

Interreg



CENTRAL EUROPE

European Union
European Regional
Development Fund

InAirQ

TAKING
COOPERATION
FORWARD



International Conference on Integrated Problem-Solving Approaches to Ensure Schoolchildren's Health
Budapest, Hungary, 23-24 May 2019



Introduction to the InAirQ project and the main achievements



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and the InAirQ team

BEFORE THE INAIRQ PROJECT

- Several projects have been carried out earlier (e.g., SEARCH, SINPHONIE, etc.);
- Several documents containing recommendations for IAQ improvement have been published.

HOWEVER

- IAQ is still not regulated (with some exceptions);
- Recommendations have been rarely implemented;
- Experts, policy makers, school managers → they usually never meet.

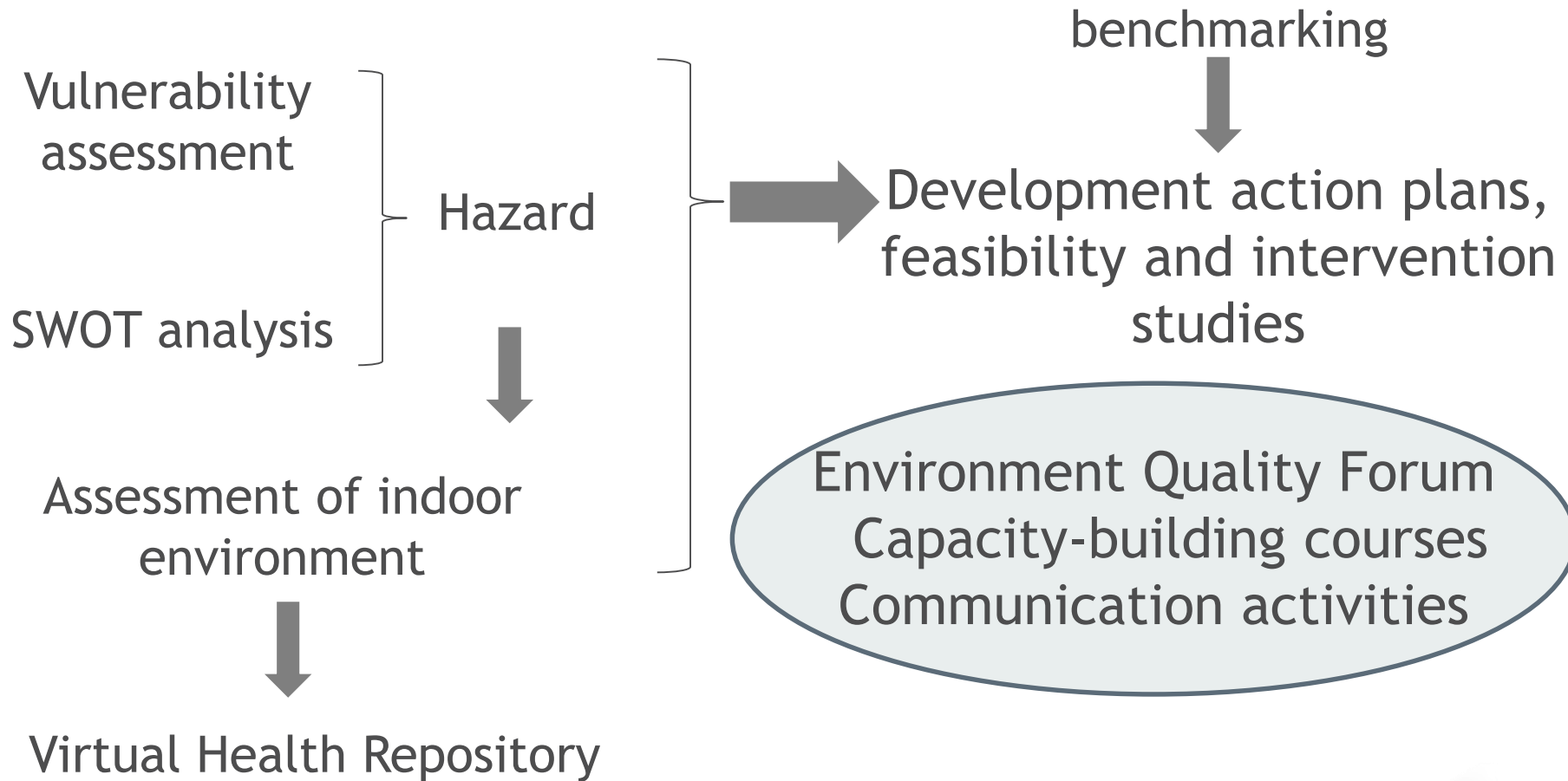


THE INAIRQ PROJECT - INTRODUCTION

- Title: Transnational Adaption Actions for Integrated Indoor Air Quality Management
