

## Work Package 3: Health transformations

### Deliverable 3.1: Report on school and pupil participation in the health impact assessment for work package 3

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## SUMMARY

Work Package 3 (WP3) of the COOLSCHOOLS project aims to investigate the associations of school yard and surrounding green spaces with cognitive function and well-being of 10-12 year old pupils attending the 5<sup>th</sup> or 6<sup>th</sup> grade of primary schools in the Brussels Capital Region. To achieve this objective, the goal is to include (at least) 10 primary schools and approximately 300 pupils in grades 5<sup>th</sup> or 6<sup>th</sup>. In this report, we present a description of the participation of schools and pupils for WP3.

We selected 199 Brussels schools paired by the amount of green within and surrounding the schools with the socio-economic (SE) background of the school. Thus, the following four categories were defined: 1) low SE background and low greenness, 2) high SE background and low greenness, 3) low SE background and high greenness, and 4) high SE background and high greenness. School SE background was determined based on indicators provided by the Flemish Government (2020) and the *Fédération Wallonie-Bruxelles* (2020-2021) in Belgium. The indicators were scores (French-speaking schools) or percentage of children with school allowance (Dutch-speaking schools) per school, and were categorized in high, medium and low SE background. School greenness was defined as the tree canopy cover percentage within the school boundaries, and within a buffer of 300 meters around the school. Schools were then classified according to high, medium and low amount of greenness within and around the school. Schools classified as having low greenness, exhibited low greenness both within and around the school. Given the scarcity of schools with high greenness within and around the school, those with medium greenness within and around the school were also considered. Within this category of schools, the schools with the highest percentage of greenness within the school were selected.

In total, 157 schools were contacted and 15% accepted to participate in the study (n=24). To date, the measurements of cognition and well-being of children have been finalized in 19 of the 24 schools, and the measurements in the 5 remaining schools will be finalized by the end of February/beginning of March. Regarding pupil participation, so far, 282 children in the 5<sup>th</sup> and 6<sup>th</sup> grades of 19 schools participated in the cognitive function and well-being measurements. We observe higher participation rates in schools classified as high SE schools with low greenness within and around the school. Yet the lowest participation rates are observed in schools with high SE background but higher amount of green spaces within and around the school.

In conclusion, the goal of including (at least) 10 schools has been achieved. However, the low participation rate of pupils in some schools required the inclusion of a higher number of schools than initially anticipated. The goal of including approximately 300 pupils has been almost achieved. Currently, 282 children attending 19 schools participated in the measurements, and we are expecting to receive consent forms for pupils from 5 additional schools in the coming weeks. Therefore, we expect that by the end of February/beginning of March, the pupil participation will reach the goal of 300 participants. Last, although the distribution in terms of school and pupil participation is unequal across the 4 pre-defined groups of schools, the numbers per category are sufficient to provide adequate statistical power for the analyses.

## 1. GENERAL OBJECTIVE AND PARTICIPATION GOALS

The objective of work package (WP) 3, is to investigate the associations of school yard and surrounding green spaces with cognitive function and well-being of pupils aged 10 to 12 years and attending the 5<sup>th</sup> or 6<sup>th</sup> grades of primary schools in the Brussels Capital Region. To achieve this objective, the goal of participation is to include (at least) 10 primary schools in Brussels and approximately 300 pupils in grades 5<sup>th</sup> or 6<sup>th</sup>. In this report, we present a description of the participation of schools and pupils for WP3.

## 2. ETHICS

Prior to starting the school selection and inclusion of schools and pupils, we submitted the study protocols to the UZA-UA ethics committee and the Committee on Medical Ethics University of Hasselt. Ethical clearance to proceed with the work planned in WP3 was obtained from both committees (project ID 5141 – BUN B3002023000034).

## 3. SELECTION OF PRIMARY SCHOOLS

In the Brussels Capital Region, 418 primary schools are part of either the French-speaking community or the Dutch-speaking community. To reduce the potential impact of socio-economic (SE) background on the results and ensure sufficient statistical power, we selected schools based on SE background of the schools, and schoolyard and school neighborhood's greenness. Thus, we selected schools in 4 groups: 1) low SE background and low greenness, 2) high SE background and low greenness, and 3) low SE background and high greenness, and 4) high SE background and high greenness.

