COVID-19 SURVEILLANCE
FREQUENTLY ASKED QUESTIONS

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1. General context

1.1. WHAT IS THE ROLE OF SCIENSANO DURING THE COVID-19 EPIDEMIC?

The World Health Organization (WHO) and the European Union (EU) require each Member State to have a structure capable of dealing with any health crisis. To this end, Belgium has set up a strong structure with 3 components:

1. Risk Assessment Group (RAG)
2. Risk Management Group (RMG)
3. National Focal Point (NFP)

Sciensano (the Belgian institute for health) coordinates the RAG which is in charge of assessing risks to public health in a national and international context. The RAG analyses any signal that may have an impact on health. The RAG is composed of permanent members who are public health experts, supported by specific experts who are invited according to the type of signal such as an infectious disease, an environmental problem, etc. The RAG proposes prevention and control measures to the RMG, which is composed of the health authorities and decides on the measures to be applied. The NFP, including amongst others the Federal Service for Public Health, ensures the implementation of measures in consultation with the various entities. The NFP acts as a relay for communication with European and international institutions. More information on the role of Sciensano in the context of emergency and response can be found on our website.

At the request of the health authorities, Sciensano also coordinates the development of the procedures to be implemented by general practitioners, hospitals, patients and laboratories in the context of the COVID-19 epidemic. It is the Risk Management Group that validates the content of the procedures and then they become operational. These procedures can be found on our website (in Dutch • in French • in German).

Finally, Sciensano has a legally determined surveillance task in the context of public health as laid down by the federal law of 25 February 2018 (in Dutch • in French). As part of this task, Sciensano has put a surveillance system in place to monitor the COVID-19 epidemic in Belgium and to report on the data that are collected.

1.2. WHICH DATA DOES SCIENSANO COLLECT FOR THE COVID-19 SURVEILLANCE?

In order to get comprehensive information to monitor the COVID-19 epidemic, Sciensano brings together data streams from different sources. Sciensano collects data on lab-confirmed COVID-19 cases (see section 3), testing (see section 4), hospitalized COVID-19 patients (see section 5) and COVID-19 deaths (see section 6).
1.3. HOW DOES SCIENSANO ENSURE DATA QUALITY IN TIMES OF A HEALTH CRISIS?

*Question added 07/04/2020 | Last updated 07/04/2020*

In times of a health crisis, Sciensano continuously monitors the situation in the field and sets up relevant data collection procedures. The data collected need to be checked and consolidated in order to get them reliable. Also, data import by the data providers can’t always be done immediately, so it can take a while before a dataset is complete and “stable”.

1.4. IS THERE A GENERAL RULE WHEN INTERPRETING THE COVID-19 DATA?

*Question added 07/04/2020 | Last updated 24/09/2020*

We take a kind of data “snapshot” every day. In such a context, it is important to be careful when interpreting absolute numbers (see also the delay in reporting as referred to in question 1.3). There is a tendency to focus on these numbers in terms of “risk” whilst in order to monitor the evolution of the COVID-19 epidemic, it is necessary to follow trends instead of absolute numbers.

During the press conference of the Home Affairs crisis centre, the interfederal COVID-19 spokesman communicates a number of clear key figures on the COVID-19 epidemic and discusses the important trends of that moment.

1.5. WHERE CAN I FIND THE DATA COLLECTED BY SCIENSANO?

*Question added 07/04/2020 | Last updated 24/09/2020*

The risk managing authorities (RMG) receive daily an epidemiological report. That way they can base their actions and decisions on accurate and up-to-date information.

Based on these reports, the interfederal COVID-19 spokesman discusses the epidemiological situation during the press conference of the Home Affairs crisis centre.

The epidemiological report (in Dutch • in French) is also publicly available on our website.

You can also stay up to date with the latest figures via:

- raw data and the corresponding codebook
- dynamic graphs
1.6. WHAT KIND OF DATA IS AVAILABLE IN THE COVID-19 OPEN DATA PORTAL?

*Question added 07/04/2020 | Last updated 24/09/2020*

You can consult specific datasets via our website (free of charge). These are updated daily during the night.

The following datasets are published as open data:

- confirmed cases by date, age, sex and province
- confirmed cases by date and municipality
- cumulative number of confirmed cases by municipality
- hospitalizations by date and provinces
- mortality by date, age, sex, and province
- total number of tests performed by date

1.7. FOR WHICH PURPOSES ARE THE SURVEILLANCE DATA USED?

*Question added 07/04/2020 | Last updated 07/04/2020*

The authorities and the Risk Management Group (RMG) use these data to manage this health crisis. Additionally, mathematical modelers use these data to predict the future course of the epidemic taking into account the measures taken. We also share our data with the European Centre for Disease Control (ECDC) and the World Health Organization (WHO) so that they can draw an accurate picture of the international situation.
2. Epidemiological terminology

2.1. WHAT IS THE DIFFERENCE BETWEEN INCIDENCE, PREVALENCE AND OTHER BASIC EPIDEMIOLOGICAL CONCEPTS?

*Question added 07/04/2020 | Last updated 07/04/2020*

In our reports, we use different epidemiological measures to characterize the current COVID-19 pandemic and its evolution. We use these terms in a vulgarized way to be understandable by the general public. Hence, our definitions may differ from the classical textbook definitions of these measures. Overall, we report 5 distinct measures:

- Number of new cases: the number of new confirmed cases, hospitalizations, or deaths reported (daily update).
- Incidence: the number of new cases, hospitalizations, or deaths reported during a certain period (for example: last 24 hours), relative to the population size.
- Cumulative number of cases: the total number of confirmed cases, hospitalizations, or deaths reported since the beginning of the outbreak or a specific starting point.
- Cumulative incidence: the total number of confirmed cases, hospitalizations, or deaths reported since the beginning of the outbreak or a specific starting point, relative to the population.
- Prevalence: the number of cases present at a given moment. It corresponds to taking a snapshot of the situation at a specific moment in time. For instance, we report the prevalence of occupied hospital beds, i.e., the total number of hospital beds occupied by COVID-19 patients at a given moment.

2.2. WHAT POPULATION IS USED FOR CALCULATIONS OF THE INCIDENCE?

*Question added 23/06/2022 | Last update 23/06/2022*

The most recent official figures for the legally registered population in Belgium are used as denominators. The population figures as of 1 January 2020 were used until July 2021, when the population numbers for 2021, published by STATBEL were used. The population figures as of 1 January 2022 were published by STATBEL on 16 June 2022 and are used since 23 June 2022 (STATBEL; population as at 1 January 2022).

2.3. WHAT IS THE MOVING AVERAGE AND HOW IS IT CALCULATED?

*Question added 30/03/2021 | Last updated 30/03/2021*

In order to obtain a better visualization of the curves we want to avoid daily fluctuations. Therefore, a smoothed curve is created based on the moving average over 7 days on the different indicators. This moving average is calculated for a day D as the arithmetic mean of the indicator over the period D-6 to D.

To find out how (positive or negative) an indicator is evolving, its change (in percentage) compared to the value of the previous week is calculated. To do so, we calculate the difference between the moving averages, on day D and day D-7, divided by the moving average on day D-7.
However, it is very important to mention that the moving averages and evolutions reported on day D are based on consolidated data, thus until D-4 (see question 1.3/3.5 above). This means that the moving average presented in our graph is calculated for the period D-10 to D-4.

The evolution of the average for the aforementioned period is calculated for the period D-17 to D-11 (for example, the average reported on 28/10 is, in fact, calculated based on the data from 18/10 to 24/10. The evolution reported on 28/10 is calculated by comparing the average on 24/10 (data from 18/10 to 24/10) with the average on 17/10 (data from 11 to 17/10).

The graph below shows the number of daily cases and the moving averages. The graph showing the corresponding evolution is placed underneath. The moving average (green line) shows a 3-day time delay compared to the raw data. This is due to the fact that the average value of the interval was not imputed at the center of the interval but at the end of it. The yellow line shows the moving average if it was imputed at the center of the interval.

As the evolution is also calculated at the end of a 7-day interval, a second delay of three days is observed on the evolution graph (see figure below).

The curves smoothed by average over 7 days and the evolutions are calculated to illustrate trends. The critical points of the curves (inflection points, maximum, minimum, etc.) should therefore not be associated to specific dates.
2.4. WHAT DATES DEFINE THE WAVES OF THE COVID-19 EPIDEMIC IN BELGIUM?

Question added 30/03/2021 | Last updated 02/06/2022

The first wave of the epidemic took place in Belgium from March 1 to June 22, 2020. The second wave of the epidemic started on August 31, 2020, the period between June 22 and August 31 has been defined as an “interwave” period. The third wave occurred from February 15 to June 27, 2021. There was no clearly observed “interwave” period between the second and third waves. The fourth wave started on October 4, 2021, the period between June 27 and October 4 has been defined as an “interwave” period. The fifth wave started on December 27, 2021, and the sixth wave on February 28, 2022. No “interwave” period between the fourth and fifth waves and between the fifth and the sixth waves have been clearly observed. When there is no specific “interwave” period or when the date of the end of a wave is not explicitly mentioned, this date corresponds to the starting date of the next wave.

2.4.1. Why is it important to define a specific date to mark the beginning and the end of an epidemic wave?

Determining a date that marks the beginning and end of an epidemic wave is essential for epidemiological analyses and for a harmonized description of data coming from different surveillance systems.

