



# JOINT TRANSNATIONAL STRATEGY FOR INDOOR AIR QUALITY ACTION PLANS

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2018

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## A. Introduction

Most of the people spend approximately 80-90% of their time indoors. Primary schools are among the indoor microenvironments where thousands of students spend approximately 6-9 h daily from Monday to Friday in each Central European country. Proper care of indoor air quality (IAQ) in primary school buildings, especially in the classrooms, is needed to ensure children`s health and well-being.

Some international projects have already been addressed to IAQ in school buildings in the past decade and several recommendations have been formulated; however, the action plans were less implemented. The InAirQ project has been launched to protect health of the schoolchildren by forcing the collaboration between different sectors and to test the action plans developed in the frame of the project.

The joint transnational strategy for IAQ action plans is a tool for providing guidance to develop a national strategy for IAQ action plans. It helps to identify the problems, to describe the ways for improvement and to integrate actions that positively affect the IAQ into the system`s normal use, management and maintenance.

The joint transnational strategy for IAQ action plans builds on the description and assessment of the current situation regarding all relevant factors which are linked to IAQ. Integral parts of the strategy are the vulnerability assessment, the SWOT analysis and the environmental and health surveillance methods. Examples for all parts of the strategy are provided in this document. Furthermore, several recommendations for the elaboration of the action plans are listed.



## B. Major components of the strategy

### B.1. Vulnerability assessment

Vulnerability assessment is a basic step to describe the situation and scope of the problem, including the availability of data. To describe the basic characteristics of the situation, follow the following points:

- Describe the range of environments and populations affected by the problem. Give information on the number of primary schools and classrooms in the country/region (based on national statistics and national/regional surveys) and number of children attending them.
- Give a general overview about the types of school buildings in the country/region  
(Possible source: National strategy on energy performance of buildings/National harmonization of the directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance buildings).
- Elaborate a general overview about the state of the school buildings in the country/region (based on available national school survey data and/or European Commission funded projects and/or other projects). Please indicate the main renovation works completed nationwide in the primary schools.
- List the major characteristics and problems regarding the maintenance of the buildings and highlight those problems which might affect indoor air quality.
- Describe legal measures related to the management of schools and monitoring of indoor environment (please check the questionnaire is in Appendix 1, based on WHO Policy Questionnaire 2008 and WHO Environmental and Health Policy Questionnaire 2014).
- Describe the results of indoor air quality field campaign(s) carried out in school buildings (e.g. national campaign, international projects and other). Prepare a database (including all IAQ data, if possible).
- Briefly describe the quality of ambient air in the country, the main issues and problematic sites and sources of air pollution information available. Assess the importance of ambient air quality in addressing indoor air quality in schools.



## B.2. SWOT Analysis

SWOT analysis is a method that can be used to evaluate the Strengths, Weaknesses, Opportunities, and Threats that exist in the case of IAQ in school buildings. This is an essential part of strategic planning. To assess the school environment, SWOT analysis uses both internal and external factors that may have an impact on the IAQ. The internal factors (strengths and weaknesses) are present within the school environment, while external factors (opportunities and threats) are beyond the schools. These critical factors, that may influence decision-making process directed to improve the IAQ in the schools, have to be identified in the country/region to use them as background to define the goals and objectives that have to be achieved in each country.

It must be noted that the factors to be maintained are **Strengths** (internal positive attributes of the school environment that can facilitate activities aimed to improve the IAQ) and **Opportunities**, (external conditions that may facilitate activities aimed to improve the IAQ in schools), while the factors to be addressed are the **Weaknesses** (internal attributes of the school environment that may hinder activities aimed to improve the IAQ) and **Threats** (external conditions that may complicate activities aimed to improve the IAQ in schools).

The presence of weaknesses and threats proves the existing gaps that have to be addressed in strategic planning (please find the definition below) to avoid or minimize their impact on the IAQ in the future. The absence of strengths and/or opportunities highlights the urgent need of further plans or developments before actions are taken to avoid weaknesses and threats [1].

**Strengths:** internal positive attributes of the school environment that can facilitate activities aimed to improve the IAQ.

**Weaknesses:** internal attributes of the school environment that may hinder activities aimed to improve the IAQ.

**Opportunities:** external conditions that may facilitate activities aimed to improve the IAQ in schools.

**Threats:** external conditions that may complicate activities aimed to improve the IAQ in schools.

There are several more or less similar definitions for strategic planning; two of them are:

- according to Geyer [2], strategic planning is a process, by which an organisation analyses whether it is effective in its goals and objectives, and it establishes whether the organisation needs to change its direction to fulfil



its purpose. Strategic planning helps to respond to the external environment in the most effective way.

- according to Lerner [3], strategic planning is a complex and ongoing process of organizational change. It is based on thorough analysis of foreseen or predicted trends and scenarios of the possible alternative futures, as well as the analysis of internal and external data. It is a qualitative, idea driven process. It integrates soft data, not always supported quantitatively, such as experiences, intuition, and ideas, involves the organization in the ongoing dialogue, and aims to provide a clear organizational vision and focus. It is an ongoing, continuous learning process, an organizational dialogue, which extends beyond attaining a set of predetermined goals. It aims to change the way an organization thinks and operates, and create a learning organization.

The methodology described below can be used to perform a SWOT analysis [1]:

- a) **Internal analysis** examines the advantages and drawbacks of school environment on the IAQ. This can be achieved by the analysis of the current state of school environment (Strengths and Weaknesses) and the impact of the school environment on the IAQ.
- b) **External analysis** examines the main relevant points in the analysis of the actual state of policy-related factors which are independent of the schools (e.g. legislation in force, financial environment). They are identified as Opportunities or Threats or obstacles to be addressed in future.
- c) **Collected information** (according to points 1 and 2) are used to fill the SWOT analysis tool in (enclosed table).
- d) Properly performed SWOT analysis is needed to elaborate the strategy that applies Strength and Opportunities to reduce Weaknesses and Threats and finally to achieve a better IAQ in primary schools.

When performing the SWOT analysis, consider the following parameters:

- education policy;
- legislation(s) in force;
- financial environment;
- stakeholders (including authorities) involvement;
- current state of the applied technology (including building technology, HVAC systems, building finishing and furnishings);
- possibility of modern technology development and innovation (including building technology, HVAC systems, building finishing and furnishings);
- dissemination of knowledge and increase of awareness of schools management regarding to ensure the good IAQ;



- trends in public health that may affect the IAQ.

## References

1. Zaletel-Kragelj L. and Božikov J. [Eds] Methods and Tools in Public Health, Ljubljana, 2010.
2. Geyer Y. Strategic planning. Handbook series for community-based organisations. Pretoria: IDASA; 2006.
3. Lerner AL. A Strategic planning primer for higher education. Northridge: College of Business Administration and Economics, California State University; 1999.



## SWOT Analysis Tool

Improvement of the Indoor Air Quality in the school environment

Identify Strengths, Weaknesses, Opportunities and Threats but limit the points to a maximum of ten under each heading [1]

SWOT analysis tool		Internal analysis	
		<b>STRENGTHS</b> What has a positive impact on the school environment regarding IAQ? 1. 2. 3.	<b>WEAKNESSES</b> What has a negative impact on the school environment regarding IAQ? 1. 2. 3.
<b>External analysis</b>	<b>OPPORTUNITIES</b> What are the opportunities to improve the IAQ in the school environment? 1. 2. 3.	<b>Opportunity-Strength (OS) Strategies</b> How can we use Strengths to take advantage of Opportunities? 1. 2. 3.	<b>Opportunity-Weakness (OW) Strategies</b> How can we overcome Weaknesses by taking advantage of Opportunities? 1. 2. 3.
	<b>THREATS</b> What are the threats that can negatively influence the IAQ in the school environment? 1. 2. 3.	<b>Threat-Strength (TS) Strategies</b> How can we use Strengths to avoid Threats? 1. 2. 3.	<b>Threat-Weakness (TW) Strategies</b> How can we minimize Weaknesses and avoid Threats? 1. 2. 3.





