Destination 2. Living and working in a health-promoting environment

Calls for proposals under this destination are directed towards the Key Strategic Orientation KSO-D '*Creating a more resilient, inclusive and democratic European society*' of Horizon Europe's Strategic Plan 2021-2024. Research and innovation supported under this destination should contribute to the impact area 'A resilient EU prepared for emerging threats' and in particular to the following expected impact, set out in the Strategic Plan for the health cluster: 'living and working environments are health-promoting and sustainable thanks to better understanding of environmental, occupational, social and economic determinants of health'. In addition, research and innovation supported under this destination could also contribute to the following impact areas: 'Good health and high-quality accessible health care', 'Climate change mitigation and adaptation', and 'Clean and healthy air, water and soil'. The environment we live and work in is a major determinant of our health and well-being. Environmental factors are estimated to account for almost 20% of all deaths in Europe. The impacting factors on both physical and mental health and wellbeing are not all identified nor their effects comprehensively understood and accounted for to support evidence-based policy- and decision-making. Therefore, Destination 2 aims at filling knowledge gaps in the understanding of the impacts on our health and well-being of those environmental, occupational and socio-economic risk factors that have the most significant or widespread societal impacts. In this work programme, Destination 2 focuses on pollution, disrupting chemicals, environmental degradation, climate and other environmental exposures in living and working environments. The results will support the EU's environment and health policies and overarching policy frameworks such as the European Green Deal, the Chemical Strategy for Sustainability, the EU Adaptation Strategy, the EU Biodiversity Strategy 2030, the 8th Environment Action Programme, the EU Strategic Framework on Health and Safety at Work as well as the WHO European Environment and Health Process (EHP). Strong collaborations across sectors and with other Horizon Europe clusters dealing with issues such as agriculture, food, environment, climate, biodiversity, mobility, security, urban planning, social inclusion and gender will be needed to ensure that maximal societal benefits are reached. Thus, in view of increasing the impact of EU investments under Horizon Europe, the European Commission welcomes and supports cooperation between EU-funded projects to enable cross-fertilisation and other synergies. This could range from networking to joint activities such as the participation in joint workshops, the exchange of knowledge, development and adoption of best practices, or joint communication activities. All topics are open to international collaboration to address global environment and health challenges.

Expected impacts:

Proposals for topics under this destination should set out a credible pathway to contributing to living and working in a health-promoting environment, and more specifically to one or several of the following impacts:

- Policymakers and regulators are aware and well informed about environmental, socio-economic and occupational risk factors as well as health-promoting factors across society;

- Environmental, occupational, social, economic, fiscal and health policies and practices at the EU, national and regional level are sustainable and based on solid scientific evidence. These include overarching policy frameworks such as the European Green Deal, the Chemical Strategy for Sustainability, the 8th Environment Action Programme, the EU Adaptation Strategy, the Farm to Fork Strategy[51], the EU Biodiversity Strategy 2030, the EU Strategic Framework on Health and Safety at Work and the European Environment and Health Process led by the World Health Organization;

- The upstream determinants of disease - related to choices in energy generation, agricultural and food processing practices, industrial production, land use planning, built environment and construction - are known, understood and reduced;

- The health threats and burden resulting from hazardous chemicals, biodiversity degradation and air, water and soil pollution and contamination is reduced, so that the related number of deaths and illnesses is substantially reduced by 2030;

- Living and working environments in European cities and regions are healthier, more inclusive, safer, resilient and sustainable;

- The adaptive capacity and resilience of populations and health systems in Europe to climate and environmental change-related health risks is strengthened;

- Citizens' health and well-being is protected and promoted, and premature deaths, diseases and inequalities related to environmental pollution and degradation as well as unhealthy lifestyles are prevented;

- Citizens understand better complex environment and health issues, and effective measures to address them and support related policies and regulation.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-HLTH-2023-ENVHLTH-02	103.00		13 Apr 2023
HORIZON-HLTH-2024-ENVHLTH-02-two-stage		60.00	19 Sep 2023 (First Stage) 11 Apr 2024

[51] https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

			(Second Stage)
Overall indicative budget	103.00	60.00	

Call - Environment and health (Single stage - 2023)

HORIZON-HLTH-2023-ENVHLTH-02

Conditions for the Call

Indicative budget(s)[52]

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million)[53]	Indicative number of projects expected to be funded
		2023		
Opening: 12 Jan 2023 Deadline(s): 13 Apr 2023				
HORIZON-HLTH-2023-ENVHLTH-02-01	RIA	30.00 [54]	5.00 to 6.00	5
HORIZON-HLTH-2023-ENVHLTH-02-02	RIA	30.00 [55]	5.00 to 6.00	5
HORIZON-HLTH-2023-ENVHLTH-02-03	RIA	40.00 [56]	6.00 to 7.00	7
HORIZON-HLTH-2023-ENVHLTH-02-04	CSA	3.00 [57]	Around 3.00	1
Overall indicative budget		103.00		

General conditions relating to this call	
Admissibility conditions	The conditions are described in General Annex A.
Eligibility conditions	The conditions are described in General

52 The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

53 Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

54 Of which EUR 17.00 million from the 'NGEU' Fund Source.

55 Of which EUR 17.00 million from the 'NGEU' Fund Source.

56 Of which EUR 24.00 million from the 'NGEU' Fund Source.

57 Of which EUR 1.50 million from the 'NGEU' Fund Source.

	Annex B.
Financial and operational capacity and exclusion	The criteria are described in General Annex C.
Award criteria	The criteria are described in General Annex D.
Documents	The documents are described in General Annex E.
Procedure	The procedure is described in General Annex F.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G.

