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

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RESULTS OF 16/03/2022

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In collaboration with:

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1. Summary

In the present work, the circulation of the SARS-CoV-2 virus in the environment is assessed 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 are a source of complementary information to the infection cases number. 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 March 16th 2022:

- At the national level: Since three weeks, the number of areas in Increasing trend and Fast increase has strongly increased. This steady and continuous increase in viral concentration has led to a significant increase in the number of areas in which the High circulation indicator is fulfilled. This pattern in the behaviour of the indicator clearly confirms the generalized increase in viral concentrations at the national level.
- At the regional level: The viral concentrations in wastewaters are increasing in the three regions. In one week time, in Wallonia, the viral concentrations have increased fast and continuously, resulting in high concentrations close to the maximum values ever recorded in that region.
- At the provincial level: The Fast increase indicator is fulfilled in all the provinces. The Increasing trend indicator is fulfilled in 10 provinces: Antwerpen, Brabant Wallon, Hainaut, Liège, Limburg, Luxembourg, Namur, Oost-Vlaanderen, Vlaams-Brabant, and West-Vlaanderen.
- At the covered areas level: among the 41 areas covered1, the number of treatment plants belonging to the different indicators are 28 for the High circulation indicator, 29 for the “Fast increase” indicator, and 33 for the “Increasing trend” indicator.
- The risk of underestimating the Omicron variant in wastewater 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 available 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

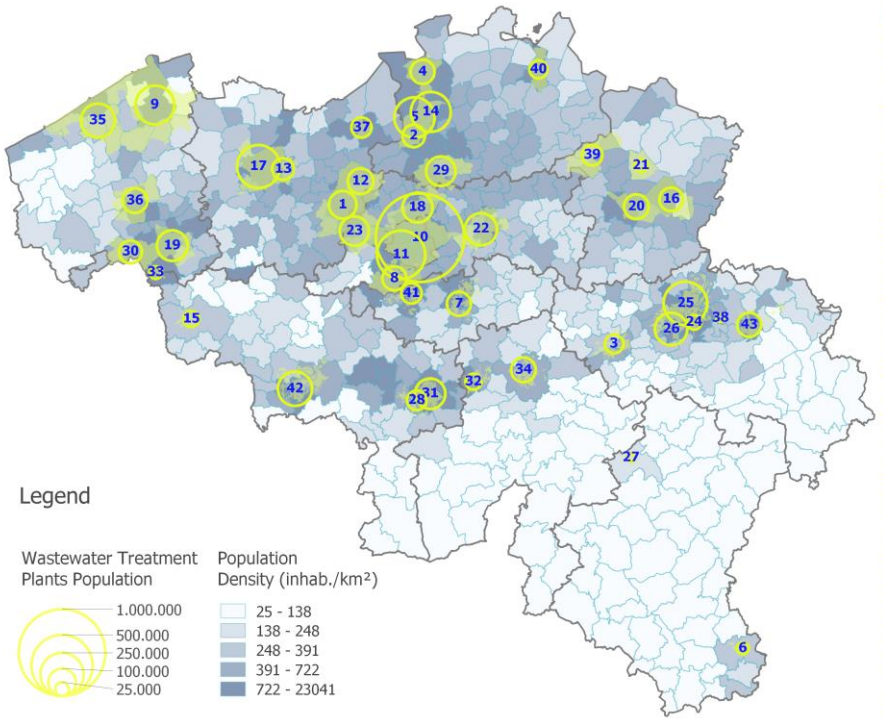
In mid-September 2020 started the SARS-CoV-2 national wastewater surveillance project. The present report is an outcome of this project aiming to assess weekly the wastewater-based epidemiological situation of Belgium.
The surveillance is based on the analysis of water samples collected twice per week 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, three 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 2 by province (see also Table A1 in the Appendix Methodology document (access available 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	55546
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 plants of Wegnez and Liège (Grosses Battes) are out of order. These areas are, hence, not considered anymore in the wastewater surveillance and has been partially 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 concern, 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 in an area start to increase, the indicator Increasing trend will be the first fulfilled. If the concentrations increase quickly, the Fast increase indicator will be fulfilled. Finally, after the initial increasing phase, the concentrations in an area may be sufficiently high to result in the High circulation to be fulfilled.

