

PREVALENCE AND INCIDENCE OF ANTIBODIES AGAINST SARS-COV-2 IN CHILDREN AND SCHOOL STAFF AN OBSERVATIONAL SERO-PREVALENCE PROSPECTIVE COHORT STUDY

Main findings of the fourth testing period among primary school pupils (September-October 2021) – brief summary

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MAIN FINDINGS

This study provides a representative estimate of the prevalence of anti-SARS-CoV-2 antibodies among Belgian primary school pupils at the start of the school year 2021-2022 (20 September - 8 October, 2021).

Since December 2020, we have been monitoring the presence of SARS-CoV-2 antibodies among primary and secondary school pupils and school staff in Belgium. Because children under 12 years of age are not yet vaccinated in Belgium, it is important to continue monitoring the prevalence of antibodies against SARS-CoV-2 among primary school pupils.

At the fourth testing period from 20 September to 8 October 2021, more than one in four (26.6%, 95% CI: 21.5 – 32.8) primary school pupils had antibodies against SARS-CoV-2. This is a large increase since the previous testing period in May-June 2021, when the seroprevalence was 15.4%.

This indicates a high circulation of the coronavirus also outside the school environment as this period largely overlaps with the summer holidays.

Regional differences in the prevalence of anti-SARS-CoV-2 antibodies were observed. In **Brussels 36.1%** (95% CI: 29.5 – 44.3) of primary school pupils had antibodies against SARS-CoV-2. In Flanders and Wallonia similar seroprevalences were observed, being: in **Flanders 26.3%** (95% CI: 19.3 – 35.7) and in **Wallonia 23.8%** (95% CI: 17.6 – 32.0). The higher prevalence among primary schoolchildren in Brussels might be due to a lower vaccination coverage and a higher virus circulation compared to Flanders and Wallonia.

It is important to emphasise that **children who are infected with SARS-CoV-2 rarely become seriously ill**. Also in this study, none of the participating children reported being hospitalised due to COVID-19.

1. STUDY EXTENTION AMONG PRIMARY SCHOOL PUPILS

It remains unclear how the COVID-19 pandemic will evolve because of the circulation of new SARS-CoV-2 variants and ever-changing levels of protection in the worldwide population as a result of ongoing vaccination campaigns and increasing numbers of recovered patients. In Belgium, at the start of the school year in September 2021, children under 12 years of age are the only population group for whom vaccination has not yet been recommended. It is still unclear how the circulation of SARS-CoV-2 will evolve in this group considering the different levels of a vaccination coverage among the adult and teenage (≥ 12 years) population. We therefore extended our prospective cohort study on the prevalence of antibodies against SARS-CoV-2 among pupils and school staff until December 2021, but only for primary school pupils.¹

The objective of this study extension is to determine the prevalence of antibodies against SARS-CoV-2 in a sample of primary school pupils in Belgium until December 2021. Two additional testing periods were planned, one in September and one in December 2021. These follow the originally planned three testing periods conducted between December 2020 and June 2021.

The study design, data collection, laboratory testing and data analysis of this study extension are the same as in the initial study. We aimed including the same primary schools and primary school pupils already tested since December 2020, but some replacement pupils were recruited due to anticipated drop-outs. A detailed protocol of the study extension is available at:

<https://www.sciensano.be/en/biblio/prevalence-and-incidence-antibodies-against-sars-cov-2-children-and-school-staff-measured-one-year>. New recruited pupils were requested to complete the baseline questionnaire at inclusion. For all pupils participating in the study extension, consent was obtained from a parent or legal guardian of the pupil and assent from the pupils themselves. The study was approved by the Ethics Committee of Gent University hospital.

In this report we present a general overview of the pupils and schools who participated in the study extension and report **the SARS-CoV-2 seroprevalence among Belgian primary school pupils at the 4th testing period from September 20 to October 8, 2021. Data are reported by region and compared to the seroprevalence measured at the previous testing periods.**

2. PARTICIPATING SCHOOLS AND PUPILS

Saliva samples of the fourth testing period (first testing period of the study extension) were collected from September 20th to October 8th, 2021. Figure 1 shows the vaccination coverage and the number of laboratory confirmed SARS-COV-2 infection cases per 100,000 population over time for the three Belgian regions and for the whole country. The four periods in which laboratory specimens for SARS-CoV-2 antibody detection were sampled from the study participants are indicated in grey.