Proposals are invited against the following topic(s):

HORIZON-HLTH-2023-ENVHLTH-02-01: Planetary health: understanding the links between environmental degradation and health impacts

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of between EUR 5.00 and 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 30.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: In recognition of the opening of the US National Institutes of Health's programmes to European researchers, any legal entity established in the United States of America is eligible to receive Union funding. If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
Award criteria	The criteria are described in General Annex D. The following exceptions apply: The thresholds for each criterion will be 4 (Excellence), 4 (Impact) and 3

	(Implementation). The cumulative threshold will be 12.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities (and in determining modalities for their implementation and the specific responsibilities of projects). Depending on the scope of proposals selected for funding, these activities may include: • Attendance of regular joint meetings (e.g., common kick-off meeting and annual meetings). • Periodic report of joint activities (delivered at each reporting period). • Common dissemination and communication activities (which may include, for example: a common dissemination and communication strategy, web portal and visual identity, brochure, newsletters). • Common Data Management Strategy and Common Policy Strategy (including joint policy briefs). • Thematic workshops/trainings on issues of common interest. • Working groups on topics of common interest (e.g. data management, communication and dissemination, science-policy link, scientific synergies).

Expected Outcome: This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 2 ‘Living and working in a health-promoting environment’. To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to most of the following expected outcomes:

- Climate and environmental policies are supported with better knowledge on the Earth natural systems and human health interactions;
- Sustainable planetary health policies which foster co-benefits to human health and the health of ecosystems are supported with robust evidence;
- Cross sectorial and multidisciplinary scientific collaborations, including expertise in public health and One Health, are established;
- Public authorities rely on indicators about the impacts on human health of changes or degradation of natural systems to support adaptation and mitigation strategies to natural hazards;

- Policymakers have better tools to improve the predictive capability and preparedness as well as to envision prevention strategies to deal with the impacts on human health of changes or degradation of ecosystems;

- Citizens are engaged and informed about the impact of natural systems' degradation on human health and behaviours aiming at the conservation of ecosystems are promoted.

Scope: Globally, life quality and expectancy have increased to unprecedented levels over the last decades due to the significant public health, agricultural, industrial and technological achievements of the 20th century. On the other hand, the ongoing trend of environmental degradation and global climate and environmental changes has introduced new pressures, which involve large impacts on human health and might put at risk the recent public health gains.

Among others, climate change, biodiversity loss, biological invasions, environmental pollution, changes in land use and degradation, deforestation, thawing permafrost (in polar regions, and particularly in the Arctic), overfishing, new animal diseases and acidification of water bodies can result in reduced food and water availability and safety and increased exposure to factors causing infectious and non-communicable diseases. Additionally, changes in weather and climate extremes have been observed across the globe, resulting in an increase of the frequency and intensity of extreme weather events such as heavy precipitation and floods, heat waves and hot extremes, droughts and tropical cyclones.

There is increasing evidence showing that many of these environmental stressors and changes can cause profound short- and long-term negative impacts on human health and well-being, contributing to increased morbidity and mortality worldwide. Understanding and acting upon these challenges calls for a multidisciplinary, cross-sectorial and trans-border approach ranging from the local to the global scale. The effects can be direct due to increases in floods, heatwaves, water shortages, landslides, exposure to ultraviolet radiation, exposure to pollutants, among others, or indirect and complex, as climate change -mediated or ecosystem-mediated. In addition, it is imperative that the solutions and initiatives chosen to prevent environmental degradation are safe for human health and the environment.

Planetary health is a concept focused on the interdependencies between human health and the state of earth's complex natural systems. A key focus is on understanding how the current trend of human-related environmental degradation can affect the health and well-being of current and future generations. The Rockefeller Foundation-Lancet Commission on Planetary Health[58] published a report in 2015, laying the foundation for the development of this important new field of study[59]. In 2020 the Helsinki declaration[60] was published, resulting

[58] https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(15)60901-1.pdf

[59] "*Our definition of planetary health is the achievement of the highest attainable standard of health, well-being, and equity worldwide through judicious attention to the human systems—political, economic, and social—that shape the future of humanity and the Earth's natural systems that define the safe environmental limits within which humanity can flourish. Put simply, planetary health is the health of human civilisation and the state of the natural systems on which it depends*"

[60] A call for urgent action to safeguard our planet and our health in line with the helsinki declaration – ScienceDirect, https://www.sciencedirect.com/science/article/pii/S0013935120314973

from a conference where participants discussed how to implement the planetary health approach in Europe in the context of the European Green Deal. Planetary health is also a priority topic in the research agenda in environment, climate and health proposed by the Coordination and support action HERA[61].

Applicants are invited to submit proposals providing actionable evidence for policymakers to take preventive actions to protect the human health and wellbeing by exploring the links between human health and environmental degradation in an integrated and comprehensive manner. More fragmented contributions focused on less studied aspects such as the links between climate change and health and, between biodiversity and health, will also be considered.

To advance the knowledge on planetary health to support policymaking in this area, the applicants should address several of the following activities:

- Provide strengthened evidence for health and wellbeing impacts of planetary changes, considering a systems thinking framework or a fragmentary approach focused on the impacts of climate change and biodiversity loss on human health (for biodiversity loss, proposals should not focus on the connection between the biodiversity loss and ecosystem degradation with the prevention of zoonotic emerging diseases since this topic will be covered by CL6-2023-BIODIV: Interlinkages between biodiversity loss and degradation of ecosystems and the emergence of zoonotic diseases);

- Provide improved understanding and modelling of human–ecological systems interactions and ecosystem-mediated effects on human health and well-being, including the attribution of health outcomes to environmental change;

- Provide a methodology to identify and prioritise threats for public health caused by environmental degradation, with a view to improving preparedness of health systems to these threats, through structured processes that move from evidence to recommendations and decisions;

- Investigation how infections agents that might have the capacity to adapt to other host species can spread via the environment, and how this type of insight might lead to enhanced monitoring strategies;

- Lay the foundations for integrated surveillance systems considering already established monitoring systems (e.g. systematic wastewater monitoring) and using available and newly collected health, socioeconomic, and environmental data for defined populations over longer time periods. This would provide early detection of emerging disease outbreaks (e.g. zoonotic diseases, potential permafrost release of new and old pathogens) or changes in nutrition and non-communicable disease burden and support the assessment of the integrated health, environmental, and socioeconomic effect of policies and technologies.