- Aims: to assess the health risk of indoor air pollutants (indoor environment) in primary school buildings and to take actions to improve the school environment
- 5 participating countries (Czech Republic, Hungary, Italy, Poland and Slovenia); 9 partners
- The project has started in 2016 under the coordination of National Public Health Center (NPHC), Hungary and will end in 2019.



THE INAIRQ PROJECT - OVERVIEW



Transnational baselining and monitoring with stakeholder involvement

- Baseline analysis - Vulnerability assessment, SWOT analysis
- Monitoring campaign in school buildings
- Virtual Health Repository - data management, online platform
- Environment Quality Forum - 5 meetings



Action Plans and Capacity Building

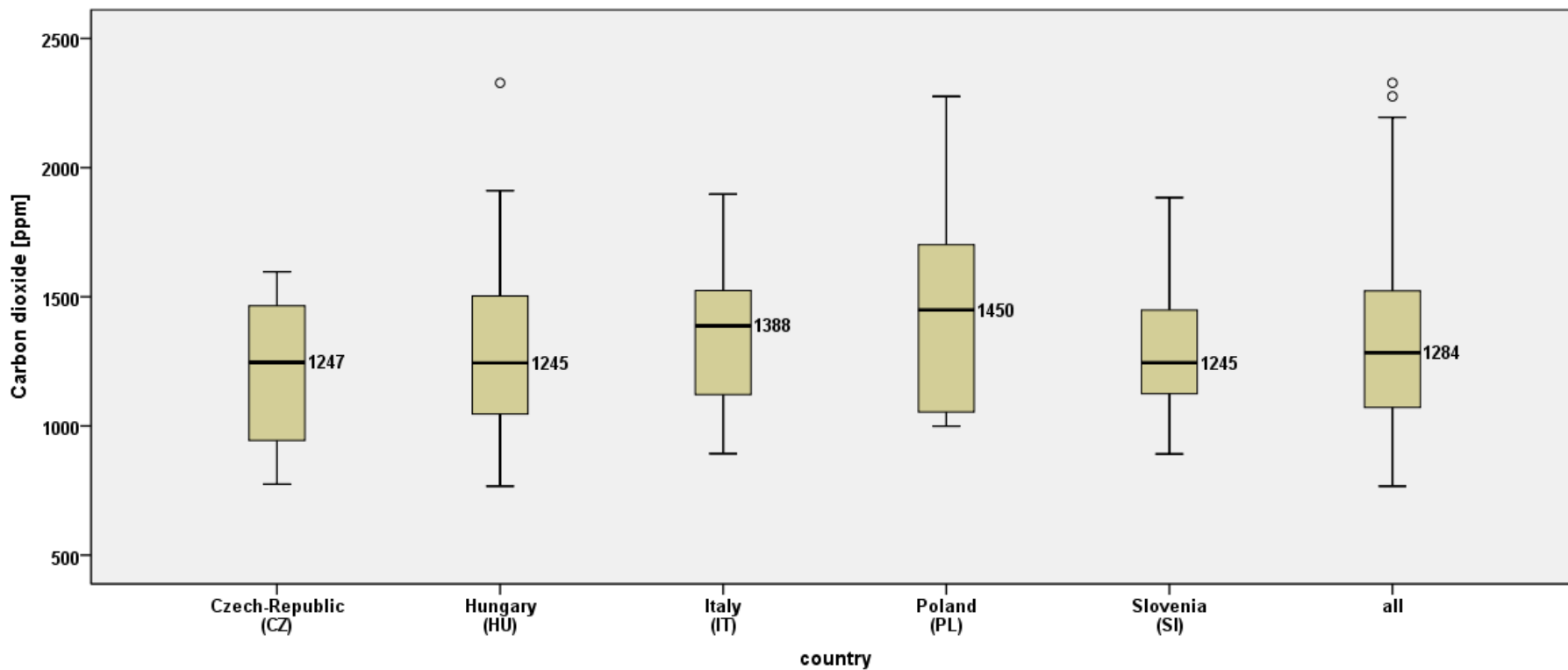
- Benchmarking and best practices
- Developing national IAQ action plans
- Feasibility and intervention studies
- Capacity building to implement action plans



