K-HEALTH inAIR

K-HEALTHinAIR
Knowledge for improving indoor AIR quality and HEALTH

D4.3
Report on stakeholder perspectives on implementation and use of K-HiA model and solution (Version I)

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ABBREVIATIONS AND ACRONYMS

CEI	Community Engagement Index
DoA	Description of the Action
D&C	Dissemination and Communication
EU	European Union
IAQ	Indoor Air Quality
IDEAL Cluster	IDEAL (Indoor Air Pollution and Health) Cluster is a task force promoted by the European Commission, including projects selected for funding under the call HORIZON-HLTH-2021-ENVHLTH-02-02.
K-HEALTHinAIR	Knowledge for improving indoor AIR quality and HEALTH
R&I	Research and Innovation

EXECUTIVE SUMMARY

K-HEALTHinAIR aims to establish a permanent stakeholders' community. This community will benefit from the K-HEALTHinAIR impacts, and its feedback is considered the best guide towards reaching maximum project results, engagement, and sustainability potential. Stakeholders' feedback will be taken into consideration for the design, implementation, and evaluation of K-HEALTHinAIR activities and results.

D4.3 - Report on stakeholder perspectives on implementation and use of K-HiA model and solution (Version I) describes the initial stakeholders' mapping and analysis, along with the selection of the best engagement tools/ methodologies, to be used for engaging the permanent stakeholders' community, within Task 4.3 - Stakeholder community involvement and capacity building, of the K-HEALTHinAIR project.

The K-HEALTHinAIR permanent stakeholder community built at pilots' level, will be involved by the project consortium in a series of consultation activities to express their expectations and evaluate the project results several times during the project lifetime. Consultation activities will engage stakeholders in the planning (co-creation) and the development phase (evaluation) of project results.

1 Introduction

Task 4.3. "Stakeholder community involvement and capacity building" aims at establishing a permanent stakeholder community at pilot sites' level. This community will be aware of the benefits of using Bigdata technologies, advanced surveillance and monitoring systems and data sharing protocols, to progress research and innovation towards the needs to enhance IAQ and reduce disease burdens.

Stakeholder communities will voice the concerns and expectations of each stakeholder and transfer them to the K-HEALTHinAIR consortium to be considered in the design, implementation, and evaluation of project results and activities.

Different means will be applied to successfully engage stakeholders from different domains and with different types/levels of expertise (e.g., citizens, patients and consumers protection associations, professional scientists' policymakers and regulators) into diverse K-HEALTHinAIR activities.

Task 4.3 includes two deliverables describing the above-mentioned process:

- The first deliverable (D4.3), due in month 9, is the present document, covering the initial stakeholders' mapping and analysis, along with the selection of the best engagement tools/ methodologies according to each stakeholder.
- The second deliverable (D4.10) will be produced towards the end of the project's lifecycle (M46), covering the implementation of the foreseen engagement activities,

along with stakeholders' perspectives on implementation and use of the K-HEALTHinAIR results.

At operational level, the following activities will be carried out:

1. Mapping and analysis of stakeholders
2. Selection of the best engagement tools/ methodologies according to each stakeholder
3. Identification of targeted stakeholders, which will be involved in the process
4. Implementation of the engagement activities (e.g., interviews, surveys etc.)
5. Engagement results analysis and development of a final report on stakeholder perspectives on implementation and use of the K-HEALTHinAIR results

2 Methodology for actively engaging the permanent stakeholders' community

Engaging the permanent stakeholders' community is crucial for the success and sustainability of K-HEALTHinAIR. Actively involving stakeholders in decision-making processes and ensuring their perspectives are heard and valued aims to lead to better outcomes, increased trust, and stronger relationships. However, effectively engaging the stakeholders' community requires a well-defined and systematic approach.

In this methodology, we outline a comprehensive framework for actively engaging the stakeholders' community. By following this methodology, project managers and stakeholders can collaborate in a structured and meaningful way, ensuring that the diverse interests, concerns, and needs of the community are addressed. This approach aims to foster inclusivity, transparency, and active participation, resulting in shared ownership and a sense of collective responsibility.

Throughout this methodology, we endorse various strategies and techniques to engage stakeholders, including identification and analysis of key stakeholders, establishing clear communication channels, facilitating meaningful interactions, and incorporating feedback into decision-making processes. We emphasize the importance of tailoring engagement strategies to the specific characteristics and dynamics of the stakeholders' community, ensuring that their voices are not only heard but also integrated into the project's development and implementation.

By implementing this methodology, organizations and project teams can build stronger relationships with their stakeholders, unlocking the potential for collaboration, innovation, and mutual understanding.

2.1 Preliminary audiences' identification

The clear identification and active involvement of all relevant stakeholders and target groups is instrumental to the effective deployment of dedicated dissemination and exploitation actions

for the K-HEALTHinAIR project. The project has already conducted a preliminary audiences' identification within its "Dissemination and Communication Strategy" (see Target groups section below). Task 4.3 aims to build on this, identifying stakeholders (see Stakeholders section below) that have a vested interest in the K-HEALTHinAIR project.

2.1.1 Target groups

The project target groups refer to the group of people or stakeholders for whom the project is being carried out. The success of the project depends on how well it meets the needs and expectations of its target groups. Identifying the target groups and understanding their requirements, preferences, and expectations is crucial in defining the scope, objectives, and outcomes of the project.

K-HEALTHinAIR target groups are:

I. **Primary target groups in public sector**

   Persons in charge of decision or policy making at health and environmental level: public administration officers in charge of decision-making at health and environmental levels and consumer and patients' associations.