### B.3. Environmental and health surveillance methods

The vulnerability assessment and SWOT analysis provide a general overview about the current situation of the school environment at a regional or country level. However, the current IAQ levels in the school buildings and the health of schoolchildren cannot be evaluated properly without additional surveys/monitoring campaigns. Moreover, the current state of the school building, the local environmental factors that might have an influence on IAQ, etc. might vary among buildings. Thus, it is recommended to carry out field campaigns according to a well-defined protocol. An example for the protocol is provided in Annex I. The field campaign usually consists of the characterization of the environmental factors by checklists, monitoring of the air quality indoors and outdoors and investigation of the respiratory health of the schoolchildren by questionnaires. These methods provide useful information for the elaboration of action plans at national, regional or building level. The investigation of the link among IAQ parameters, health aspects and environmental factors is needed to reduce the exposure of children to indoor air pollution.

#### B.3.1. Characterization of a school building by checklists

The first step is to describe and assess the current state of the school environment and to identify potential problems in a school building. The description is based on the assessment of the factors that might have an influence on the IAQ. The subjective evaluation of the occupants is also a good indicator of problems related to IAQ.

The following factors might have an influence on IAQ:

- a) Outdoor air quality (air pollution in the wider area, sources of air pollutants in the immediate vicinity of the building /e.g., main roads, parking, waste disposal facilities, industrial activities, etc./)
- b) Soil beneath the building and surrounding (e.g., radon, old loads)
- c) School building materials, furniture, equipment (e.g. building elements, insulating materials, flooring material, paints and adhesives used, room equipment, furniture, etc.)
- d) Source processes for air pollutants based on activities in school buildings such as:
  - incineration, heating, cooking;
  - regular school activities of children (e.g., sport, art, etc.);
  - activities of the staff (e.g., use of cleaning products, smoking, use of laser printers, photocopiers);



- renovation works;
  - non-expected events (damage to the building due to heating or leakage).
- e) Other factors that affect the quality of the indoor air:
- method of air exchange in the building;
  - occurrence of moisture and mould.

Examples for checklist which can be used for the assessment of the classroom and the school building are provided in Annex II. and Annex III., respectively. Subjective user reviews can be obtained through a simple questionnaire or by evaluating complaints (if they exist). The number of reviewers is crucial to get an overall picture on the current state of the school environment.

### B.3.2. Assessment of indoor air quality

Indoor air quality plays an important role regarding the health status of the schoolchildren. The monitoring of physical parameters and quantification of the biological and chemical air pollutants are necessary actions to determine the health risk of air pollution on the health of the pupils. There are plenty of air pollutants present in the air, thus the proper selection of the investigated parameters is crucial. Some parameters might have an influence on the comfort of the students, while others might cause respiratory symptoms and diseases. Since there is still no consensus on how to regulate IAQ at an international level, the recommendations of the World Health Organisation or national guidelines (if they exist) are relevant. The investigated parameters are usually the following:

- physical parameters: temperature, relative humidity, air exchange rate
- biological air pollutants: bacteria, fungi
- chemical air pollutants: volatile organic compounds, aldehydes, particulate matter (PM10 and PM2.5), carbon-dioxide, radon.

It should be noted that several air pollutants have seasonal variability, thus the timing of the measurements must be taken into account. Besides IAQ, simultaneous monitoring of the ambient air quality is recommended to identify the sources of air pollutants.

### B.3.3. Health risk evaluation

An Indoor Health Index can be calculated if the main air pollutants and physical factors were investigated during the monitoring campaign. The calculation of the Indoor Health Index is based on different threshold values determined by the health



effects of the air pollutants/physical parameters (recommendations of the WHO and/or EC and/or scientific papers). The methodology for calculating Indoor Health Index is described in details in Annex IV. The Indoor Health Index can be used (i) to disseminate the results of the monitoring campaign among the public and stakeholders and (ii) to provide health relevant information about the IAQ.

Furthermore, health-relevant information can be collected by questionnaires filled in by the parents of the schoolchildren. An example for the questionnaire on the respiratory and allergic health of schoolchildren and home environment is provided in Annex V.



## C. Recommendations for the elaboration of the action plans

Based on the above-mentioned methods (vulnerability assessment, SWOT analysis, environmental and health surveillance) a national strategy for IAQ action plans can be elaborated. It is recommended that the national strategy should include the national vulnerability assessment and the nation SWOT analysis as well as the plans for a nationwide environmental and health monitoring campaign. If representative IAQ and health-relevant data have already been collected in the primary school buildings then the details should be added. All of these methods help to identify the problems related to the indoor school environment.

The responsibilities and roles regarding IAQ management must be described at different levels (i.e. stakeholder, municipality, school management) which might make the execution of the national strategy for IAQ action plans clear for all participants. The representatives of all affected sectors should be included in the development process. The action plans should be cost-effective; however, the health gain related to the implementation of the action plan must be high. The number of the necessary action plans depends on the problems identified. The capacity-building is an important part of the national strategy, thus there is a need for education and special handbooks for the target groups.

The national strategy should contain some examples of the IAQ action plans. Some recommendations are provided as follows:

- operational, i.e. modifying the mode of some activities that can affect the quality of the indoor environment (e.g., increasing air exchange rate, limiting the number of people in the room, changing the cleaning period);
- systemic, i.e. measures that will lead to the removal of the source (e.g., replacement of floor coverings, prohibition of using some detergents).

The proposal must be accompanied by:

- economic estimation and feasibility assessment (i.e. estimated cost of intervention has to be compared to the estimated health gain);
- timing of implementation of individual measures respecting potential health risks.



## Annex 1. PROTOCOL OF DATA COLLECTION (EXAMPLE)

*NOTE: The protocol was prepared based on US-EPA, UK, EC funded projects, Sinfonie.  
Requires amending by the checklists and questionnaire template*

### **I. Professional partner contribution and field cooperation**

1. In the preparation of the Data collection protocol, it is necessary to create a study team at the first level of each project. It should include experts in this area, staff responsible for the operation and management of schools and school staff themselves. It is instructed in detail about the objectives and rules concerning collection of data from schools included in the project. The study team is responsible for coordination and leading data collection in scientific and technical manner, including indoor air quality (IAQ) on-spot measurements and cooperation the schools where the measurements are performed.
2. The national study team comprises 2-3 internal project staffs and appropriate school operative(s). The school operative team member is suggested to be school manager, teacher, school technician, regional/local official etc. Important that the school operative has full responsibility for ensuring the school on-spot measurements (e.g. provide place and time for measurements, operation of the mobile equipment).
3. The study team designates a study team leader, field team leader and analysis team leader. There is a possibility to assign more than one responsibilities for one person. The field team leader is responsible for instructing the members of study teams, coordination of the study team activities, timeliness as well as quality of the data collection / measurements and analysis of the collected data.
4. Study team leader contributes to the preparation of the report on data accessibility and compatibility and setting up and maintenance of the joint indoor air quality database and evaluate the data. The study team encourages and fosters the establishment of the local Environment Quality Forum where the results are disseminated.

### **II. Selection of school buildings**

1. School buildings chosen to collect IAQ and health-relevant data are selected according to predefined criteria. The selected school buildings have to



represent the school building stock of the country. The schools initial and final selection in each country is performed by the study teams.

2. Each initially selected school is visited by the study team to confirm directly the compatibility of data from documentations and the actual state related to the parameters required by the objectives. The visit also aims to select the proper classroom(s) for measurements. During the visit the study team has opportunity to meet the school operative and other staffs of the schools.

### III. Field campaign

Characterization of the whole building and study areas (a questionnaire study).