2.4.2. How were these dates defined?

The knowledge and approach to the COVID-19 epidemic (affected groups, characteristics of hospitalized patients, circulation of different variants, ...) has changed significantly over time. This has had an impact on the indicators used to survey the evolution of this epidemic. Each wave has its own specificities, therefore there is no fixed combination of indicators that determine the start of a new wave.

The start of the COVID-19 epidemic and therefore the start of the first wave is defined as the date of the first case diagnosed in Belgium, i.e. 1 March 2020. The end of the first wave of the epidemic was defined based on the fact that the number of confirmed cases was at its lowest on 22 June 2020.

The start of the second wave was defined on the basis of the evolution of the number of new cases as well as the number of hospitalizations. The week of 31 August was the first week after the end of the first wave in which both the evolution of the number of new cases and the evolution of hospital admissions remained positive throughout the week. Thereafter, both indicators remained positive for a significant period of time. For more information on the determination of the start date of the second wave of the epidemic please see the corresponding explanatory note (NL/FR).

The start of the third wave was determined on the basis of the number of new hospitalisations and the number of occupied hospital and intensive care beds, which are the two most important indicators of this wave. These indicators increased substantially as of week 7 2021, i.e. from 15 February 2021. Their increase had been preceded by the increase in the number of cases by one week and was followed by the increase in the number of COVID-19 deaths two weeks later.

The start of the fourth wave was defined based on the number of new hospitalizations. Indeed, the week 40 2021, and more precisely from October 4, 2021, has marked the start of the
increase of the number of hospital admissions. Moreover, an increase in the number of cases has been observed during this week, with an acceleration of the speed of this increase.

The start of the fifth wave has been principally established based on the number of new cases as well as on the speed at which this number of new cases has increased. Since week 52, starting from December 27, those two indicators have greatly increased, marking the start of the fifth wave. Additionally, the number of new hospitalizations has also increased since that week.

The start of the sixth wave was defined on the basis of an increase in the number of new hospitalisations, which was observed from week 9 (28 February 2022) after several weeks of decrease.
2.5. WHICH SCALE IS USED FOR THE GEOGRAPHICAL COLOURED MAPS IN THE EPIDEMIOLOGICAL REPORT?

Question added 31/08/2021 / Last updated 31/08/2021

The geographical maps that are presented in the report use a continuous scale, illustrated by colour gradients, in order to adapt the maps in an optimal way to the values of the variables presented on the maps. The scales used in the report present only continuous quantitative variables, like, for example, the number of cases, the incidence, the number of tests performed or the positivity rate.

2.5.1. What is a continuous scale?

The continuous scale that is used in the report is a numerical scale that can extend to an infinitive amount of values. It is a progressive scale indicated by colours (from lighter tonality to darker).

The intervals shown above the coloured scale are automatically calculated based on the two extreme values (minimum and maximum) of the presented variable at a given moment. (For example, on the map above, presenting the positivity rate per province in the report of the 25th of August 2021, the lowest value on that date was 3,8%, while the highest value was 7%. The colour scale is thus adapted to this interval of values). The scales were implemented in a continuous way to provide a better visualisation of the geographical differences observed at a certain moment.

Such scale, with an automatic adaptation of the intervals, is more suitable than a scale with fixed values, given the fact that the maps show variables that could fluctuate enormously depending on the evolution of the epidemiological situation.
3. Data on lab-confirmed COVID-19 cases

3.1. HOW DO WE COLLECT DATA ON LAB-CONFIRMED COVID-19 CASES?

Question added 07/04/2020 | Last updated 19/01/2021

According to the COVID-19 case definition and the recommendations for testing (Dutch • French), persons are diagnosed on the basis of a laboratory test carried out by the laboratory of the National Reference Centre (KU Leuven) or by a peripheral clinical laboratory, by the national testing platform, or by the network of university laboratories. The diagnostics include PCR tests, antigen tests as well as rapid antigen tests. Patients with a positive laboratory result are confirmed cases.

Data collection includes the number of tests performed, positive and negative results, as well as basic demographic data (age, gender, postcode) collected via application forms sent to Sciensano by the different laboratories performing COVID-19 diagnostics.

Since the 9th of April 2020, the national testing platform has been operational. This platform carries out tests for nursing homes, other residential collectivities and triage centers.

The data on lab-confirmed COVID-19 cases are summarized in the daily reports (Dutch • French), dynamic graphs and are available through the open data portal.

3.2. WHICH DATA DO WE USE TO REPORT LAB-CONFIRMED CASES AND PERFORMED TESTS?

Question added 30/09/2020 | Last updated 19/01/2021

As is typical for intervention epidemiology, Sciensano adapts its data collection in function of the evolution of the epidemic and the needs for the crisis management. Therefore, COVID-19 data used to report have evolved over time.

At the beginning of the epidemic (February 2020), we reported new cases based on the notification by the regional health authorities to Sciensano. This notification was done by structured forms through the system of mandatory declaration of infectious diseases which has been in place for years.

During this period of the epidemic, the National Reference Center for respiratory pathogens (NRC) was the only laboratory in Belgium performing PCR tests for SARS-CoV-2. From the end of February, some other laboratories started to perform PCR tests, but during this first period the positive samples from these laboratories were forwarded to the NRC for confirmation.

Cases notified by the mandatory declaration system were linked to a positive PCR test from the NRC. In some cases, e.g. when a positive sample, originating from another laboratory, was confirmed by the NRC, the notification of the regional health authorities reached Sciensano more quickly than the confirmation result from the NRC. Thus, during this period we used the mandatory notifications in combination with the NRC laboratory test results, to complete the dataset used to report confirmed cases.
By 15 March 2020, the number of tests performed and the number of confirmed cases importantly increased. Regional health authorities stopped using the structured forms and prospective reporting was mainly based on laboratory test results.

During the first weeks of March, more and more Belgian clinical laboratories implemented the analysis for SARS-CoV-2. From 15 March 2020, these laboratories started to notify Sciensano directly. Simultaneously, as it was no longer mandatory, most laboratories stopped to forward positive samples to the NRC for confirmation. By 30 March 2020, more than 40 laboratories were performing PCR and antigen tests and providing the results to Sciensano. In this way the database for confirmed cases was built up.

On 9 April 2020 the National testing platform was put in place in order to increase the testing capacity. Testing was performed among others by pharmaceutical and university laboratories. The National platform has mainly been carrying out tests for samples taken in nursing homes, other residential collectivities and triage centers. Results from the National platform were therefore added to those notified by the NRC and the other clinical laboratories.

In addition to the described data flow, on 5 May 2020, all laboratories (NRC, clinical laboratories and National testing platform) were asked to send their COVID-19 data also to the Healthdata.be platform, the department of Sciensano for data standardization. A new database for COVID-19 was developed over the following months. During this time, a double flow of data was crucial for comparison and validation of this new database.

Since September 26, only data from the new database from the Healthdata.be platform is used for reporting.

As of 16 December 2020 patients with a positive rapid antigen tests are also counted as a confirmed case.

3.2.1. What is the Healthdata.be platform?

The Healthdata.be platform is a standardization system for health-related scientific data flows developed by Sciensano and funded by INAMI-RIZIV

The Healthdata.be platform allows health professionals to collect data in a standardized and completely digitalized way. The resulting databases can then be transferred to Sciensano scientists for surveillance purposes and are subsequently used to inform health policy makers.

Different sources of data related to COVID-19 (laboratory data, contact tracing, serology, hospital data among others...) have been progressively integrated in the Healthdata.be platform. For more information on Healthdata.be, please click [here](#).
3.2.2. What are the advantages of the Healthdata.be platform?

Firstly, it allows to collect data via a single data flow. This lowers the workload for laboratories as they can transfer their data at once.

Secondly, a single data flow implies that the data is stored in a unified database, making it possible to link all data from a single patient through a unique identifier (national register number). This improves the efficiency and accuracy of the data management. In order to protect patients identity and privacy, data is (pseudo)anonymized and highly secured control mechanisms are in place.

Lastly, the healthdata.be platform is also used by other services within Sciensano. Therefore, data from different sources could be combined for more in-depth analyses through the unique identifier provided agreement of the privacy commission.

3.3. HOW DO WE ENSURE THAT WE ONLY TAKE THE NEW CASES INTO ACCOUNT?

Persons might be tested more than once (see question 4.3). To assure that only the new cases are counted, a system of deduplication is put in place.

Until October 22 2020 duplicates of reported positive test results were removed based on date of birth/gender/postal code and only the first positive test was taken into account as a new confirmed case (see also question 4.2).

Since October 23 2020, the deduplication process has changed. The combination of age/gender/postal code to identify duplicates is no longer used because the national register number is now available (see question 3.2.2). In addition, a period of time between a first and second positive test is taken into account before considering the second positive test as a possible re-infection. This period of time was initially set at 8 weeks and has been extended to 90 days based on the RAG advice of March 29, 2021 that states that an interval of at least 90 days is needed to consider a second positive PCR test as a potential reinfection. Since April 1st 2022, this period has been shortened to 60 days (see Sciensano advice from March 30 2022).

Duplicates are thus removed based on the national register number if this person already had another positive test within the last 60 days. In this case only the first positive test result within this timeframe is retained.

3.4. WHY IS IT HARD TO COMPARE CASE NUMBERS FROM DIFFERENT COUNTRIES?

Each country has its own testing strategy to determine who should be tested for COVID-19. This strategy evolves and can be adapted to the epidemiological evolution and available resources.
In Belgium, for example, from 11 March 2020, only hospitalized persons with acute respiratory complaints, even if they are mild, as well as health personnel and symptomatic people (up to 5 people) were tested in residential communities such as nursing homes.