Information on the SE background of the school was provided by the VUB (WP1). For French-speaking community schools, this was based on the 'Indice Socio-économique' (ISE) 2020-2021 provided by the *Fédération Wallonie-Bruxelles*. In brief, schools are assigned a score ranging from 1 to 20, where the higher the score the lower the SE background of the school. Details on the methods to calculate the index and the school classifications for the French-speaking community schools in Belgium are provided elsewhere (see here [methods](#) and [classification](#), documents available only in French). For the inclusion of schools we classified schools in high (ISE 16 to 20), medium (ISE 6 to 15) and low (ISE 1 to 5) SE background. For Flemish-speaking schools, SE background was obtained from the Flemish Government based on the percentage of pupils with a school allowance for school year 2020-2021 (see [here](#) for details). We considered schools having a low SE background when the percentage of pupils with school allowance was 54% or higher. Medium SE background was for schools with 21 to 53% pupils with school allowance and high SE background included schools where the percentage of pupils with school allowance was 20% or less.

Schoolyard greenness and neighborhood greenness were estimated by the VUB in WP1. Schoolyard greenness was defined as the tree canopy cover percentage within the school boundaries. Neighborhood greenness was defined as the tree canopy cover percentage within an Euclidian buffer area of 300 meters around the school compounds. For both, three categories were defined (1 – High greenness (26-65%), 2 – Medium greenness (11-25%) and 3 – Low greenness (0-10%)). For the school selection, we included schools from all categories).

Initially, we excluded the medium category for both SE background and greenness from the selection. When the number of schools in a specific category was insufficient, we used schools within the medium categories that scored close to the target cut-off (high or low) for either green spaces or SE background. In total, we selected 199 schools (i.e. 48% of all schools in Brussels). **Table 1** illustrates the categorization of primary schools and number of schools in each category that were eligible for recruitment. The number of schools within the low SE

background and low greenness category was considerably higher than the number of schools in the other categories. The category with the lowest number of schools included was that of high SE background and high greenness.

**Table 1.** Number of schools eligible for recruitment by SE background and schoolyard and neighborhood greenness of the schools (total  $n=199$ ).

	SE background	
	Low	High
<b>Greenness within and around the school</b>		
Low	118	33
High	38	10

SE: socio-economic

## 4. RECRUITMENT

After the selection of primary schools, we started contacting and inviting schools to participate. When schools agreed to participate, pupils in the 5<sup>th</sup> and 6<sup>th</sup> grades of these schools were invited to participate. The methods used for recruitment of both schools and pupils were adapted during the work in order to improve participation. Here, we explain the methods used and adaptations for both schools and pupil recruitment and provide an overview of participation after the adaptations in the recruitment methods (see section 5).

### a. Schools

The schools included in our selection list (see table 1 in the previous section) were contacted either directly by the researchers at UHasselt and UAntwerp or by Brussels Environment (BE - COOLSCHOOLS partner) and were invited to participate. Contacts were done via telephone and email. For schools that replied positively to the initial invite, we organized a meeting at the school with the school principal/director and (when possible) other staff members. In this meeting the researchers provided more details about the work and expectations for WP3. This approach resulted in a school participation rate of 15%.

### b. Pupils

When schools consented to participate, the information documents and informed consents for parents were provided to the school principal (or other staff members). These documents and consents were then distributed by the 5<sup>th</sup> and 6<sup>th</sup> grade teachers to their pupils, who would give the documents to their parents. Parents were requested to read the information documents and sign the informed consent for participation.

In addition, information sessions lead by the researchers were organized for the parents. The information sessions did not attract parents and participation rate was 20%. Therefore, the sessions were replaced by short videos where one of the researchers explained the project and the details of the measurements in four languages (Dutch, French, English and Arabic). The videos were distributed through QR-codes that were put on all envelopes with the information documents and informed consents for the parents. So far, this approach has resulted in an increase in pupil participation (provisional participation rate when using videos: 27%). At the moment of writing this report, we lack information on the last 5 schools that consented to participate. These schools are currently distributing the informed consents to the parents. Therefore, the final participation rate for pupils will be available in March 2024 (see also next section on “Participation”).