[61] https://www.heraresearcheu.eu/

- Explore strategies to reduce environmental damage and harmful emissions (e.g. air pollution) including assessment of health co-benefits through engagement with relevant HE partnerships and missions;

- Explore implications of planetary health for health systems and public health and identify opportunities to mitigate adverse health impacts of environmental degradation;

- Improve risk communication to policymakers, public authorities, industry and the public and support evidence-informed decisions by policymakers, by increasing capacity to do systematic reviews and provide rigorous policy briefs;

- Advance knowledge and actions to reduce the burden of non-communicable diseases while reducing the environmental pressure in areas like nutrition, physical activity, and mobility, and to assess the integrated health, environmental, and socioeconomic effect of those actions (i.e. behaviour change interventions, policies or new technologies);

- Provide better understanding on adaptation to climate and other environmental changes to protect human health, including the interactions between different planetary boundaries and the need to integrate adaptation and mitigation strategies;

- Improved health impact assessment approaches accounting for environmental externalities and estimating the cost and benefits of interventions versus no action.

This topic requires the effective contribution of social sciences and humanities (SSH) disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Researchers should carefully integrate distributive considerations in their analysis by considering, where relevant, disaggregated effects for different socio-economic groups.

In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities. Without the prerequisite to detail concrete joint activities, proposals should allocate a sufficient budget for the attendance to regular joint meetings and to cover the costs of any other potential common networking and joint activities.

Applicants envisaging to include clinical studies should provide details of their clinical studies in the dedicated annex using the template provided in the submission system. See definition of clinical studies in the introduction to this work programme part.

HORIZON-HLTH-2023-ENVHLTH-02-02: Evidence-based interventions for promotion of mental and physical health in changing working environments (post-pandemic workplaces)

Specific conditions	
Expected EU	The Commission estimates that an EU contribution of between EUR

contribution per project	5.00 and 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 30.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: In recognition of the opening of the US National Institutes of Health's programmes to European researchers, any legal entity established in the United States of America is eligible to receive Union funding.
Award criteria	The criteria are described in General Annex D. The following exceptions apply: The thresholds for each criterion will be 4 (Excellence), 4 (Impact) and 3 (Implementation). The cumulative threshold will be 12.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities (and in determining modalities for their implementation and the specific responsibilities of projects). Depending on the scope of proposals selected for funding, these activities may include: • Attendance of regular joint meetings (e.g., common kick-off meeting and annual meetings). • Periodic report of joint activities (delivered at each reporting period). • Common dissemination and communication activities (which may include, for example: a common dissemination and communication strategy, web portal and visual identity, brochure, newsletters). • Common Data Management Strategy and Common Policy Strategy (including joint policy briefs). • Thematic workshops/trainings on issues of common interest. • Working groups on topics of common interest (e.g. data management, communication and dissemination, science-policy link, scientific synergies).

Expected Outcome: This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 2 'Living and working in a health-promoting environment'. To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to most of the following expected outcomes:

- Public authorities and regulators are supported with evidence-based guidance to design occupational health policies;
- Public authorities, employers, organisations and social partners (e.g. trade unions and employer organisations) are better supported with tools, evidence-based intervention options and guidelines to promote mental and physical well-being and health in the workplace;
- Public authorities and the scientific community have access to FAIR data[62] and robust evidence on direct links between psychosocial and physical risk factors at the workplace (considering also individual differences such as age, gender, cultural background, bodily/cognitive abilities) and specific health outcomes;
- Public authorities, regulators and social partners are informed by evidence on the costs, benefits, sustainability and expected challenges of available solutions;
- Public authorities and employers take advantage of the best available knowledge (including new innovations and ways for action) to support interventions and solutions on the design of the built working environment and promote healthier behaviours at the workplace;
- Public authorities and employers develop adequate measures to prevent and reduce the negative outcomes of exposure to psycho-social and physical risk factors in the workplace and support recovery;
- Workers are more protected against work-related hazards and informed about effective prevention approaches based on specific and appropriate measures and health enhancing behaviours;
- Workers living with a chronic disease and/or recovering from a mental of physical health problem are supported to continue/return to work.

Scope: The digital and green transitions (referred to as 'twin transition') have been changing the workplace at a rapid pace, leading to new forms of work (e.g. hybrid work, gig economy jobs) or changes in the forms of management and work organisation (e.g. through algorithmic decision-making and digital worker performance monitoring) for workers across the spectrum. These changes have varying impacts on the working conditions, income and health and occupational safety both for skilled and unskilled workers. Furthermore, they contribute to the high costs of work-related illnesses and accidents for employers and the European economy in general.

[62] See definition of FAIR data in the introduction to this work programme part.

Mental health and ergonomic-related problems affect a significant number of EU workers. Musculoskeletal disorders (MSDs) are one of the most common work-related health problems in the EU and workers and managers commonly identify stress, depression and anxiety as serious psychosocial outcomes of workplace exposures. Changes in the organisation of work can bring flexibility that allows more people to enter the labour force, but may also lead to psychosocial problems (for example, insecurity, compromised privacy and rest time, inadequate OSH and social protection, as well as stress due to excessive or atypical working hours, performance monitoring by algorithms and similar AI applications).

