

# PREVALENCE AND INCIDENCE OF ANTIBODIES AGAINST SARS-COV-2 IN CHILDREN AND SCHOOL STAFF MEASURED BETWEEN DECEMBER 2020 AND JUNE 2021: AN OBSERVATIONAL SERO-PREVALENCE PROSPECTIVE COHORT STUDY

## Main findings of the third testing period – brief summary

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### 1. PREVALENCE OF ANTI-SARS-COV-2 ANTIBODIES

The third testing period of the study took place from May 17<sup>th</sup> to June 11<sup>th</sup>, 2021. Saliva samples were collected from 1,868 subjects: 1,214 pupils (682 primary and 532 secondary school; 94.1% of 1,290 pupils enrolled in the study) and 654 staff (352 in primary and 302 in secondary schools; 79.3% of 825 enrolled in the study). Of these, 36 samples (2%) (25 pupils, 11 staff) could not be tested due to insufficient sample volume. The remaining samples from 1,189 pupils and 643 school staff 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. We received an online questionnaire for 896 (73.8%) pupils and 597 (91.3%) staff members who participated in the 3<sup>rd</sup> testing period.

Prevalence estimates and differences between groups were estimated with generalized estimating equations to account for possible clustered outcomes for subjects from the same schools. Difference between testing periods were analogously tested using the subject as the clustering variable.

During the 3<sup>rd</sup> testing period in May/June 2021, we recorded **anti-SARS-CoV-2 antibodies in 15.4% of primary and 17.2% of secondary school children in Belgium**. The prevalence of anti-SARS-CoV-2 antibodies among **school staff was 39.7% in primary and 36.1% in secondary schools** (see Table 1 and Figure 1 below).

The higher sero-prevalence among school staff compared to pupils and compared to the sero-prevalence measured in March 2021 (2<sup>nd</sup> testing period) is largely due to the presence of vaccinated subjects as further documented in section 2. Between the 2<sup>nd</sup> and 3<sup>th</sup> testing point, the sero-prevalence in school staff increased with 19.0 percentage points (95% CI (confidence interval) 15.2 - 22.9). Sero-prevalence estimates of detectable anti-SARS-CoV-2 antibodies among staff members are therefore attributable to both past infection and vaccination

**Table 1: Number and adjusted prevalence of anti-SARS-CoV-2 antibodies (IgG) among primary (age 7-9) and secondary (age 13-14) school children and school staff (vaccinated and non-vaccinated), Belgium and three regions, May 17<sup>th</sup>- June 11<sup>th</sup> 2021**