II. **Secondary target groups in society**

   General society: (population or residents and consumers), group of professionals and workers, vulnerable groups and patients, scientific community dedicated to IAQ and EU Technology developers on technologies and sensors related to IAQ.

2.1.2 Stakeholders

A stakeholder is a person, group or organization with a vested interest, or stake, in the decision-making and activities of K-HEALTHinAIR project. Stakeholders can be members of the organization they have a stake in, or they can have no official affiliation. Stakeholders can have a direct or indirect influence on the activities of the project. In all cases, their support and active engagement is considered as crucial for the success and sustainability of the project.

An initial stakeholders scoping exercise (see Table 1) has been included in the K-HEALTHinAIR Description of the Action (DoA) and in the D&C plan. For the scope of Task 4.3, the present methodology aims to segment stakeholders and to adopt tailor made approaches for optimized engagement results.

Multipliers are important stakeholders with a high multiplying potential for accomplishing the project outcomes as well as the dissemination objectives, ensuring the highest impact of the dissemination activities, in line with the implementation of the K-HEALTHinAIR project.

Apart from multiplies, the project aims to include individuals and the general society in its activities, aiming for wider representation and inclusivity.

Table 1: Stakeholders' scoping matrix

Stakeholders' categories	Description
Multipliers	Public administration, Civil Society Organizations and associations at EU level, platforms, and networks.
General society	Actual or potential patients and patients' associations and environmental association

Multiplies represent wider groups, have a well-established reach among their members and audiences, and can therefore further support the project's reach and engagement with them. Active engagement of multipliers will allow wider reach and therefore, multipliers will be considered as intermediaries, which can also support active engagement of target groups, apart from engaging with the project themselves. The consortium had identified already in its DoA among others, multipliers which will be approached for further engagement in the K-HEALTHinAIR project (see Table 2 below).

Table 2: Multiplier stakeholders

Multipliers' groups	Stakeholder entities
Representing public authorities	The Directorate-General for Climate Action (DG CLIMA) The Directorate-General for Environment (DG ENV) European Agency for Safety and Health at Work (EU-OSHA) The European Environment Agency (EEA)
Representing health and public health	Patient Innovation European Public Health Alliance Health and Environment Alliance Alliance of Nurses for Healthy Environments

Representing environmental concerns	EPPA Working Group – Air, Ambient Air Quality Working Group on Particulate Matter, Ambient Air Quality Working Group on Implementation, Air quality European Citizen Science Association Norway Climate Foundation
International networks and working groups	EcoHealth Alliance Alliance for Clean Air Air Quality Alliance
ECHAlliance Ecosystems	Housing & Health Thematic Innovation Ecosystem

2.2 Mapping of K-HEALTHinAIR pilot sites stakeholders

In continuation of the preliminary audiences' identification, task 4.3 aims to establish a permanent stakeholders' community at pilot sites level. This community will benefit from the project's activities and results and its active engagement with the project, as well as ownership of project results is expected to foster the project's sustainability potential. ECHAlliance has developed and shared a mapping tool with all pilot studies leaders (see Figure 1), for them to identify targeted stakeholders at local and national level. These stakeholders will be initially invited to join and be part of the K-HEALTHinAIR permanent stakeholder's community.

K-HEALTH inAIR — K-HEALTHinAIR Stakeholders mapping tool

Stakeholder groups		Organization	Country	Coverage	Website	Social media channels	Contact person	Email address	Organisation Short description	Reason for interest in KHinAIR
Primary target groups	Public administrations: decision making level healthcare									
	Public administrations: decision making level environment									
	Consumers associations: main users of transports, markets, canteens, etc									
	Professional associations									
	Residents Associations: formal group of people who live in a neighbourhood getting together to deal with concerns that affect their local community									

Figure 1: Permanent stakeholders' community mapping tool

The stakeholders mapping exercise will be running throughout the project's lifecycle, in order to achieve the widest possible reach and engagement. Building on the initial stakeholders' identification described in this document, pilot sites leaders will be updating the K-HEALTHinAIR

Stakeholders mapping tool for their respective locations upon identification of more stakeholders through the project's lifecycle.

The mapping exercise is segmented in two phases:

1) November 2022 – April 2023

Initial mapping, conducted by the partners responsible for each pilot site. Pilot site leaders provided information about the stakeholders in their areas of responsibilities, including contact and communication information. The first phase concluded with an initial analysis of stakeholders, conducted by ECHAlliance, Kveloce I+D+i and CARTIF at the end of April 2023.

2) May 2023 – August 2026

Continuous mapping, conducted by the partners responsible for each pilot site, supported by ECHAlliance with communication and supportive material and activities.

2.3 Consultation methodology

The K-HEALTHinAIR permanent stakeholder community built at pilots' level, will be involved by the project consortium in a series of consultation activities to express their expectations and evaluate the project results several times during the project lifetime.

The consultation activities that, based on the stage of the project and topic to be addressed, might take the form of online surveys, questionnaires, storyboards, user journeys and/or roundtable discussions/workshops, will target the main project's results and achievements.

The ultimate goal of this process is to include users' and stakeholders' opinions in key decisions, improve knowledge of their needs and reflect it in project development, improve validation times of ideas or concepts, increase levels of support and enthusiasm for innovation and change, increase the degree of user satisfaction and retention.

The outcomes of this complex activity will be summarized in a report on stakeholder perspectives on implementation and use of the K-HEALTHinAIR results that will be delivered at the end of the project (M46 - D4.10).

The table below (see Table 3 below), to be considered as a living document susceptible to modifications during the project lifecycle, due to intermediate results achieved, outlines the main topics on which the consortium will consult the community for guidance and/or to evaluate the result achieved against the expectations and real needs of end users.