After the fourth testing period, Brussels became the most affected region, while numbers increased evenly in Flanders and Wallonia, despite differences that appeared between the latter two regions during the second wave. Since June 2021, is the vaccination coverage among persons 18 years and older in Brussels clearly lagging behind. At the end of October 2021, the coverage reached over 80% in Flanders and Wallonia, while it remained just below 70% in Brussels.

¹ Information, including reports of the first study part (December 2020 – June 2021) are available at the Sciensano dashboard (<https://datastudio.google.com/embed/reporting/7e11980c-3350-4ee3-8291-3065cc4e90c2/page/ZwmOB>), 4th and 5th graph and link to reports under 5th graph.

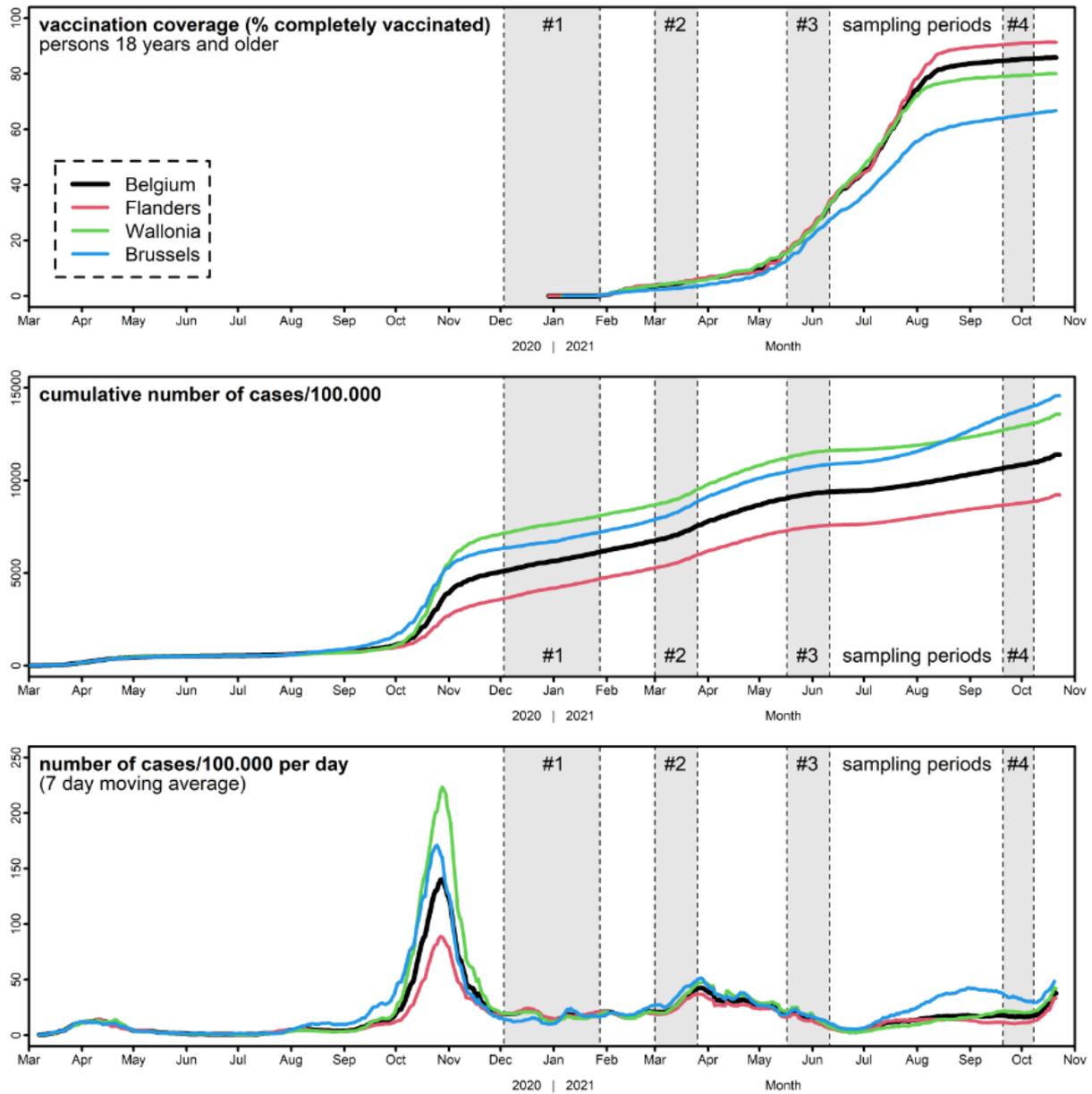


Figure 1: Vaccination coverage (top), cumulative number (middle) and seven day moving average (bottom) of laboratory confirmed SARS-CoV-2 cases per 100,000 population, Belgium and by region, March 2020- Oct 2021. Study sampling periods are marked in grey.