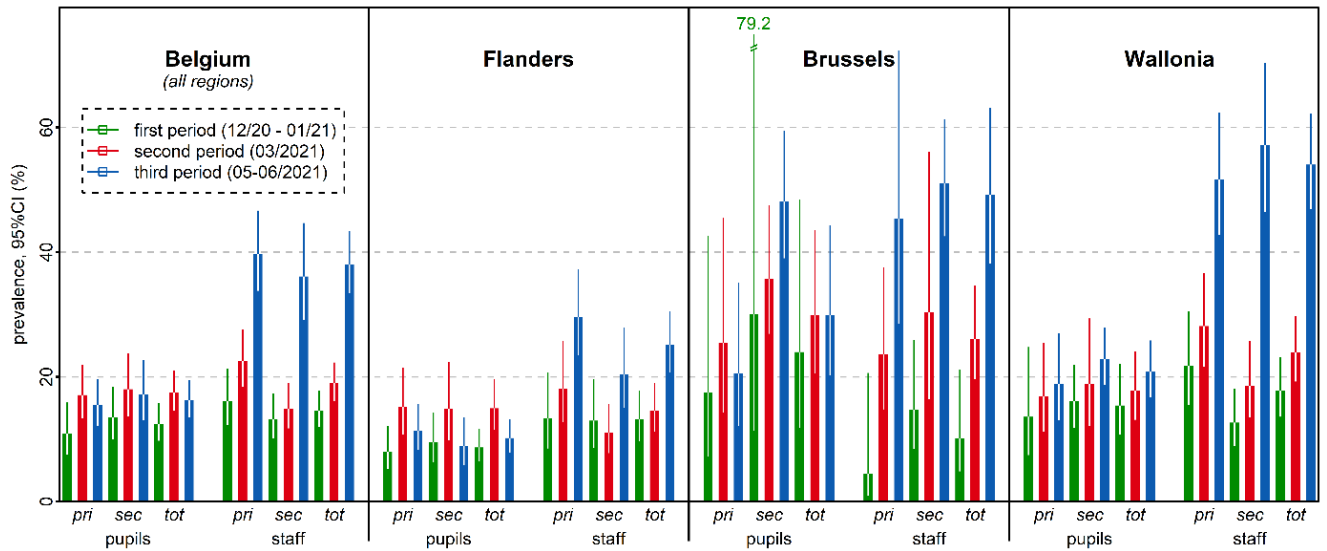
	Pupils		Staff*	
	number positive/total	Prevalence % (95% CI)	number positive/total	Prevalence % (95% CI)
<b>BELGIUM</b>				
Primary school	102/664	15.4 (12.2 – 19.6)	137/345	39.7 (33.8 – 46.7)
Secondary school	87/525	17.2 (13.1 – 22.7)	108/298	36.1 (29.2 – 44.7)
<b>TOTAL</b>	<b>189/1189</b>	<b>16.2 (13.5 – 19.4)</b>	<b>245/643</b>	<b>38.0 (33.4 – 43.3)</b>
<b>REGIONS</b>				
<b>BRUSSELS</b>				
Primary school	19/92	20.6 (12.1 – 35.0)	21/45	45.4 (28.5 – 72.3)
Secondary school	20/43	48.2 (39.0 – 59.5)	18/34	51.1 (42.5 – 61.3)
<b>TOTAL</b>	<b>39/135</b>	<b>29.9 (20.2 – 44.2)</b>	<b>39/79</b>	<b>49.1 (38.2 – 63.2)</b>
<b>FLANDERS</b>				
Primary school	38/337	11.4 (7.7 – 15.0)	52/176	29.6 (22.7 – 36.4)
Secondary school	27/309	8.9 (5.2 – 12.7)	34/166	20.4 (14.1 – 26.8)
<b>TOTAL</b>	<b>65/646</b>	<b>10.2 (7.6 – 12.8)</b>	<b>86/342</b>	<b>25.1 (20.3 – 30.0)</b>
<b>WALLONIA</b>				
Primary school	45/235	18.8 (13.6 – 27.0)	64/124	51.6 (42.7 – 62.4)
Secondary school	40/173	22.9 (18.8 – 27.9)	56/98	57.1 (46.4 – 70.3)
<b>TOTAL</b>	<b>85/408</b>	<b>20.8 (16.7 – 25.8)</b>	<b>120/222</b>	<b>54.0 (46.9 – 62.2)</b>

CI, confidence interval (adjusted for clustering of subjects); N, number.

\***Sero-prevalence estimates include both vaccinated and non-vaccinated staff.** Detailed numbers and proportion of vaccinated staff in Table 2.

Differences between primary and secondary school pupils were not statistically significant during the first two testing periods. This remains true at the national level (RD 1.7; 95% CI -4.3 – 7.7) and within the regions of Flanders (RD -2.6; 95% CI -7.8 – 2.6) and Wallonia (RD 4.4; 95% CI -4.2 – 12.9), but the large difference observed between age groups in Brussels is statistically significant (RD 25.0; 95% CI 8.3 – 41.7).

