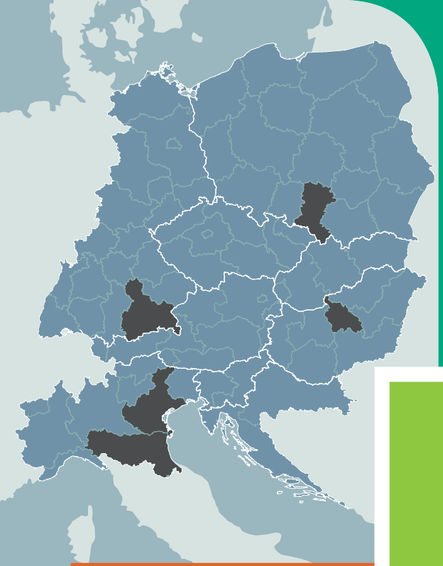
AWAIR project

Interreg Central Europe

EnvironmentAl integrated, multilevel knowledge and approaches to counteract critical AIR pollution events, improving vulnerable citizens quality of life in Central Europe Functional Urban Areas



1.59 million euro ERDF

246 million euro ERDF

9 countries

The AWAIR project

An integrated approach to air pollution

AWAIR wants to find new ways for managing Severe Air Pollution Events in EU Functional Urban Areas, working with cities and environmental agencies to improve air pollution measurements and forecasting. Communication to citizens with a focus on vulnerable people is also an essential part of the project. The whole project was inspired by a participative approach with stakeholders' involvement.

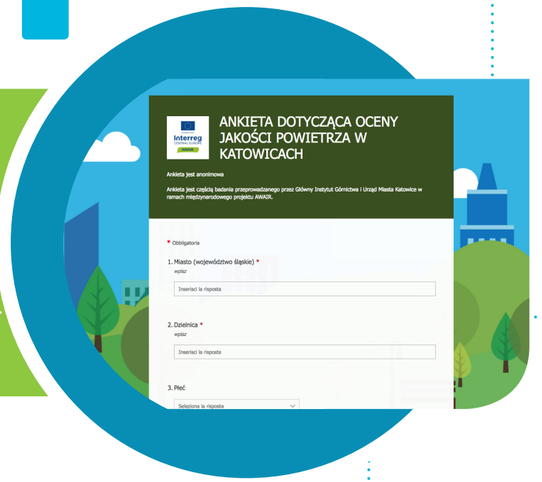
Essential information about the project

The project partners came from seven institutions in four Central European regions: Northern Italy, Hungary, Poland and Germany. The funding from European Regional Development Funds was 1.59 million euros.
The project lasted from September 2017 to February 2021.

Interreg Central Europe

With 246 million Euro of funding from the European Regional Development Fund, the programme supported institutions to work together beyond borders to improve cities and regions in Austria, Croatia, Czech Republic, Germany, Hungary, Italy, Poland, Slovakia and Slovenia.

The transnational strategy



WHY

Low air quality and high concentrations of particular matter, ozone, SO_2 and NO_2 in cities is recognized as one of the main weaknesses of the Central Europe area, and investments for improving air quality represent a key opportunity to improve quality of life in FUAs. Cities generate air pollution, but the ill-effects extend beyond urban cores to surrounding areas. Specifically, AWAIR focused on Severe Air Pollution Episodes (SAPEs), a phenomenon typical of flat areas of CE where the high anthropic pressure and emission levels coupled with meteorological air stagnation lead to drastic increase of concentrations (often above EU limits) for several consecutive days.

WHAT

The issue of SAPEs cannot be addressed at the single city/urban level, but need to be faced at a wider spatial scale, as in Functional Urban Area (FUA), defined as "city" with its commuting zones. The partners in AWAIR worked together to define common transnational regulations and approaches for addressing air quality in larger areas impacted by a city's pollution. The project also introduced innovative approaches to monitor and prevent air pollution.

HOW

AWAIR organised ad hoc stakeholder plans to deeply identify, address and reach each category in a customized way ensuring knowledge transfer at wider level: other FUAs, cities in Europe, local administrators, representatives from vulnerable groups and citizens. Pervasive, wide-ranging communication was structured to guarantee maximum AWAIR visibility and information on opportunities in FUA-cities but also for other citizens in other cities.