All 44 primary schools that participated in the first three testing periods were invited for a 4th (September-October) and 5th (December 2021) round of data collection. Of these, 31 schools continued their participation and 13 declined. Schools who declined were not replaced since the regional representation was still ensured by the participating schools (Figure 2).

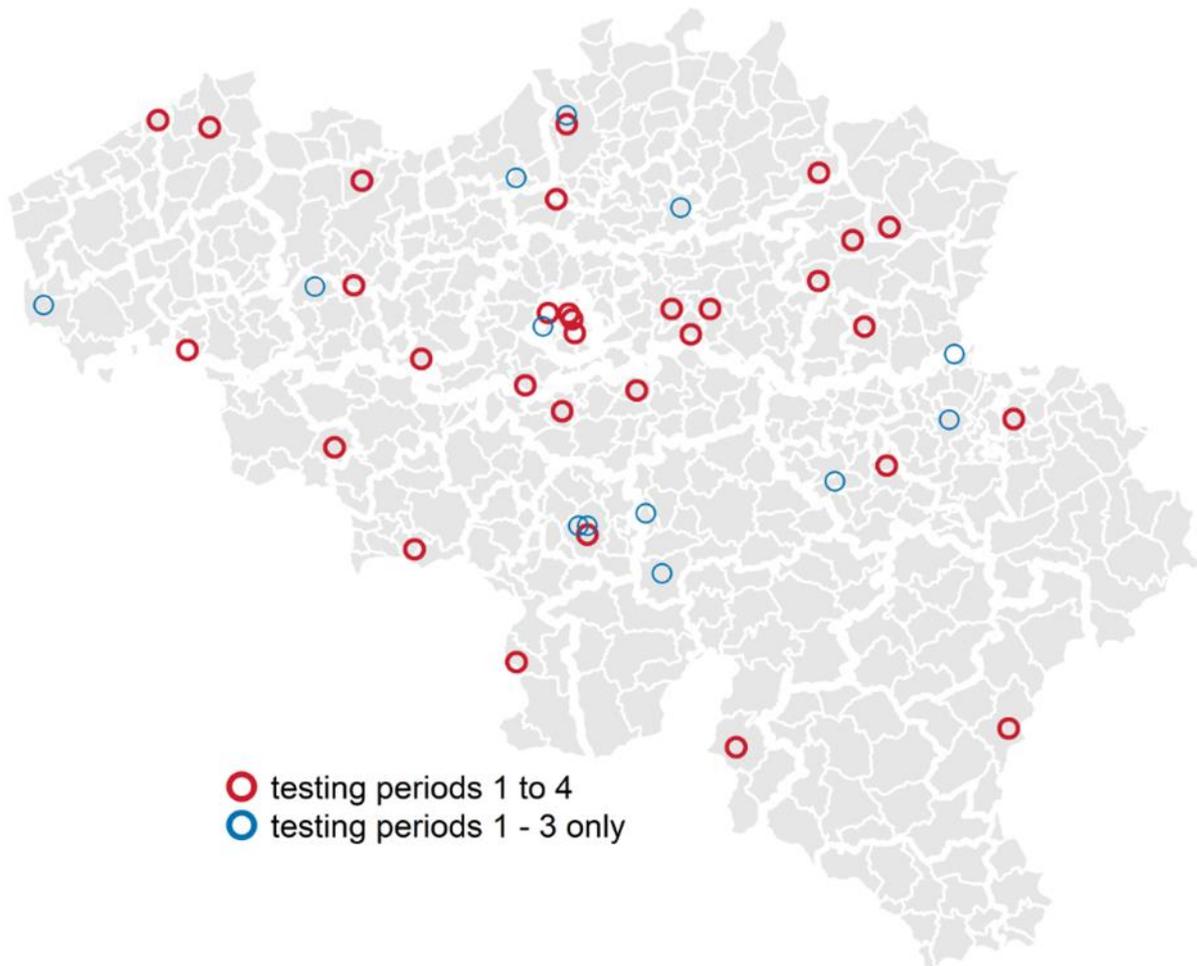


Figure 2: Distribution of primary schools in the study. Schools that participate in the study extension are marked in red, those that declined in blue.