It should be noted that in several areas, the measured viral concentration exceeded the maximal concentration registered during the 3rd wave. The date at which the maximal concentration has been reached for each station is indicated in the tables A1 to A4 in the appendices.

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. As the concentration values differ from an WWTP to another, notably due to the differences in population sizes covered, absolute values should not be compared. 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 numbers include only the persons clinically tested 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, i.e. 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 but at an undetermined concentration.

4. Results

4.1. REGIONS

Figure 2 represents the quantitative SARS-CoV-2 RNA concentrations 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).
Several waves can be seen in Figure 2:

- The 3rd wave occurring in March 2021. In Wallonia, several hypotheses could explain the lower viral concentration measured compared to the ones in Flanders and Brussels: (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)
- The 4th wave occurring in December 2021
- The 5th wave starting at the beginning of January 2022 when a fast and steep increase in the viral concentrations was observed.

It should be noted that the last viral concentrations in wastewaters are not displayed in the Figure 2 as the regional corresponding trends are based on centred moving averages, and therefore will be validated with the next week results[2].
Table 1 shows, for each region, the results associated with the samples of Wednesday January 26th 2022.

Table 1 allows to track the changes between the situation as of today (March 16th 2022) and the situation as of last week (March 09th 2022). Hereby, two distinct cases are taken into account:

1. If a region 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 region 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**.

The last trends were analysed based on the alerting indicators presented in Table 1. The viral concentrations in wastewaters are increasing in the three regions. In one week time, in Wallonia, the viral concentrations have increased fast and continuously, resulting in high concentrations close to the maximum values ever recorded in that region.

Table 1: Alerting indicators fulfilled (1) or not (0) on March 16th 2022. Columns represent the population coverage of the regions (Pop. coverage) and the three alerting indicators High Circulation (High), Fast increase (Fast) and Increasing trend (Incr.). The specifications of the four last columns are explained in the footnotes 1-4 below the table. Missing data is indicated with a "/".

Region	Pop. coverage	High	Fast	Incr.	Norm. viral cc. (%)[1]	Mean viral. cc. (c./ml)[2]	Norm. evol. (%/w)[3]	Incr. days[4]
Brussels	100%	1	1	0	52	4672	112	2
Flanders	41%	1	1	1	62	1171	104	11
Wallonia	31%	1	1	1	522	1030	1685	9

[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.