In addition, since 10 April 2020, the staff and residents of residential care centres have been systematically tested as part of a specific screening strategy targeting nursing homes only.

On 22 April 2020, the testing strategy was extended and since that date, anyone requiring hospitalisation, including day hospitalisation (first time), can be tested. On top of that, any person entering a residential community for the first time (e.g. nursing homes, homes for disabled, youth centres, prisons, etc.) or any resident of that residential community with compatible symptoms can also be tested.

On 15 May 2020, the testing strategy was extended once again in the context of the deconfinement strategy. From then on, all persons with a possible COVID-19 infection will be tested, as well as persons who had a high-risk contact with a COVID-19 case and who are themselves in professional contact with people who are at risk of developing a serious form of the disease. (link to case definition and testing)

The implementation of testing strategies and the overall epidemiological timelines differ between countries. Therefore a direct comparison of case numbers between two countries remains difficult.

3.5. WHY IS THE REPORTED NUMBER OF CONFIRMED CASES ALWAYS LOW FOR THE LAST REPORTED DAY (I.E. ‘TODAY’)?

Question added 07/04/2020 | Last updated 23/06/202

There are two important reasons for this apparent underestimation:

1. Firstly, in order to produce the daily reports and open data, we take the situation at 4PM. The data for the last day in the time series are therefore always incomplete.

2. Secondly, the reported data for the last 4 days always require progressive consolidation. The data are mainly displayed on the date the sample was taken. The analysis in the laboratory obviously takes time, as do the subsequent reporting and processing of the data. Therefore, the number of positive samples taken ‘today’ is only integrated in the data in the course of the following days.

Both issues imply that the data reported for the last 2 days will be updated in future iterations of the daily reports and open data. In other words, our database is dynamic and subject to continuous updating and improvement of the already reported data.
3.6. WHY DO THE MAPS WITH NUMBER OF CASES VERSUS THE ONES WITH INCIDENCE/1000 POPULATION LOOK SO DIFFERENT?

*Question added 07/04/2020 | Last updated 01/05/2020*

The maps with the (absolute) number of cases per municipality make it easy to see where the largest number of cases are. However, these results are also strongly influenced by the population density of the different municipalities. Indeed, it is easier for larger municipalities, with larger numbers of inhabitants, to accumulate a larger number of COVID-19 cases.

To directly compare the burden of disease between different municipalities with different numbers of residents, we therefore also calculate and map the number of new cases in function of the number of residents. We currently calculate incidence rates per 1000 inhabitants. These maps can give an indication of where the “risk” of infection is highest.

3.7. WHY ARE THERE ALWAYS LESS CASES REPORTED DURING THE WEEKENDS?

*Question added 07/04/2020 | Last updated 24/09/2020*

We observe that less cases are being reported over the weekends (see figure in the lighter green). This can be due to several factors:

1. First of all, patients may be reluctant to go to the general practitioner or the hospital during the weekend and rather wait until Monday.

2. Secondly, less staff may be working in the hospitals and in the diagnostic labs on weekends, which may delay the processing of samples and the reporting of results.

We mainly see this effect in the number of reported cases, less so in the number of hospitalizations, and almost not in the number of deaths.
3.8. ARE SEROLOGICAL RESULTS ALSO INCLUDED IN THE NUMBER OF CONFIRMED COVID-19 PATIENTS?

Question added 23/06/2020 | Last updated 23/06/2020

Persons with only a positive serological test are not included in the figures of confirmed cases, as a serological test examines the presence of antibodies and does not indicate an acute infection. A positive serological test confirms that the person has had a COVID-19 infection. In most cases these are older infections and have already been cured. Therefore, these test results are not included in the reporting of new cases.
4. Data on the tests performed and the positivity ratio

4.1. WHAT IS THE POSITIVITY RATIO AND HOW IS IT CALCULATED?

The positivity ratio describes which proportion of all the performed tests are positive for a certain time period (e.g. per day or per week). Therefore, to calculate it, we divide the total number of positive tests by the total number of tests for a certain time period.

Example: When, in a certain time period, among 100 persons, there are 5 positive tests and everybody got tested only once, the positivity ratio is 5% and there are 5 new cases.

It is important to bear in mind that the testing strategy has changed a lot since the beginning of March (also see question 3.3). As a result, comparing positivity ratio over time should be done with caution.

4.2. WHY IS THE POSITIVITY RATIO IN THE EPIDEMIOLOGICAL REPORT NOT EQUAL TO THE NUMBER OF DIAGNOSED CASES DIVIDED BY THE TOTAL NUMBER OF TESTS FOR THAT SAME TIME PERIOD?

1. Since March 15 the laboratories are participating in the reporting of PCR tests. It can be noted that the number of positive tests is larger than the number of cases. This is because a positive PCR test is not counted as a new case when there had been a positive test for this person within a reference period (see question 3.3). Therefore, duplicates have been removed and only the first positive test of a person is taken into account. Depending on the testing strategy, the proportion of people with a previous positive test varies. Stricter application of the testing strategy will result in fewer people being tested, as was the case at the beginning of the epidemic. This reduces the chance of a person testing positive twice and thus the respective share in the total number of tests.

Example: In a given time period, 100 people are tested of which 1 person has already been tested positive at least once. If 5 of those 100 tests are positive, the positivity ratio is 5%. However, there are only 4 new cases because several positive results come from the same person.

2. For the time period until March 15, the number of new cases is higher than the number of positive tests. This is explained by the fact that at the beginning of the epidemic, new cases were notified by the regional health authorities to Sciensano. They used the system of mandatory declaration of infectious diseases that has been in place for years. It was not possible to retrospectively link all of these declarations back to a positive PCR test. These possible cases were counted as confirmed cases. As the PCR test result was not available for these cases, they were not included in the calculations of the positivity rate.
4.3. FOR WHAT REASONS CAN A PERSON BE TESTED SEVERAL TIMES? AND HOW BIG IS THE SHARE OF THESE MULTIPLE TESTS?

Question added 18/09/2020 | Last updated 18/09/2020

There are several situations in which a test is indicated, for example when developing possible COVID-19 symptoms, when returning from an orange or red zone, after a high-risk contact with a confirmed case of COVID-19 or in the context of screening in residential collectivities. On one hand, a person may find himself in several of these situations, on the other hand, he may be tested several times in the same situation.

Preliminary analyses of the data available in Sciensano's database (up to September 17) indicated that 24% of the patients that were tested actually had been tested more than once. Among them, 14% tested positive more than once.

4.4. WHY IS THE NUMBER OF POSITIVE TESTS IN THE OPEN DATA TABLE “TESTS” NOT THE SAME AS THE NUMBER OF CASES IN “CASES_AGESEX”? 

Question added 30/09/2020 | Last updated 30/09/2020

The number of positive tests (TESTS) refers to the total number of tests that yielded a positive result. Sometimes the same person undergoes multiple tests, and can therefore yield multiple positive tests (see question 4.3). In order to obtain the number of cases (CASES_AGESEX) we perform a deduplication process, after which only the first positive test of a person is taken into account. i.e. number of unique individuals with at least one positive tests (see question 4.2).

Moreover, the number of positive tests are aggregated by date of laboratory diagnosis (or date of sampling if date of diagnosis was not available), while the number of cases are aggregated by date of symptoms onset (or, if not available, date of diagnosis or notification). A person does not always have the possibility to get tested on the first day of symptoms. Moreover the result, and thus the diagnosis, is not always known on the same day of the sampling. Therefore the test result of a person diagnosed with COVID-19 might be included as a positive test (TESTS) on a different date than the inclusion as a case (CASES_AGESEX).

This reflects the fact that indicators on performed tests are used for monitoring laboratory capacity, while the number of cases is an epidemiologic indicator. As a result of this difference, sometimes the number of new cases will be higher than the number of positive tests and sometimes, for a given date, it could be lower. Therefore, they shouldn’t be compared, as they do not refer to the same dates.
5. Data on hospitalized COVID-19 patients

5.1. HOW DO WE COLLECT DATA ON HOSPITALIZED COVID-19 PATIENTS?

Question added 07/04/2020 | Last updated 30/03/2021

Two separate surveys provide us data about hospitalization:

- All Belgian general hospitals should provide aggregated data on the number of hospitalized and deceased COVID-19 patients through a daily online survey (Surge Capacity survey). Psychiatric and rehabilitation hospitals do not register in this surveillance. Participation to this surveillance is mandatory for all general hospitals (Royal Decree of 30.04.2020) and can therefore be considered as containing exhaustive data on the number of COVID-19 patients within Belgian general hospitals. It is meant to follow the daily evolution of COVID-19 patients in Belgian hospitals and contains data on both prevalence (number of patients currently in the hospital, number of patients currently in ICU, number of patients receiving ventilation support and ECMO [extracorporeal membrane oxygenation]) and incidence (number of new admissions, number of discharges, number of deaths). Since 24 March 2020, this database is the official reference to follow up COVID-19 deaths in hospitals.

You can find this information in the daily report (Dutch • French), the Epistat dashboard and the open data portal.

- Additionally, all hospitals in Belgium provide case-based data on their hospitalized patients with a confirmed COVID-19 infection (Clinical Hospital Surveillance) through an online survey comprising 3 questionnaires: one on admission information, one on discharge information and a third in case the patient is admitted in ICU. This data collection is not exhaustive but is representative for the population of hospitalized COVID-19 patients in Belgium. In the Clinical Hospital Surveillance information is collected on demographic data, comorbidities (underlying diseases), symptoms at admission, medication and treatments received during hospitalization and complications from COVID-19. These data are used to examine patient profiles, to monitor these over the course of the epidemic and to examine the association of these profiles with development of severe disease, admission in ICU and/or death.