Some workplaces have either become exclusively virtual or they have evolved into a 'hybrid' model (e.g. multilocational working, home office), some work tasks and processes performed virtually and others requiring physical presence[63]. A significant number of jobs are performed at clients' premises or require workers to commute long distances and/or cross borders regularly. Such workers are facing additional legal, social, environmental and economic issues. Data on how these affect their mental/physical health and well-being is scarce.

The emergence and persistence of the COVID-19 pandemic has accelerated the pace of change, causing, in some cases, additional challenges for workers' mental health (differentially affecting certain segments of the working force) and intensifying already existing physical risk factors (e.g. ergonomic risks). The European Pillar of Social Rights Action Plan[64] aims to promote a healthy, safe and well-adapted work environment in the EU and relies on Horizon Europe for research and innovation supporting economic and social resilience and sustainability. The EU strategic framework on health and safety at work 2021-2027[65] recognises the needs, challenges and opportunities that technological innovation and the pandemic bring for the working population and calls for strengthening the evidence-base for policymaking and implementation.

To address the issues described above, research actions under this topic should include several of the following activities:

- Provide adequate and robust data on the impact (positive and negative) that the ongoing changes in the workplace are having on the mental and physical health of different categories of workers and working sectors (e.g. teleworkers, cross-border commuters, gig economy workers, and vulnerable groups such as women, migrants and young and older workers with increased demonstrated risk for MSDs), including gender and intersectional analyses, where appropriate;

- Generate evidence (including data) not only on mental health, but also on mental well-being at the workplace and how changing work organisation due to the twin transitions and the pandemic affects workers' work-life balance and work ability;

63 The future of working in a virtual environment and occupational safety and health, https://osha.europa.eu/en/publications/future-working-virtual-environment-and-occupational-safety-and-health

64 https://op.europa.eu/webpub/empl/european-pillar-of-social-rights/en/

65 https://osha.europa.eu/en/safety-and-health-legislation/eu-strategic-framework-health-and-safety-work-2021-2027

- Generate evidence (including data) on the importance of risk factors (such as stress caused by new working environments, static postures and physical inactivity, physically strenuous and highly repetitive work arising from the workplace design) in the development of chronic and acute diseases;

- Increase the understanding of the links between different health-promoting factors in the working-built environment and physical and mental health outcomes, and how these may be mutually reinforcing;

- Explore the health impacts of changing working times, including excessive and atypical working hours and work in different time zones that blur work from leisure time, limiting recovery. Effects should consider a wide range of diseases;

- Provide recommendations for effective interventions to prevent occupational risks and support the mental and physical health and well-being at individual (worker), organisation (employer) and policy (government) levels for different sectors/types of work, including an analysis on their cost-effectiveness, sustainability and barriers to implementation at national and/or EU level;

- Advance the development of a scientific framework addressing Occupational safety and health (OSH) across policies and sectors and support new and sustainable (future-proof) tools, guidelines and policies concerning the evaluation and design of physical and psychosocial work environment;

- Provide tools and approaches to anticipate new OSH risks, also taking account of lessons learnt from the COVID-19 pandemic, for instance in relation to digital technologies and associated new ways of working.

This topic requires the effective contribution of social sciences and humanities (SSH) disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Researchers should carefully integrate distributive considerations in their analysis by considering, where relevant, disaggregated effects for different socio-economic groups.

Projects are expected to contribute to the New European Bauhaus (NEB) initiative[66] by interacting with the NEB Community, NEBLab and other relevant actions of the NEB initiative through sharing information, best practice, and, where relevant, results.

In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities. Without the prerequisite to detail concrete joint activities, proposals should allocate a sufficient budget for the attendance to regular joint meetings and to cover the costs of any other potential common networking and joint activities.

[66] https://europa.eu/new-european-bauhaus/index_en

Applicants envisaging to include clinical studies should provide details of their clinical studies in the dedicated annex using the template provided in the submission system. See definition of clinical studies in the introduction to this work programme part.

HORIZON-HLTH-2023-ENVHLTH-02-03: Health impacts of endocrine-disrupting chemicals: bridging science-policy gaps by addressing persistent scientific uncertainties

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of between EUR 6.00 and 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 40.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: In recognition of the opening of the US National Institutes of Health's programmes to European researchers, any legal entity established in the United States of America is eligible to receive Union funding. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Award criteria	The criteria are described in General Annex D. The following exceptions apply: The thresholds for each criterion will be 4 (Excellence), 4 (Impact) and 3 (Implementation). The cumulative threshold will be 12.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities (and in determining modalities for their implementation and the specific responsibilities of projects). Depending on the scope of proposals selected for funding, these activities may include: • Attendance of regular joint meetings (e.g., common kick-off meeting and annual meetings). • Periodic report of joint activities (delivered at each reporting period). • Common dissemination and communication activities (which may

	include, for example: a common dissemination and communication strategy, web portal and visual identity, brochure, newsletters). • Common Data Management Strategy and Common Policy Strategy (including joint policy briefs). • Thematic workshops/trainings on issues of common interest. • Working groups on topics of common interest (e.g. data management, communication and dissemination, science-policy link, scientific synergies).

Expected Outcome: This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 2 'Living and working in a health-promoting environment'. To that end, proposals under this topic should aim for delivering results that are directed towards and contributing to all of the following expected outcomes:

- Public authorities including EU risk assessment bodies and regulators are supported with scientific evidence to implement the comprehensive European Union Framework on Endocrine Disruptors[67], Chemicals Strategy for Sustainability Towards a Toxic-Free Environment[68], EU legislation on plant protection products[69] and EU occupational safety and health legislation[70];
- Public authorities improve their risk assessment, management and communication through access to FAIR data[71] and more robust evidence on the causal links between exposure to endocrine disruptors and health outcomes for which insufficient data exist;
- Research community has better data on the role of endocrine disruptors and other co-factors (e.g., lifestyle, behavioural, socio-economic) to enable a better understanding of their individual or combined health impacts;
- Public authorities and the scientific community take advantage of latest methodologies for advancing the understanding of health impact of exposures;
- Public authorities, employers and citizens rely on practical evidence-informed guidelines for exposure prevention and reduction;
- Citizens are engaged and informed about the health impact of exposures to endocrine disruptors and risk-preventing behaviours are promoted.