Compared with the 2<sup>nd</sup> testing period in March 2021, the total sero-prevalence among pupils decreased with 1.3 percentage points (95% CI 0.8 - 3.4) from 17.5% in March 2021 to 16.2% in May/June 2021. However, this change is not statistically significant. At national level this change is due to a lower sero-prevalence among pupils in Flanders in whom a statistical significant decrease with 4.3 percentage points (95% CI 1.5 - 7.0) was observed, which, in turn, is mainly driven by a statistically significant decrease with 5.7 percentage points (95% CI 2.4 - 9.0) among secondary school pupils. Waning of detectable antibodies, combined with a low rate of infections between the 2<sup>nd</sup> and 3<sup>rd</sup> testing period are the most likely hypotheses for this decrease. Differences between the 2<sup>nd</sup> (March) and 3<sup>rd</sup> (May/June) testing periods among primary school pupils in Flanders and among primary and secondary school pupils in Wallonia and Brussels, either separately or combined, were found to be not statistically significant.



**Figure 1: Prevalence and 95% confidence interval (whiskers) of anti-SARS-CoV-2 antibodies (IgG) among primary (age 7-9) and secondary (age 13-14) school children and school staff (including vaccinated staff), Belgium and three regions, first (3 Dec 2020-28 Jan 2021), second (1-26 Mar 2021) and third (17 May-11 June 2021) testing period (pri, primary schools; sec, secondary schools; tot, total)**

## 2. FINDINGS ON VACCINATION, PCR POSITIVITY AND HOSPITALISATION

Data on vaccination status, PCR positivity for COVID-19 and hospitalisation were collected with an online questionnaire.

At the 3<sup>rd</sup> testing period, 252/597 (42.2%) of the school staff who completed the questionnaire received at least one dose of SARS-CoV-2 vaccine, 141/322 (43.8%) of primary school, and 111/275 (40.4%) of secondary school staff. However, the (partial) vaccination coverage was considerably higher in Wallonia and Brussels than in Flanders, which reflects regional differences in vaccination policy.

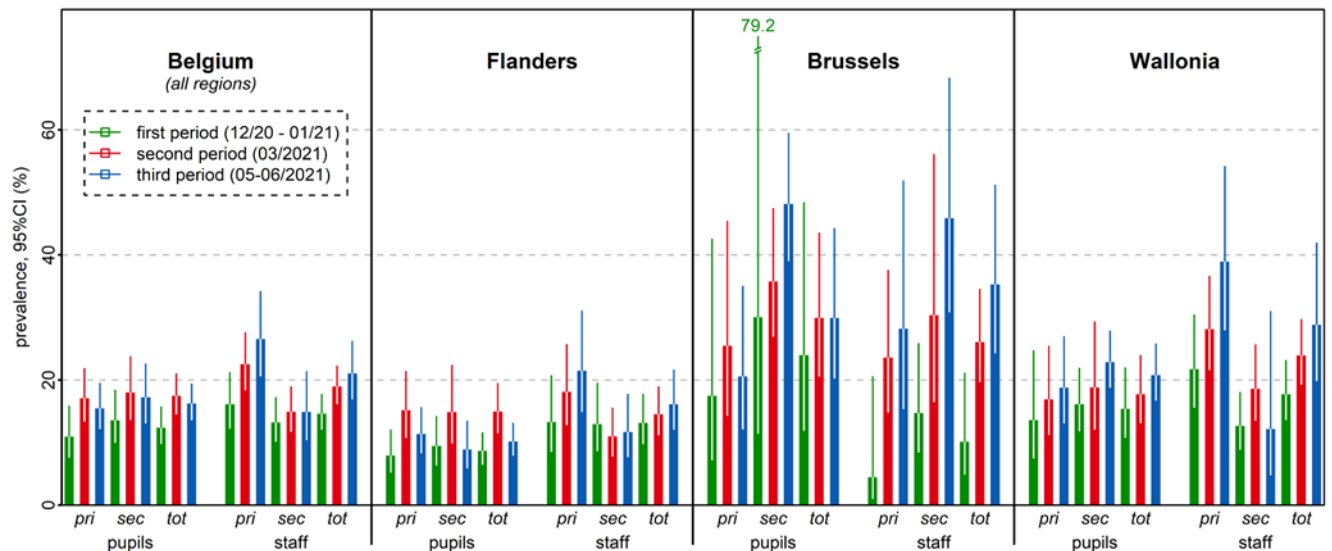
The vaccination coverage by region and type of school is listed in Table 2, along with sero-prevalence estimates among non-vaccinated staff (see also Figure 2). Compared with our estimate of 19.0% in March 2021 (2<sup>nd</sup> testing period), the sero-prevalence was only slightly and not statistically significant increased in non-vaccinated school staff in May/June 2021. When accounting for the study design, the risk difference was 0.4 percentage points (95% CI -3.6 - 4.5) in primary and secondary school staff in Belgium, 0.2 percentage points (95%CI -4.3 - 4.8) in Flanders and 3.4 percentage points (95% CI -7.7 - 14.4) in Wallonia). The confidence intervals are however large due to the small number of eligible subjects.