Information obtained from the Clinical Hospital Surveillance can be found on the Epistat dashboard, the weekly report and in the thematic reports published on the Epidemiological situation page of the Sciensano COVID-19 webpage

More information regarding the methodology of both hospital surveillance systems can be found in the following publication:
5.2. WHY IS THE DIFFERENCE BETWEEN THE NUMBER OF HOSPITALIZED PATIENTS BETWEEN 2 CONSECUTIVE DAYS NOT THE SAME AS THE DIFFERENCE BETWEEN NEW INTAKES AND DISCHARGES TODAY?

Question added 07/04/2020 | Last updated 30/03/2021

We will use the daily report of 28/03 to answer this question. The report can be downloaded in Dutch or French.

This apparent discrepancy has many reasons, and the relative importance of each specific reason will vary from day to day. Important to note is that incidence (new intakes, “NEW IN”) and prevalence (occupied beds, “TOTAL IN”) are queried separately; we thus do not (and cannot) mathematically derive one from the other:

a) A difference in prevalence is not only the result of new intakes and discharges, but also of new hospital deaths.

b) Approx. 99% of hospitals report each day, but the subset of reporting hospitals may vary from day to day; even one (large) hospital reporting or not can already give noticeable differences.

c) New ‘confirmed’ hospitalized patients might not always be reported as ‘new intakes’ if the patient was already hospitalized as a ‘suspected’ patient because the test result is not available at the moment of reporting. They would however be counted in the prevalence from the moment that the test result turns out positive. We are working with the hospitals to increase consistency in reporting in order to count patients who were hospitalized but got a positive test result at a later time as new confirmed COVID-19 patients. The same applies to internal hospital outbreaks of COVID-19 infections among already hospitalized patients.

d) In light of the advice published on April 22, 2020 on the extension of test indication criteria (all patients admitted in hospital could be tested, irrespective of the reason of admission), since April 30 2020 patients are stratified according to pathology. Patients admitted for non-COVID-19 reasons but that are tested positive in a screening context are registered separately and are not counted in the daily new patients that are daily reported (“NEW IN”). It is however possible that these patients are isolated on a COVID-19 unit and thus counted in the prevalence count (“TOTAL IN”).

5.3. WHAT EXACTLY IS MEANT BY THE TOTAL NUMBER OF HOSPITAL ADMISSIONS?

Question added 29/01/2021 | Last updated 30/03/2021

The number of new COVID-19 patients that is daily monitored and reported in the reports, dashboard and open data (“NEW IN”) contains the new laboratory-confirmed COVID-19 patients over the last 24 hours, admitted because of COVID-19 and not referred from another hospital. Also patients admitted previously for COVID-19 but getting a positive test result during the last 24 hours are counted in this number. Patients admitted because of another pathology and being tested positive in a screening context are registered separately and are not included in this number.
5.3.1. What exactly is meant by the total number of hospital admissions?

Question added 17/06/2020 | Last updated 30/03/2021

We will use the daily report of 09/03/2021 to answer this question.

1. Kerncijfers - Trends

Between 15/03/2020 (the date after which more than 99% of hospitals participate in data collection) and 08/03/2021, 58 246 COVID-19 symptomatic patients confirmed by the lab were admitted to the hospital. When interpreting this figure, it is important to consider the following information:

- It concerns only the lab-confirmed patients who were hospitalized because of COVID-19. Patients who were hospitalized because of another cause but tested positive in a screening context are registered separately since 30/04/2020 and are not included in this figure.

- Patients admitted previously for COVID-19 but receiving a positive test result during the last 24 hours (new ‘confirmed’ hospitalized patients) should also be counted in this number. However, depending on the hospitals’ internal data systems, patients for whom no lab confirmation was (yet) available at the time of reporting are not consistently reported at the moment the test result turns out positive, leading to an underestimation of the number of newly confirmed COVID-19 patients. It only concerns the new patients for whom a lab confirmation was available at the time of reporting. Patients for whom no lab confirmation was (yet) available at the time of reporting were reported as new hospitalizations under the category ‘CT confirmed or possible cases’ in the survey.
5.4. HOW ARE NEW HOSPITALIZATIONS CATEGORIZED BY PROVINCE?

Question added 30/03/2021 | Last updated 30/03/2021

The hospitals register by their recognition number. A recognition number can contain multiple hospital campuses/sites. The recognition number is linked to a zip code and thus the province of the main campus/site. In an exceptional case not all campuses/sites lie in the same province. This is the case for one recognition number that belongs to Brussels Capital Region but has a campus/site in Brabant wallon. As we do not have data per hospital campus, it is impossible to correctly break down the data per province in this case.

Within the Surge Capacity Surveillance, the number of hospitalisations is aggregated per hospital. Given the lack of individual patient information within this surveillance, new admissions are classified according to the province of the hospital where the patient was hospitalised. We estimated from the individual patient data collected through the non-exhaustive Clinical Hospital Surveillance that 87% of patients are hospitalised in a hospital located in the province where the patient lives.
6. Data on COVID-19 deaths

6.1. HOW DO WE COLLECT DATA ON COVID-19 DEATHS?

Question added 07/04/2020 | Last updated 08/04/2022

Sciensano collects and combines data on all deaths due to possible or confirmed COVID-19 through several sources:

- daily reporting from the hospitals to Sciensano (see question 5.1).
- daily reporting from nursing homes to the regional authorities.
- mandatory declaration for general practitioners to the regional authorities.

For more details on the methodology of COVID-19 mortality surveillance see section 3.3. of the report on COVID-19 mortality surveillance in Belgium or the publication "Establishing an ad hoc COVID-19 mortality surveillance during the first epidemic wave in Belgium, 1 March to 21 June 2020" (Eurosurveillance, 2021).

6.2. HOW ARE DEATHS REPORTED IN BELGIUM IN COMPARISON TO OTHER COUNTRIES? HOW CAN WE COMPARE THESE NUMBERS?

Question added 07/04/2020 | Last updated 08/04/2022

Each country has its own reporting strategy of COVID-19 deaths, linked to its ability to implement out-of-hospital data flows.

In Belgium, deaths in hospitals are reported by hospitals through the “hospital surge capacity survey”. Deaths for which the COVID-19 infection has been confirmed by a laboratory test or on the basis of a CT scan of the thorax with suggestive clinical presentation of COVID-19 are reported as “deaths of confirmed case”. Deaths from patients who were not tested for COVID-19 but who met the clinical criteria for COVID-19 as determined by a clinician, are reported as “deaths of possible cases” (see the case definition/testing: Dutch • French • German).

Deaths outside the hospital (nursing homes and others) are reported by the regional authorities and refer to confirmed and possible COVID-19 cases. During the first six weeks of the epidemic, the vast majority of people who died outside the hospital setting were possible COVID-19 cases.

Comparing mortality data between countries has some limitations. This comparison must first of all take into account the total number of inhabitants of each country. Moreover, in Belgium, the registration of COVID-19 deaths is precise (including confirmed as well as possible cases; inpatient and outpatient cases) whereas other countries may have more restrictive registration criteria (see the description of COVID-19 death surveillance among European countries, ECDC).

Given the different international methods for the surveillance of COVID-19 deaths, excess mortality is a better indicator to assess the severity of the epidemic as long as there is no other major cause of death (e.g. heat wave). In Belgium, Sciensano carries out all-cause mortality monitoring through the Be-MOMO project (Belgian Mortality Monitoring). Mortality during the the COVID-19 epidemic was shown in the weekly epidemiological reports (Dutch • French). Further analysis of the excess mortality during the first two waves has been reported in a separate report (French). Further information on the link between COVID-19 mortality and all-
cause mortality during the first wave of the epidemic can be found in the publication "All-cause mortality supports the COVID-19 mortality in Belgium and comparison with major fatal events of the last century".

At the European level, excess mortality is assessed on a weekly basis by EuroMOMO.

6.3. ARE DEATHS IN NURSING HOMES ALSO INCLUDED IN THE COVID-19 DEATH STATISTICS?

*Question added 07/04/2020 | Last updated 19/01/2021*

Yes, these are included in the dataset with the total number of deaths.

The surveillance of deaths of confirmed COVID-19 cases in hospital does not reflect the true magnitude of COVID-19 mortality in our population, our goal is to have mortality statistics that are as complete as possible and, therefore, to include COVID-19 deaths occurring in hospital and elsewhere (e.g. in nursing homes, other residential communities, or at home), as well as confirmed and possible COVID-19 deaths.

6.4. HOW IS THE NUMBER OF DEATHS IN NURSING HOME RESIDENTS OBTAINED?

*Question added 18/12/2020 | Last updated 08/04/2022*

As described above, information on the number of COVID-19 deaths in hospitals, nursing homes and in the “community” (at home or in other places) is available.

Currently, deaths in nursing homes are first notified to the regional authorities and reported with a delay of more or less 2 days by Sciensano. All regions provide individual data for deaths of nursing home residents, specifying whether the death occurred in a nursing home or in hospital. In addition, since 19 June 2020, hospitals indicate whether the person who died of COVID-19 in hospital was a nursing home resident or not.

Each week, the hospital data are combined with the data from the nursing homes, in order to determine as accurately as possible the total number of COVID-19 deaths among nursing home residents and also to specify whether these deaths occurred in the nursing home or in hospital. The linkage of these two databases takes place on Wednesdays and is published in the weekly epidemiological report in the chapter on nursing home surveillance.