67 https://ec.europa.eu/info/policies/endocrine-disruptors_en
68 Chemicals strategy (europa.eu)
69 https://www.efsa.europa.eu/en/efsajournal/pub/5311
70 EU Strategic Framework on Health and Safety at Work 2021-2027 | Safety and health at work EU-OSHA (europa.eu)
71 See definition of FAIR data in the introduction to this work programme part.

Scope: The function and regulation of the endocrine system in humans and other species is of high biological complexity. Endocrine disrupting chemicals (EDCs or endocrine disruptors) are chemical substances that alter the functioning of the endocrine system and negatively affect the health of humans and animals. They may either be of synthetic or natural origin.

EDCs are of increasing importance in chemical regulations in the European Union. According to the Comprehensive European Union Framework on Endocrine Disruptors, adopted in 2018, the EU strategic approach on endocrine disruptors for the years to come should be based on the application of the precautionary principle. This approach would aim at, *inter alia*, minimising overall exposure of humans and the environment to endocrine disruptors, paying particular attention to exposures during important periods of development of an organism, such as foetal development and puberty, possibly integrating a life course approach, as well as accelerating the development of a thorough research basis for effective and forward-looking decision-making. This includes research for the further management of chemicals (including multi-constituent chemicals as well as chemical mixtures), the understanding of the mechanistic effects of endocrine disruptors and their dose-response relationships (including at the molecular and cellular level through the use of new approach methodologies, such as 'multiomics', cheminformatics, *in vitro* 2D and 3D models, *in vivo* models and computational approaches), and the collection, sharing, harmonisation and combination of robust data sources.

Closing existing knowledge gaps in the understanding of EDC effects will support more effective and evidence-based regulations at the European level.

Bringing together, *inter alia*, (molecular) epidemiologists, exposure scientists, toxicologists, endocrinologists, health care practitioners and risk assessors, research actions under this topic should focus on the understanding of the impact of exposures at critical life stages as regards development of diseases later in life, focusing on the several health endpoints for which there is currently less information available. Advantage should be taken of existing biobanks and disease registries and/or cohorts, with carefully planned measurement strategies and clearly worked-out hypotheses. The nature of the dose-response relationships and whether effects are threshold-dependent should be addressed in the study designs. Similarities between endocrine systems and certain health outcomes across species should be exploited to improve understanding of functioning of the endocrine system. Finally, research should attempt at identifying predictive biomarkers (e.g. from liquid biopsies such as saliva, urine, blood) that would allow the tracing of endocrine disrupter-mediated health effects in a shorter period of time than normally would be required for epidemiological studies.

Research actions under this topic should provide forward-looking mechanistic information on potential hazards and health risks of exposures to EDCs, through innovative molecular epidemiological, multifactorial models and systems biology approaches, exploiting the use of state of the art non-animal methodologies when relevant, and should include several of the following activities:

- Studying the impact of EDCs on target organs and in multi-organ models, and physiological barriers, such as the placenta, the blood-brain barrier, the blood-saliva

barrier, intestinal, pulmonary and immune cells as well as their interaction with microbiota. This should include the provision of a thorough understanding of dose-response relationships;

- Elucidating health endpoints for which insufficient data exist, such as disturbances in the development and functioning of the nervous and cardiovascular systems, the immune system, bone development and disease, obesity, diabetes, hormone-dependent cancers and fertility (e.g. minipuberty, prepuberty and puberty);

- Providing better biological and imaging biomarkers to predict EDC-mediated health outcomes, including the quantitative probabilities of having an adverse effect based on such biomarkers;

- Gaining better insights into the developmental origins of health and disease, especially for those where less data are available. Assessing the occurrence and relevance of multi- and transgenerationally inherited effects, including molecular and epigenetic mechanisms that drive multigenerational effects;

- Gaining better insights into the most sensitive windows of susceptibility, during which exposure are of particular importance for health effects;

- Better understanding of the effects of chemicals and chemical mixtures on the underlying mechanistic crosstalk between endocrine axes, endocrine pathways and other key biological systems, including immune, neurological and metabolic functions;

- Improving the understanding of chemical mixture effects, including with other toxins and at low doses. The role of the microbiome in the activation or detoxification of these chemicals should be explored where relevant.

- Investigating biological effects of realistic mixtures to get a more detailed understanding of the endocrine effectome, taking advantage of computational toxicology and development of up-to-date models;

- Performing comparative analysis between species, assessing similarities to human endocrine system and health outcomes and exploiting non-mammalian species as test organisms, e.g. non-mammalian vertebrates and invertebrates to predict effects or raise concern about potential effects in humans or vice versa;

- Exploiting systems biology approaches in order to understand how exposure to an EDC results in an altered phenotype, a process that implies complex interactions across multiple levels of biological organisation.

Aspects such as gender, regional variations, socioeconomics and culture should be considered, where appropriate. Proposals should ensure that chemical monitoring data are shared in IPCHEM[72] through involvement with the European Commission's Joint Research

[72] IPCheM Portal (europa.eu)

Centre (JRC). Proposals should also consider involving JRC with respect to the value it could bring in providing an effective interface between the research activities and regulatory aspects and/or to translating the research results into validated test methods and strategies fit for regulatory purpose. In that respect, the JRC will collaborate with any successful proposal and this collaboration, when relevant, should be established after the proposal's approval.