[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

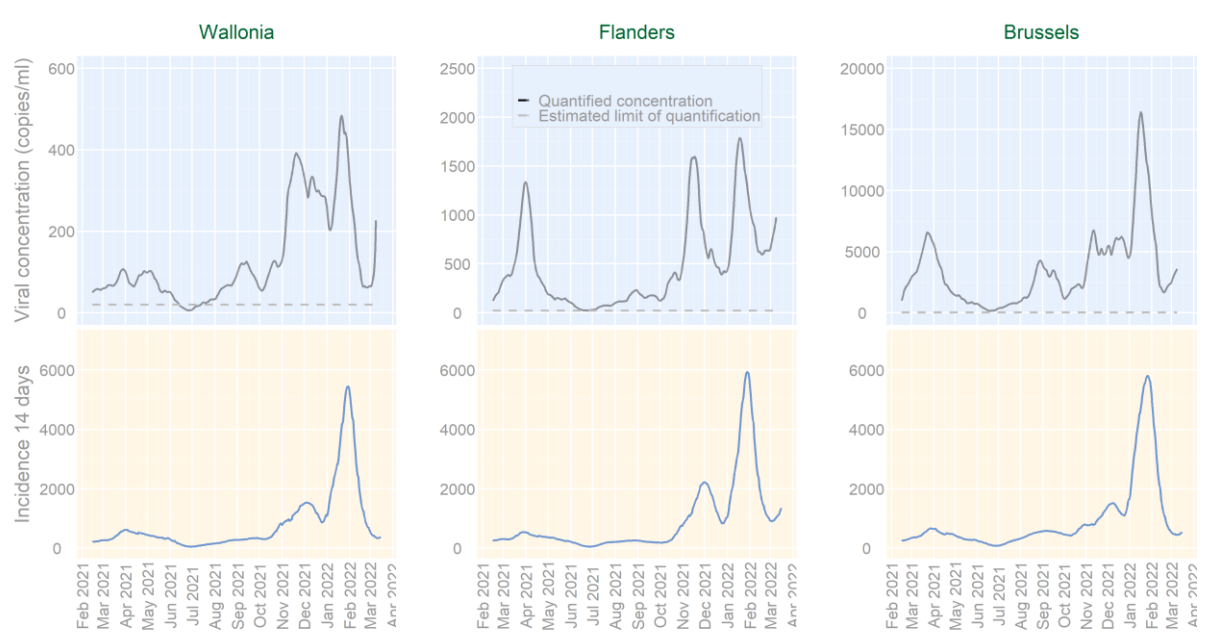


Figure 2: The SARS-CoV-2 RNA estimated and quantified concentrations expressed as copies/ml (based on the two weeks centered moving average applied on the linear interpolation) and the estimated limit of quantification of 20 SARS-CoV-2 RNA copies/ml (dashed line) (Top), and the 14 days incidence in the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

4.2. PROVINCES

Table 2 shows, for each Province, the results associated with the samples of Wednesday March 16th 2022.
Table 2 allows to track the changes between the situation as of today (March 16th 2022) and the situation as of last week (March 09th 2022). Hereby, two distinct cases 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 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**.

Table 2 shows, for each Province, the results associated with the samples of Wednesday March 16th 2022, for the three alerting indicators:

- The High circulation indicator is fulfilled in 10 provinces: Brabant Wallon, Brussels, Hainaut, Liège, Limburg, Luxembourg, Namur, Oost-Vlaanderen, Vlaams-Brabant, and West-Vlaanderen.
- The Fast increase indicator is fulfilled in all the provinces.

- The Increasing trend indicator is fulfilled in 10 provinces: Antwerpen, Brabant Wallon, Hainaut, Liège, Limburg, Luxembourg, Namur, Oost-Vlaanderen, Vlaams-Brabant, and West-Vlaanderen. Amongst these provinces, the viral concentrations is continuously increasing for more than two weeks in Limburg (21 days), Luxembourg (18 days) and Antwerpen (14 days). Also, this indicator is not fulfilled in Brussels only.
- The provinces of Brabant Wallon, Hainaut, Liège, Limburg, Luxembourg, Namur, Oost-Vlaanderen, Vlaams-Brabant, and West-Vlaanderen are of particular concern as 3 indicators are fulfilled in these provinces.

Table 2: Alerting indicators fulfilled (1) or not (0) on March 16th 2022. Columns represent the population coverage of the WWTPs within the Province (Pop. coverage) and the three alerting indicators High circulation (High), Fast increase (Fast) and Increasing trend (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	1	1	29	196	78	14
Brabant Wallon	33%	1	1	1	785	1032	1962	7
Brussels	100%	**1**	**1**	**0**	52	4672	112	2
Hainaut	29%	1	1	1	302	551	868	12
Liège	50%	1	1	1	709	1561	2610	7
Limburg	26%	1	1	1	90	187	108	21
Luxembourg	10%	1	1	1	367	713	601	18
Namur	23%	1	1	1	268	641	772	9
Oost-Vlaanderen	38%	1	**1**	**1**	92	1786	101	8
Vlaams-Brabant	61%	1	**1**	**1**	66	2066	131	7
West-Vlaanderen	52%	1	1	1	59	1489	115	11

[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 3 shows, for each catchment area, the values of the three alerting indicators obtained based on the results of last Wednesday's sample. Table 3 is a snapshot of the number of areas highlighted by the indicators for the last results obtained.
Table 3 allows to track the changes between the situation as of today (March 16th 2022) and the situation as of last week (March 09th 2022). 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 3.