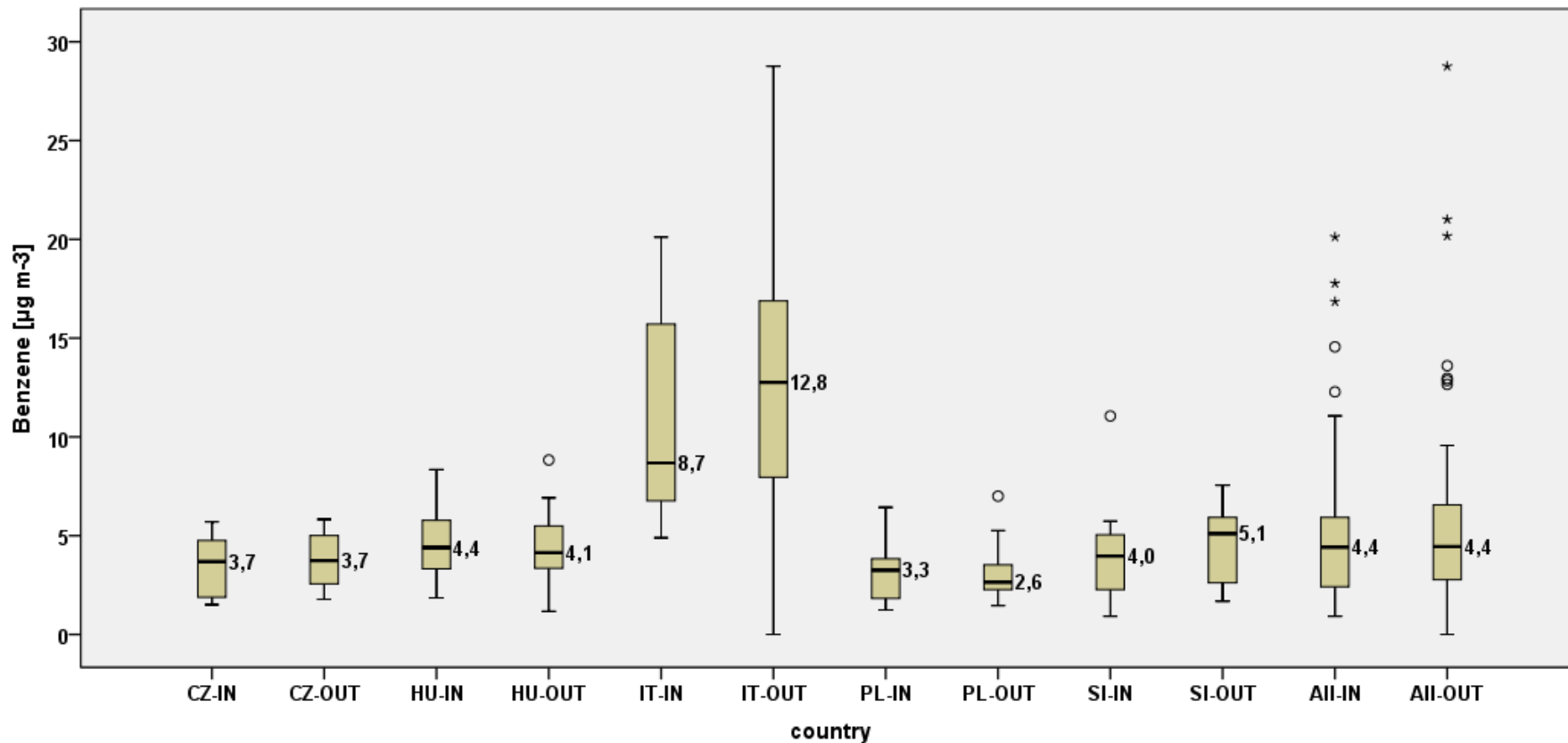
- 64 primary school buildings were selected based on predefined criteria
- 1 classroom and 1 outdoor location per school
- 1 week during the heating season in 2017/2018
- investigated parameters: aldehydes, volatile organic compounds, $PM_{2.5}$, CO_2 , radon, T, RH
- checklists and questionnaire on the respiratory health of schoolchildren and the home environment