Detailed information about each school related to building(s), classrooms selected for measurements, surrounding and possible specific sources of harmful agents (indoor and outdoor) that can affect and decrease IAQ including HVAC (Heating Ventilation Air Conditioning) is collected using the tools (checklists) jointly developed and accepted by all the participant of the study. The tools are prepared based on the checklists questionnaires developed under the previous studies and guidelines related to IAQ (US-EPA, UK, EC funded projects, Sinphonie). The checklists and questionnaires are filled in by the school management staff person and in consultation with the study teams during their visits to the school buildings and interviews performed with schools heads or other responsible persons indicated by them. This part of the study is conducted at the beginning of measurements.

#### 1. Monitoring of indoor air quality

In each school selected according to point II. **Selection of school buildings** monitoring of the most important IAQ parameters (e.g., temperature, relative humidity, PM<sub>2.5</sub> and CO<sub>2</sub>) are performed using, for example, sensor device. During the measurements, the equipment is used only in the manner indicated and allowed in the user manual. The measurements are taken in the central point of each selected classroom (optimally) under the conditions such as those usually occurring during the lessons (e.g. heating, ventilation including open windows, air conditioning if available). To illustrate exposure of pupils/students as well as possible, the measurements are taken during all lessons in a week, on each workday of the week (from Monday to Friday). The measurements are performed not disturbing the lessons.

#### 1. Environmental monitoring (outdoor)

For each series of IAQ measurements, the same outdoor measurements are performed. The selected outdoor locations are as close as possible to fresh air in the school building. Outdoor measurements are performed simultaneously with IAQ



measurements or data is taken from a nearby stationary measuring station that is representative for the closest neighborhood of the school (if any).

#### **IV. Survey of the occurrence of symptoms in pupils/students**

In the each school involved in the project a questionnaire study of the occurrence of symptoms in pupils/students is performed. In order to obtain results of the highest quality this part of the study is conducted using a tool developed previously in other projects. Students and their parents will be informed through a brochure with information about the project, a letter to parents asking for agreement to survey and questionnaire to be filled in by the parents along with instructions for completion.



## Annex 2. CHECKLIST AND QUESTIONNAIRE ABOUT THE CLASSROOM (EXAMPLE)

**Instructions for completing the checklist and questionnaire** (only one questionnaire for each classroom. It would be desirable that the questionnaire is completed with the cooperation of all teachers who use the classroom).

- When you are asked to write a text (e.g. name of the school/country/city, some specifications...), write clearly, if possible in capital letters, and in the space provided.
- Tick the box or cross out the number corresponding to your response option. Tick only one option unless otherwise instructed. Examples:

**- When were the walls of the classroom painted last time?**

1. Within 1 year
2. 1-2 years ago
- 3 or more years ago

**- Are the windows open during cleaning of the classroom?**     No     Yes

**- During the day, when is this classroom cleaned?**  
*(More answers are possible)*

- In the morning, before school-time
- In the evening, after school-time
- At noon, between classes

- If you make a mistake, circle the wrong answer and tick the right one. Examples:

*- 1 was ticked by mistake and 3 is right:*

**When were the walls of the classroom painted last time?**

- Within 1 year
2. 1-2 years ago
- 3 or more years ago

*- 'No' was ticked by mistake and 'Yes' is right:*

**Are the windows open during cleaning of the classroom?**     No     Yes



Code:     
Country School Classroom

C\_Q1. Date of investigation: (Day/Month/Year) \_\_/\_\_/\_\_

C\_Q2. Name of the School: .....

C\_Q3. City/Town: ..... C\_Q4. Country: .....

C\_Q5. Class: ..... C\_Q6. Number of pupils in the school : .....

C\_1. On which floor is this classroom situated? .....

C\_2. Floor surface of the classroom: ..... m<sup>2</sup>

C\_3. Ceiling height of the classroom: ..... m

C\_4. Windows area: ..... m<sup>2</sup>

C\_5. Orientation of the classroom I.:

1. Facing the street
2. Facing the yard or garden
3. Other (Please, specify) .....

C\_6. Orientation of the classroom II.:

1. East
2. North
3. West
4. South

C\_7. The floor material is made of:

1. Parquet
2. Laminate
3. Plastic (Please, specify) .....
4. Stone or concrete
5. Tiles
6. Stone or concrete covered with carpet
7. Other (Please, specify).....



**C\_8. What is the main type of wall covering?**

1. Whitewash
2. Water-soluble paint
3. Water-resistant paint
4. Wallpaper
5. Wood-panel
6. Other (*Please, specify*).....

**C\_9. The ceiling is covered by:**

1. Whitewash
2. Water-soluble paint
3. Water-resistant paint
4. Wall-paper
5. Wood-panel
6. Other (*Please, specify*).....

**C\_10. When were the walls of the classroom painted last time?**

\_\_\_/\_\_\_ (Month/Year)

**C\_11. Is there air conditioning (functioning) in the classroom?**

- No
- Yes

**C\_12. Is there mechanical ventilation (functioning) in the classroom?**

- No
- Yes

**C\_13. How frequently are the windows opened during a usual day in the heating period?**

1. In every interclass break
2. 2-3 times a day
3. Once a day
4. Never (i.e. mechanical ventilation and not openable windows)

**C\_14. Is there any of the windows usually open during the classes in the heating period?**

1. Yes (.....% of the windows)
2. No, it is not needed (mechanical ventilation)
3. No, because of the outside noise

**C\_15. How frequently is this classroom cleaned?**

1. Twice a day
2. Once a day
3. Once a week
4. 2 or more times a week



**C\_16. During the day, when is this classroom cleaned? (Please tick any which apply)**

- In the morning before the arrival of the pupils/students
- In the afternoon/evening after school-time
- Between classes

**C\_17. What is generally used for cleaning the floor of the classroom? (Please tick any which apply)**

- Vacuum cleaner
- Broom
- Mop
- Mop with bleach
- Other (Please, specify).....

**C\_18. Are the windows open during cleaning of the classroom?**

- No
- Yes

**C\_19. When was the furniture in this classroom installed? ..... (Year)**

**C\_20. What kind of board is used in this classroom?**

1. Blackboard with chalk
2. Whiteboard with alcohol-based markers
3. Other (Please, specify) .....

**C\_21. What is the type of the window frame?**

1. Metal
2. Wood
3. PVC
4. Aluminium
5. Other (Please, specify).....

**C\_22. During school activities, do children use glue, paint, enamels or other products for artwork with an irritant smell?**

- No
- Yes



**C\_22.1. Where are they stored?**

1. In an air-tight chest, into the classroom
2. In a normal chest or on the shelves, into the classroom
3. In an air-tight sealed chest, outside the classroom
4. In a normal chest or on the shelves, outside the classroom

**C\_22.2. What precautions are taken when they are used?**

1. None
2. Windows are open
3. Used under a hood



**C\_23.** During the cold season, are there any days when it is very cold inside the classroom, so to be uncomfortable?

1. Never    2. Rarely    3. Sometimes    4. Often

**C\_24.** During the cold season, are there any days when it is very hot inside the classroom, so to be uncomfortable, because the heating system is too high?

1. Never    2. Rarely    3. Sometimes    4. Often

**C\_25.** During the cold season, are there any days when outside is cold and windows glasses become steamy?

1. Never    2. Rarely    3. Sometimes    4. Often

**C\_26.** During the hot season, are there any days when it is so hot inside the classroom to be uncomfortable?

1. Never    2. Rarely    3. Sometimes    4. Often

**C\_27.** In the classroom, does sunshine ever hit directly on some of the benches?

- No     Yes

**C\_28.** Have you ever noticed a mouldy/earthy or cellar-like odour inside the classroom?

- No     Yes

**C\_29.** Have there ever been visible signs of moisture damage such as damp stains or spots, deterioration or darkening of surface materials in the ceiling, walls, or floors, or signs of condensation of water on surfaces in the classroom?