The table includes a brief description of each topic, the planned timeline of the related activities completion, an initial planning of the related consultation activities, group(s) of stakeholders to be involved, and possible consultation means to be used.

Table 3: Consultation activities matrix

Activity code #	Expected Results	Brief description	When it will be achieved	When to consult stakeholders	Stakeholder group	How to consult them
#1	**New user-friendly IAQ sensor**	New configuration of IAQ monitor tools, covering the most relevant parameters and a smart data platform. This will be configured jointly by **INBIOT** and **I2M/MANN+HUMMEL** within WP1 and WP3.	M18 – M30 – M48	M25 initial M46 Final	Consumers' associations Patients' organizations Vulnerable groups Associations/ working groups in public health Environmental organizations/ networks Scientific community Technology developers	Initial – short written interview about connectivity and usability. Panel discussion (mid-term workshop) Final – online survey on platform user's experience and/or monitoring tool trial
#2	**Data sets from monitoring campaigns in 9 scenarios**	Data collection from the 9 scenarios within WP1/WP2. **ATOS** leads the data collection from the	M18 – M30 – M48	M46	Scientific community Technology developers IDEAL Cluster	Online survey (for result's evaluation) on how to provide the information.

		pilot studies.				
#3	**Analytical models/algorithm (adapted to each scenario - 9) based on big data and AI for IAQ health harmful effects**	Results from the data analysis within WP2. **ATOS** leads the data analysis.	M30 – M48	M46	Scientific community Associations/ working groups in public health IDEAL Cluster	Short written interview (for interpretation of results)
#4	**Tests and health surveillance with outpatients**	Special protocols and dataset coming from the study with outpatients. Novel protocols can include innovative tools such as the IAQ portable tool, the use of wristband linked with the IAQ monitors among others. **Hospital Clinic of Barcelona** and **IDIBAPS** lead the tests and health	M30 – M48	M28	Public administration: decision making level healthcare Patients' organizations Associations/ working groups in public health Scientific community IDEAL Cluster	Online survey (for co-creating the project result and planning)

		surveillance with outpatients.				
#5	**Determinants and their sources identification affecting health**	Results and interpretation of the analysis of data collected in the different scenarios. **CARTIF** leads results interpretation and analysis of collected data.	M30 – M48	M46	Public administration: decision making level healthcare Public administration: decision making level environment Patients' organizations Vulnerable groups Associations/ working group Scientific community IDEAL Cluster	Short written interview (for interpretation of results)
#6	**Advanced filter - hybrid system of air filtration and photocatalytic oxidation**	Description of the performance of these both advanced systems to improve IAQ in selected scenarios. **MANN+HUMMEL** and **CIEMAT** will oversee	M48	M44	Scientific community Technology developers IDEAL Cluster	Online survey (for result's evaluation)

		this analysis.				
#7	**Guidelines to IAQ/health improvement –Training and educational materials**	Guidelines to support society (building managers, dwelling owners, infrastructure managers, etc.) in defining (simple or complex, but affordable) customized interventions to improve IAQ per scenario. Education and awareness raising materials focused on risk prevention and harm reduction for specific and particularly vulnerable groups (high-risk outpatients, older people, children, etc.), general knowledge about IAQ and its effects on health, and methods for IAQ	M30 - M42 - M48	M24 initial M40 Final	Public administration: decision making level healthcare Public administration: decision making level environment Consumers associations Professional associations Residents associations Patients' organizations Vulnerable groups Associations/ working groups in public health Environmental organizations/ networks	Short written interview (M28, (for co-creating the project result and planning) Online survey (M40, for result's evaluation)

		monitoring and improvement. **UNL** leads these tasks.			Scientific community IDEAL Cluster	
#8	**Open access platform**	K-HEALTHinAIR Open-access Bigdata platform, allowing easy consultation of the knowledge and data generated by the project based on the stakeholders' perspectives. **ATOS** leads the development of the Open Access platform.	M12, M24, M36, M48	M18 initial M25 final	Public administrations: decision making level healthcare Public administrations: decision making level environment Associations/working groups in public health Scientific Community IDEAL Cluster	Online survey (for co-creating the project result and planning) on usability, structure, etc. Panel discussion (mid-term workshop) Short written interview (for co-creating the project result and planning)
#9	**Proposal of new regulations and standards**	New regulations and standards will be proposed based on the project lessons learnt and results. The contribution of the project to current standards (i.e., ICHOM sets) will also be	M33, M42	M40	Public administration: decision making level healthcare Public administration: decision making level environment Consumers	Online survey (for result's evaluation) Panel discussion (mid-term workshop)

		analyzed. **UNL** leads the proposal of new regulations and standards development.			associations Professional associations Residents' associations Patients' organizations Vulnerable groups Associations/ working groups in public health Environmental organizations/ networks Scientific community IDEAL Cluster	

2.4 Enlarging the permanent local stakeholder's community: the Advisory Board, the IDEAL Cluster, and other relevant initiatives

Stakeholders at pilot level are expected to provide feedback and ideas for implementation, based on their own insights and expertise. Aiming to provide knowledge and solutions incorporating state of the art from European R&I, to optimize synergies, to avoid overlapping and to increase its overall impact, K-HEALTHinAIR will invite members of its Advisory Board (see section 2.4.1 below), the IDEAL Cluster (see section 2.4.2 below) and other relevant initiatives (see sections 2.4.3, 2.4.4 and 2.4.5 below) in the permanent stakeholders' community aiming to also engage them in the consultation activities:

2.4.1 Advisory Board

The K-HEALTHinAIR Advisory Board will support the project consortium by reviewing the task deliverables, ensuring their practical consistency, and contributing to the alignment of the project with its scope. Advisory Board members will represent the main research approaches and aspects of Indoor Air Quality research and innovation. The group will be consulted to evaluate the specifications and the achievements, and to give guidance for future exploitation of the project results. The Advisory Board will count on the participation of experts on air quality, reporting topics from European and Non-European countries. It has been already selected and it is formed by seven (7) international experts on different issues related with the project.