Many investigations have already been carried out by Sciensano to improve the counting of COVID-19 deaths among nursing home residents. The list of major changes to the COVID-19 death database is available in the [Open data codebook](#).

6.5. ARE DEATHS OUTSIDE HOSPITALS AND NURSING HOMES ALSO INCLUDED IN THE COVID-19 DEATH STATISTICS?

*Question added 07/04/2020 | Last updated 19/01/2022*

Yes, these are included in the dataset with the total number of deaths.

The surveillance of deaths of confirmed COVID-19 cases in hospital does not reflect the true magnitude of COVID-19 mortality in our population, our goal is to have mortality statistics that are as complete as possible and, therefore, to include COVID-19 deaths occurring in hospital and elsewhere (e.g. in nursing homes, other residential communities, or at home), as well as confirmed and possible COVID-19 deaths.
6.6. DO THE DATA ON COVID-19 DEATHS INCLUDE CONFIRMED CASES AND POSSIBLE CASES?

Question added 07/04/2020 | Last updated 08/04/2022

Yes, COVID-19 death data includes laboratory confirmed cases as well as chest CT confirmed and possible cases. Possible cases refer to patients who did not undergo a COVID-19 diagnostic test, but who met the clinical criteria for COVID-19 as judged by the physician (see case definition definition/testing: Dutch • French • German).

Sciensano aims to report mortality statistics that are as complete as possible. Since the surveillance of deaths of confirmed COVID-19 cases in hospital does not reflect the true extent of COVID-19 mortality in our population, out-of-hospital COVID-19 deaths are also included (in particular deaths in nursing homes).

For out-of-hospital deaths, only deaths of confirmed COVID-19 cases were reported before 30 March 2020. Before the start of the specific screening strategy targeting nursing homes, the vast majority of out-of-hospital deaths were reported as possible COVID-19 cases. This expansion to possible COVID-19 cases was also done retroactively for all out-of-hospital deaths reported before that date.

Since 5 May 2020, deaths of possible cases and radiologically confirmed cases in hospital are also included in the statistics. This expansion was also done retrospectively for deaths of possible and radiologically confirmed in-hospital cases reported before this date.

6.7. WHY CAN THE NUMBER OF DEATHS FOR A SPECIFIC DATE CHANGE?

Question added 22/04/2020 | Last updated 08/04/2022

The mortality database is dynamic. Every day, improvements are made after checking the data with the regional health authorities or hospitals. Sometimes dates of death or birth are incorrectly entered in the questionnaires; after checking with hospitals and nursing homes, these dates are corrected. More specific information about deaths nursing homes in Flanders was added to the database on 26 August (see question 6.4). As a result, a case may be moved to another date of death or deleted if it is found to be a duplicate.

6.8. WHAT CHANGES TO DATA COLLECTION HAVE BEEN MADE?

Question added 08/04/2022 | Last update 08/04/2022

Some data were not always available. Here is an overview of the improvements that have taken place in the collection of COVID-19 death data:

- COVID-19 hospital surveillance data specify the type of residence of deceased patients (home, nursing home, ...) since 19 June 2020. The full date of birth of deceased patients, as well as their postal code of residence, are available from 24 April 2020.
- For the Walloon Region, the complete date of birth of the deceased residents of MR/MRS of COVID-19 was available from 20 January 2021, before this date, only the age was notified.

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1 This makes it impossible to univocally identify nursing home (NH) and thus to check that the information provided by the hospitals is consistent with that provided by the RHs/RCs. Indeed, it happens that a resident of an NH is erroneously indicated by the hospital as still living at home.
• Until 2 June 2020, the Flemish Region only provided aggregated data on COVID-19 deaths occurring in MR/MRS. Therefore, for deaths of MR/RSM residents in hospital, the cause of death (COVID-19 or not) is not specified by the Flemish regional authority.

• The number of hospital deaths of Flemish MR/RSM residents could only be estimated in the first wave. Thanks to a retrospective survey by the Flemish Agency for Care and Health (Agentschap Zorg en Gezondheid - VAZG), individual data on age, sex and exact date of death could be obtained for a large part of the deaths that occurred before 2 June 2020. On 26 August 2020, this additional information was integrated into the database. The results of this update are detailed in the report: Mortality COVID-19 - Data update - 26 August 2020 (Dutch • French).

• A survey was conducted in the summer of 2021 among the 103 Belgian general hospitals and the military hospital to retrieve unavailable data on people who died of COVID-19 during the first wave of the epidemic. These data were used to improve the mortality statistics. More detailed information is described in the report published on 18 December 2021.

• The vaccination status of the COVID-19 decedents was requested from 8 December 2021 in the hospital surveillance data. In nursing home surveillance, the vaccination status was requested from 21 July 2021, 13 December 2021, 23 December 2021 and 10 January 2022 for the deceased in the Brussels Region, the Walloon Region, the German-speaking Community and the Flemish Region respectively.

The investigations conducted during the first wave of the epidemic are described in the publication "Establishing an ad hoc COVID-19 mortality surveillance during the first epidemic wave in Belgium, 1 March to 21 June 2020" (Eurosurveillance, 2021). The list of major changes to the COVID-19 mortality database since the beginning of the epidemic is available in the Open data codebook.
7. Data from the Influenza Surveillance System

7.1. HOW DO WE COLLECT DATA ON INFLUENZA-LIKE ILLNESSES?

Question added 07/04/2020 | Last updated 03/04/2020

The **sentinel network of general practitioners** continuously records consultations in general medicine for influenza-like illnesses and acute respiratory infections. The network has around 120 general practitioner offices spread throughout Belgium. It records for each episode age group, vaccination status, outcome and immediate hospitalization. In a subset of these patients, a clinical sample is collected and virologically tested by the **National Reference Centre (NRC) for Influenza**. From this subgroup, we also record additional clinical data (symptoms, risk factors and comorbidities, vaccination, treatment and severity indicators).

Additionally, six sentinel hospitals participate in this surveillance. Since the 2011-2012 respiratory season, this network has recorded all episodes of hospitalized severe acute respiratory infections (SARI) that occur during the period of high influenza activity. The surveillance starts as soon as the first signs of influenza virus circulation are detected by the **NRC for Influenza**, and ends at least 3 weeks after the incidence of influenza-like syndromes (collected via the sentinel network of general practitioners) again drops below the epidemic threshold. For each episode, the patient's demographic characteristics, symptoms, risk factors and comorbidities, vaccination status, treatment, severity and clinical outcome are registered during the hospital stay. In addition to this clinical data recording, the hospital collects a nasopharyngeal sample from each patient, which is virologically tested by the **NRC for Influenza**.

We carry out both surveillances in close collaboration with the **NRC for Influenza**, which performs microbiological tests on nasopharyngeal samples collected from each patient for the influenza virus and, since March 2020, SARS-CoV-2.

The **results of the influenza surveillance** can be found on our website.

They are also included in the weekly COVID-19 report (**in Dutch** • **in French**) which is also available on our website.
8. Mobility

8.1. WHERE DO THE MOBILITY DATA COME FROM?

Question added 30/03/2021 | Last updated 30/03/2021

The mobility data analyzed in the report are based on aggregated (anonymized) data sent to Sciensano by the telephone operator Proximus and from aggregated data made available in open access by Google. The raw data from Proximus are the number of journeys outside the postal code of origin (place of residence) proportionally to the number of Proximus clients living in this postal code.

Google creates the Community Mobility Reports in open access that aim to provide insights on the movement trends for different categories of places and on time spent at home. This aggregated data is collected from Google users who have turned on the Location History via their mobile device (phone or tablet). The aggregated data from Google is available via this link.

8.2. HOW IS THE MOBILITY DATA PROVIDED BY PROXIMUS PROCESSED?

Question added 30/03/2021 | Last updated 30/03/2021

Concerning the raw mobility data from Proximus (number of journeys outside the postal code of origin (place of residence)), following steps are taken before publishing:

- Calculation of the averages of the number of journeys per province and at national level.
- Subsequently calculation of a moving average over 7 days (to avoid weekend effects).
- Conversion of the results in percentages. The reference period is the pre-pandemic situation from 10 to 23 February 2020 (weeks 7 and 8 2020).
- If data should be missing for a given day, even though that is unlikely, a value is determined based on the average for the corresponding week.

8.3. WHAT CATEGORIES OF PLACES ARE USED BY GOOGLE AS MOBILITY INDICATORS?

Question added 30/03/2021 | Last updated 30/03/2021

- residential: time spent at home.
- workplaces: number of journeys to a workplace.
- retail and recreation: number of journeys to places such as restaurants, cafés, shopping malls, amusement parks, museums, libraries and cinemas.
- transit stations: number of journeys to places such as metro, bus and train stations, taxi services, ports, car rental services and rest areas.

For the categories “residential” and “workplace”, information is collected if Google users registered configure these places as such in their navigation app.
8.4. CONCERNING THE GOOGLE MOBILITY DATA, DOES A CHANGE IN ONE OF THE INDICATORS AUTOMATICALLY LEAD TO A CHANGE IN ANOTHER INDICATOR?

Question added 30/03/2021 | Last updated 30/03/2021

No. Each mobility indicator provided by Google has its own baseline. Furthermore, only a limited set of places is analyzed. A change in the trend of one mobility indicator does not therefore automatically lead to a change, proportional or not, in the trend of the other mobility indicators.