The project improved the status of integrated environmental capacities in functional Urban Areas by:

- increasing the extent of knowledge of the public sector about air pollution
- supplying tools and action plans to enhance local know-how
- creating a legal and institutional environment where new management policies can be developed and coordinated at the FUA level
- creating a network between administrators, scientists, stakeholders, citizens and most vulnerable groups that favour communication about urban quality and its effects on human health and wellbeing
- promoting new performance indicators for implemented actions that allow greater efficiency in local policies.

Pilot Action - Budapest-ZUGLÓ

WHY

Budapest-Zugló the 14. district of Budapest was the partner of AWAIR.
The Municipality organised 9 micro pilot projects during the Pilot periods. The pilots concentrated to the FUA problems: 4 policy recommendation, 3 technical projects and 2 awareness raising projects were implemented with the collaboration of professionals and members of FUA.

WHO

Budapest-Zugló's AWAIR team collaborated with the main professionals on air quality: Hungarian Meteorology Institute, Hungarian Health Office, Clean Air Alliance, Universities and members of FUA platform. With this approach we managed to embed for long term collaboration and boosted the policy recommendations.

WHAT

With the help of the professionals involved in the whole period, we made 4 policy recommendation on how to develop new alarm system for Budapest FUA, how to regulate green waste burning and how to make step towards collaboration among Administrative bodies on air quality related topics. With the technical projects we also supported the policy regulations and with the awareness project we supported vulnerable citizens to get information on air quality.

HOW

Budapest-Zugló main methodology was to involve as many professionals as possible and provide room for discussion and collaboration.

Pilot Action - Katowice

WHY

Within the framework of the project, the city of Katowice undertook to promote activities in the neighboring communes belonging to the Metropolis GZM. Under this assurance, an agreement was signed with the Silesian Union of Municipalities and Districts, the Regional Fund for Environmental Protection and Water Management in Katowice, the Union of Polish Metropolises as well as Mikołów and Siemianowice Śląskie. The signatory cities, on the basis of the signed agreement, have access to information points in their public utility buildings, where you can learn details about the air quality condition, thus extending the air quality monitoring system to other cities in the Metropolis.

WHO

Air quality monitors with a multimedia presentation have been installed primarily in public buildings – nurseries, kindergartens, orphanages and nursing homes; that is because they host the largest number of people from the so-called vulnerable groups, i.e. the most exposed to health effects caused by poor air quality.

WHAT

Air pollution sensors were installed in selected locations in the city.
Air quality sensors measure particulate matter PM10 and PM2.5, they also determine air parameters such as temperature, humidity and atmospheric pressure. The collected measurements are presented on a dedicated internet platform, as well as on multimedia presentations located in municipal units.
Katowice air quality monitoring consists of a total of 127 air sensors and 154 multimedia screens as well as the website powietrze.katowice.eu, where citizens can track real-time measurements and check how air quality changes during the day.

HOW

Katowice City and the Central Mining Institute worked closely together for the project with a capillary work in the territory. Workshops for stakeholders and vulnerable groups of citizens were highly attended.
The monitoring network with sensors installed around town was a very visible contribution of the project.
The highlight was the organization of special sessions during the United Nations Climate Change Conference COP24, and the AWAIR message could reach delegates from all over the world.

COP24·KATOWICE 2018
UNITED NATIONS CLIMATE CHANGE CONFERENCE

Pilot Action - Parma

WHY

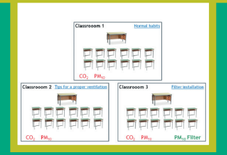
Parma lies in one of the European areas with the most severe air pollution; yet it is in the Food Valley, where a high percentage of Italian food is produced, with world-known products of excellence. Attention to the environment is high in the City Administration and citizens are aware of this. Parma ranks high among the cities where cycling for urban transportation is encouraged and frequent. The intention to reach citizens in a more effective way stems from the high frequency of SAPEs in the area.

WHO

The Pilot Action in Parma has considered the peculiarities of the city and its FUA, located in the Po river plain in NorthItaly.
The involvement of citizens and stakeholders has been focused at first on the administrators of the FUA municipalities.
The groups representing vulnerable people have been addressed through the involvement of associations and health professionals. Particularly relevant has been the involvement of schools and students in educational initiatives including the training of teachers. In addition, a pool of schools in Parma FUA were involved in a campaign to monitor the presence of atmospheric pollutants inside school buildings. This activity is carried out to define protocols aiming at the reduction of children exposure to bad air quality conditions and to test the effectiveness of such protocols.