2.4.2 IDEAL Cluster

IDEAL (Indoor Air Pollution and Health) Cluster is a task force promoted by the European Commission, including projects selected for funding under the call HORIZON-HLTH-2021-ENVHLTH-02-02. K-HEALTHinAIR is part of the IDEAL Cluster, together with 6 other projects: SynAir-G, LEARN, TwinAir, InChildHealth, Inquire & EDIAQi. The activities of the cluster are dedicated to the creation of working groups on topics of common interest, to provide the European Commission with scientific input, if necessary, to organize training sessions on relevant issues, and to implement a dissemination and communication campaign to create awareness on the activities jointly implemented.

2.4.3 Urban Health Cluster

The Urban Health Cluster is the first European Cluster to improve and safeguard health and well-being of citizens, leaving none behind. It consists of six Horizon2020 projects (eMOTIONAL Cities, ENLIGHTENme, HEART, RECETAS, URBANOME and WELLBASED), funded under the same Call of the Horizon 2020 European Framework Programme.

2.4.4 ECHAlliance Ecosystems

ECHAlliance Group is a multi-stakeholder international organization, facilitating connection and knowledge exchange among the players engaged in digital health innovation and deployment, driving sustainable change and disruption in the delivery of health and social care. ECHAlliance will engage ecosystems out of its members (e.g. Housing & Health Thematic Innovation Ecosystem).

During the project's lifetime, additional ECHAlliance members and locally based health ecosystems and additional organizations coming from other partners' suggestions may be involved in the permanent stakeholders' community, based on project developments and the analysis of consultation activities results, as well as the monitoring of the Community Engagement Index.

2.4.5 Other relevant projects & initiatives

The K-HEALTHinAIR consortium has already identified other EU funded projects and relevant initiatives that will be invited to join the permanent stakeholders' community, and engage with the project:

The H2020 BRAINTEASER project, is a data science project that seeks to exploit the value of big data, including those related to health, lifestyle habits, and environment, to support patients with amyotrophic lateral sclerosis (ALS) and multiple sclerosis (MS) and their clinicians. Among other things, the project aims to understand whether different ecological factors can influence the disease phenotype and progression of ALS and MS patients, studying how disease characteristics can be modified by environmental factors such as increased exposure to environmental pollutants.

Digital Health Uptake (DHU) is an EU-funded project under the Digital Europe Programme, aiming to facilitate the alignment of policies, strategies, instruments, and activities to advance the uptake of digital health solutions and services in Europe. Digital tools have become crucial to the operation of Europe's health and care systems. DHU aims at coordinating health stakeholders to integrate digital solutions along the continuum of health and care.

SIRENE is a Coordination and Support Action, funded by the European Union Horizon Europe Programme, aiming to support the growth of social innovation ecosystems delivering eco-friendly and sustainable community-based services for SHAFE (Smart Healthy Age-Friendly Environments) implementation in Europe, by providing a workable framework for investment and the broad adoption of high-quality smart living solutions, combining the housing sector and ICT infrastructure. The desired impact of the SIRENE proposal is to improve the wellbeing and housing conditions of the European population by empowering social and private entrepreneurs.

2.5 Analysis of stakeholders

The following tables provide the initial list of potential stakeholders identified at pilot sites. Pilot sites leaders have identified relevant stakeholders and have analyzed their background and expertise, as well as the reasons that would motivate them to engage with the K-HEALTHinAIR project.

2.5.1 Spain

Organization	Stakeholder group	Coverage	Organization short description	Reason for interest in K-HEALTHinAIR
AESCAI	Professional associations	Regional	AESCAI is a private non-profit association whose mission is the promotion, dissemination and disclosure of the importance of indoor and outdoor air quality, sustainability, efficiency and environmental health.	Mission aligned with IAQ improvement
Ecologistas en Acción	Environmental organizations/networks	National	Ecologists in Action is a confederation of more than 300 environmental groups distributed by towns and cities, carrying out awareness campaigns, public or legal complaints against those actions that damage the environment, while developing concrete and viable alternatives in each of the areas in which it carries out its activity.	Vigilance of pollution stations
Centro Nacional de Salud Ambiental ISCII	Scientific Community	National	The National Center for Environmental Health is the scientific-technical body of the Carlos III Health Institute, specialized in health aspects derived from environmental contamination. The CNSA	Mission to evaluate exposure to environmental contamination and protect human health against it.

			contributes to the protection of the health of the Spanish population by evaluating its exposure to environmental contamination.	
Paediatric Environmental Health Speciality Unit Murcia	Scientific Community	Regional	PEHSU-Murcia is a clinical unit located in the Pediatric Service of the Hospital Clínico Universitario Virgen de la Arrixaca where family doctors, pediatricians, nurses, environmentalists and Environmental Health technicians work with experience in Pediatric Environmental Health and cooperating with other pediatric subspecialties and adult medicine, and other areas (biologists, engineers, architects, ecologists…) working to recognize, evaluate and manage environmentally related diseases and risks as well as provide education, training and research in Pediatric Environmental Health in general, and community and school in particular.	Assessment and management of health, training, and education.