All pupils who participated in the initial study were invited for the study extension. Because we anticipated some degree of attrition, additional pupils were recruited to a maximum of 25 per school. In total 489 primary school pupils participated in the study extension of whom 316 (64.6%) also participated in the initial study and 173 (35.4%) were additionally recruited. Of the 714 primary school pupils who participated in the initial study, 44.5% continued participation in the study extension.

Aggregate sociodemographic information of all pupils participating in the study extension is given in Table 1. Baseline questionnaire data were available for 438 pupils (296 initial and 142 additional participants) at the time of reporting, and the online follow-up questionnaire covering symptoms, suspected contacts and activities since the previous testing period was available for 405 pupils (263 from the initial study and 142 newly recruited pupils).

Participants to the study extension were on average 8 years old. The Brussels region was equally represented in the initial study and the extension, while the proportion of participants increased in Flanders (51.% to 63.4%) and decreased in Wallonia (35.5% to 23.9%). This is largely attributable to the recruitment of additional pupils in Vlaams Brabant and pupils lost to follow up in Namur. While schools with a socio-economic status (SES) in the middle tertile remain proportionally represented, the study extension includes less pupils from schools with a SES in the lower tertile. The distribution of SES in the fourth testing period was however comparable among newly and initially enrolled pupils.

Table 1: Sociodemographic characteristics of primary school pupils participating in the initial study and the study extension.

	Initial study		Study extension	
		All pupils	Pupils from the initial study	Additional recruited pupils
Total number	714	489	316	173
Sex: M/F, (% male)	380/332 (53.4%)	232/227 (50.5%)	156/160 (49.4%)	76/67 (53.1%)
Age, years (mean, range)*	9 (6 – 12)	8 (5 - 11)	9 (7 – 11)	8 (5 – 10)
Region/province (% of total)	N (%)	N (%)	N (%)	N (%)
Brussels	96 (13.5%)	62 (12.7%)	39 (12.3%)	23 (13.3%)
Flanders, total	362 (51.0%)	310 (63.4%)	188 (59.5%)	122 (70.5%)
Antwerpen	67 (9.4%)	37 (7.6%)	27 (8.5%)	10 (5.8%)
Limburg	74 (10.4%)	73 (14.9%)	53 (16.8%)	20 (11.6%)
Vlaams Brabant	72 (10.1%)	85 (17.4%)	38 (12.0%)	47 (27.2%)
Oost-Vlaanderen	85 (12.0%)	71 (14.5%)	47 (14.9%)	24 (13.9%)
West-Vlaanderen	64 (9.0%)	44 (9.0%)	23 (7.3%)	21 (12.1%)
Wallonia, total	252 (35.5%)	117 (23.9%)	89 (28.2%)	28 (16.2%)
Brabant-Wallon	30 (4.2%)	28 (5.7%)	22 (7.0%)	6 (3.5%)
Hainaut	88 (12.4%)	48 (9.8%)	31 (9.8%)	17 (9.8%)
Liège	76 (10.7%)	18 (3.7%)	15 (4.7%)	3 (1.7%)
Namur	43 (6.1%)	10 (2.0%)	10 (3.2%)	0 (0.0%)
Luxembourg	15 (2.1%)	13 (2.7%)	11 (3.5%)	2 (1.2%)
School SES	N (%)	N (%)	N (%)	N (%)
Lower tertile	252 (35.5%)	118 (24.1%)	77 (24.4%)	41 (23.7%)
Middle tertile	262 (36.9%)	195 (39.9%)	124 (39.2%)	74 (41.0%)
Highest tertile	196 (27.6%)	176 (36.0%)	115 (36.4%)	61 (35.2%)

F, female; N, number; M, male; SES, socioeconomic status

3. PREVALENCE OF ANTI-SARS-COV-2 ANTIBODIES

During the fourth testing period saliva samples were collected from 485 primary school pupils. Seven (1.4%) of these could not be tested due to insufficient sample volume (a minimum of 110 µL after centrifugation was required for reliable testing). The remaining 478 samples were tested in the Sciensano (Public Health Belgium) laboratories for the presence of anti-SARS-CoV-2 antibodies using an in-house semi-quantitative anti-RBD IgG (Receptor Binding Domain) ELISA.

During the 4th testing period, between Sep 20th and Oct 8th, 2021, we recorded **SARS-CoV-2 antibodies among 26.6% (95% CI 21.5 - 32.8) of primary school pupils in Belgium** (see Table 3 and Figure 3 below).