## 5. PARTICIPATION

In total, we contacted 157 schools out of the 199 eligible schools presented in **Table 1**. Of these 157 schools, 24 (15%) consented to participate. The final number of included schools more than doubles the minimum number of schools planned to include (see first section “General objective and participation goals”). This is related to the initial low pupil/parent response rate, that would not allow to reach a sufficient number of pupils when including only around 10 schools.

At the moment of writing this report, the cognitive and well-being measurements among pupils have been conducted in 19 out of the 24 schools that consented to participate (i.e. 80% of the included schools). The measurements among pupils in the remaining 5 schools will be conducted during February and (latest) during the first week(s) of March 2024. Therefore, the data presented here refers to the 19 schools in which the pupil measurements have been completed.

### a. Description of participating schools.

As mentioned in section 3 of this report (“Selection of primary schools”), we invited schools based on the level of greenness within and around the school, and based on the SE background of the school. **Table 2** shows the number of schools included (and with measurements finalized to date, n=19) by green-SE background pair. In total, 4 schools had a high amount of surrounding greenness, and medium to high amount of greenness within the school. These 4 schools were also classified as medium to high SE background and were considered therefore within the high green – high SE background group. In the low green – low SE background group we included 6 schools, all with low to medium green within and around the school, and low to medium SE background. The group with low green and high SE background included 5 schools, all with low green within the school, medium-low green in the surroundings and mainly low SE background. Last, 4 schools were included in the category of high green and low SE background, the level of greenness in these schools was medium to high and the SE background in all schools was low. The 5 schools that have accepted to participate but for which the measurements have not yet been done will be included in high SE background and low greenness (1 school), low SE background and high greenness (3 schools), and high SE background and greenness (1 school). Information for these 5 schools without measurements is not included in **Table 2** as the number of pupils is yet unknown and, therefore, their final inclusion is not ensured.

**Table 2.** Number of schools included in each category of greenness and SE background (total n=19).

	SE background	
	Low	High
<b>Greenness within and around the school</b>		
Low	6	5
High	4	4

SE: socio-economic

### b. Description of participating pupils.

In total, 1309 children attending the 19 schools described in this report were invited to participate. Among them, parents of 282 children (21% of the invited) signed the informed consent and their children participated in the measurements. This participation rate, however, varied considerably across schools, ranging from 7% to 47%

(data per school not shown). A description of numbers of included children's participation rates per school category (greenness and SE background) is provided in **table 3**. The highest number of children included to date are attending schools within the categories of high green with low SE background and low green with high SE background. These categories were also the ones with the highest response rates, with about one quarter of the invited children participating in the study. So far, the lowest participation rate was observed for schools with high greenness and high SE background. These data will be updated with the numbers obtained in the 5 schools that will start with the measurements in the coming weeks.

**Table 3.** Number of children included and percentage of respondents by category of greenness and SE background (total n children included=282; total n schools = 19).

	SE background			
	Low		High	
	Included children (n)	Participation rate (%)	Included children (n)	Participation rate (%)
<b>Greenness within and around the school</b>				
<b>Low</b>	63	20%	84	27%
<b>High</b>	81	24%	54	16%

SE: socio-economic

## 6. CONCLUSIONS

For this WP, we selected 199 schools within the Brussels Capital Region paired by the amount of green within and surrounding the schools with the SE background of the school. Overall, 157 schools were contacted and 15% (n=24) accepted to participate in the study. Children of 5 schools that have accepted to participate will undergo the measurements during February-March 2024. Within the 19 schools where the measurements are finalized, 282 children participated in the cognitive function and well-being measurements. We observe higher participation rates in schools with predominantly medium to high SE background that also have low greenness within and around the school. The lowest participation rates are observed in schools with the same SE background as the latter but higher amount of green spaces within and around the school.

In conclusion, the goal of including (at least) 10 schools has been achieved. The low participation rate of pupils in some schools required the inclusion of a larger number of schools. The goal of including approximately 300 pupils has been almost achieved. Currently, 282 pupils of 19 schools participated and 5 additional schools still need to return the signed informed consents. Therefore, we expect that by the end of February/beginning of March 2024, the pupil participation will reach the goal of 300 participants. Last, although the distribution in terms of school and pupil participation is unequal across the 4 pre-defined groups of schools, the numbers per category are adequate to provide sufficient statistical power for the subsequent quantitative analyses.