**Table 2: Vaccination coverage by region and adjusted prevalence of anti-SARS-CoV-2 antibodies (IgG) among non-vaccinated school staff, Belgium and three regions, 17 May-11Jun 2021**

	Staff vaccinated/total (%) <sup>*</sup>	Unvaccinated Staff <sup>**</sup> number positive/total	Prevalence % (95% CI)
<b>BELGIUM</b>			
Primary school	141/322 (43.8)	47/177	26.5 (20.6 – 34.2)
Secondary school	111/275 (40.4)	24/161	14.9 (10.3 – 21.4)
<b>TOTAL</b>	<b>252/597 (42.2)</b>	<b>71/338</b>	<b>21.1 (16.9 – 26.3)</b>
<b>REGIONS</b>			
<b>BRUSSELS</b>			
Primary school	16/41 (39.0)	7/25	28.2 (15.3 – 51.9)
Secondary school	16/31 (51.6)	7/15	45.9 (30.8 – 68.4)
<b>TOTAL</b>	<b>32/72 (44.4)</b>	<b>14/40</b>	<b>35.3 (24.3 – 51.3)</b>
<b>FLANDERS</b>			
Primary school	63/173 (36.4)	23/107	21.5 (14.9 – 31.1)
Secondary school	37/162 (22.8)	14/122	11.7 (7.7 – 17.8)
<b>TOTAL</b>	<b>100/335 (29.9)</b>	<b>37/229</b>	<b>16.2 (12.0 – 21.7)</b>
<b>WALLONIA</b>			
Primary school	62/108 (57.4)	17/45	38.9 (27.9 – 54.2)
Secondary school	58/82 (70.7)	3/24	12.2 (4.8 – 31.0)
<b>TOTAL</b>	<b>120/190 (63.2)</b>	<b>20/69</b>	<b>28.8 (19.8 – 41.9)</b>

CI, confidence interval (adjusted for clustering of subjects); N, number.

<sup>\*</sup>Number vaccinated with at least one dose among survey respondents; including 10 staff members who could not be tested. <sup>\*\*</sup> Staff members who were tested and reported “no vaccination” on the online questionnaire, 7 unvaccinated staff members could not be tested.



**Figure 2: Prevalence and 95% confidence interval (whiskers) of anti-SARS-CoV-2 antibodies (IgG) among primary (age 7-9) and secondary (age 13-14) school children (same data as figure 1) and non-vaccinated school staff, Belgium and three regions, first (3 Dec 2020-28 Jan 2021), second (1-26 Mar 2021) and third (17 May-11 June 2021) testing period (pri, primary schools; sec, secondary schools; tot, total)**

In total, 7.0% (95% CI 5.3%-9.1%) of pupils and 15.1% (95% CI 11.9%-19.0%) of staff for whom a questionnaire was completed reported a confirmed infection with SARS-CoV-2 since the start of the pandemic (reported in the survey of the 3<sup>rd</sup> testing period or before). Antibodies could be detected in 113 (74.8%) out of 151 subjects for whom a confirmed infection was reported.

None of subjects who participated in the 3<sup>rd</sup> testing period were known to be admitted to the hospital because of COVID-19 since the pandemic start.

For the general methods and study protocol we refer to:

Report first testing point: <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>

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