Between the 3rd and 4th testing period, the seroprevalence in primary schoolchildren increased with 11.0 percentage points (95% CI 7.2 – 14.9). This increase was largest in Flanders and in the Brussels region.

Table 3: Number and prevalence* of anti-SARS-CoV-2 antibodies (IgG) among primary (age 7-9) school pupils, Belgium and three regions, Sept 20th- Oct 8th 2021

	Number positive/total	Prevalence* % (95% CI)
Belgium	125/478	26.6 (21.5 – 32.8)
Brussels	23/62	36.1 (29.5 – 44.3)
Flanders	75/301	26.3 (19.3 – 35.7)
Wallonia	27/115	23.8 (17.6 – 32.0)

*adjusted for clustering of subjects within schools; CI, confidence interval

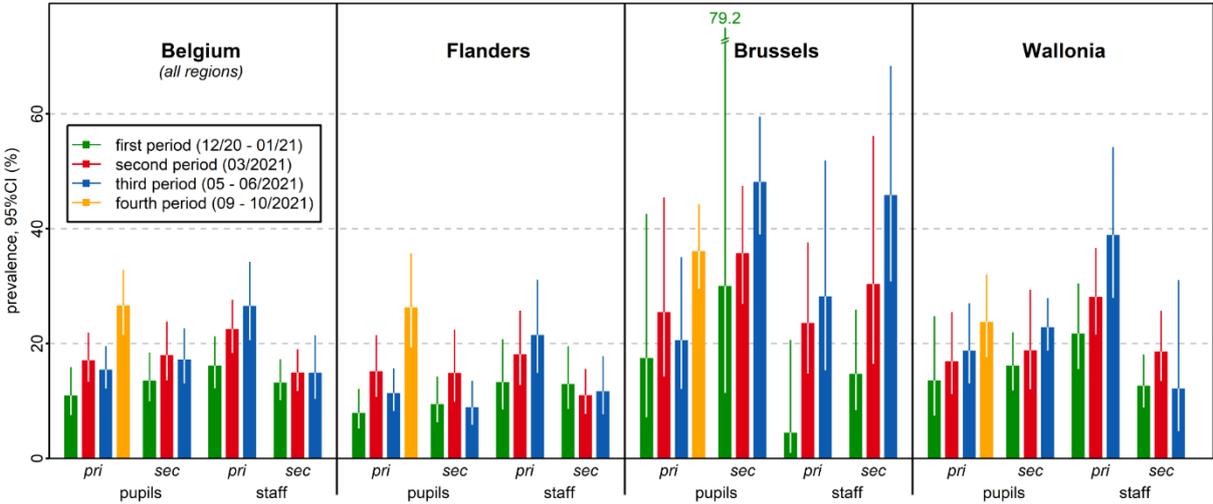


Figure 3: Prevalence and 95% confidence interval (whiskers) of anti-SARS-CoV-2 antibodies (IgG) among primary (age 7-9) and secondary (age 13-14) school pupils and non-vaccinated school staff, Belgium and three regions, first (3 Dec 2020-28 Jan 2021), second (1-26 Mar 2021), third (17 May-11 Jun 2021), and fourth (20 Sep-8 Oct 2021) testing period (pri, primary schools; sec, secondary schools). The fourth testing period only includes primary school pupils.

4. FINDINGS ON PCR POSITIVITY AND HOSPITALISATION

The online survey of the 4th testing period was completed by parents of 405 pupils, of whom 31 (7.7%) reported a confirmed SARS-CoV-2 infection since the start of the pandemic. For 13 (3.2%) pupils the infection was diagnosed during the summer holidays, between the end of the 2020-2021 academic year and the 4th testing period.

No pupil with completed questionnaire for the 4th testing period was admitted to the hospital because of COVID-19 since the pandemic start.

REFERENCES

For the general methods and study protocol we refer to:

Report first testing period: <https://www.sciensano.be/en/biblio/prevalence-and-incidence-antibodies-against-sars-cov-2-children-and-school-staff-measured-between>, and

Brief summary second testing period: <https://www.sciensano.be/en/biblio/prevalence-and-incidence-antibodies-against-sars-cov-2-children-and-school-staff-measured-between-0>

Brief summary third testing period: <https://www.sciensano.be/en/biblio/prevalence-and-incidence-antibodies-against-sars-cov-2-children-and-school-staff-measured-between-2>

Study protocol: <https://www.sciensano.be/en/biblio/prevalence-and-incidence-antibodies-against-sars-cov-2-children-and-school-staff-measured-one-year>.

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