Here are the results associated with the samples of March 16th 2022:

- The High circulation indicator is fulfilled in 28 covered areas. The full list of these areas can be found in Appendix A1. Last week, this indicator was fulfilled in 9 covered areas.
- The Fast increase indicator is fulfilled in 29 covered areas. The full list of these areas can be found in Appendix A2. Last week, this indicator was fulfilled in 17 covered areas.
- The Increasing trend indicator is fulfilled in 33 covered areas. The full list of these areas can be found in Appendix A3. Last week, this indicator was fulfilled in 22 covered areas.
- An alerting situation is evidenced for the covered areas of Aalst, Amay, Arlon, Basse Wavre (Dyle), Brussel-South, Destelbergen, Froyennes, Gent, Grimbergen, Liège Oupeye, Liège Sclessin, Marche-en-Famenne, Marchienne-au-Pont, Montignies-sur-Sambre, Mornimont, Mouscron versant Espierres, Namur-Brumagne, Oostende, Soumagne, Tessenderlo, Turnhout, Vallée du Hain (L'Orchis), and Wasmuel as all three indicators are fulfilled.

The wastewater results at the level of the local covered areas can be accessed online for each area on the COVID-19 dashboard.

Table 3: Alerting indicators fulfilled (1) or not (0) on March 16th 2022. Columns represent the provinces, different WWTPs within the Provinces and the three alerting indicators High circulation (High), Fast increase (Fast) and Increasing trend (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	1	1	1	182	3716	193	14
Antwerpen	Aartselaar	0	0	1	19	113	57	16
Liège	**Amay**	1	1	1	181	265	346	7
Antwerpen	Antwerpen-South	0	0	1	5	96	16	16
Luxembourg	Arlon	1	1	1	403	778	482	16
Brabant Wallon	**Basse Wavre (Dyle)**	1	1	1	898	1238	2,607	7
West-Vlaanderen	**Brugge**	1	1	0	99	932	116	2
Brussels	**Brussel-South**	1	1	1	97	10228	348	9
Oost-Vlaanderen	Dendermonde	0	0	1	34	122	45	9
Oost-Vlaanderen	**Destelbergen**	1	1	1	53	2806	163	9
Antwerpen	Deurne	0	1	1	5	305	228	21
Hainaut	Froyennes	1	1	1	659	859	422	14
Limburg	Genk	1	0	1	58	219	-38	21
Oost-Vlaanderen	Gent	1	1	1	99	1627	87	7
Vlaams-Brabant	**Grimbergen**	1	1	1	79	2065	297	9
West-Vlaanderen	**Harelbeke**	0	1	1	45	1092	104	9
Limburg	Hasselt	1	0	1	167	193	-48	28

Province	WWTP	High	Fast	Incr.	Norm. viral cc (%)[1]	Mean viral cc (c./ml)[2]	Norm evol. (%/w)[3]	Incr days[4]
Vlaams-Brabant	Leuven	1	0	0	95	2901	-28	2
Vlaams-Brabant	Liedekerke	0	1	1	42	1205	198	14
Liège	**Liège Oupeye**	1	1	1	123	280	3928	7
Liège	Liège Sclessin	1	1	1	1937	4228	1089	7
Luxembourg	Marche-en-Famenne	1	1	1	285	566	870	21
Hainaut	**Marchienne-au-Pont**	1	1	1	90	200	418	7
Antwerpen	Mechelen-Noord	1	0	0	123	316	14	2
West-Vlaanderen	Menen	0	1	1	13	2817	79	14
Hainaut	**Montignies-sur-Sambre**	1	1	1	250	635	1607	9
Namur	Mornimont	1	1	1	322	523	384	14
Hainaut	Mouscron versant Espierres	1	1	1	263	481	479	16
Namur	**Namur-Brumagne**	1	1	1	245	690	934	7
West-Vlaanderen	Oostende	1	1	1	63	1662	75	16
West-Vlaanderen	Roeselare	0	1	1	15	1992	238	21
Liège	Soumagne	1	1	1	555	2415	1142	7
Limburg	Tessenderlo	1	1	1	54	210	575	21
Antwerpen	Turnhout	1	1	1	63	247	122	16
Brabant Wallon	**Vallée du Hain (L'Orchis)**	1	1	1	631	749	1077	7
Hainaut	Wasmuel	1	1	1	340	543	587	16

[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.

The covered area of Antwerpen-North had the Fast increase indicator fulfilled last week but not this week.

The covered areas of Antwerpen-North, Brussels-North and Sint-Niklaas had the Increasing trend indicator fulfilled last week but not this week.

Details on covered area without fulfilled indicators can be found in Table A4.