2.5.2 Netherlands

Organization	Stakeholder group	Coverage	Organization short description	Reason for interest in K-HEALTHinAIR
GGD Rotterdam-Rijnmond	Environmental organizations/ networks	Regional	GGD Rotterdam-Rijnmond promotes and protects the health of the inhabitants in the region. The GGD does this for 13 municipalities in the Rijnmond region	Promotes and protects the health of the inhabitants in the region

			based on the Public Health Act. GGD stands for Municipal Health Service.	
Netherlands Institute for Health Sciences (NIHES)	Scientific community	National	Netherlands Institute for Health Sciences (NIHES) is an international academic research institute that provides all courses and programmes in English	Scientific interests similar to the project's

2.5.3 Norway

Organization	Stakeholder group	Coverage	Organization short description	Reason for interest in K-HEALTHinAIR
Norwegian Institute of Public Health (NIPH / FHI)	Public administration	National	The Norwegian Institute of Public Health is a government agency under the Ministry of Health and Care Services. Our employees are located in Oslo and Bergen.	Mission to produce, summarize and disseminate knowledge to support good public health efforts and healthcare services.
Grimstad municipality	Public administration	Regional	Grimstad is a town and municipality in the county of Agder, Norway and belongs to the geographical region of Sørlandet. Grimstad municipality is located in the southern part of Norway and covers an area of 304 square kilometers.	Chief municipal medical officer
Norwegian	Public administration	National	The Norwegian Labor Inspection Authority	The Norwegian Occupational

Labor Inspection Authority (Arbeidstilsynet)			is a state agency under the Ministry of Labor and Inclusion, consisting of a directorate and an external agency with six departments.	Safety and Health Administration has several instruments to influence Norwegian businesses to systematically work preventively with the working environment.
Student organization Agder (STA)	Consumers associations	Regional	The Student Organization of Agder is an interest organization for all the students at the University of Agder. Our main purpose is to ensure the student's academic, social, economic, and general wellbeing	Consumer / potential end user
Norwegian student organization (NSO)	Consumers associations	National	The National Union of Students in Norway (Norsk student organization, or NSO in Norwegian) is the largest organization for students in Norway. Comprising 30 member unions from higher education institutions across the country. The member unions represent more than 240 000 students. NSO's goal is to ensure students' academic, social, and economic rights.	Consumer / potential end user
J. B. Ugland	Consumers associations	Regional	J.B. Ugland develops buildings and urban spaces where people can live, work and study.	Real estate business owning the university campus in Agder
Fagskolen i	Consumers	Regional	The vocational school in Agder is located	Participates in the Norwegian

Agder/ Vocational technical college	associations		in Grimstad. The school has around 500 students and 40 employees, and we offer a range of studies as full-time, part-time or as online studies.	pilot study, providing their canteen for IAQ monitoring
Multiconsult	Professional associations	European	Multiconsult ASA is a leading Norwegian engineering and architecture company. The company offers multidisciplinary consultancy, design, engineering, architecture, project follow-up, management, verification, and control - both nationally and internationally.	The goal is to make it easier to develop and implement value-creating and sustainable projects for the company's many customers.
Asplan Viak	Professional associations	National	Asplan Viak is one of Norway's leading consulting companies in planning, architecture and engineering.	Consulting engineers with research interests similar to the project
Rambøll	Professional associations	European	Rambøll is a global engineering, architecture and consulting company that was founded in Denmark in 1945.	Consulting engineers with research interests similar to the project
GK	Professional associations	European	GK is Scandinavia's leading technical contractor and service partner and delivers smart solutions in ventilation, cooling, building automation, electricity, and pipes.	Designers/ suppliers of ventilation and building automation systems
Caverion	Professional	European	Caverion is a technical supplier of smart	Designers/ suppliers of ventilation and building

	associations		and green buildings where people thrive.	automation systems
Student welfare organization Agder, SiA	Residents' associations	Regional	SiA offers a wide range of services, activities and benefits for the students who are affiliated with the Student Welfare Organization in Agder (SiA).	Participates in the Norwegian pilot study, providing their canteen and residence hall for IAQ monitoring
Norges Astma- og allergiforbund (NAAF)	Patients' organizations	National	The Norwegian Asthma and Allergy Association works both locally and nationally to ensure that politicians, decision-makers and society in general take our challenges seriously.	Mission to spread knowledge on respiratory diseases
Tre på Agder - Wood in Agder	Environmental organizations	Regional	Wood - construction industry cluster	Special interest in relation to wood and health
Norwegian institute of wood technology (NTI) / Treteknisk	Scientific community	National	The Norwegian Treteknisk Institute (Treteknisk) was established in 1949 as a branch research institute for the wood industry in Norway and is an independent research association with 125 member companies.	Special interest in relation to wood and health
Norwegian Institute for Air Research (NILU)	Scientific community	National	The Climate and Environmental Research Institute NILU is an independent, nonprofit research institution established in 1969.	Research interests similar to the project.
CLEVAIR	Technology developers	National	ClevAir was started out of a desire for making a difference and helping real	Company that delivers sensors, software for building climate

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			estate to be sustainable. ClevAir works to help customers run their HVAC energy efficiently, stabilize indoor climate, cut costs, reduce CO_2 emissions and give them knowledge for decisions on even more sustainable actions.	settings
Massivtre AS	Technology developers	National	Massivtre AS was established in 2016 with a background in experience with solid wood.	Massivtre AS designs, delivers, and installs wooden constructions for the private and professional market.