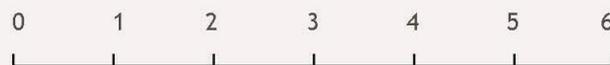
- No     Yes

**C\_30.** How dusty is usually (frequently/often) the classroom?

1. Not at all  
 2. Sometimes a little dusty  
 3. Usually a little dusty  
 4. Very dusty

**MARK AN X ON A NUMBER OF THE SCALE FROM 0 TO 6:**

**C\_31.** How do you perceive the natural illumination in the classroom?

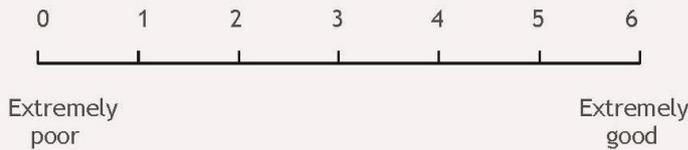


Extremely  
poor

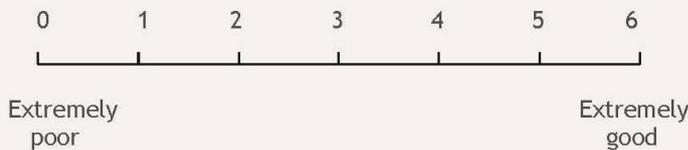
Extremely  
good



**C\_32. How do you perceive the artificial illumination in the classroom?**



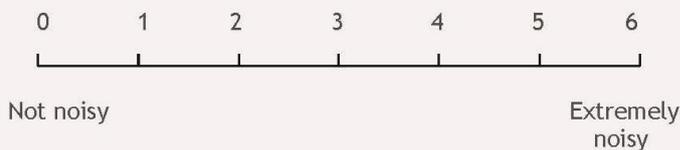
**C\_33. How do you perceive the indoor air quality in your classroom?**



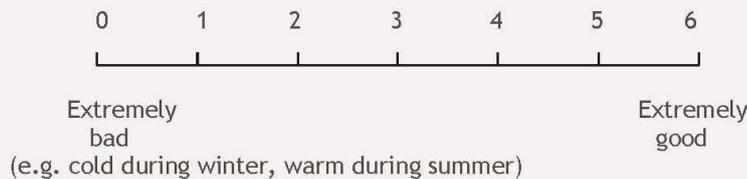
If you think that indoor air quality is not good, try to explain why:

.....

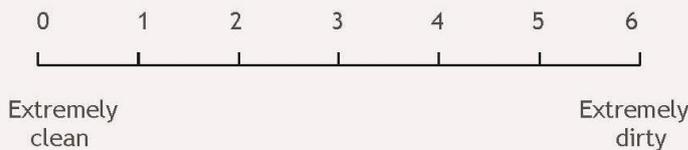
**C\_34. How do you perceive the noise level (outdoor source) in your classrooms?**



**C\_35. How do you perceive the temperature in your classrooms?**



**C\_36. How do you perceive the cleanliness of your classrooms?**







- Waste storage site  No  Yes  
Other polluting establishments  No  Yes *(Please, specify):*

.....

**C\_43. Is there visible mould growth in the classroom?**

- No  Yes

**C\_44. Are there damp spots on walls, ceilings or floors?**

- No  Yes

**C\_45. Are there any major indoor air pollution sources present?**

1. No indoor air pollutant sources
2. Printers (number of printers: .....)
3. Air fresheners
4. Other *(Please, specify)* .....

**C\_46. Are there plants present?**

- No  Yes (number of plants: .....)

**C\_47. What is the material of the desks?**

1. Wood
2. Plywood
3. Metal
4. Plastic laminate or composite
5. Other *(Please, specify)* .....

**C\_48. Are there window blinds present?**

- No  Yes

**C\_49. What is the position of the window blinds (if they are present)?**

1. Outside
2. Inside
3. Both
4. Other *(Please, specify)* .....

**C\_50. What is the material of the window blinds in the classroom?**

1. Window blinds are not present
2. Textile
3. Wood
4. Plastic
5. Metal
6. Other *(Please, specify)* .....



**C\_51. What is the material of the schoolyard?**

- 5. Green space
- 6. Asphalt
- 7. Sand
- 8. Plastic material
- 9. Other *(Please, specify)* .....

**C\_52. Do pupils have meal in the classroom?**

- No
- Yes

**END - THANK YOU FOR YOUR COOPERATION!**



## Annex 3. CHECKLIST AND QUESTIONNAIRE ABOUT THE SCHOOL (EXAMPLE)

Instructions for completing the checklist and questionnaire (only one questionnaire for each school.

- When you are asked to write a text (e.g. name of the school/country/city, some specifications...), write clearly, if possible in capital letters, and in the space provided.
- Tick the box or cross out the number corresponding to your response option. Tick only one option unless otherwise instructed. Examples:

**- Generally, what is the traffic density in the direct neighbourhood of the school (within 100 metres)?**

1. Light
2. Medium
3. Heavy
4. Very heavy with trucks (lorries) as well

**- Are kept any animals with furs or feathers (birds, cats, dogs, ferrets, guinea pig, mice, etc)?**

No       Yes

**- What kind of activities is the school yard adequate for? (Please tick any which apply)**

Sports  
 Playing  
 Resting

- If you make a mistake, circle the wrong answer and tick the right one. Examples:

**- 3 was ticked by mistake and 2 is right:**  
**Generally, what is the traffic density .....**

1. Light
2. Medium
3. Heavy
4. Very heavy with trucks (lorries) as well

**- 'Yes' was ticked by mistake and 'No' is right:**  
**In the school are kept any animals.....?**

No       Yes



Code:       
Country School Classroom

S\_Q1. Date of investigation: (Day/Month/Year) \_\_/\_\_/\_\_\_\_

S\_Q2. Name of the School: .....

S\_Q3. City/Town: ..... S\_Q4. Country: .....

S\_Q5. Location: ..... (e.g., city center, suburban, town, village, industrial area, residential area, commercial area, mixed)

S\_1. Who is the Maintainer of the school:

1. Municipality
2. Foundation
3. Church
4. Private
5. Institution
6. Other (Please, specify) .....

S\_2. When was the school building built? (Year) .....

S\_3. What are the main building materials? (Please tick any which apply)

- Brick
- Concrete
- Wood
- Mud
- Other (Please, specify) .....

S\_4. Was the school building built originally for being a school?  No  Yes

S\_5. Number of storeys (occupied) .....

S\_6. Was the school (as a whole) restored?

- No
- Yes When? (Year) .....



**S\_7. During the last 5 years, were parts of the school restored?**

- No  Yes

**Which ones? (Please tick any which apply)**

- Electric cables  
 Lighting  
 Water-system  
 Classrooms  
 Windows  
 Insulation

**S\_8. Generally, which is the traffic density in the direct neighbourhood of the school (within 100 metres)?**

1. Light                      2. Medium  
3. Heavy                     4. Very heavy with trucks (lorries) as well

**S\_9. Has the school got a yard?**

- No                       Yes

IF "No" GO TO QUESTION S\_12

**S\_10. What kind of activities is the school yard adequate for? (Please tick any which apply)**

- Sports  
 Playing  
 Resting  
 Other (Please, specify) .....