Applicants should be acquainted with planned activities under the European partnership for the assessment of risks from chemicals PARC[73]. PARC will be informed about successful proposals. Successful proposals will be invited to establish synergies with PARC and take advantage of the partnership as a facilitator for open data and methodology sharing with risk assessors and their scientific networks.

This topic requires the effective contribution of social sciences and humanities (SSH) disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities. Without the prerequisite to detail concrete joint activities, proposals should allocate a sufficient budget for the attendance to regular joint meetings and to cover the costs of any other potential common networking and joint activities.

Applicants envisaging to include clinical studies should provide details of their clinical studies in the dedicated annex using the template provided in the submission system. See definition of clinical studies in the introduction to this work programme part.

HORIZON-HLTH-2023-ENVHLTH-02-04: Global coordination of exposome research

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 3.00 million.
Type of Action	Coordination and Support Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: In recognition of the opening of the US National Institutes of Health's programmes to European researchers, legal entities established in the

[73] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-hlth-2021-envhlth-03-01

	United States of America may exceptionally participate as a beneficiary or affiliated entity, and are eligible to receive Union funding. Coordinators of projects must be legal entities established in an EU Member State or Associated Country. The following additional eligibility criteria apply: In order to achieve the expected objectives, namely the establishment of a forward-looking cooperation framework in the area of the exposome, the consortium must include at least one legal entity established in a country other than a Member State or an Associated Country. If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
Award criteria	The criteria are described in General Annex D. The following exceptions apply: The thresholds for each criterion will be 4 (Excellence), 4 (Impact) and 3 (Implementation). The cumulative threshold will be 12.

Expected Outcome: This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 2 'Living and working in a health-promoting environment'. To that end, proposals under this topic should aim for delivering results that are tailored towards and contributing to all of the following expected outcomes:

- Environment and health research community, research-policymaking authorities, research funders and other relevant stakeholders work together at the European and international level towards establishing a medium-long-term Global Human Exposome Network;
- Environment and health research community, authorities working at the science-policy interface and research funders provide options for functioning, financing and governance of a medium-long-term Global Human Exposome Network also considering the strengthening of the coordination of the European Human Exposome Network;
- Relevant stakeholders profit from a strengthened coordination and collaboration globally among different fields of research and innovation with relevance to deciphering the human exposome;
- A roadmap and a R&I agenda for international cooperation in specified areas of exposome research and innovation, including, among others, recommendations for exchange of knowledge and data, policy uptake, technological and conceptual approaches and promotion of global level coordinated initiatives on the exposome are made available to the relevant international stakeholders;

- The coordination of research initiatives, infrastructures, facilities and resources in the area of the Exposome in Europe is supported and reinforced;

- The interoperability and harmonisation between data and studies is increased facilitating the exchange and use of information across research disciplines and groups.

Scope: The concept of the exposome refers to the totality of environmental exposures from conception onwards, including its external (e.g. diet, lifestyle, occupational and environmental factors) and internal components (e.g. epigenomics, metabolomics). Developing a comprehensive Human Exposome Project would present a fundamental shift in looking at health, by moving research away from 'one exposure, one disease' understanding to a more complex picture upon which to build solid, cost-effective preventive actions and policies. At its most complete, the efforts could resemble in scope the Human Genome Project.

The European Human Exposome Network (EHEN)[74], a cluster of 9 projects funded since 2020 for five years from Horizon 2020, is currently the world's largest network of projects studying the impact of environmental exposure on human health with an exposome angle. Together, the network of projects aims to study the combination of exposures to pollutants and other stressors, across different life stages and socio-economic conditions, via a number of exposure vehicles such as consumption patterns, lifestyle and working and living environment, and their collective effect on human health.

At the international level, some related activities are ongoing in, e.g., the US (National Institute for Environmental Health Sciences) and Japan. Currently, there is only sporadic cooperation initiatives between the ongoing research at the EU level and important research groups outside Europe. However, in order to fulfil the promise of deciphering the human exposome, a large-scale effort similar to the Human Genome Project could be envisaged, for which a preparatory coordination and support action would be highly useful to identify and discuss the research needs and specific areas of potential cooperation at the global level. Additionally, both at the European and global level better coordination is essential to foster new opportunities to collect, harmonise, combine and analyse large data sets emanating from new and evolving technologies. This offers also new possibilities to understand the pathways leading from a multitude of environmental exposures to the global health burden of common chronic diseases. Standardisation and interoperability of data is also needed to assure access to quality data sources at the European and global level.

On the policy side, the outcomes of advancing the exposome research can touch upon and contribute to a better implementation of a wide range of policies and EU priorities such as the EU Chemicals Strategy[75], Zero Pollution Action Plan[76], the European Green Deal[77] and climate policies[78], among others. The benefits of cooperation would also extend to

74 https://www.humanexposome.eu/
75 https://ec.europa.eu/environment/strategy/chemicals-strategy_en
76 https://ec.europa.eu/environment/strategy/zero-pollution-action-plan_en
77 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
78 https://ec.europa.eu/clima/index_en

international initiatives such as activities of the World Health Organization related to environment and health[79] and the United Nations activities on climate[80] and environment[81].

Accordingly, proposals should cover, among others, most of the following activities:

- Proposal for a common agreed conceptual framework for the exposome;
- Proposal for options for a global governance structure for a Global Human Exposome Network taking advantage of and connecting to the existing research infrastructures and services in the area of the Exposome at the European level;
- Agreed technologies needed to decipher the external and internal exposome, support longitudinal studies and potential for international cooperation;
- Proposal for data mining, analysis, opportunities for harmonisation, interoperability, and standardisation in data collection, knowledge storage and transfer, and bioinformatics needs at the European and global level;
- Cooperation between population and patient cohorts, integrating a large number of variables and comprehensive environmental datasets, and biobanks, also covering the perinatal period;
- Facilitation of the regulatory uses of results including for regulatory science and risk assessment.