2.5.4 Germany

Organization	Stakeholder group	Coverage	Organization short description	Reason for interest in K-HEALTHinAIR
Berufsgenossenschaft Nahrungsmittel und Gastgewerbe	Professional association	National	The trade association for food and hospitality (BGN) based in Mannheim has been the statutory accident insurance for companies in the food and beverage industry, the hotel and catering trade, the bakery and confectionery trade, the meat industry, breweries, and malt houses as well as showmen's trades since 1885. and circuses. By law, all employees in these companies are insured with the BGN for accidents at work and occupational diseases – currently around three million	The branch competence of the BGN is the basis for practical and problem-oriented prevention and rehabilitation offers to the companies.

			people in almost 380,000 companies.	
ISAPS Hochschule Heilbronn	Scientific community	Regional	Heilbronn University of Applied Sciences ranks among the major institutions of Higher Education in the state of Baden-Württemberg where it caters for about 8,000 seeking students.	Appointed member of the "Expertenkreis Aerosole" of the state government of Baden-Württemberg and joined public funded project ESTATE on Energy-efficient operating concepts for health protection with cooperative ventilation systems based on simulations, sensor data and artificial intelligence (ESTATE).
Aktionsbündnis Gesunde Luft	Environmental organizations/networks	National	Action Alliance for Healthy Air takes the initiative to strategically appreciate air purification together and from different perspectives - as companies, scientific actors, associations and institutional users. Action Alliance for Healthy Air advocates making air purification technologies better known and more systematic than before and integrating them into everyday social life. What unites us is the idea of sustainably strengthening social resistance and public health with the help of air purification. .	Interested in topics relevant to the project, involved in similar projects and in contact with policy makers.

Palas GmbH	Technology developers	National	The Palas GmbH is a leading developer and manufacturer of high-precision devices for the generation, measurement and characterization of particles in the air. With numerous active patents Palas® develops technologically leading and certified fine dust and nanoparticle measuring devices, aerosol spectrometers, generators and sensors as well as associated systems and software solutions. Palas® was founded in 1983 and employs about 100 employees at the company headquarters in Karlsruhe.	Leading sensor development company for indoor and outdoor air quality.

2.5.5 Poland & Austria

Organization	Stakeholder group	Coverage	Organization short description	Reason for interest in K-HEALTHinAIR
Austrian Doctors for the Environment	Scientific community	National	The Austrian Doctors for a Healthy Environment (AeGU) were established in 1989. In 1990 together with organizations from Italy, Germany, and Switzerland they founded an international umbrella organization: International Society Doctors for the Environment (ISDE).	As doctors they not only strive to motivate their patients to lead a healthy life. They also feel responsible for a health promoting environment.
Association IBO - Austrian	Environmental	National	As an independent scientific association, the IBO has been researching the	The IBO employs people from a wide variety of backgrounds

Institute for Healthy and Ecological Building	organizations/networks		interactions between humans, buildings and the environment since 1980. One of its central tasks is the development and promotion of the fundamentals of ecological architecture.	who have been involved in building biology and building ecology for many years.
Polish Federation of Asthma, Allergy and COPD Patients' Association	Patients' association	National	The purpose of the Federation is to represent the interests of people suffering from asthma and allergic diseases and chronic obstructive pulmonary diseases, defending their rights and freedoms, coordinating activities in this area and creating conditions for the full and active participation of people suffering from asthma and allergic diseases and chronic obstructive pulmonary diseases in social life.	Representing the interests of people suffering from asthma and allergic diseases of chronic obstructive pulmonary diseases before the state and local government authorities of the country, as well as other national, foreign and international organizations.
Polish Smog Alarm	Environmental organizations/networks	National	Polish Smog Alert (PAS) is an initiative that brings together civic movements concerned about poor air quality in Poland. The aim of PAS is to bring the air quality to a state that does not threaten the health and life of people living in Poland. We strive to achieve air quality that meets the standards in force in our country. The Polish Smog Alert is a non-party organization, cooperating with local governments, non-governmental	Improving access to information on air pollution, adapting the levels of alerting and informing about air pollution to European standards

			organizations, and scientific communities, as well as with anyone who cares about clean, pollution-free air, as well as the health of Polish citizens.	
The Austrian Lung Union (ÖLU)	Patients' organization	National	The Austrian Lung Union (ÖLU) provides information from both conventional medicine and complementary medicine. It also offers practical tips and strategies for avoiding and managing disease. This is intended to improve the ability to make judgments about one's own illness, but also about therapy and rehabilitation options. Information about alternative or complementary forms of treatment should give those affected the opportunity to better assess the quality, the benefit of therapy and the costs of this rapidly growing offer.	Offers practical tips and strategies for avoiding and managing the disease.
Center for Public Health	Scientific community	National	The Center for Public Health is devoted to the influence of health and sickness on society, as well as developing measures for prevention, health promotion, improved medical care and check of environmental conditions.	The aim of the Center for Public Health is to improve the physical and mental well-being of the population by means of health-related initiatives in research, development, education and public information and by advising national and international committees.