**S\_11. When do the pupils use it? (Please tick any which apply)**

- In the breaks between classes  
 Only in the morning long break  
 After school-time  
 Almost never, or very seldom  
 It is used for other purposes (e.g. car park)

**S\_12. Has the school got a green space around it? (sports-field, park, etc.)**

- No                       Yes

**S\_13. Has the school got a gymnasium?**

- No                       Yes

**S\_14. What kind of heating system is there in the school building?**

1. Central or district heating with radiators  
2. Electric heating appliances  
3. Gas heaters  
4. Coal or wood-fired ovens



**S\_15. Is there air conditioning in the school building?**

1. Yes, there is air conditioning in the whole building
2. Yes, there is air conditioning in some parts of the building
3. No, there is no air conditioning in any parts of the building

**S\_16. Is there mechanical ventilation in the school building?**

1. Yes, there is mechanical ventilation in the whole building
2. Yes, there is mechanical ventilation installed in some parts of the building
3. No, there is no mechanical ventilation in any parts of the building

**S\_17. Are there any nearby (within 100 m) potential sources of outdoor air pollution that might influence the indoor environment?**

- |                                |                             |   |
|--------------------------------|-----------------------------|---|
| Car park                       | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Busy road                      | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Industry (factory, plant)      | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Power plant                    | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Incinerator                    | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Waste storage site             | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Other polluting establishments | <input type="checkbox"/> No | <input type="checkbox"/> Yes (If Yes, please, specify): |

.....  
**S\_18. Are there any nearby (within 100 m) noise sources outside the building that might influence the indoor environment?**

- |  |                             |   |
|--|-----------------------------|---|
| Car park                                   | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Busy road                                  | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Railway or station                         | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Air traffic                                | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Sea, river or canal traffic                | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Construction works                         | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Factories                                  | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Community buildings (halls, churches, etc) | <input type="checkbox"/> No | <input type="checkbox"/> Yes                            |
| Other                                      | <input type="checkbox"/> No | <input type="checkbox"/> Yes (If Yes, please, specify): |

.....  
**S\_19. Are kept any animals with furs or feathers (birds, cats, dogs, ferrets, guinea pig, mice, etc.) in the school?**

- No       Yes

**S\_20. While the children are in the school, are ever used paints, soaps, or other cleaning products with an irritant smell (such as chlorine)?**

- No       Yes



**S\_21. Are there places in the school with much dust?**

- No       Yes

**If Yes: Which ones? (Please tick any which apply)**

- Any classroom
- Bathrooms
- Gym
- Corridors
- Kitchen
- Canteen
- Basement
- Offices
- Other places (Please, specify) .....

**S\_22. Do you notice a mouldy/earthy or cellar-like odour inside the school?**

- No       Yes

**Where? (Please tick any which apply)**

- Any classroom
- Bathrooms
- Gym
- Corridors
- Kitchen
- Canteen
- Basement
- Offices
- Other places (Please, specify) .....

**S\_23. Is there a history of water damage such as leakage from water pipes or washing machines, boiler, refrigerator, freezer, or cooling of the ventilation system in the school building?**

- No       Yes

**Where? (Please tick any which apply and indicate the time of it (Month/Year))**

- Any classroom (\_\_\_/\_\_\_)
- Bathrooms (\_\_\_/\_\_\_)
- Gym (\_\_\_/\_\_\_)
- Corridors (\_\_\_/\_\_\_)
- Kitchen (\_\_\_/\_\_\_)
- Canteen (\_\_\_/\_\_\_)
- Basement (\_\_\_/\_\_\_)
- Offices (\_\_\_/\_\_\_)
- Other places (Please, specify) ..... (\_\_\_/\_\_\_)



**S\_24. Have there ever been visible signs of moisture damage such as damp stains or spots, deterioration or darkening of surface materials in the ceiling, walls, or floors, or signs of condensation of water on surfaces in the school?**

- No       Yes

**Where? (Please tick any which apply)**

- Any classroom
- Bathrooms
- Gym
- Corridors
- Kitchen
- Canteen
- Basement
- Offices
- Other places (Please, specify) .....

**S\_25. Have you ever seen cockroaches inside the school?**

1. Never      2. Rarely      3. Sometimes      4. Often

**S\_26. Are the teachers allowed to smoke in the school building (including during school-sponsored events)?**

- 1. Yes, without any restrictions
- 2. Yes, but only in designated spaces
- 3. No, not at all

**S\_27. Are there any people who smoke tobacco in the school building?**

- No       Yes

**Where? (Please tick any which apply)**

- Any classroom
- Bathrooms
- Gym
- Corridors
- Kitchen
- Canteen
- Basement
- Offices
- Other places (Please, specify) .....

**S\_28. Are there materials containing asbestos in the building?**

- 1. Yes, flocculate
- 2. Yes, but compact
- 3. Yes, but sealed
- 4. No



If Yes:

**S\_29. Is there an asbestos management plan?**

- No       Yes

**S\_30. Are there any lead components in the building?**

- No       Yes

If Yes: What ones?

- Lead water pipes  
 Lead paints  
 Other (*Please, specify*) .....

**S\_31. Is the building located in a radon-affected area?**

1. Not designated as a radon-affected area
2. Radon area
3. Don` t know

**S\_32. Does the building contain potential radon bearing construction materials (e.g. gypsum, alum shale, granites or volcanic tuffs)?**

- No       Yes

**S\_33. Has there been any reported case of the presence of Legionella in the water supply system in the last 3 years?**

- No       Yes

**S\_34. When generally are the classrooms cleaned?**

1. In the morning before the arrival of the pupils/students
2. In the afternoon/evening after school-time
3. Between classes

**S\_35. How often does a deep clean of the classrooms take place?**

1. Once a month or more often
2. Once every three months or more often
3. Once every six months or more often
4. Once every year or more often
5. Less often
6. Never

**S\_36. Are chemicals used for cleaning floors in the classrooms?**

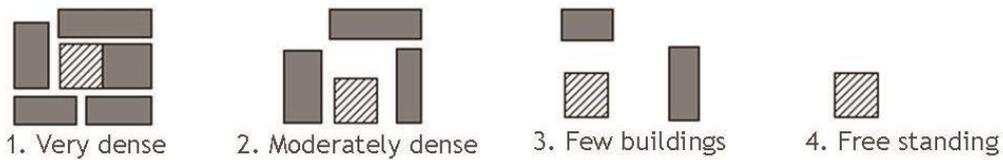
- No       Yes

**S\_37. Are chemicals used for cleaning desks in the classrooms?**

- No       Yes



**S\_38. What is the density of nearby obstructions?**



**MARK AN X ON A NUMBER OF THE SCALE FROM 0 TO 6**

**S\_39. How do you perceive the natural illumination in your school?**  
*(If the natural illumination is varying, try to give an average rating)*



Extremely  
poor

Extremely  
good

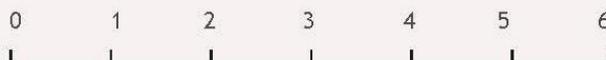
**S\_40. How do you perceive the artificial illumination in your school?**  
*(If the artificial illumination is varying, try to give an average rating)*



Extremely  
poor

Extremely  
good

**S\_41. How do you perceive the indoor air quality in your school building?**  
*(If the air quality is varying, try to give an average rating)*



Extremely  
poor

Extremely  
good

If you think that indoor air quality is not good, try to explain why:

.....



**S\_42. How do you perceive the outdoor air quality outside your school?**

*(If the air quality is varying, try to give an average rating)*

0      1      2      3      4      5      6  
└──────────┘

Extremely  
poor

Extremely  
good

**S\_43. How do you perceive the noise level (outdoor source) in the classrooms?**

*(If the noise level is varying, try to give an average rating)*

0      1      2      3      4      5      6  
└──────────┘

Not noisy

Extremely  
noisy

**S\_44. How do you perceive the cleanliness of the classrooms in your school?**

*(If the cleanliness is varying, try to give an average rating)*

0      1      2      3      4      5      6  
└──────────┘

Extremely  
clean

Extremely  
dirty

**S\_45. How do you perceive the decoration in the classrooms in your school?**

*(If it is varying, try to give an average rating)*

0      1      2      3      4      5      6  
└──────────┘

Extremely  
poor

Extremely  
good

**END - THANK YOU FOR YOUR COOPERATION!**



## Annex 4. INDOOR HEALTH INDEX

Indoor air quality (IAQ) can be characterised by physical parameters (e.g., temperature, relative humidity, air exchange rate), chemical air pollutants (e.g., carbon dioxide, nitrogen dioxide, particulate matter, ozone, benzene, etc.) and biological agents (e.g., pollen, fungi). Due to the complexity of this issue, a simple Indoor Health Index has been developed (i) to disseminate the results of the project among the public and stakeholders and (ii) to provide health relevant information about the IAQ.