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

Since three weeks, the number of areas in Increasing trend and Fast increase has strongly increased. This steady and continuous increase in viral concentration has led to a significant increase in the number of areas in which the High circulation indicator is fulfilled. This pattern in the behaviour of the indicator clearly confirms the generalized increase in viral concentrations at the national level.

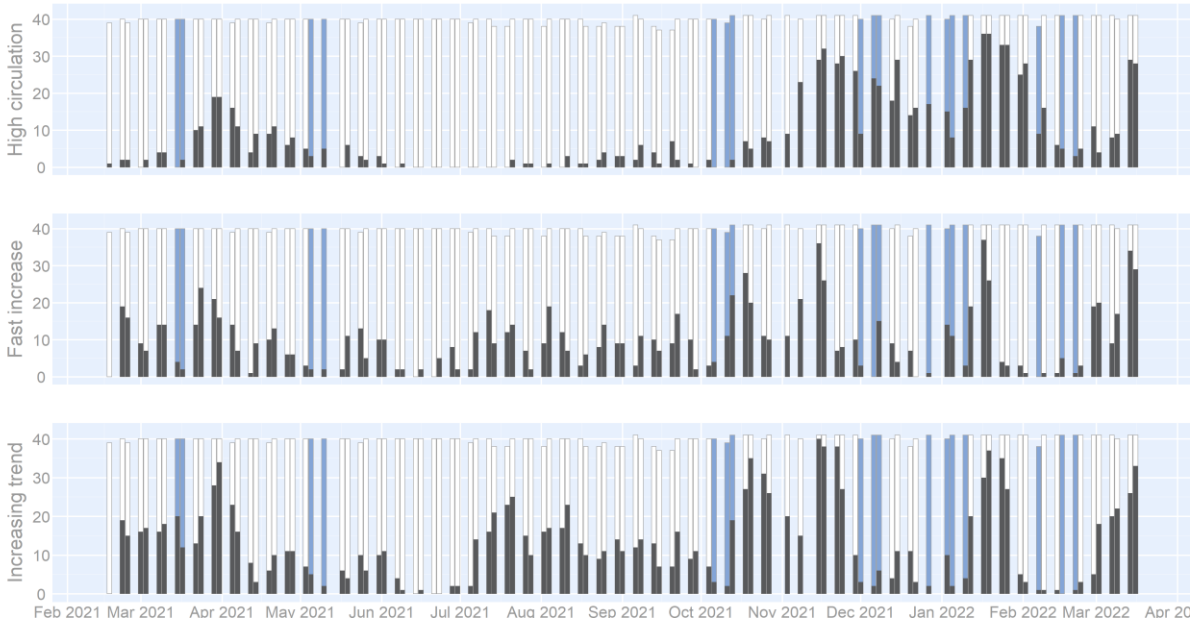


Figure 3: The number of areas (among the 41 covered by the wastewater surveillance this week and the 42 normally considered), with positive alerting indicators (black) compared to total number of areas considered every week in the wastewater surveillance (white). Latest results (last bar) from March 16th 2022. The white bars represent the total number of areas considered every week in the wastewater surveillance. The blue bars indicate dates at which an underestimation of the number of areas in which indicators are fulfilled due to dilution in the wastewaters.

4.4. VARIANTS

The Omicron variant represents a high proportion of all reported cases in Belgium[3]. The impact of the variant of concern Omicron was assessed to be negligible for the following reason: mutations present in the Omicron variant on the N1 and E genes could have potentially led to a drop out of those two genes leading to an underestimation of the viral concentrations in wastewaters. Preliminary experimental lab results indicate that no drop out of the genes should be expected. Hence, the sensitivity of the analytical lab 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.