WHAT

The Mitigation and Adaptation Action Plan, defined in the framework of AWAIR Project for Parma FUA, contains actions and measures to cope with SAPEs. They focus on knowledge enhancement about air quality, implementing a monitoring campaign about some specific traffic related pollutants, during two consecutive winters.
Their monitoring in Europe is not yet mandatory. The message of the AWAIR project has been tailored to appeal to Parma citizens: pollution and food, how air quality affects health and how nutrition is connected to vulnerability.
Diabetes, obesity, intolerances are connected to pollution impact. The involvement of doctors, patients' associations, school professionals has proved it; the results of the multistakeholder table has suggested scenarios with mitigation and adaptation actions and how to improve communication.



HOW

The atmospheric pollutant concentrations collected during the winter monitoring campaigns set up a substantial database. Analysis of the data collected, focusing also on the assessment of effectiveness of the pilot actions started during the Project lifetime. The database is a step forward to increase the knowledge of air quality conditions and evolutions in an urban area, characterized by relevant pollution threats. The message of the AWAIR project has been debated in many public occasions, meetings, exhibition, lectures - in the Researchers' Night at the University - speaking to high school teachers - playing with children - discussing with high school students - training administrators and technicians in the FUA. But the specific focus of AWAIR in Parma was the involvement of health professionals, who met on several occasions culminating in a conference at APE Museum (6-11-2019) where the impacts of air pollution on health of vulnerable citizens were discussed at length. The work is continuing (see "the AWAIR legacy").

The AWAIR handbook

WHY

Considering the transnational approach to a transnational problem with a local application, AWAIR answered to the lack of coordination of environmental policies between core urban areas and their surroundings: it defined a common approach for managing Mitigation & Adaptation actions at the level of Functional Urban Area, focusing on the training of local administrators.

WHAT

The project aimed at increasing local knowledge about pollution causes and effects and at improving the ability of local public authorities:

- to manage Severe Air Pollution Events
- to put in place mitigation actions to reduce emissions of atmospheric pollutants and adaptation actions to lower population exposure
- to measure the effectiveness of the implemented policies and actions.

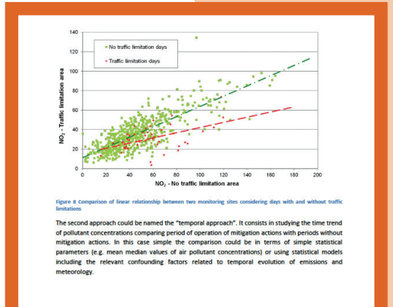


Figure 8 Comparison of linear relationship between two monitoring sites considering days with and without traffic limitations

The second approach could be named the "temporal approach". It consists in studying the time trend of pollutant concentrations comparing period of operation of mitigation actions with periods without mitigation actions. In this case simple the comparison could be in terms of simple statistical parameters (e.g. mean median values of air pollutant concentrations) or using statistical models including the relevant confounding factors related to temporal evolution of emissions and meteorology.

HOW

Training for communication managers provides a guide for making best use of dissemination channels to communicate the right information to the right audience at the right time. A set up of customized trainings was addressed to local administrators to enhance their capabilities in tackling SAPE. AWAIR brought together public administrations from different countries, boosting cooperation and common policy strategies at national and EU level. Local administrators have then benefited from publication of project results, like the AWAIR handbook, to assist them in dealing with issues of air pollution in their own territories.

The AWAIR Decision Support System

WHY

The involvement of urbanized centers plus their commuting zones (FUA) is necessary since SAPEs are manageable only at a large spatial scale.
The strategy presents already tested and innovative policy instruments that facilitate the adoption of shared measures and capitalization of project results.

WHAT

The DSS consists of a system that guides administrators in the activation of targeted mitigation and adaptation actions. It has been developed at project level but customized to local needs. Local administrators and local environmental control agencies have been directly involved in the development.