The calculation of the Indoor Health Index is based different threshold values determined by the health effects of the air pollutants/physical parameters (recommendations of the WHO and/or EC and/or scientific papers).

We applied a five scale categorization of the most important and frequent chemical air pollutants using for the cut off points.

Table 1. The scale of Indoor Health Index

category	benzene ( $\mu\text{g}/\text{m}^3$ )	formaldehyde ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )
healthy	<1.7	<10	<10
moderate	1.7-4.99	10-19.9	10-24.9
unhealthy	5-7.5	20-50	25-49.9
very unhealthy	7.51-10	51-100	50-75
dangerous	>10	>100	>75

When applying the index in practice we characterize the actual air quality according to the worst category, indicating the pollutant.

The database in which the Indoor Health Index has been calculated is available upon request.

To characterize the thermal comfort, different cut-off points for two physical parameters, temperature and relative humidity, as well as for the concentration of carbon dioxide have been set (Table 2).



Table 2. Categories based on the measured temperature, relative humidity and carbon dioxide concentration values

Category	RH (%)	T (°C)	CO <sub>2</sub> (ppm)
healthy	43<RH<67	18.5<T<25.5	<1 200
moderate	37<RH<43; 67<RH<73	17.5<T<18.5	1 200-1 800
unhealthy (discomfort)	RH<37 RH>73	T<17.5 T >25.5	>1 800



# Annex 5.

## QUESTIONNAIRE ON RESPIRATORY AND ALLERGIC HEALTH OF SCHOOLCHILDREN AND HOME ENVIRONMENT (EXAMPLE)

Dear Parent/Guardian,

we are inviting your child to take part in an important international survey about child health with the approval of the school. If you agree to your child taking part in the survey, then we would like you to complete the attached questionnaire. Your child's questionnaire will be treated confidentially and all collected information will be used only for scientific research purposes. The survey is anonymous and the participation in this survey is voluntary.

Instructions for completing the questionnaire *(If possible, it would be better that the questionnaire is completed by both parents).*

- When you are asked to write a text (e.g. name of the school/country/child, some specifications....), write clearly, if possible in capital letters, and in the space provided.
- Tick the box or cross out the number corresponding to your response option. Tick only one option unless otherwise instructed. Examples:

- Your child is:     Male                       Female

- Does your child have phlegm on most days (4 or more days for weeks) apart from common colds?

1. No
2. Yes, for less than 1 month per year
3. Yes, for 1-2 months per year
4. Yes, for 3 months or more per year

- Which food caused allergy? *(Please tick any which apply)*

- It was not identified
- Milk
- Eggs
- Peanuts
- Fruits
- Fish

- If you make a mistake, circle the wrong answer and tick the right one. Examples:

- ~~For male gender:~~

Your child is:     Male                       Female

- 2 was ticked by mistake and 3 is right:

Does your child have phlegm .....

1. No
2. Yes, for less than 1 month per year
3. Yes, for 1-2 months per year
4. Yes, for 3 months or more per year



Code:      
Country School Building Classroom

PQ1. Today's Date: (Day/Month/Year) \_\_/\_\_/\_\_\_\_

PQ2. The questionnaire is completed by:

Mother  Father  Both  Other (Please, specify).....

THE SCHOOL OF YOUR CHILD:

PQ3. Name of the school:  
.....

PQ4. Address of the school: .....

PQ5. City/Town: ..... PQ6. Post-code: .....

PQ7. Class: .....

YOUR CHILD:

PQ8. Child's Age: ..... years and ..... months

PQ9. Child's weight: ..... Kg PQ10. Child's height: ..... cm

PQ11. Your child is:  Male  Female

PQ12. Your child is:  Caucasian  Asian  Black  
 Middle-Oriental  Other

Age of the parents (completed years):

PQ13. Mother: ..... years PQ14. Father: ..... years



**A) PERINATAL INFORMATION**

**PA1.** The pregnancy was:    1. Single    2. Multiple    3. Don't know

**PA2.** What was the length of pregnancy?

1. 35 weeks or less
2. 36-37 weeks
3. 38-40 weeks
4. 41-42 weeks
5. Don't know

**PA3.** The child's birth weight was: ..... grams                       Don't know

**PA4.** Was the child breast-fed?

1. No
2. Yes, exclusively (not even water)
3. Yes, but with also water                      → up to ..... months of age
4. Don't know

**PA5.** Did the mother smoke during pregnancy?

- No
- Yes                      → about ..... cigarettes per day
- Don't know

**PA6.** Did the father or other family members smoke in presence of the mother during her pregnancy?

- No
- Yes
- Don't know

**PA7.** During the first year of life, has been your child exposed to tobacco smoking?

- No
- Yes
- Don't know

**PA8.** During the first two years of life, did your child suffer any infections, such as:

- |                      |                             |                              |                                     |
|----------------------|-----------------------------|------------------------------|-------------------------------------|
| Pneumonia            | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> Don't know |
| Bronchitis           | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> Don't know |
| Asthmatic bronchitis | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> Don't know |
| Bronchiolitis        | <input type="checkbox"/> No | <input type="checkbox"/> Yes | <input type="checkbox"/> Don't know |

**PA9.** How many younger brothers and sisters has your child? .....  
 (write 0 if none)

**PA10.** How many older brothers and sisters has your child? .....  
 (write 0 if none)



## B) RESPIRATORY/ALLERGIC HEALTH OF THE CHILD

**PB1.** Has your child ever had wheezing or whistling in the chest at any time in the past?

- No  Yes
- ↓

**PB2.** In the past 12 months, has your child had wheezing or whistling in the chest?

- No  Yes
- ↓

**PB3.** In the past 12 months, how many attacks of wheezing has your child had?

- |            |                 |
|------------|-----------------|
| 1. None    | 2. 1 to 3       |
| 3. 4 to 12 | 4. More than 12 |

**PB4.** In the past 12 months, how often, on average, has your child's sleep been disturbed due to wheezing?

1. Never woken due to wheezing
2. Less than three nights in the past 12 months
3. Less than one night per month
4. Between one and three nights per month
5. One or more nights per week

**PB5.** In the past 12 months, did your child's wheezing occur in association with colds or influenza?

1. Only during colds or influenza
2. Only apart from colds or influenza
3. Both during and apart from colds and influenza

**PB6.** In the past 30 days, has your child had wheezing or whistling in the chest?  No  Yes

**PB7.** In the past 12 months, has your child's chest sounded wheezy during or after exercise?  No  Yes

**PB8.** In the past 12 months, has your child had a dry cough at night, apart from a cough associated with a cold or chest infection?

- No  Yes



**PB9.** Has your child ever had asthma diagnosed by a doctor?

- No                       Yes



**PB10.** What age did the first asthma attack\* occur? (Years).....

*\* An asthma attack is an acute (that comes on suddenly) change in asthma symptoms that interrupts the normal routine of your child and requires either extra medication or some other intervention to improve so that it can breathe normally again. Symptoms are cough or wheeze or both with breathing difficulty. Wheezing can be severe enough to limit the speech of your child to only one or two words at a time between breaths.*

**PB11.** What age did the last asthma attack occur? (Years) .....

**PB12.** In the past 12 months, did your child use any drug (pills, sprays, nebulizers or any other remedies) for asthma?