[3] Source :Molecular surveillance of SARS-CoV-2

5. Appendix – Areas classified by alerting indicator

A 1: Covered areas (28 out of 41 on March 16th 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	1	1	1937	4228	1089	7	16/03/2022
Brabant Wallon	Basse Wavre (Dyle)	1	1	1	898	1238	2607	7	16/03/2022
Hainaut	Froyennes	1	1	1	659	859	422	14	16/03/2022
Brabant Wallon	Vallée du Hain (L'Orchis)	1	1	1	631	749	1077	7	16/03/2022
Liège	Soumagne	1	1	1	555	2415	1142	7	16/03/2022
Luxembourg	Arlon	1	1	1	403	778	482	16	24/01/2022
Hainaut	Wasmuel	1	1	1	340	543	587	16	16/03/2022
Namur	Mornimont	1	1	1	322	523	384	14	16/03/2022
Luxembourg	Marche-en-Famenne	1	1	1	285	566	870	21	14/03/2022
Hainaut	Mouscron versant Espierres	1	1	1	263	481	479	16	14/03/2022
Hainaut	Montignies-sur-Sambre	1	1	1	250	635	1607	9	24/01/2022
Namur	Namur-Brumagne	1	1	1	245	690	934	7	16/03/2022
Oost-Vlaanderen	Aalst	1	1	1	182	3716	193	14	15/11/2021
Liège	Amay	1	1	1	181	265	346	7	26/01/2022
Limburg	Hasselt	1	0	1	167	193	-48	28	17/01/2022
Liège	Liège Oupeye	1	1	1	123	280	3928	7	15/11/2021
Antwerpen	Mechelen-Noord	1	0	0	123	316	14	2	17/01/2022
West-Vlaanderen	Brugge	1	1	0	99	932	116	2	17/11/2021
Oost-Vlaanderen	Gent	1	1	1	99	1627	87	7	02/02/2022
Brussels	Brussel-South	1	1	1	97	10228	348	9	19/01/2022
Vlaams-Brabant	Leuven	1	0	0	95	2901	-28	2	17/11/2021
Hainaut	Marchienne-au-Pont	1	1	1	90	200	418	7	17/01/2022
Vlaams-Brabant	Grimbergen	1	1	1	79	2065	297	9	17/01/2022
West-Vlaanderen	Oostende	1	1	1	63	1662	75	16	19/01/2022
Antwerpen	Turnhout	1	1	1	63	247	122	16	17/01/2022
Limburg	Genk	1	0	1	58	219	-38	21	09/03/2022
Limburg	Tessenderlo	1	1	1	54	210	575	21	17/01/2022

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	1	1	1	53	2806	163	9	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.
[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 (29 out of 41 on the March 16th 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]
Liège	Liège Oupeye	1	1	1	123	280	3928	7	15/11/2021
Brabant Wallon	Basse Wavre (Dyle)	1	1	1	898	1238	2607	7	16/03/2022
Hainaut	Montignies-sur-Sambre	1	1	1	250	635	1607	9	24/01/2022
Liège	Soumagne	1	1	1	555	2415	1142	7	16/03/2022
Liège	Liège Sclessin	1	1	1	1,937	4228	1089	7	16/03/2022
Brabant Wallon	Vallée du Hain (L'Orchis)	1	1	1	631	749	1077	7	16/03/2022
Namur	Namur-Brumagne	1	1	1	245	690	934	7	16/03/2022
Luxembourg	Marche-en-Famenne	1	1	1	285	566	870	21	14/03/2022
Hainaut	Wasmuel	1	1	1	340	543	587	16	16/03/2022
Limburg	Tessenderlo	1	1	1	54	210	575	21	17/01/2022
Luxembourg	Arlon	1	1	1	403	778	482	16	24/01/2022
Hainaut	Mouscron versant Espierres	1	1	1	263	481	479	16	14/03/2022
Hainaut	Froyennes	1	1	1	659	859	422	14	16/03/2022
Hainaut	Marchienne-au-Pont	1	1	1	90	200	418	7	17/01/2022
Namur	Mornimont	1	1	1	322	523	384	14	16/03/2022
Brussels	Brussel-South	1	1	1	97	10228	348	9	19/01/2022
Liège	Amay	1	1	1	181	265	346	7	26/01/2022
Vlaams-Brabant	Grimbergen	1	1	1	79	2065	297	9	17/01/2022
West-Vlaanderen	Roeselare	0	1	1	15	1992	238	21	3rd wave