WOJEWÓDZTWO ŚLĄSKIE

POZIOM 2 — Powiadomienie o ryzyku wystąpienia przekroczenia poziomu informowania dla pyłu zawieszonego PM10 w powietrzu

INFORMACJE O RYZYKU PRZEKROCZENIA POZIOMU INFORMOWANIA	
Zagrożenie	Ryzyko wystąpienia przekroczenia poziomu informowania (100 µg/m³) dla pyłu zawieszonego PM10 w powietrzu.
Data wystąpienia	26.03.2021 r.
Przewidywany czas trwania ryzyka	Od godz. 9.00 do 24.00 dnia 26.03.2021r.
Przyczyny	Warunki meteorologiczne utrudniające rozprzestrzenianie się zanieczyszczeń w sytuacji wzmożonej emisji z sektora bytowo-komunalnego.

Dzień 26.03.2021r.
Na podstawie wyników pomiarów jakości powietrza na stacjach monitoringu na poniższych obszarach, ze względu na pył zawieszony PM10, prognozowana jest zła jakość powietrza, szczególnie w godzinach porannych, wieczornych i nocnych.

Obszar ryzyka wystąpienia przekroczenia poziomu informowania dla pyłu PM10: Prognozowane na dzień 26.03.2021 r. przekroczenie poziomu informowania dla pyłu PM10 obejmuje Częstochowę, Gliwice, Rybnik, Żory, Jastrzębie-Zdrój, Katowice, Chorzów, Mysłowice, Siemianowice Śląskie, Sosnowiec, Jaworzno, Zabrze, Bytom, Piekary Śląskie, Ruda Śląska, Świętochłowice, powiaty: częstochowski, gliwicki, tarnogórski, lubliniecki, kłobucki, rybnicki, mikołowski, wodzisławski, pszczyński, część bielskiego, zawierciański, myszkowski gminy: Bestwina, Czechowice-Dziedzice, Wilamowice.

Ludność narażona na ryzyko wystąpienia przekroczenia poziomu informowania dla pyłu PM10:
Ludność zamieszkująca obszar, na którym w dniu 26.03.2021 r.istnieje ryzyko przekroczenia poziomu informowania dla pyłu PM10.3 362 119 osób.

INFORMACJE O ZAGROŻENIU	
Wrażliwe grupy ludności	• osoby cierpiące z powodu przewlekłych chorób sercowo-naczyniowych (zwłaszcza niewydolność serca, choroba wieńcowa), • osoby cierpiące z powodu przewlekłych chorób układu oddechowego (np.: astma, przewlekła obturacyjna choroba płuc), • osoby starsze, kobiety w ciąży oraz dzieci, • osoby z rozpoznaną chorobą nowotworową oraz ogólnowiekowy.
Możliwe negatywne skutki dla zdrowia	Osoby cierpiące z powodu chorób serca mogą odczuwać: pogorszenie samopoczucia np. uczucie bólu w klatce piersiowej, brak tchu, zmęczenie.

HOW

It defines shared protocols for coordination of mitigation and adaptation actions at a scale larger than the single city or municipality. The target is to help local administrators deciding when and through which instruments to manage SAPEs.
And to manage SAPEs with some advance, and systems guiding administrators in activation of targeted mitigation and adaptation actions.

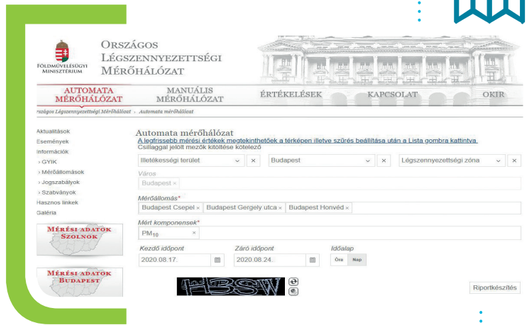
Communicating SAPEs

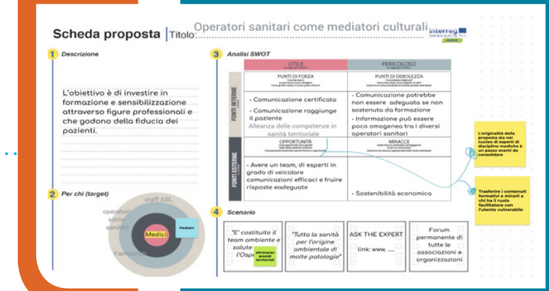
WHY

The project is considered extremely important to reach vulnerable categories with timely information in case of SAPEs. The information from experts and measurement stations does not reach the population in an appropriate form. Specifically, the information must be understandable and clear, to prompt mitigation and adaptation actions in the vulnerable groups. But who decides if the information is good enough, validated and certified? And who can reach in capillary way these groups of people – for instance patients of cardiovascular diseases, school children, elderly people, pregnant women, or sport practitioners?