1. Never
2. Yes, occasionally, when needed
3. Yes, regularly for at least 2 months

**PB13.** Is your child currently (in the last 3 months) taking any medicine, including inhalers, aerosols or tablets, for asthma?

- No                       Yes

**PB14.** Did your child ever had an asthma attack while at school?

- No                       Yes



**PB15.** During which school activities did these asthma attacks occur?

*(Please tick any which apply)*

- Normal teaching
- Exercise
- Art activities (painting, gluing, etc)
- Break
- Other *(Please, specify)* .....

**PB16.** How were these asthma attacks managed?

*(Please tick any which apply)*

- Nothing was done
- The child self-administered his/her anti-asthma drug
- The school operators invited the child to take his/her anti-asthma drug
- The school operators provided an anti-asthma drug for the child
- The parents were called
- The child was taken in charge by the school nurse or physician
- The emergency health service was called, or the child was sent to the hospital



**PB17.** Does your child have cough on most days (4 or more days per week) apart from common colds?

1. No
2. Yes, for less than 1 month per year
3. Yes, for 1-2 months per year
4. Yes, for 3 months or more per year

**PB18.** Does your child have phlegm on most days (4 or more days per week) apart from common colds?

1. No
2. Yes, for less than 1 month per year
3. Yes, for 1-2 months per year
4. Yes, for 3 months or more per year

**PB19.** In the past 12 months, has your child had a problem with sneezing, or a runny, or blocked nose when he/she DID NOT have a cold or the flu?

- No       Yes



**PB20.** In the past 12 months, has this nose problem been accompanied by itchy- watery eyes?

- No       Yes

**PB21.** Has your child ever had nasal allergies, including hay fever?

- No  
 Yes      **→** Was it confirmed by a physician?     No     Yes

**PB22.** Has your child ever had allergic rhinitis different from hay fever (dust, animals, etc)

- No  
 Yes      **→** Was it confirmed by a physician?     No     Yes

**PB23.** Have you noticed hypersensitivity/allergy to cats in your child?

- No  
 Yes      Was it confirmed by a physician?     No     Yes

**PB24.** Have you noticed hypersensitivity/allergy to dogs in your child?

- No  
 Yes      Was it confirmed by a physician?     No     Yes

**PB25.** Have you noticed hypersensitivity/allergy to pollen in your child?

- No  
 Yes      Was it confirmed by a physician?     No     Yes

**PB26.** Has your child ever had allergy to foods?

- No  
 Yes      Was it confirmed by a physician?     No     Yes



**PB27.** Has your child ever had an itchy rash which was coming and going for at least 6 months?

- No
- Yes

**PB28.** In the past 12 months, did your child suffer from ear ache or otitis?

- No
- Yes

**PB29.** Does your child have important health problems (including non respiratory)?

- No
- Yes



Please, specify: .....

.....

.....



**C) CURRENT SYMPTOMS/DIAGNOSIS**

**During the past 3 MONTHS, has your child had any of the following symptoms?**

	(1) Yes, Daily	(2) Yes, Often (1-4 times/week)	(3) Yes, Sometimes (1-3 times/month)	(4) No, never
<b>PC1.</b> Skin rash on hands or forearms				
<b>PC2.</b> Skin rash on the face or neck				
<b>PC3.</b> Eczema				
IF 'Yes', Where? .....				
<b>PC4.</b> Itching on hands or forearms				
<b>PC5.</b> Itching on the face or neck				
<b>PC6.</b> Eye irritation (redness, dryness, itch)				
<b>PC7.</b> Swollen eyes				
<b>PC8.</b> Headache				
<b>PC9.</b> Nausea				
<b>PC10.</b> Runny nose/nasal phlegm				
<b>PC11.</b> Nasal obstruction/blocked nose				
<b>PC12.</b> Dry throat				
<b>PC13.</b> Feeling like getting a cold				
<b>PC14.</b> Sore throat				
<b>PC15.</b> Irritative cough				
<b>PC16.</b> Breathing difficulties				
<b>PC17.</b> Feeling tired and out of sorts				

**PC18.** Do any of these symptoms improve when your child is away from school?  
 1. No                      2. Yes                      3. Don't know

↓

Which symptom/s? (Write the corresponding code/s of symptom/s, e.g. PC1, PC2...., in the space provided )

.....

**PC19.** Do any of these symptoms improve when your child is away from home?  
 1. No                      2. Yes                      3. Don't know

↓

Which symptom/s? (Write the corresponding code/s of symptom/s, e.g. PC1, PC2...., in the space provided )

.....



**D) QUESTIONS ABOUT THE CURRENT HOME ENVIRONMENT OF YOUR CHILD AND COMMUTING**

**PD1. What type of building is your child living in now?**

1. Single family house
2. Semi-detached house
3. Flat
4. Farm
5. Other

**PD2. Number of rooms:** ..... *(Don't count kitchen, bathroom, corridor/storage, room without windows or heating)*

**PD3. How many people live in the dwelling?** ..... *people*

**PD4. Which year (approximately) was the house constructed?** *(Year)* .....

**PD5. Which year did your child move to the current dwelling?** *(Year)* .....  
*(write 0 if since the date of birth)*

**PD6. Where is the dwelling situated?**

1. In an area with clean air and far from busy traffic
2. In an area with small (reasonably) traffic
3. Near to busy traffic

**PD7. Does your child live within 200 meters from a street with heavy traffic?**

1. No
2. Yes
3. Don't know

**Which type?** 1. Highway 2. Street 3. Boulevard 4. Other

**How many meters?**

1. within 20 m
2. within 50 m
3. within 100 m
4. within 200 m

**PD8. Is the dwelling close to cultivation (kitchen-garden, orchard, vineyard, ...) that are sprayed with pesticides?**  No  Yes

**PD9. In the dwelling, are there fireplaces (for heating)?**  No  Yes

**PD10. Is there an air conditioner in the dwelling?**  No  Yes

**PD11. Is there an air conditioner in the child's room**  No  Yes

**PD12. Is there a mechanical ventilation in the dwelling?**  No  Yes

**PD13. Is there a humidifier in the dwelling, including any humidifier built into the home heating system?**  No  Yes



- PD14. What type of cooker is used in the kitchen?**
1. Only electric
  2. Gas cooker (even if combined with electric oven)
  3. Coal or wood fired oven
- PD15. Is there a functioning extractor fan above the cooker?**
1. No
  2. Yes, and it is connected to the outdoor air
  3. Yes, but it is not connected to the outdoor air
- PD16. Is there a gas-boiler in the bathroom?**
1. No
  2. Yes, and the combustion products are led out to the outdoor air
  3. Yes, but the combustion products are not led out to the outdoor air
- PD17. Is there a gas-heater in the dwelling?**
1. No
  2. Yes, and the combustion products are led out to the outdoor air
  3. Yes, but the combustion products are not led out to the outdoor air
- PD18. Is your child exposed to tobacco smoke in the dwelling?**
1. Yes, daily
  2. Yes often (1-4 times/week)
  3. Yes, sometimes (1-3 times/month)
  4. No, never
- PD19. How many smokers live in the house with your child?**
1. None
  2. One
  3. Two
  4. Three or more
- PD20. How many cigarettes in total are smoked in the house (indoor spaces) where your child lives, on average, each day?**
1. None
  2. 1 or 2
  3. 3 to 4
  4. 5 to 10
  5. 11 to 20
  6. More than 20
- PD21. During the past 12 months, has the interior of the dwelling been decorated?**
- No       Yes
- ↓
- PD22. When was it decorated (the last time)?**  
(Month): ..... (Year): .....
- What was decorated? (Please tick any which apply)**
- Ceiling
  - Walls
  - Joinery/woodworks
  - Floors
  - Metal pipes/radiators
  - Others (Please, specify).....