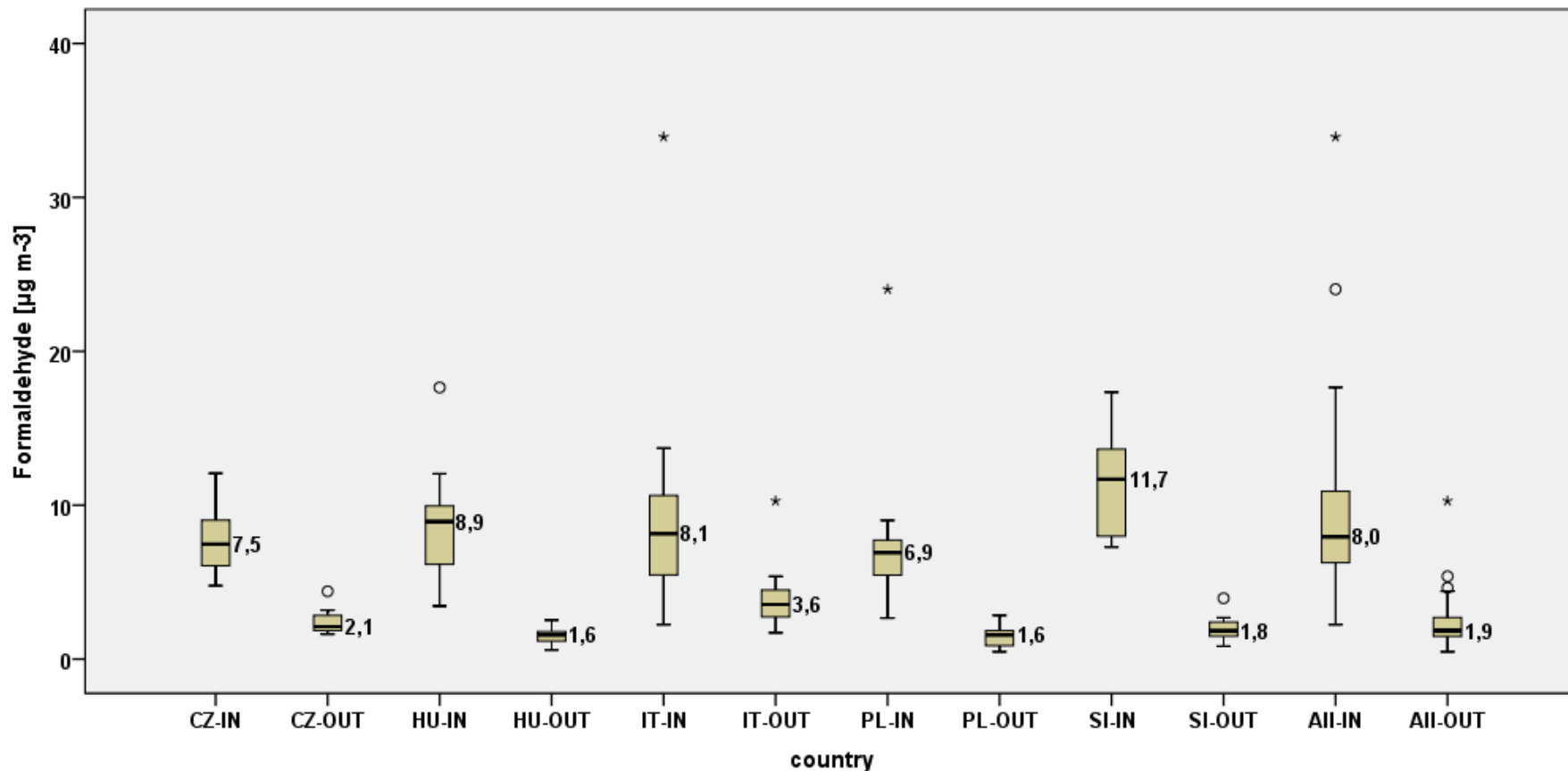
RESULTS - CARBON DIOXIDE



RESULTS - BENZENE



RESULTS - FORMALDEHYDE



Carcinogenic risk:

- The sum of the excess lifetime cancer risk values was higher than 10^{-6} in the case of several primary schools.

Non-carcinogenic risk:

- Neither the hazard quotient (HQ) nor the hazard index values exceeded one.
- Based on the maximum cumulative ratio approach, in general, only a couple of compounds with high HQ values are relevant for the human health.