Proposals should interact with existing research infrastructures, services and research projects in the area of the exposome (namely the European Human Exposome Network but also other related projects and actions supported through Horizon 2020 and Horizon Europe) and build on and integrate the work being developed in these initiatives. The composition of the applicant consortia should ensure a broad and balanced geographical representation of Member States and Associated Countries and the proposals should involve also Widening Member States and Associated Countries. International cooperation beyond EU with interested parties is required.

Call - Environment and health (Two stage - 2024)

HORIZON-HLTH-2024-ENVHLTH-02-two-stage

Conditions for the Call

Indicative budget(s)[82]

[79] https://www.who.int/health-topics/environmental-health;https://www.euro.who.int/en/health-topics/environment-and-health

[80] https://www.un.org/en/climatechange

[81] https://www.unep.org/

[82] The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million)[83]	Indicative number of projects expected to be funded
		2024		
Opening: 30 Mar 2023 Deadline(s): 19 Sep 2023 (First Stage), 11 Apr 2024 (Second Stage)				
HORIZON-HLTH-2024-ENVHLTH-02-06-two-stage	RIA	60.00	7.00 to 8.00	8
Overall indicative budget		60.00		

General conditions relating to this call	
Admissibility conditions	The conditions are described in General Annex A.
Eligibility conditions	The conditions are described in General Annex B.
Financial and operational capacity and exclusion	The criteria are described in General Annex C.
Award criteria	The criteria are described in General Annex D.
Documents	The documents are described in General Annex E.
Procedure	The procedure is described in General Annex F.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G.

Proposals are invited against the following topic(s):

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

[83] Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

HORIZON-HLTH-2024-ENVHLTH-02-06-two-stage: The role of environmental pollution in non-communicable diseases: air, noise and light and hazardous waste pollution

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of between EUR 7.00 and 8.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 60.00 million.
Type of Action	Research and Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: In recognition of the opening of the US National Institutes of Health's programmes to European researchers, any legal entity established in the United States of America is eligible to receive Union funding. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding. If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
Award criteria	The criteria are described in General Annex D. The following exceptions apply: For the second stage, the thresholds for each criterion will be 4 (Excellence), 4 (Impact) and 3 (Implementation). The cumulative threshold will be 12.
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [84]. In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities (and in determining modalities for their implementation and the specific responsibilities of projects). Depending on the scope of proposals selected for funding, these activities may include: • Attendance of regular joint meetings (e.g., common kick-off meeting and annual meetings). • Periodic report of joint activities (delivered at each reporting period). • Common dissemination and communication activities (which may include, for example: a common dissemination and communication strategy, web portal and visual identity, brochure, newsletters). • Common Data Management Strategy and Common Policy Strategy (including joint policy briefs). • Thematic workshops/trainings on issues of common interest. • Working groups on topics of common interest (e.g. data management, communication and dissemination, science-policy link, scientific synergies).

Expected Outcome: This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 2 'Living and working in a health-promoting environment'. To that end, proposals under this topic should aim for delivering results that are tailored towards and contributing to all of the following expected outcomes:

- National and EU authorities apply user-friendly tools to produce and use generated data on the impact of pollutants on health;

[84] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- National and EU authorities benefit from access to robust and transparent indicators for health impact assessment to monitor efficacy of pollution-mitigating actions and policies;

- Policymakers and other stakeholders, e.g. public authorities such as urban planners, health professionals, employers, civil society organisations and citizens, use developed guidelines to take action to prevent pollution-related illnesses and impairments, and choose healthier lifestyles and behaviours;

- EU, national and regional authorities receive guidance and recommendations for updates of (1) scientific evidence about health risks caused by environmental pollutants (2) advice on management and mitigation of these health risks and (3) guidance and recommendations for updates of limit values for different classes of pollutants in the environment; these recommendations should take into account vulnerable population groups and people with increased vulnerability because of pre-existing medical conditions;

- The implementation of the Zero-Pollution Action Plan, the Chemical Strategy for Sustainability and the EU legislation on air quality, noise and waste continue to be supported by a strong evidence-base;

- Relevant actors in our daily lives, e.g. medical personnel, building engineers, teachers, urban planners etc., have access to information such as training courses on pollution and health impacts.

Scope: The European Green Deal set out by the European Commission recognises that man-made environmental pollution is an increasing threat for human health and wellbeing. Opinion polls[85] show that climate change, air pollution, and waste are the three most important environmental issues that European citizens are concerned about. Over three-quarters (78%) of respondents believe that environmental issues have a direct effect on their daily life and health.

Pollution affects a large number of people in Europe and beyond: A 2018 assessment attributed 16% of total global mortality to pollution-related disease. Over 7 million people die of exposure to polluted air every year worldwide[86]. For 2019, the European Environment Agency has estimated that around 350 000 premature deaths in the EU can be attributed to air pollution (namely from particulate matter, nitrogen dioxide and ozone)[87]. Today, more than 1 in 4 Europeans is exposed to traffic noise levels dangerous to their health in their homes, schools and workplaces[88]. The increase of artificial light at night (ALAN) in cities has altered the natural light levels in the environment and extended human activities to the usually dark hours. It has been estimated that more than 80% of the world population is living under light

85 E.g. Eurobarometer 501 – 2020- https://ec.europa.eu/commission/presscorner/detail/en/ip_20_331
86 Air pollution (who.int)
87 For more details, see Briefing no. 19/2021: Health impacts of air pollution in Europe, 2021
88 EEA 2020 report on Healthy environment, healthy lives: how the environment influences health and well-being in Europe

polluted skies[89]. Waste[90] continues to be a persistent environmental issue in Europe, and it is estimated that there are 2.5 million contaminated sites in Europe, with potentially significant adverse health effects[91].