**PD23. What kind of decoration material was used? (Please tick any which apply)**

- Wall paper
- Whitewash
- Water-soluble paint
- Water-resistant (synthetic) paint
- Wood panels
- Others (Please, specify).....

**PD24. On which floor is the bedroom of your child located? .....**

**PD25. What type of floor material is in your child's bedroom?**

1. Plastic (Vinyl/PVC)
2. Linoleum
3. Wood/Parquet
4. Wall-to-wall carpet (moquette)
5. Tiles
6. Others (Please, specify).....

**PD26. Are there carpets in the child's bedroom?**       No  Yes

**PD27. What is the type of heating in the child's bedroom?**

1. Electric
2. Central or district heating (using radiators)
3. Gas-heater, gas stove
4. Floor heating
5. Wall heating
6. Tiled clay stove, iron stove (using wood, oil or coal)

**PD28. Has the child, or any other family member, any pets in the dwelling?**

- No
- Yes      **What type of pet? (Please, specify) .....**

**PD29. During the past 12 months, have any of the following items been identified in the dwelling?**

1. Water leakage or water damage indoors in walls, floor or ceiling
2. Bubbles or yellow discoloration on plastic floor covering or black discoloration on parquet floor
3. Visible mould growth indoors on walls, floor or ceiling
4. The smell of mould in one or more rooms (not the basement)

**PD30. Is it common with dampness/condensation on the lower part of the windows in winter?**

- No
- Yes

**PD31. Is there dampness or visible mould growth in your child's bedroom?**

- No
- Yes

**PD32. During the past 5 years, have any dampness problem/water damage/visible mould growth/smell of mould occurred in the dwelling?**



- No
- Yes

**PD33. Have you ever seen cockroaches in the dwelling?**

1. Never
2. Rarely
3. Sometimes
4. Often

**PD34. Do you usually use air fresheners in the dwelling?**

- No
- Yes

**PD35. Do you usually use incense sticks in the dwelling?**

- No
- Yes

**PD36. Do you usually use glues, solvents, industrial products in the dwelling in presence of your child?**

- No
- Yes

**PD37. Is there a garage communicating with the dwelling?**

- No
- Yes

**PD38. What means of transport does your child use to reach his/her school?**

*(Please tick any which apply)*

- Car/Cab
- Bus
- Tram
- Underground
- Train
- Bicycle
- On foot
- Other (Please, specify) .....

**PD39. Please, provide a time estimate for each modality (time per week)**

	< 1 h	1 - 3 h	2 - 3 h	3 - 4 h	>4 h
Car/Cab	<input type="checkbox"/>				
Bus	<input type="checkbox"/>				
Tram	<input type="checkbox"/>				
Underground	<input type="checkbox"/>				
Train	<input type="checkbox"/>				
Bicycle	<input type="checkbox"/>				
On foot	<input type="checkbox"/>				
Other	<input type="checkbox"/>				



**E) QUESTIONS ON SOCIO-ECONOMIC STATUS**

<b>PE1. Education:</b>	<b>Mother's</b>	<b>Father's</b>
1. Less than primary school	<input type="checkbox"/>	<input type="checkbox"/>
2. Completed primary school	<input type="checkbox"/>	<input type="checkbox"/>
3. Vocational school	<input type="checkbox"/>	<input type="checkbox"/>
4. Secondary school (with final exam)	<input type="checkbox"/>	<input type="checkbox"/>
5. College/University	<input type="checkbox"/>	<input type="checkbox"/>
6. PhD	<input type="checkbox"/>	<input type="checkbox"/>
<b>PE2. Employment:</b>	<b>Mother's</b>	<b>Father's</b>
1. Fully employed	<input type="checkbox"/>	<input type="checkbox"/>
2. Part-time employed	<input type="checkbox"/>	<input type="checkbox"/>
3. Unemployed	<input type="checkbox"/>	<input type="checkbox"/>
4. Pensioner	<input type="checkbox"/>	<input type="checkbox"/>
5. Disabled	<input type="checkbox"/>	<input type="checkbox"/>
<b>PE3. Most recent occupation (current/past):</b>	<b>Mother's</b>	<b>Father's</b>
1. Entrepreneur	<input type="checkbox"/>	<input type="checkbox"/>
2. Working for an employer as manager, foreman or supervisor	<input type="checkbox"/>	<input type="checkbox"/>
3. Teacher/Secretary	<input type="checkbox"/>	<input type="checkbox"/>
4. Engaged in house-keeping/workman	<input type="checkbox"/>	<input type="checkbox"/>
5. Other working for an employer	<input type="checkbox"/>	<input type="checkbox"/>
6. Self-employed	<input type="checkbox"/>	<input type="checkbox"/>
7. Other (Please, specify) _____		
<b>PE4. Does the family get state benefits (beside the general child allowance)? (e.g. tax benefit, financial support to balance work and family life .....)</b>		
1. Yes, regularly	2. Yes, sometimes	3. No, not at all



## F) QUESTIONS ON HOW YOUR CHILD PERCEIVES THE SCHOOL ENVIRONMENT

MARK AN X ON A NUMBER OF THE SCALE FROM 0 TO 6



**PF1.** How does your child perceive the natural illumination in his/her classroom? (If the natural illumination is varying, try to give an average rating)



Extremely  
poor

Extremely  
good

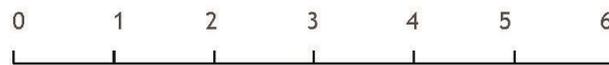
**PF2.** How does your child perceive the artificial illumination in his/her classroom? (If the artificial illumination is varying, try to give an average rating)



Extremely  
poor

Extremely  
good

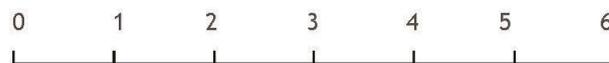
**PF3.** How noisy does your child feel the classroom during school activities? (If the noise is varying, try to give an average rating)



Extremely  
silent

Extremely  
noisy

**PF4.** How does your child perceive the temperature in his/her classroom? (If the temperature is varying, try to give an average rating)



Extremely  
cold

Extremely  
warm

**PF5.** How does your child perceive the air movement in his/her classroom? (If the ventilation is varying, try to give an average rating)

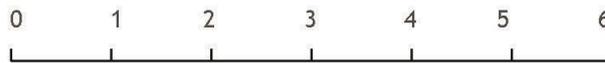


Extremely  
still

Extremely  
draughty



**PF6.** How does your child perceive the indoor air quality in his/her classroom? (If the air quality is varying, try to give an average rating)



Extremely  
poor

Extremely  
good

If your child thinks that indoor air quality is not good, try to explain why:

.....  
.....

**PF7.** How does your child perceive the outdoor air quality outside his/her school? (If the air quality is varying, try to give an average rating)



Extremely  
poor

Extremely  
good

**PF8.** Does your child think that the ability to do the school work is reduced because of poor indoor air quality in the school?

- No                       Yes                       Don't know

MARK AN X ON A NUMBER OF THE SCALE FROM 0 TO 10



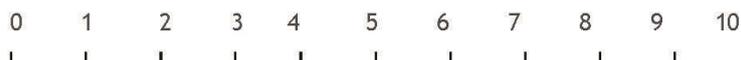
**PF9.** How satisfied is your child with the school?



Totally  
dissatisfied

Totally  
satisfied

**PF10.** How stressful is the school work to your child?



No stress

Extremely  
stressful



**PF11.** How does your child perceive the climate of co-operation at school?

0 1 2 3 4 5 6 7 8 9 10  
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

Very poor

Very good

**PF12.** In the past 12 months, has your child lost school days due to allergic problems or to respiratory symptoms/diseases apart from common colds or chest infections?

No       Yes      How many days? (*Number*): .....

**END - THANK YOU FOR YOUR COOPERATION!**