For example, if we note a decrease in the time spent at home, it is not guaranteed that an increase (or an increase of the same magnitude) will be observed in the number of journeys to the workplace at the same time.

Furthermore, changes in time spent at home (percentages) are generally more discrete than changes in journeys to places (number of journeys).
9. Molecular surveillance

9.1. WHAT IS MOLECULAR SURVEILLANCE?

The term "molecular surveillance" in the context of COVID-19 refers to the genetic characterisation of circulating viruses from PCR-positive samples, and thus the monitoring of the different circulating variants. This genetic characterisation is done by sequencing the whole genome of the virus (WGS), or by analysing specific regions that are of interest.

Analysis of the genetic diversity of circulating viruses and its evolution over time is essential to understand the dynamics of the epidemic and to adapt measures accordingly.

9.2. HOW IS MOLECULAR SURVEILLANCE ORGANISED IN BELGIUM?

In Belgium, molecular surveillance, especially for whole genome sequencing, is organised by different clinical laboratories that collaborate within the WGS platform. Part of the positive samples had been sequenced by the NRC since the beginning of the COVID-19 epidemic, but molecular surveillance has been expanding since December 2020.

Since it is impossible to sequence all positive samples diagnosed in Belgium, the molecular surveillance focuses on a baseline surveillance on the one hand, and on an active surveillance on the other.

The baseline surveillance aims to sequence 5-10% of positive samples diagnosed in Belgium, taken at random from sentinel laboratories in order to represent all positive samples in the country (i.e. samples from the different regions of the country, from patients presenting the whole clinical spectrum). The results from the baseline surveillance should reflect the genetic diversity of the viruses circulating in the country.

Within the active surveillance, sequenced samples are selected because they are of particular interest, for instance a selection of 'travelers' samples from red zones, outbreaks of unexpected course, certain samples with particular PCR results, possible re-infections, etc... The results of the active surveillance allow for better monitoring of genetic variation in these specific contexts.
9.3. HOW IS INFORMATION ABOUT DIFFERENT VARIANTS COLLECTED, REGISTERED AND REPORTED BY SCIENSANO?

Question added 18/05/2021 | Last updated 25/04/2022

9.3.1. Collection

For the baseline surveillance, a number of laboratories performing COVID-19 PCR-testing were selected to participate as a sentinel laboratory in the molecular baseline surveillance. There are about 30 sentinel laboratories spread over Belgium. They are selected based on their catchment area with the objective to obtain a representative set of samples of the population (geographic location, ambulant and hospitalised patients, all age groups,…). Once a week, the sentinel laboratories send a completely random selection of their PCR positive samples (with sufficient viral load to allow good quality sequencing analysis) to one of the sequencing laboratories involved in the baseline surveillance.

In comparison, the active surveillance relies first on additional information available on the COVID-19 PCR tests performed in hospitals and other laboratories. If the laboratory identifies specific criteria associated with a positive COVID-19 sample, this sample will be analysed in the active molecular surveillance in one of the sequencing laboratories. (These criteria include a vaccine breakthrough, a possible reinfection, an outbreak with unexpected evolution, travelers from zones known with a variant,…)

For example, to support this process, a clinical laboratory will receive a notification when they obtain a positive COVID-19 result for a sample of a patient who has already completed a primary course of vaccination for more than 7 days. Due to this notification, the clinical laboratory can identify possible samples which apply for further laboratory analysis within the active surveillance, and forward these samples for sequencing.

9.3.2. Registration and reporting

All the results of the sequencing analyses are uploaded in an aggregated manner to a central national registration system. This means that the registration is based on the week of sampling of the original sample, the indication for sequencing (baseline or active surveillance), and the identification of a variant. The individual sequencing labs complete this registration after each run performed, report of all sequenced results is done by the NRC and sent to Sciensano on a weekly basis. This data is used, amongst others, for the weekly risk assessment of the epidemiological situation and for the weekly epidemiologic report, section ‘molecular surveillance’.

While the aggregated registration system is an adequate tool for the surveillance of the current major variants of concern over time, it is limited in the flexibility of the output and the level of detail associated to the registered results. (For example, there is no information about localization, neither about the clinical status (ambulant or hospitalised) of the patients.)

From the end of March 2021 onwards, the laboratories have started reporting the results of the sequencing analyses in a case-based manner via HealthData. This is a process which needs to be automated and might not yet be in place for all laboratories.
The case-based reporting is, essential for an efficient surveillance of the transmissibility and severity of the variants, the vaccine-effectiveness against variants, as well as for a more detailed surveillance and reporting of the spread of the variants.

Until completeness of the case-based registration, the reporting of the results of the molecular surveillance in the weekly epidemiological bulletin will still be based on the aggregated registration system.

9.4. HOW IS MOLECULAR SURVEILLANCE REPORTED ON AN INTERNATIONAL LEVEL?

All results of the molecular surveillance are also uploaded to the international database GISAID[^2], where comparisons can be done with data uploaded from other countries. This international database registers sequencing results in an anonymous way and is limited in the amount of information (metadata) that is available for each sample.

The GISAID database allows for phylogenetic analyses at an international level. Technical analyses performed by the NRC and the WGS-consortium based on the data present in GISAID are weekly published in a technical report. The result of the phylogenetic analysis for Belgium, based on the data present in GISAID, is accessible via an interactive dashboard.

[^2]: GISAID is a global science initiative and primary source established in 2008 that provides open-access to genomic data of influenza viruses and, since March 2020, the coronavirus responsible for the COVID-19 pandemic
10. Data for the surveillance of vaccinations

10.1. HOW ARE THE DATA FOR THE SURVEILLANCE OF VACCINATIONS COLLECTED?

*Question added 21/05/2021 | Last updated 21/05/2021*

The information used by Sciensano for the surveillance of vaccinations is obtained through the Vaccinnet+ database, the national COVID-19 vaccination registry. All doses of COVID-19 vaccines administered in Belgium, are, as required by law, recorded in this database. Vaccinations in this database are recorded as accurately and completely as possible, under the responsibility of medical doctors. Nevertheless, a delay may occur between the time of vaccination and the time of registration in Vaccinnet+. This is something to take into account when interpreting the results of this surveillance. The percentage of all vaccinations recorded within three days of vaccine administration is reported on a weekly basis in the weekly epidemiological bulletin (only available in **French** and **Dutch**).

10.2. WHICH DATA ARE COLLECTED IN VACCINNET+ AND SENT TO SCIENSANO?

*Question added 30/04/2021 | Last updated 07/03/2022*

Sciensano receives demographical data (sex, age, postal code of residence) of all people in Belgium having received at least one dose of a COVID-19 vaccine. In addition, Sciensano also receives data on the vaccinator (type (person or organisation) and postal code) and on the administered vaccine (brand of the vaccine, lot number, date of administration, date of registration).

Vaccinnet+ does not register information concerning the indication for COVID-19 vaccination (resident of a nursing home, health care worker, pregnancy, etc.). Similarly, the dose sequence (distinction between a first, second or third dose) of a COVID-19 vaccine is not directly available in Vaccinnet+. At the level of healthdata.be a sequence is attributed to a dose according to the date of administration of a vaccine (**see question 3.2**). Initially, a formula, based on the time that was minimally needed between two doses, was applied to distinguish effective second doses from possible encoding errors in Vaccinnet+. Because the quality and completeness of the surveillance data on the vaccinations evolved positively, this rule is not applied anymore since 15th June 2021. All encoded doses in Vaccinnet+, including those that were registered previously, are considered to be effectively administered as long as no correction is applied by the vaccinator. Until the 9th of September, only the 1st and 2nd doses encoded in Vaccinnet+ were taken into account in our vaccination coverage reports. From this date onwards, following the new recommendations concerning additional and booster doses (**see question 10.3**), the doses of vaccines recorded in people who have previously received a complete vaccination schedule are included in our reports.

Since the 23rd June 2021, vaccinations administered to Belgian residents abroad or in the context of a clinical trial can be encoded in Vaccinnet+ upon specific request of the vaccinated person. Only the vaccinations with vaccines approved by a national regulatory authority in Europe or included in the **World Health Organization’s Emergency Use listing** are included in the numbers we report. Currently these include Sinovac®, Sinopharm®, Sputnik V® and...
Covishield®, in addition to the five vaccines that are currently used, or have been used before in Belgium (see question 10.3). Vaccinations performed with a vaccine that does not fulfil these criteria may be recorded in Vaccinnet+ in a generic form (without specifying the COVID-19 vaccine brand) but are excluded from Sciensano’s reported vaccination figures.

Please note that the processing of data concerning vaccinations against COVID-19 is regulated by the Cooperation agreement of 12 March 2021 between the Federal State, the Flemish Community, the French Community, the German speaking Community, the Common Community Commission, the Walloon Region and the French Community Commission with regard to the processing of data concerning vaccinations against COVID-19 (only available in French and Dutch).

10.3. WHAT DO THE DIFFERENT VACCINATION SCHEMES AGAINST COVID-19 LOOK LIKE IN BELGIUM?

Currently, four COVID-19-vaccines are in use in Belgium: the Comirnaty® vaccine (Pfizer/BioNtech), the Spikevax® vaccine (Moderna), the COVID-19 Vaccine Janssen® (Johnson & Johnson) and the Nuvaxovid® vaccine (Novavax). The Vaxzevria® vaccine (AstraZeneca-Oxford) was used in 2021 but is currently not being used anymore.