WHAT

The project partners have worked with stakeholders representing the categories of vulnerable citizens, developing scenarios to identify professionals and operators who could understand the original information, understand the possible impacts on citizens, understand the risks and hazards, reach a wide section of the population. In the territory there are several associations and organizations potentially fulfilling this role, but the ones closest to all citizens are the family doctors.





HOW

The Parma pilot action identified the health professionals as intermediaries towards patients and citizens, including children and mothers. It is important to "go beyond" the existing plans, and the role of the AWAIR project has been to instruct operators and stakeholders, working on ideas and systems on how to provide crucial information to the doctors, even involving formal training.
The 2020 experience with the COVID-19 pandemics has provided a tragic opportunity to show how misinformation concerning health impacts can be detrimental
- the AWAIR project wants to learn from this.

The pilot actions in the three regions also offered a testing ground for interactions with vulnerable categories.

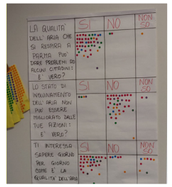
How to involve the population

WHY

Since the beginning of the project, AWAIR partners interacted with citizens of the FUAs in person and on the Internet. At the beginning, the purpose was to understand how information on air quality and SAPEs is transmitted to the citizens, and how citizens perceive the relevance and impact of air pollution in their lives. During and after the pilot actions, the purpose was to assess the impact of the project activities and gather feedback.

WHAT

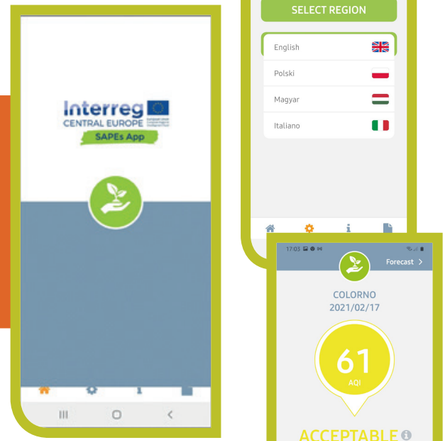
Even though the AWAIR project dealt specifically with the SAPEs, the partners interacted with potential stakeholders on all topics dealing with air quality and air pollution, mitigation, adaptation, measurements and countermeasures. We asked about the type and frequency of information, about the sources of information, about the perception on the impacts of pollution, and about the behaviour changes which can be implemented.



HOW

All FUAs, in Poland, Hungary and Italy, managed a two-way communication with municipalities administrators and with citizens. A website for the project was managed throughout the project to publish documents and results, mainly in English. Facebook and Twitter accounts were created and managed, also through the institutional channels of the different partners, using the National languages. Visits to schools, public exhibitions and events, fairs and markets were exploited to speak to citizens, distribute informative materials, get answers to questionnaires. We were highly satisfied by the interest in the air that we breathe – as a matter of fact the three regions are among the most polluted areas in Europe....

The air quality app



WHY

The INTERREG SAPEs App has the following purposes:

- Better communication with citizens during and before Severe Air Pollution Episodes
- Greater protection of the health of citizens during Severe Air Pollution Episodes
- Focus on susceptible groups
- Improvement of environmental management capacities to cope with Severe Air Pollution Episodes
- Communication of results to research projects and administrators in other countries.

WHAT

The air pollution data is delivered from three specifically tailored forecasting systems (one for each FUA) and provided to the backend system. The backend assesses the level of air pollution assigning it to a certain alert level defined by the FUAs. They can differ in each FUA. Via push message the current air pollution level, the alert level and additional information regarding suggested behaviour is sent to the single mobile phones.