2.5.6 EU level & other initiatives

Organization	Stakeholder group	Coverage	Organization short description	Reason for interest in K-HEALTHinAIR
EFA	Patients' association	National	The European Federation of Allergy and Airways Diseases Patients' Associations (EFA) is an independent non-profit organization with its central office located in Brussels, Belgium. EFA connects 45 allergy, asthma and chronic obstructive pulmonary disease (COPD) patients' associations in 26 countries.	As a European level patient-led organization, EFA advocates to improve the lives of all people living with allergies and airways diseases.
International Society of Indoor Air Quality and Climate	Professional associations	International	AESCAI is a private non-profit association whose mission is the promotion, dissemination and disclosure of the importance of indoor and outdoor air quality, sustainability, efficiency and environmental health.	Mission aligned with IAQ improvement
Indoor Air Quality Association (IAQA)	Professional associations	International	ISIAQ is an international, independent, multidisciplinary, scientific, non-profit organization whose purpose is to support the creation of healthy, comfortable and productive indoor environments.	Mission aligned with IAQ improvement
Convenant on demographic	Associations/ working groups in	EU level	The Covenant on Demographic Change gathers all local, regional and national	Network of entities promoting age-friendly Europe

change	public health		authorities, and other stakeholders, that commit to cooperate and implement evidence-based solutions to support active and healthy ageing as a comprehensive answer to Europe's demographic challenge.	
Convenant of mayors	Associations/ working groups in public health	EU level	The EU Covenant of Mayors for Climate & Energy is an initiative supported by the European Commission bringing together thousands of local governments that want to secure a better future for their citizens. By joining the initiative, they voluntarily commit to implementing EU climate and energy objectives.	Decarbonized cities
EnergyCities	Environmental organizations/ networks	EU level	EnergyCities is a community of several hundred local authority representatives from 30 countries. The network gathers frontrunners and energy transition beginners, city officials and technical experts.	Fossil-free cities, local governance, community energy, food systems
International Council on Clean Transportation	Environmental organizations/ networks	International	The International Council on Clean Transportation (ICCT) is an independent nonprofit organization incorporated under Section 501(c)(3) of the US tax code. It provides technical and scientific analysis to	Mission to improve the environmental performance and energy efficiency of road, marine, and air transportation sectors and fuels, to benefit public health and mitigate

Funded by the European Union

			environmental regulators.	climate change.
ICLEI Local governments for sustainability	Environmental organizations/ networks	International	ICLEI – Local Governments for Sustainability is a global network of more than 2500 local and regional governments committed to sustainable urban development.	Sustainable urban development
European Lung Foundation	Patients' organization	International	ELF is a patient-led organization that works internationally to bring patients and the public together with healthcare professionals to improve lung health and advance diagnosis, treatment and care.	Improving lung health
European Respiratory Society	Associations/ working groups in public health	International	ERS is one of the leading medical organizations in the respiratory field, with a growing membership spanning over 160 countries. ERS prioritizes science, education, and advocacy to promote lung health, alleviate suffering from disease and drive standards for respiratory medicine globally.	Promotes health and alleviates suffering from disease

Funded by the European Union

2.6 Tools/ methods to create the appropriate awareness around the project

2.6.1 Social media

K-HEALTHinAIR social media channels (LinkedIn and Twitter) will support the engagement of stakeholders, running a campaign targeting each pilot site location. Partners leading the pilot studies will share information about their scenarios (150-200 words) and media material (5 representative photos or videos from the pilot study premises, the city or the organizations involved).

2.6.2 Email communication

ECHAlliance will organize an email marketing campaign targeting stakeholders at the pilot sites levels and will monitor and support pilot sites in their implementation.

The campaign will consist of two parts: initially, it will introduce the project to the permanent stakeholders' community, providing background information, promoting expected impacts, and presenting ways for stakeholders to get engaged and benefit from the project. At the second phase, the campaign will segment stakeholders identified by the consortium as targets for further involvement according to the topic, as described in the Consultation methodology (see Table 3), and will share with them material related to the planned engagement activities (i.e., online surveys, short written interviews) and timeline.

2.7 Key Performance Indicators

The K-HEALTHinAIR consortium had already identified Key Performance Indicators (set out in the DoA) related to stakeholders' community engagement during the project proposal submission phase. These KPIs aim to reassure adequate and fair representation and involvement of stakeholders:

- Strong community of multiple actors (at least two areas of activity, i.e., health, environment, education)
- Dedicated activities for stakeholders at EU and local level (events) (at least one activity for each pilot study)
- At least 5 Stakeholders in local dissemination activities
- At least 18 stakeholders representing the 6 countries of the pilots (3 per country)
- At least 3 EU stakeholders at large through networks, associations, and platforms as potential replicators
- Networking with associations (at least 50)
- Dissemination webinar (minimum 50 attendees) as a mid-term workshop (September 2024)

2.8 Community Engagement in Research Index monitoring and evaluation of community engagement

Community participation in research can increase the potential for designing, implementing, and sustaining interventions that better fit community needs, enhance community capacity, and lead to policy changes.

Active participation of community partners in K-HEALTHinAIR research activities is expected to have a positive impact on the project's outcomes. The value of community engagement in research, however, cannot be empirically determined without good measures of the level of community participation in research activities.

ECHAlliance has developed a Community Engagement Index to monitor impact and engagement of stakeholders, within the framework of the K-HEALTHinAIR Dissemination and Communication strategy (see Table 4). The Community Engagement Index (CEI) measures the level of interest generated by all communication activities and describes the impact on the community, by monitoring its behavior in relation to specific activities. Apart from evaluating the quality of D&C activities, CEI will also be used to assess the level of engagement of the permanent stakeholders' community, in the framework of Task 4.3.

Permanent stakeholders' community engagement will be monitored and assessed continuously, through this Community Engagement Index. This Index offers a multidimensional view of community participation in the research process.

The CEI will be used to measure and assess stakeholders' community engagement in 3 stages (M18, M30, M42). Monitoring and assessment will provide the K-HEALTHinAIR consortium with a thorough understanding of community engagement levels, allowing corrective measures in a timely manner.

Table 4: CEI Survey

CEI Survey Items			
Consultation topic	Invited for consultation	Active contribution	Did not participate
	(%)	(%)	(%)

3 Practical consultation activities

Engagement activities will be planned in a flexible way, will be targeted and short, providing comprehensive feedback without adding significant workload to the targeted stakeholders.