The Comirnaty® vaccine (Pfizer/BioNtech) is in use in Belgium since 28th December 2020. It is an mRNA-vaccine that is administered with a two dose primary immunization schedule. The interval between the two doses varies between 19 and 42 days, depending on the region, in the Belgian vaccination campaign. The age indication for Comirnaty® was expanded during the Belgian vaccination campaign as follows: (i) from December 28 to June 4: ≥18 years old; (ii) from June 5: ≥16 years old; (iii) from June 26: ≥16 years old and open to 12- to 15-year-olds with comorbidities; (iv) from July 7 2021: ≥16 years old and open to all 12- to 15-year-olds on a voluntary basis and subject to parental (or legal guardian) consent.

Since the 20th December 2021, a paediatric formulation of the Comirnaty® vaccine (Pfizer/BioNtech) is in use in Belgium for the vaccination of children aged 5 to 11 years. It consists of a reduced dose of mRNA (10 µg/dose compared to 30 µg/dose in the adult formulation). The primary immunization schedule consists in two doses, administered with a recommended interval of 21 days. It is offered to children aged 5-11 years on a voluntary basis and subject to parental (or legal guardian) consent.

The Spikevax® vaccine (Moderna) is in use in Belgium since 11th January 2021. This is also a mRNA-vaccine with a two dose primary immunization schedule, administered with a recommended interval of 28 days. It was initially used in Belgium in adults of 18 years and older. On the 23 of July 2021, following EMA approval, its use was extended to 12- to 17-year-olds, in the same conditions as the Comirnaty® vaccine (i.e: for 12- to 15-years old on a voluntary basis and subject to parental or legal guardian consent).

The Vaxzevria® vaccine (AstraZeneca-Oxford) is a non-replicating viral vector (chimpanzee adenovirus) vaccine that has been used in Belgium since 12th February 2021. It was used until the summer of 2021 (from 13th September 2021 onwards there were less than 1000 administrations/day). The vaccine was administered using a two dose primary schedule. The interval between the two doses was shortened from 12 weeks to 8 weeks on 3rd May 2021 in
the Brussels-capital region, and on 12th May 2021 in the whole country. The age indications for this vaccine were modified during the Belgian vaccination campaign: (i) 12th February to 2nd March 2021: 18 to 55 year olds; (ii) 3rd March to 6th April 2021: ≥ 18 years old; (iii) 7th April to 23rd April 2021: ≥ 56 years old; (iv) 24th April 2021 onwards: ≥ 41 years old.

The COVID-19 Vaccine Janssen® (Johnson & Johnson) is a non-replicating viral vector (human adenovirus 26) vaccine that has been used since 28th April 2021. The primary schedule consists of a single dose. It was used in Belgium in adults of 18 years and older. However, as of May 26, 2021, the Interministerial Conference (IMC) on Public Health decided to adopt a precautionary principle and temporarily limit the use of the COVID-19 Vaccine Janssen® to people aged 41 and older. On June 9, 2021, the FPS Public Health decided that people between 18 and 40 years of age can voluntarily choose for the COVID-19 Vaccine Janssen® after having received full information on the benefit/risk ratio.

The Nuvaxovid® Vaccine (Novavax) is a subunit protein vaccine that was approved for use in Belgium since 19th January 2022. The primary schedule consists of two doses, administered with an interval of at least three weeks. Nuvaxovid® will primarily be offered to 1) individuals who have a high risk of allergic reactions against the other vaccines that are used in the Belgian vaccination campaign, and 2) those who have already had severe side effects after vaccination with one of the other vaccines used in the Belgian vaccination campaign.

On the 9th of September 2021, the IMC on Public Health decided, based on the opinion of the Superior Health Council (CSS), to invite people with reduced immunity (due to congenital immune disorders, chronic dialysis, immunosuppressants, cancer, AIDS or Down syndrome) for an additional dose of mRNA vaccine (Comirnaty® or Spikevax®) after a complete primary vaccination schedule. On the 24th of January 2022, the IMC has decided to offer a booster dose to this group, at least three months after the additional dose.

On the 22nd of September 2021, the IMC on Public Health decided to offer a booster dose with an mRNA vaccine (Comirnaty® or half a dose of Spikevax®) to nursing home residents. Additional target groups for a booster dose were consecutively identified by the IMC, namely people over the age of 65 on the 29th of September 2021, healthcare workers on the 30th of October 2021, and people who have received one dose of the COVID-19 vaccine Janssen® on the 10th of November 2021. On the 27th of November 2021, it was decided that all persons aged 18 years and older who have received a full primary vaccination schedule will be invited for a booster dose, in order of descending age groups. The minimal required duration for providing the booster dose after the complete primary immunization schedule differs by brand: two months after the single dose of the COVID-19 Vaccine Janssen®, four months after the second dose of Vaxzevria®, and six months after the second dose of Comirnaty® or Spikevax®. On the 16th of December 2021, the IMC decided to accelerate the administration of booster doses to address the spread ability of the Omicron variant and announced that people who received an mRNA vaccine (Comirnaty® or Spikevax®) may be invited to receive the booster vaccine after 4 months instead of 6. On the 4th of February 2022, it was decided that adolescents aged 12-17 years in Flanders can receive a booster dose on a voluntary basis and subject to parental or legal guardian consent. On the 16th of February 2022, the IMC decided that those who have received a primary schedule with the COVID-19 Vaccine Janssen® can receive a second booster dose, at least three months after the first booster dose. On the 4th of March 2022, the IMC decided to offer a booster dose to the 12-17 year-olds with underlying conditions leading to an increased risk of developing severe COVID-19; for the other 12-17 year-olds, a booster dose can be administered at the initiative of the
adolescent or his/her parents/legal guardians. From May 2022 onwards, nursing home residents and those aged 80 years and over in Flanders have been offered a second booster dose. Although initially, only mRNA vaccines were used as booster doses, other vaccine types have gradually been included as boosters as well (i.e. the COVID-19 Vaccine Janssen® and Nuvaxovid®).

In Vaccinnet+, it is not possible to distinguish those who received an additional dose from those who received a booster dose. The term “booster dose” used in epidemiological reports from Sciensano and on the dashboard Epistat therefore includes both groups.

More information about the different vaccines is published on the dedicated FAMHP webpage (only available in Dutch and French) and in the Sciensano Factsheet.

10.4. HOW IS THE VACCINATION COVERAGE CALCULATED?

The vaccination coverage is the percentage of vaccinated people in a certain target group. The different reports of Sciensano show the vaccine coverages per age group, by sex, per municipality, per region/community and for Belgium. For this purpose, the most recent official figures with regards to the legally registered population in Belgium are used as denominator. The population figures on 1st January 2020 were used up until 18th May 2021, after which the provisional population figures on 1st January 2021 were used, as published by STATBEL (STATBEL; population on 1st January 2021). Since the 23rd of June 2022, the population figures on 1st January 2022 are used (STATBEL; population on the 1st of January 2022).

At the start of the vaccination campaign, the age of a vaccinated person was determined on the date of administration of a vaccine for the calculation of vaccination coverage per age category. In order to align with the updated denominators, from the 9th of June 2021 to the 22nd of June 2022, the age on 1st January 2021 was used and since the 23rd of June 2022, the age on the 1st of January 2022 is used. People who died in 2021 are not included in the denominators on the 1st of January 2022. For that reason, deceased people should also be excluded from the vaccination figures, to avoid an overestimation of vaccination coverage estimates. People deceased in 2021 were identified through an extract of the national registry, in order to make this correction.

Data on the geographical distribution of the vaccinated persons are based on the postal code of the place of residence of the vaccinated person, and not on the postal code of the place of vaccination. Consequently, this distribution does not reflect the number of vaccinations carried out by the federated entities, as some people are vaccinated at their place of work (e.g. nursing homes, hospitals).

As part of the LINK-VACC project, a linkage will be made with external databases, in particular the CoBRHA database (Common Base Registry for Healthcare Actors), the database of the Intermutualist Agency and STATBEL, which will allow us to retrospectively analyse the vaccine coverage achieved in certain target groups. In this regard, the vaccine coverage achieved among healthcare professionals has been published in a thematic report (in Dutch and French) and is updated weekly on our Epistat page. A thematic report published on the 26th of November 2021 (in Dutch and French) describes the vaccination coverage of the complete Belgian population, as well as for high risk groups (nursing home residents, healthcare
workers, those with comorbidities and pregnant women) until the 31st of October 2021. More information on the LINK-VACC project and its objectives can be found on the project page.

10.5. WHAT IS THE MEANING OF THE TERMINOLOGY «AT LEAST ONE DOSE», «PRIMARY COURSE COMPLETED» AND “+BOOSTER” THAT IS USED IN THE SURVEILLANCE OF COVID-19 VACCINATIONS?

Question added 30/04/2021 │ Last updated 25/04/2022

The category « at least one dose » covers all persons who have received at least one dose of a COVID-19 vaccine, regardless of the vaccine schedule. Persons who subsequently received a second dose of a vaccine with a two dose schedule, or those who received an additional or booster dose, are not excluded from this category. Therefore, this category comprises partially vaccinated persons (1 of 2 doses received), persons who have completed their primary course (1 of 1 dose / 2 of 2 doses received) and those who received an additional or booster dose (1 of 1 dose +1 / 2 of 2 doses +1).