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	Deurne	0	1	1	5	305	228	21	3rd wave
Vlaams-Brabant	Liedekerke	0	1	1	42	1205	198	14	3rd wave
Oost-Vlaanderen	Aalst	1	1	1	182	3716	193	14	15/11/2021
Oost-Vlaanderen	Destelbergen	1	1	1	53	2806	163	9	3rd wave
Antwerpen	Turnhout	1	1	1	63	247	122	16	17/01/2022
West-Vlaanderen	Brugge	1	1	0	99	932	116	2	17/11/2021
West-Vlaanderen	Harelbeke	0	1	1	45	1092	104	9	18/10/2021
Oost-Vlaanderen	Gent	1	1	1	99	1627	87	7	02/02/2022
West-Vlaanderen	Menen	0	1	1	13	2817	79	14	3rd wave
West-Vlaanderen	Oostende	1	1	1	63	1662	75	16	19/01/2022

[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 (33 out of 41 on the March 16th 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]
Limburg	Hasselt	1	0	1	167	193	-48	28	17/01/2022
Antwerpen	Deurne	0	1	1	5	305	228	21	3rd wave
Limburg	Genk	1	0	1	58	219	-38	21	09/03/2022
Luxembourg	Marche-en-Famenne	1	1	1	285	566	870	21	14/03/2022
West-Vlaanderen	Roeselare	0	1	1	15	1992	238	21	3rd wave
Limburg	Tessenderlo	1	1	1	54	210	575	21	17/01/2022
Antwerpen	Aartselaar	0	0	1	19	113	57	16	29/11/2021
Antwerpen	Antwerpen-South	0	0	1	5	96	16	16	3rd wave
Luxembourg	Arlon	1	1	1	403	778	482	16	24/01/2022
Hainaut	Mouscron versant Espierres	1	1	1	263	481	479	16	14/03/2022

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]
West-Vlaanderen	Oostende	1	1	1	63	1662	75	16	19/01/2022
Antwerpen	Turnhout	1	1	1	63	247	122	16	17/01/2022
Hainaut	Wasmuel	1	1	1	340	543	587	16	16/03/2022
Oost-Vlaanderen	Aalst	1	1	1	182	3716	193	14	15/11/2021
Hainaut	Froyennes	1	1	1	659	859	422	14	16/03/2022
Vlaams-Brabant	Liedekerke	0	1	1	42	1205	198	14	3rd wave
West-Vlaanderen	Menen	0	1	1	13	2817	79	14	3rd wave
Namur	Mornimont	1	1	1	322	523	384	14	16/03/2022
Brussels	Brussel-South	1	1	1	97	10228	348	9	19/01/2022
Oost-Vlaanderen	Dendermonde	0	0	1	34	122	45	9	17/01/2022
Oost-Vlaanderen	Destelbergen	1	1	1	53	2806	163	9	3rd wave
Vlaams-Brabant	Grimbergen	1	1	1	79	2065	297	9	17/01/2022
West-Vlaanderen	Harelbeke	0	1	1	45	1092	104	9	18/10/2021
Hainaut	Montignies-sur-Sambre	1	1	1	250	635	1607	9	24/01/2022
Liège	Amay	1	1	1	181	265	346	7	26/01/2022
Brabant Wallon	Basse Wavre (Dyle)	1	1	1	898	1238	2607	7	16/03/2022
Oost-Vlaanderen	Gent	1	1	1	99	1627	87	7	02/02/2022
Liège	Liège Oupeye	1	1	1	123	280	3928	7	15/11/2021
Liège	Liège Sclessin	1	1	1	1,937	4228	1089	7	16/03/2022
Hainaut	Marchienne-au-Pont	1	1	1	90	200	418	7	17/01/2022
Namur	Namur-Brumagne	1	1	1	245	690	934	7	16/03/2022
Liège	Soumagne	1	1	1	555	2415	1142	7	16/03/2022
Brabant Wallon	Vallée du Hain (L'Orchis)	1	1	1	631	749	1077	7	16/03/2022

[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 4: Covered areas (5 out of 41 on the March 16th 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]
Antwerpen	Antwerpen-North	0	0	0	11	35	-69	0	29/11/2021
Vlaams-Brabant	Beersel	0	0	0	29	1842	59	2	19/01/2022
Brussels	Brussels-North	0	0	0	38	3015	41	0	12/01/2022
Limburg	Houthalen-Centrum	0	0	0	0	0	0	0	24/01/2022
Oost-Vlaanderen	Sint-Niklaas	0	0	0	33	361	4	2	17/01/2022

[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.