Consultation activities will engage stakeholders in the planning (**co-creation**) and the development phase (**evaluation**) of project results.

Co-creation consultation will gather stakeholders' views and insights on K-HEALTHinAIR plans, with the aim of delivering highly impactful and more sustainable project results. Co-creation is expected to both enhance stakeholders' ownership of project results and ensure that the solutions and knowledge delivered from the project will better match the needs of stakeholders and final users. The co-creation consultation activities will focus on collection of mostly qualitative data, thus the means to be used will include online surveys with open questions, interviews, workshops and focus group discussions.

Evaluation consultation will be conducted within the development phase of project results, with the aim of fine-tuning project results, before final release. Draft and demo versions of the different project results described in the Consultation methodology will be made available to the permanent stakeholders' community members, for their review and feedback. The means to be used for the collection of feedback will be online surveys, delivering quantitative data on the acceptance of the proposed solutions. The leading partners will then take this feedback into consideration, for the fine-tuning of the respective project results.

ECHAlliance will plan, organize and run the practical consultation activities, supported by the pilot sites leaders and partners responsible for each project result under consultation.

The following means will be used for consultation with the stakeholders' community:

3.1 Informative material

ECHAlliance will design informative material, with the support of the respective leading partners, featuring the proposed solutions and knowledge to be delivered, following the course of activities as described in Table 3 (see Consultation methodology section). This material will be communicated to the stakeholders' community members, as the first step for each consultation activity. The informative material will focus on presenting the key features of project results, in an easily understandable and user-friendly format, facilitating timely and effective communication and consultation with stakeholders.

3.2 Short video demonstrations

Short videos, with key people from the WP Leading partners, presenting the solutions under development will be recorded and made available to the stakeholders' community members, initiating consultation on specific project results. These videos will be used in cases of complex solutions, to present more effectively individual characteristics and technical aspects of the respective solutions.

3.3 Online surveys

Online surveys are an efficient way to collect information from a substantial number of people (i.e., respondents) to answer evaluation research questions. Online surveys allow respondents to pace up or down as per their convenience, are accessible from any device, cost-efficient and provide design flexibility. Use of online surveys leads to better quality of responses and more accurate feedback.

Surveys will include both closed-ended and open-ended questions. Closed-ended questions may include multiple choice, dichotomous, Likert scales, rank order scales, and other types of questions for which there are only a few answer categories available to the respondent. Open-ended survey questions will be used to reflect respondents' experience or attitudes, providing narrative responses (qualitative data).

3.4 Interviews

Interviews are an efficient personalized way to collect feedback. Interviews can provide thorough and detailed feedback, allowing interaction between responders and interviewers. This aligns closely with the co-creation approach, providing opportunities for more in-depth examination of targeted topics and features.

Short written interviews will be used to gather qualitative data such as expert insights and pilot users' experience, in a resource-efficient way.

3.5 Virtual panel round tables

During the project's mid-term workshop (M24), a virtual panel round table will be organized by ECHAlliance with stakeholders' community members. This group of experts will discuss project results and further plans and will provide recommendations and feedback for the overall stakeholders' community engagement, taking into consideration the findings of the Community Engagement Index.

3.6 Policy briefs

The project will develop and share policy briefs, featuring key research findings and relevant recommendations for Indoor Air Quality (IAQ) and health improvement. The permanent stakeholder's community will be the first receivers of policy briefs, benefiting this way from their engagement in the project, but also serving as agents for further diffusion of knowledge generated by the project, in their local, regional, and national contexts.

4 Results' analysis

Data collected through the consultation activities will be analyzed and will inform the design, planning and development of K-HEALTHinAIR outputs. Results' analysis will follow the course of

consultation activities (see Consultation methodology), starting from June 2023. Data will be collected at the end of each consultation activity period and will be made available to the project consortium through relevant reports, to inform the design and planning of project activities, or to provide feedback on project outputs.

The results' analysis reports aim to provide summarized and constructive feedback to the consortium. ECHAlliance has developed a template (see Annex 6.1 Results' analysis report) to be used for the results' analysis reports.

5 Conclusions and the way forward

The initial stakeholders' identification described in this document will serve as the basis for further activities within Task 4.3 (Stakeholder community involvement and capacity building). The Methodology for actively engaging the permanent stakeholders' community will guide the K-HEALTHinAIR consortium towards establishing the local permanent stakeholders' community at pilot sites level and enlarging it, by engaging other relevant initiatives. ECHAlliance, working together with Pilot Sites Leaders and Work Package Leaders will coordinate this process, enabling the tools and methods selected, monitoring progress towards the set Key Performance Indicators.

The permanent stakeholders' community engagement activities are planned to kick start in June 2023. The course of these activities will follow the timeline presented in the Consultation methodology (Table 3: Consultation activities matrix), engaging the relevant categories of stakeholders identified for each expected project result.

The first step will include communication of the project's plans, the outline of the consultation process, and the timeline of planned activities. A special flyer in digital format will be designed by ECHAlliance for this purpose. In addition, the 2nd newsletter of the project will be devoted to the permanent stakeholders' community engagement activities, featuring pilot sites activities, consultation topics and more.

The next step will be the establishment of a stable communication channel with the stakeholders' community members, building on the direct contact that the pilot sites leaders have with the local stakeholders.

6 Annex

6.1 Results' analysis report

Consultation activity code	Result
#	
Stakeholders' groups consulted	
Type of consultation activity	
Results' analysis	

"We only see what we know"