HOW

The Interreg SAPEs App is available in four different languages: Italian, Hungarian, Polish and English. The App does:

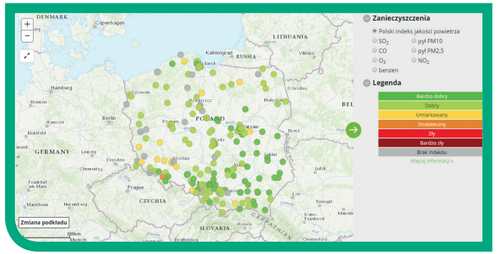
- warn citizens in case of severe air pollution episodes
- raise the awareness for the impacts of air quality on health
- focus on susceptible groups
- increase the general knowledge on air quality
- prompt changes in attitude and behaviour in citizens and stakeholders

This App also focuses on susceptible groups such as pregnant women, children, elderly and people with chronic diseases.

Sensors and measurements

WHY

Fixed site monitoring stations are the reference source of information about air quality in European cities. However, due to the high costs of installation and maintenance, fixed site stations are limited in number and can't provide a detailed view of the spatial variability of air pollution within urban areas. A promising way to achieve this view is represented by air quality sensor systems which are much less expensive and easier to use than reference grade monitors. However, precision and accuracy of these devices must be assessed in the field prior to their use for monitoring campaigns. The project activities have explored this aspect in depth in view of a deployment of sensors to map pollutants at high spatial resolution. In addition, to integrate the information from fixed site stations, black carbon monitors were installed in order to provide data about this air quality parameter, indicated by the WHO as important from a health point of view.



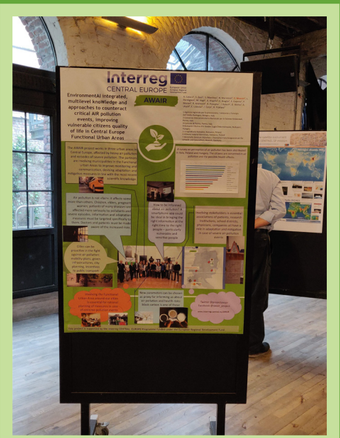
WHAT

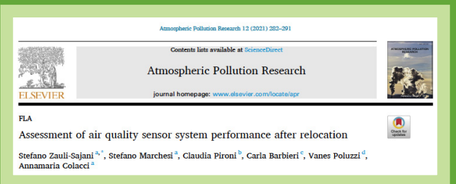
The project partners selected different sensor systems to measure air quality. The sensors were deployed and tested in Parma and Katowice. Measurement campaigns were conducted both indoors and outdoors. The air quality parameters measured were nitrogen oxide (NO), nitrogen dioxide (NO_2), ozone (O_3), carbon dioxide (CO_2) and particulate matter (PM1, PM2.5 and PM10). Black carbon (BC) was measured in two sites of the Parma's FUA.

HOW

In depth assessment of air quality sensor systems were carried out in Parma. Sensors were positioned at the reference stations to compare measurements from reference monitors and sensors. The analyses showed excellent agreement for NO_2 during winter and O3 during summer, whereas the measurements for NO_2 were less accurate in the summer season. In Katowice, 127 sensor devices were deployed next to schools and other public buildings. Data from sensors were made available real time for students and citizens using a web site and 154 screens. Black carbon data enabled to assess the mean concentration and the temporal variability of this parameter in the Parma's FUA and highlighted its primary origin from traffic.

Our Scientific activities




Atmospheric Pollution Research 12 (2021) 282–291

Contents lists available at ScienceDirect

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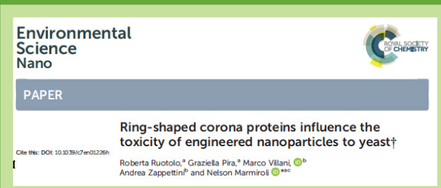
FLA

Assessment of air quality sensor system performance after relocation

Stefano Zauli-Sajani [a,*], Stefano Marchesi [a], Claudia Pironi [b], Carla Barbieri [c], Vanes Poluzzi [d], Annamaria Colacci [e]


Environmental Science Nano

PAPER

Ring-shaped corona proteins influence the toxicity of engineered nanoparticles to yeast†

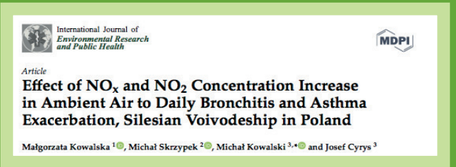
Cite this: DOI: 10.1039/c7en01226h

Roberta Ruotolo,[a] Graziella Pira,[a] Marco Villani,[b] Andrea Zappettini[b] and Nelson Marmiroli[a]