Indoor Health Index

Category	benzene ($\mu\text{g}/\text{m}^3$)	formaldehyde ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)
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

Comfort parameters

Category	RH (%)	T (°C)	CO ₂ (ppm)
healthy	43 < RH < 67	18.5 < T < 25.5	<1200
moderate	37 < RH < 43 67 < RH < 73	17.5 < T < 18.5	1200-1800
unhealthy	RH < 37 RH > 73	T < 17.5 T > 25.5	>1800



Online platform - available on the website of the NPHC, Hungary

InAirQ – Virtual Health Repository (VHR)

About us

Virtual Health Repository (VHR) – general overview

VHR

VHR - Czech Republic

VHR - Hungary

VHR - Italy

VHR - Poland

VHR - Slovenia

Transnational Environment Quality Forum

VHR - Hungary

Number of school buildings investigated: 16
Monitoring campaigns were conducted during the heating season of 2017/2018.

HU01 is located in the city centre of Várpalota, close to a relatively high traffic road. The school building was built from brick at the beginning of the 18th century. The indoor air quality was in the unhealthy category based on the indoor health index. The main air pollutants were benzene and particulate matter (PM_{2.5}). It should be noted that the outdoor value for the PM_{2.5} and benzene mass concentrations were also high, thus the inappropriate indoor air quality was mainly caused by the outdoor air pollution. Furthermore, one of the comfort parameters was also in the unhealthy range; the relative humidity was low in the classroom and the carbon dioxide concentration was in the moderate range.

HU04 is a provincial school in Péteri, close to a relatively high traffic road. The school building was built from brick at the end of the 20th century. The indoor air quality was in the unhealthy category based on the indoor health index. The main air pollutant was particulate matter (PM_{2.5}). It should be noted that the outdoor value for the PM_{2.5} mass concentration was also high, thus the inappropriate indoor air quality was mainly caused by the outdoor air pollution. Furthermore, one of the comfort parameters was in the



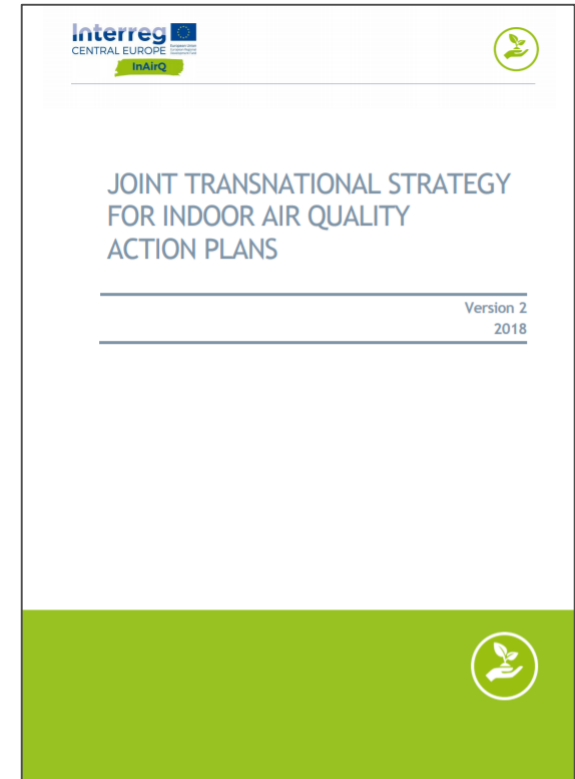
JOINT TRANSNATIONAL STRATEGY FOR INDOOR AIR QUALITY ACTION PLANS

Perform

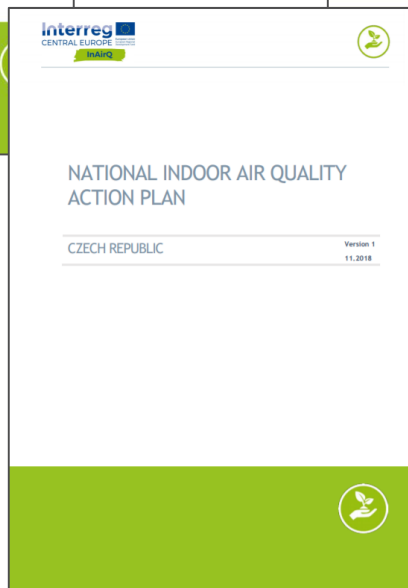
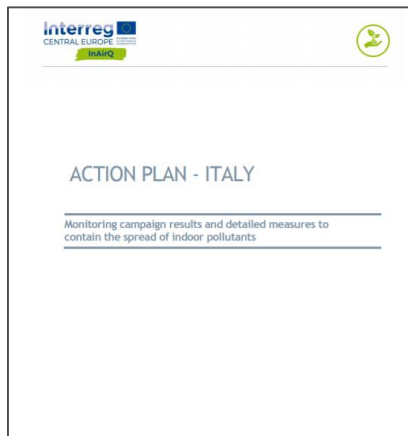
- vulnerability assessment,
- SWOT analysis,
- environmental and health surveillance.