The global burden from non-communicable diseases (NCDs) has consistently increased over the last decades, being now estimated to account for 70% of deaths globally (World Health Organization). The growing burden of chronic diseases will also be a challenge for Europe's healthcare systems, these diseases already accounting for an estimated 70-80% of healthcare costs. Currently, around 50 million European citizens suffer from two or more chronic conditions and most of these people are over 65.[92] The most recent WHO environmental burden of disease estimations suggest that, annually, 13% of deaths (630 000) in the WHO Europe region are attributable to environmental stressors and an EEA report concluded that, 90% of deaths attributable to the environment result from non-communicable diseases, including cancers, cardiovascular diseases, stroke, chronic obstructive pulmonary disease, mental, behavioural and neurological disorders, diabetes, kidney disease and asthma[93]. While early childhood deaths have declined, the years lived with disability have increased, particularly with chronic disease.

The proposed research should strengthen the knowledge base available to policymakers regarding pollution-disease associations and causal mechanisms at different phases of the life course, taking advantage of latest molecular, cellular and computational technologies to elucidate biological pathways from exposure (including combined exposures) to disease. The work should bring together toxicology, exposure science, public health engineering and environmental epidemiology, and build on data from sources such as pollution-related databases, disease registries, epidemiological studies and biobanks, environmental and human biomonitoring data and new generated data and could consider citizen science and other innovative approaches. All exposure routes should be considered where relevant (oral/digestive tract, inhalation, dermal).

The focus of this topic should be on three areas where the understanding of and evidence on causality should be strengthened to overcome the current paucity of data and respond to calls from policymakers. The applicants should focus on at least one of the following three aspects:

- Air pollution, especially in the urban environment, taking into account existing evidence, notably the latest WHO air quality guidelines of 2021 and their recommendations on different pollutants[94], including on pollutants of emerging concern, looking at e.g.

89 Evaluating the Association between Artificial Light-at-Night Exposure and Breast and Prostate Cancer Risk in Spain (MCC-Spain Study) | Environmental Health Perspectives | Vol. 126, No. 4 (nih.gov)

90 https://ec.europa.eu/environment/topics/waste-and-recycling_en

91 Data presented at the Ministerial Meeting on Environment and Health, Ostrava, CZ (2017)

92 European Commission 2020 Report on the Impact of Demographic Change

93 EEA 2020 report on Healthy environment, healthy lives: how the environment influences health and well-being in Europe

94 World Health Organization. (2021). WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. World Health Organization. https://apps.who.int/iris/handle/10665/345329.

ultrafine particles and interactions with aeroallergens, black carbon, sand and dust storms and impact on human health;

- Noise pollution and light pollution impact on human health;
- Pollution from hazardous waste (e.g. pharmaceuticals, illicit drugs, e-waste, plastics (including nano- and microplastics)) in heavily contaminated environments and adverse health outcomes.

Several of the following activities should be included:

- Research activities to strengthen the evidence base for pollution-disease associations and underlying causality mechanisms and biological pathways, taking into account combined exposures and mechanisms of increased sensitivity in susceptible groups;
- Delivery of FAIR data[95] on causal associations between environmental risk factors and health outcomes, in particular for air pollutants of emerging concern, specifically ultrafine particles, black carbon, and others, taking into account vulnerable population groups and specific exposure situations in a life-course approach including vulnerable early-stages of life and transgenerational risks;
- Development of user-friendly tools for systematic mining and assessment of the knowledge generated and translation into best practices and to improve the assessment of individual life-exposure to pollutants;
- Proposals for environmental limit values for the studied pollutants and generation of health impact indicators, where relevant and taking into account existing standards and evidence;
- Development of guidelines and socio-economic and decision support tools for different actors including policymakers, health professionals and citizens to take action to prevent pollution-related illnesses and impairments, and to enable the choice of healthier lifestyles and behaviours;
- Identification of cross-sectoral interventions (case studies) with the potential for remediating pollution and risk of exposure and improving human health and well-being in the short/medium term;
- Development of training courses on pollution and health impacts to inform professionals impacting our daily lives e.g. medical personnel, engineers, teachers, urban planners;
- Design of best-practice evidence-based communication actions for fact-based risk and benefit communication and improving citizen awareness of pollution and preventive actions, offsetting dissemination of misinformation;

95 See definition of FAIR data in the introduction to this work programme part.

- Undertaking case studies to demonstrate the added societal value of tools, methodologies and guidelines developed and the implementation of resulting actions to decrease health impacts of exposures.

Aspects such as gender, regional variations, socioeconomics and culture should be considered, where appropriate. Proposals should ensure that chemical monitoring data are shared in IPCHEM[96] through involvement with the European Commission's Joint Research Centre (JRC). In that respect, the JRC will collaborate with any successful proposal and this collaboration, when relevant, should be established after the proposal's approval.

This topic requires the effective contribution of social sciences and humanities (SSH) disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

In order to optimise synergies and increase the impact of the projects, all projects selected for funding from this topic will form a cluster and be required to participate in common networking and joint activities. Without the prerequisite to detail concrete joint activities, proposals should allocate a sufficient budget for the attendance to regular joint meetings and to cover the costs of any other potential common networking and joint activities.

Applicants invited to the second stage and envisaging to include clinical studies should provide details of their clinical studies in the dedicated annex using the template provided in the submission system. See definition of clinical studies in the introduction to this work programme part.

96 IPCheM Portal (europa.eu)