ECOSCIENZA Numero 6 • Anno 2017

AWAIR, CITTADINI PIÙ INFORMATI E CONSAPEVOLI SULL'ARIA

IL PROGETTO EUROPEO AWAIR INTENDE DEFINIRE STRATEGIE EFFICACI DI RIDUZIONE DELL'ESPOSIZIONE DEI CITTADINI ALL'INQUINAMENTO ATMOSFERICO. PREVISTE AZIONI PER CONOSCERE MEGLIO LA SITUAZIONE DELLA QUALITÀ DELL'ARIA E L'INDIVIDUAZIONE DI AZIONI DI MITIGAZIONE E DI ADATTAMENTO IN CASO DI EPISODI ACUTI DI INQUINAMENTO.


International Journal of Environmental Research and Public Health

MDPI

Article

Effect of NO_x and NO_2 Concentration Increase in Ambient Air to Daily Bronchitis and Asthma Exacerbation, Silesian Voivodeship in Poland

Małgorzata Kowalska [1], Michał Skrzypek [2], Michał Kowalski [3,*] and Josef Cyrys [3]

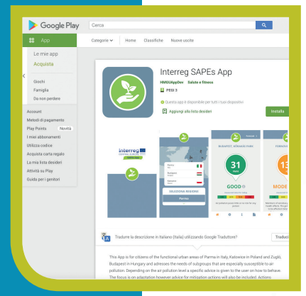
The AWAIR legacy

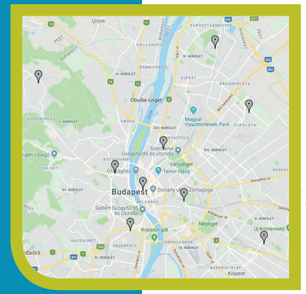
IN PARMA

AWAIR has left a formal agreement between the City of Parma and the neighboring municipalities for a better approach to air pollution, involving forecasting, communication and attention to vulnerable citizens, and changes to mobility. AWAIR has left training materials and tools for administrators. AWAIR has left a series of lectures and tools for school teachers and students, and an information spot in the "sustainable home" of ARPAE. AWAIR has left the app for communicating with citizens. AWAIR has left a core of health professionals and associations who will work together to improve the communication to citizens and the protection of vulnerable groups.

IN KATOWICE

AWAIR has left a form agreement between the City of Katowice and two towns of Katowice FUA: Siemianowice Śląskie and Mikołów. Agreement contains several actions to inform about air pollution, including extending air quality monitoring system in other towns, educational and informing activities for residents. Agreement includes also communication and promotional activities about the project and it's results. AWAIR has left training materials and tools for administrators and the app for communicating with citizens.





IN BUDAPEST-ZUGLO'

AWAIR has left a formal agreement between the City of Budapest and Zugló and the neighboring municipalities for a better approach to air pollution; all together 4 municipalities, two NGOs and one Association signed the MOU and joined the FUA platform. AWAIR has also left a series of lectures and tools for nursery teachers and administrators. AWAIR has left the app for communicating with citizens. AWAIR FUA platform will continue the policy and decision-making work too by making proposals on air quality plan for Budapest and other lobby activities.

AWAIR partners and main stakeholders

- LEADER: ARPAE Agenzia Regionale per la prevenzione, l'ambiente e l'energia dell'Emilia-Romagna - ITALY
- CINSA Consorzio Interuniversitario Nazionale per le Scienze Ambientali - ITALY
- Comune di Parma - ITALY
- Urząd Miasta Katowice - POLAND
- GIG Główny Instytut Górnictwa - POLAND
- Budapest Főváros XIV. Kerület Zugló Önkormányzata - HUNGARY
- Helmholtz Zentrum München - Deutsches Forschungszentrum für Umwelt und Gesundheit - GERMANY

Associated partners

- Associazione per l'aiuto ai giovani diabetici (Italy)
- Azienda Unità Sanitaria Locale di Parma (Italy)
- Śląski Uniwersytet Medyczny w Katowicach (Poland)
- Centro Etica Ambientale (Italy)

Management assistance: EURIS [www.eurisnet.it]

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arpae agenzia prevenzione ambiente energia emilia-romagna

GIG Research Institute

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KATOWICE for a change

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AWAIR

The AWAIR project

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https://www.interreg-central.eu/Content.Node/AWAIR/AWAIR.html

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