Define

- actions,
- roles,
- timing,
- costs.



NATIONAL IAQ ACTION PLANS



Aim: attempt for IAQ improvement

Czech Republic

- impact of changes in traffic density at the school



Hungary

- use of air cleaner in the classroom



Poland

- continuous use of air quality monitors to inform teachers



ENVIRONMENT QUALITY FORUM

In total, more than 400 stakeholders were reached in the 5 participating countries.



DECLARATIONS

Target: schools, school networks, municipalities, public health authorities, ministries, etc.

Examples:

We resolve ...

„ to prioritize the health and well-being of schoolchildren”

„to raise awareness on the importance of indoor air quality”

„to support the implementation of national strategies that aim to create a healthier school environment”



The image shows a sample declaration form titled "DECLARATION OF SCHOOLS ON THE SCHOOL ENVIRONMENT". At the top, it features the logos for Interreg Central Europe and InAirQ. The text of the declaration states that air pollution is a major environmental health risk and that school children are particularly vulnerable. It then states that the representatives of the Körösi Csoma Sándor Elementary and Grammar School in Hungary, based on evidence and reports, recognize the importance of indoor air quality for children's health and well-being. The form lists five specific commitments: to protect and promote health and safety, to raise awareness, to investigate indoor air quality, to provide guidance to staff, and to decrease pollutant concentrations. The form is signed on 02.05.2019 in Budapest, Hungary, and includes a signature and the name of the school.

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DECLARATION OF SCHOOLS ON THE SCHOOL ENVIRONMENT

Air pollution is a major environmental health risk in both cities and rural areas. Indoor air quality is of paramount importance as people spend most of their time indoors. Primary school students, one of the most vulnerable groups, spend approximately 6-8 h daily in school buildings, thus the quality of the indoor air plays a key role in children's health and well-being.

We, the representatives of the Körösi Csoma Sándor Elementary and Grammar School, in Hungary responsible for, among others, the management of the school recognize that, based on well-documented evidence and the reports of relevant national and international bodies and organizations, the school environment, especially the indoor air quality, has an influence on the children's health, well-being and productivity and it is crucial for us to act.



Therefore, we resolve:

- to protect and promote the health and well-being of schoolchildren to increase health, well-being and safety and, consequently, to decrease the burden of disease related to indoor air pollution;
- to raise awareness on the importance of indoor air quality among students and parents;
- to investigate the indoor environmental quality through checklists and/or indoor air quality monitoring and to provide the data to national public health experts and to the Virtual Health Repository developed in the InAirQ project (funded by Interreg Central Europe);
- to provide guidance to teachers and technical staff on actions aiming at the improvement of the school environment;
- to decrease the concentration of indoor air pollutants considering the (limit/target) values (set/recommended) by the (national legislation/World Health Organization) through indoor air quality action plans;
- to support the introduction of national action plans to create healthier school environments.

Signed on 02. 05. 2019 in Budapest, Hungary)



Position
Name of school



JOINT METHODS AND
CONTENTS FOR
AWARENESS ACTIONS

Guidelines Version 1
01.2018



 European Union
European Regional
Development Fund
TRANSNATIONAL ADAPTION ACTIONS FOR INTEGRATED INDOOR AIR QUALITY MANAGEMENT

**INAIQ
NEWSLETTER #3**

YEAR 2 | FEBRUARY 2018



JULY 2016 - JUNE 2019
www.interreg-central.eu/INAIQ



**Learning is easier
IN CLEAN AIR** 

 Open the
windows
during breaks!

 Have a separate
pair of shoes
for school!

 Wash the
blackboard with
a wet sponge!

 Decorate the classroom
with air-cleaning plants!
Your teacher will help
in the selection.



 National Public Health Center



JOURNEY TOWARDS THE CLEAN AIR

Competition (drawing, poster, photo, video) for schoolchildren



2019, Hungary

in total, 458 submissions



Source: Lajos Marton (11)



How to regulate IAQ?

Do we really need limit values?

National IAQ action plans should be implemented

Continuous awareness raising is important

Training



Thank you for your attention!