A person is considered as « primary course completed» when he has received all doses required of the primary vaccine schedule. This definition thus depends on the type of vaccine the person receives. With Comirnaty®, Spikevax® and Vaxzevria® vaccines, a person has completed his primary course of vaccination if he has received two doses. For the COVID-19 Janssen® vaccine, a person has completed his primary course after a single dose of the vaccine. Persons who subsequently received an additional or booster dose, are not excluded from this category. Therefore, this category comprises both those who have completed their primary course (1 of 1 dose / 2 of 2 doses received) and those who received an additional or booster dose (1 of 1 dose +1 / 2 of 2 doses +1). A person who received the COVID-19 Janssen® vaccine will be directly included in both groups « at least one dose » and « primary course completed». Please note that « primary course completed» is a term that is used here in the context of vaccination coverage surveillance. Another definition is to be applied in the context of individual immune protection. For example, with regards to the COVID-19 Janssen® vaccine, a delay of 14 days after inoculation of the vaccine dose must be taken into account before the person is considered protected. For the other vaccine brands, a person is considered protected 14 days after the second dose of the vaccine. The term “fully vaccinated” was previously used to describe those who had completed their primary vaccination schedule. However, to avoid confusion, we replaced this term by “primary course completed” or simply “primary course” in our reports, since the 25th of April. The term “fully immunized” was previously used to describe persons that have completed their primary course of vaccination since 14 days or more. For clarity purposes, the term “fully immunized” was replaced by “primary course + 14 days” after deployment of the booster doses.

A person who receives an additional or booster dose after a full primary vaccine schedule belongs to the category « +booster ». This category includes both additional doses given to immunocompromised individuals to complete their primary vaccination regimen and booster doses given to the general population. It is considered that the booster dose provides immune protection 14 days after administration.

10.6. WHY DO THE VACCINATION NUMBERS REPORTED BY SCIENSANO FLUCTUATE?

Question added 07/07/2021 │ Last updated 07/03/2022
Every day, Sciensano receives data on vaccinations encoded or corrected in Vaccinnet+ the previous day. These data are published on the Epistat Dashboard the day after they have been received, and in the daily epidemiological report one day after appearing on the Dashboard. These retrospective encodings and corrections performed continuously in the Vaccinnet+ registry allow for a constant improvement of the data quality and explain the visible fluctuations in the data reported in near real time by Sciensano.

Please note that any registration errors identified by the citizen when consulting their MyHealthViewer or when downloading the CovidSafe certificate can be corrected by the vaccinator in Vaccinnet+. If you need help with this, please contact the call centers organized by the competent authorities: https://covidsafe.be/en/frequently-asked-questions.

10.7. HOW ARE BREAKTHROUGH INFECTIONS DEFINED AND MONITORED BY SCIENSAO?

Question added 18/08/2021 │ Last updated 25/04/2022

10.7.1. Lab-confirmed COVID-19 cases surveillance

A breakthrough infection is defined as a new laboratory confirmed COVID-19 infection (positive RT-PCR or Rapid Antigen test; no positive test in prior 90 days) occurring in persons who have received their primary course for at least 14 days, previously called “fully immunized” and “fully vaccinated for at least 14 days” (see question 10.5). In the same line, we monitor infections that have occurred 14 days or more after the person has received the additional or booster dose.

Breakthrough infections are monitored by Sciensano by linking data from the Vaccinnet+ registry and the COVID-19 laboratory test results database (LINK-VACC project). The different databases are linked at the individual level on the basis of the unique identification number of the Belgian social security system (NISS number) in a pseudonymized form. This link enables us to calculate the daily mean of the number of new laboratory confirmed COVID-19 infection within three populations: unvaccinated individuals, persons who completed their primary course since at least 14 days and persons having received a booster dose since at least 14 days. By dividing the daily number of infections by the total number of people having obtained the vaccination status 14 days before the day considered for the calculation, we can calculate a daily incidence. The 14-day cumulative incidence is obtained by summing the daily incidences of the 14 days period considered.

Of note, partially vaccinated and individuals with a complete primary course since less than 14 days are not included in these calculations. Individuals having received a booster dose since less than 14 days are included in the category “primary course + 14 days”.

10.7.2. Hospital surveillance

Having the vaccination status of individuals who require hospitalization, are admitted to an ICU, or die as a result of COVID-19 infection, allows tracking incidence rates of these events (cases/100,000 persons with a specific vaccination status).

To perform this monitoring on a weekly basis, Sciensano uses the Surge Capacity Survey. It consists of a daily online survey through which all Belgian general hospitals must provide aggregated (non-individual) data on the number of hospital and ICU admissions, as well as individual data on deceased COVID-19 patients. This data collection is mandatory and can therefore be considered as an exhaustive database of the number of COVID-19 patients in
Belgian general hospitals. Since the 6th of October, 2021, new variables have been added to this monitoring to allow hospitals to report the number of hospitalized patients by vaccination status (unvaccinated, partially vaccinated, primary course completed, unknown vaccination status) in different age categories. Since the 8th of December 2021, having received the booster dose has been added as an additional category within vaccination status. Since that date, the vaccination status of persons dying from COVID-19 in the hospital has also been added in the data collection. Hospitalized patients diagnosed as COVID-19 positive during routine screening (in the absence of COVID-19 symptoms) are not reported herein. No information on the delay between vaccination and hospitalisation/death is collected through that system.

Each week, we present the daily mean and incidence of patients hospitalized/admitted in ICU/deceased in hospitals due to COVID-19 infection according to the vaccination status reported by hospitals. While the delay of 14 days after vaccination considered as needed to develop immunity can’t be taken into account in the numerator, we are using the same denominators as for the surveillance of breakthrough infections, meaning the total number of people having obtained the vaccination status mentioned 14 days before the date considered for calculation. In addition to being more harmonized in the different calculations, this 14-day duration was chosen because there is generally a delay between the onset of symptoms and the development of a severe form, leading to hospitalisation, ICU admission or death. Persons who have received only one dose out of a two dose schedule are not included in these calculations.

10.8. HOW IS THE IMPACT OF VACCINATION ASSESSED?

By comparing the 14-day cumulative incidences of infections/hospitalizations/ICU admissions between the population with a complete primary course of vaccination and the unvaccinated population, we make a preliminary assessment of the impact of vaccination (see question 10.7). For that purpose, we calculate the non-adjusted relative risk reduction (RRR) as 1 – Risk Ratio (RR), where the RR is the ratio of the 14-day cumulative incidences of the considered event (e.g. hospitalisations) in the two populations compared (e.g. primary course completed compared to unvaccinated). This is done for infections, hospitalizations and ICU admissions.

Of importance, this relative risk reduction calculation does not account for certain biases, such as differences in frailties, behavior and testing between vaccinated and unvaccinated individuals. In addition, the sizes of the populations by vaccination status (denominators for the calculation of the incidence) change rapidly during periods of intense vaccination. For example, the population receiving the booster dose increases while the "primary course completed" population, not (yet) having received the booster, decreases accordingly. This leads to big differences in incidence values between different time periods. As such, these crude data cannot be use as vaccine effectiveness estimates. Vaccine effectiveness is assessed in studies designed specifically to overcome these biases. Until now, Sciensano conducted a model to assess vaccine effectiveness against infection and onwards transmission published here. A more recent study can be found here.

10.9. ARE THE DATA USED BY SCIENSANO FOR THE SURVEILLANCE OF VACCINATIONS AVAILABLE FOR THE GENERAL PUBLIC?

By comparing the 14-day cumulative incidences of infections/hospitalizations/ICU admissions between the population with a complete primary course of vaccination and the unvaccinated population, we make a preliminary assessment of the impact of vaccination (see question 10.7). For that purpose, we calculate the non-adjusted relative risk reduction (RRR) as 1 – Risk Ratio (RR), where the RR is the ratio of the 14-day cumulative incidences of the considered event (e.g. hospitalisations) in the two populations compared (e.g. primary course completed compared to unvaccinated). This is done for infections, hospitalizations and ICU admissions.

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10.9. ARE THE DATA USED BY SCIENSANO FOR THE SURVEILLANCE OF VACCINATIONS AVAILABLE FOR THE GENERAL PUBLIC?

Question added 21/05/2021 │ Last updated 21/05/2021
The General Data Protection Regulation (GDPR) is applicable to the surveillance of vaccinations. Sciensano obtained a positive deliberation (only available in Dutch and French) of the Sectoral Committee of Social Security and Health to use personal data for this surveillance. A privacy statement in the context of this surveillance is available here.

Two datasets of aggregated and anonymous data were approved for sharing by the Interfederal Commission within the framework of open data. The information below has been made available for the general public:

- Administered vaccines per date, region, age, sex, brand and dose.
- Administered vaccines per week, municipality, age group and dose.

To guide you in the usage of these data, a codebook describing each of the variables has been made available.

The data in the Vaccinnet+ registry are accessible for Sciensano researchers in a pseudonymised manner (non-aggregated, not anonymous). This means that the individual data or direct identification data of the vaccinated person, like the national registration number, are replaced by a code.

Given the fact that the vaccination data are not exclusively owned by Sciensano, but are co-owned by the regions/communities, a proposal for access to the pseudonymised data must be submitted to the Interfederal Commission. The same commission will also evaluate possible extensions of anonymous data in the open data domain.

10.10. WHERE CAN I FIND THE DISTRIBUTION FIGURES OF VACCINES IN BELGIUM?

Question added 02/04/2021 | Last updated 01/10/2021

The analysis of the vaccine distribution numbers is not carried out by Sciensano. Information concerning the delivery of vaccines and vaccination material can however be consulted on the website of the FPS Health. In addition, the Corona-commission of the government has published a comparison between the number of distributed vaccines and the number of administered and registered vaccines in Vaccinnet+, which you can find here.