] : the slope (%/week) of the past 7 days moving average of the viral concentration if being above the estimated limit of quantification.

[4] : the cumulative number of days of increase of the past 14 days moving average of the viral concentration.

[5] : date at which the measured viral concentration was the highest since the beginning of the measurements. If the date was between 15th February and 15th May 2021, the date is considered to be during the third wave and mentioned as such.

A 2: Covered areas (17 out of 41 on the January 12th 2022) characterized as Fast increase sorted in the descending order of importance.

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml) [2]	Norm evol. (%/w) [3]	Incr days[4]	Date Max cc[5]
Oost-Vlaanderen	Destelbergen	0	1	1	28	1469	2797	7	3rd wave
Vlaams-Brabant	Beersel	1	1	1	83	5384	870	7	3rd wave
Brussels	Brussel-South	1	1	1	149	15656	640	7	12/01/2022
Brussels	Brussels-North	1	1	1	230	18101	627	7	12/01/2022
Vlaams-Brabant	Grimbergen	1	1	1	134	3497	586	7	15/11/2021
Vlaams-Brabant	Liedekerke	0	1	1	48	1380	525	9	3rd wave
Antwerpen	Turnhout	1	1	0	68	267	504	2	24/11/2021
West-Vlaanderen	Harelbeke	1	1	1	99	2423	479	7	18/10/2021
Limburg	Houthalen-Centrum	1	1	1	122	260	447	7	10/01/2022
Vlaams-Brabant	Leuven	1	1	1	85	2579	423	7	17/11/2021
West-Vlaanderen	Oostende	1	1	0	53	1412	296	2	17/11/2021
Brabant Wallon	Vallée du Hain (L'Orchis)	1	1	0	194	230	261	2	15/12/2021
Antwerpen	Mechelen-Noord	1	1	0	116	298	175	2	24/11/2021
Liège	Soumagne	1	1	0	84	366	170	2	15/11/2021
West-Vlaanderen	Brugge	1	1	1	90	850	142	7	17/11/2021
Oost-Vlaanderen	Gent	1	1	1	169	2780	134	7	17/11/2021
Hainaut	Froyennes	1	1	0	85	111	131	0	08/12/2021

[1] : the viral concentration normalized with the maximum viral concentration measured in the corresponding catchment area during the third wave (i.e. from mid-February 2021 till begin of July).

[2] : the viral concentration computed on the replicate of the three targeted gene fragments.

[3] : the slope (%/week) of the past 7 days moving average of the viral concentration if being above the estimated limit of quantification.

[4] : the cumulative number of days of increase of the past 14 days moving average of the viral concentration.

[5] : date at which the measured viral concentration was the highest since the beginning of the measurements. If the date was between 15th February and 15th May 2021, the date is considered to be during the third wave and mentioned as such.

A 3: Covered areas (20 out of 41 on the January 12th 2022) characterized as Increasing trend sorted in the descending order of importance.

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml)[2]	Norm evol. (%/w)[3]	Incr days[4]	Date Max cc[5]
Antwerpen	Antwerpen-North	1	0	1	108	340	-8	16	29/11/2021
Antwerpen	Deurne	0	0	1	12	713	0	16	3rd wave
Limburg	Genk	1	0	1	56	210	58	9	15/11/2021
Vlaams-Brabant	Liedekerke	0	1	1	48	1380	525	9	3rd wave
Oost-Vlaanderen	Aalst	0	0	1	47	965	41	7	15/11/2021
Antwerpen	Aartselaar	0	0	1	29	175	-30	7	29/11/2021
Antwerpen	Antwerpen-South	0	0	1	23	481	0	7	3rd wave
Vlaams-Brabant	Beersel	1	1	1	83	5384	870	7	3rd wave
West-Vlaanderen	Brugge	1	1	1	90	850	142	7	17/11/2021
Brussels	Brussels-North	1	1	1	230	18101	627	7	12/01/2022
Brussels	Brussel-South	1	1	1	149	15656	640	7	12/01/2022
Oost-Vlaanderen	Destelbergen	0	1	1	28	1469	2797	7	3rd wave
Oost-Vlaanderen	Gent	1	1	1	169	2780	134	7	17/11/2021
Vlaams-Brabant	Grimbergen	1	1	1	134	3497	586	7	15/11/2021
West-Vlaanderen	Harelbeke	1	1	1	99	2423	479	7	18/10/2021
Limburg	Houthalen-Centrum	1	1	1	122	260	447	7	10/01/2022
Vlaams-Brabant	Leuven	1	1	1	85	2579	423	7	17/11/2021
West-Vlaanderen	Menen	0	0	1	11	2398	0	7	3rd wave
Hainaut	Montignies-sur-Sambre	1	0	1	57	145	-43	7	15/11/2021
West-Vlaanderen	Roeselare	0	0	1	12	1595	0	7	3rd wave

[1] : the viral concentration normalized with the maximum viral concentration measured in the corresponding catchment area during the third wave (i.e. from mid-February 2021 till begin of July).

[2] : the viral concentration computed on the replicate of the three targeted gene fragments.

[3] : the slope (%/week) of the past 7 days moving average of the viral concentration if being above the estimated limit of quantification.

[4] : the cumulative number of days of increase of the past 14 days moving average of the viral concentration.

A 4: Covered areas (4 out of 41 on the January 12th 2022) in which no alerting indicator are fullfilled.

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml)[2]	Norm evol. (%/w)[3]	Incr days[4]	Date Max cc[5]
Oost-Vlaanderen	Dendermonde	0	0	0	40	142	-9	2	22/11/2021
Luxembourg	Marche-en-Famenne	0	0	0	5	11	0	0	29/11/2021
Hainaut	Marchienne-au-Pont	0	0	0	33	73	-72	0	15/11/2021
Namur	Mornimont	0	0	0	24	39	0	0	15/11/2021

[1] : the viral concentration normalized with the maximum viral concentration measured in the corresponding catchment area during the third wave (i.e. from mid-February 2021 till begin of July).

[2] : the viral concentration computed on the replicate of the three targeted gene fragments.

[3] : the slope (%/week) of the past 7 days moving average of the viral concentration if being above the estimated limit of quantification.

[4] : the cumulative number of days of increase of the past 14 days moving average of the viral concentration.

[5] : date at which the measured viral concentration was the highest since the beginning of the measurements. If the date was between 15th February and 15th May 2021, the date is considered to be during the third wave and mentioned as such.