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epa Research

Consistent and Proportionate Consideration of Health in Strategic Environmental Assessment (Pro-Health SEA)

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Lead organisations: University College Dublin and BCA Insight Ltd

www.epa.ie

Rialtas na hÉireann
Government of Ireland

Environmental Protection Agency

The EPA is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

Regulation: Implementing regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply.

Knowledge: Providing high quality, targeted and timely environmental data, information and assessment to inform decision making.

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Our Responsibilities Include:

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- Urban waste water discharges;
- The contained use and controlled release of Genetically Modified Organisms;
- Sources of ionising radiation;
- Greenhouse gas emissions from industry and aviation through the EU Emissions Trading Scheme.

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- Assess and report on public and private drinking water quality;
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- Develop and implement the National Waste Prevention Programme;
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- Produce the State of Ireland's Environment and Indicator Reports;
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- Oversee the implementation of the Environmental Noise Directive;
- Assess the impact of proposed plans and programmes on the Irish environment.

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- Coordinate and fund national environmental research activity to identify pressures, inform policy and provide solutions;
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- Monitoring radiation levels and assess public exposure to ionising radiation and electromagnetic fields;
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- Monitor developments abroad relating to nuclear installations and radiological safety;
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- Provide independent evidence-based reporting, advice and guidance to Government, industry and the public on environmental and radiological protection topics;
- Promote the link between health and wellbeing, the economy and a clean environment;
- Promote environmental awareness including supporting behaviours for resource efficiency and climate transition;
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- Work with international and national agencies, regional and local authorities, non-governmental organisations, representative bodies and government departments to deliver environmental and radiological protection, research coordination and science-based decision making.

Management and Structure of the EPA

The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

1. Office of Environmental Sustainability
2. Office of Environmental Enforcement
3. Office of Evidence and Assessment
4. Office of Radiation Protection and Environmental Monitoring
5. Office of Communications and Corporate Services

The EPA is assisted by advisory committees who meet regularly to discuss issues of concern and provide advice to the Board.

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What did the research aim to address?

This research project aimed to enable the EPA to develop a considered position with regard to addressing population and human health in strategic environmental assessment (SEA). This was achieved by undertaking a thorough review of current international practice and guidance, and by consulting international health and SEA experts. The Health in SEA Toolkit developed as part of this research identifies good practice case studies, formulates procedural and methodological recommendations to better consider population and human health in SEA, and provides the basis for developing "good practice guidance for addressing health in SEA", a key commitment in the national SEA Action Plan 2021–2025.

The research outputs and recommendations support the assessment, mitigation and monitoring of potential health effects in SEA practice, as well as associated reporting, capacity building and regulatory activities of the EPA. The research has also generated evidence that is crucial in assisting Ireland to meet commitments under international, EU and national policies and strategies.

What did the research find?

The research confirmed that SEA provides an excellent opportunity to incorporate public health considerations into plan-making and determined that there are significant prospects for improving practice in this regard. In this context, the research identified good practice recommendations for the consistent and proportionate consideration of health in SEA. These include the adoption of clear definitions of health in SEA processes; the explicit identification of direct and indirect health effects and outcomes from environmental determinants in SEA environmental reports; due consideration of inequalities within populations, with a particular focus on vulnerable groups; the use of evidence-based indicators to monitor health change, appropriate to the relevant plan and SEA tier; and encouraging proactive participation of human health professionals and specialists at each stage of the SEA process as appropriate.

How can the research findings be used?

The project has contributed to delivering on the action to prepare "good practice guidance for addressing health in SEA" set out in the SEA Action Plan 2021–2025. The project outputs and recommendations will inform the preparation of this planned guidance and contribute to any future revisions of the national SEA guidelines and relevant EPA SEA guidance. They will also be incorporated into the EPA-funded national SEA capacity-building programme. It is anticipated that the toolkit developed will also support the work of the EPA SEA team and inform the Department of Housing, Local Government and Heritage's (Environmental Assessment) EU and International Planning Regulation Unit, the Office of the Planning Regulator, and the National SEA Forum. The toolkit also provides information and guidance that may be applicable to other EU Member States and the wider impact assessment community.

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EPA RESEARCH PROGRAMME 2021–2030

Consistent and Proportionate Consideration of Health in Strategic Environmental Assessment (Pro-Health SEA)

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EPA Research Report

Independent scientific research funded by the Environmental Protection Agency

Prepared by

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DISCLAIMER

This report is based on research carried out/data from April 2023 to June 2025. More recent data may have become available since the research was completed.

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Executive Summary

Strategic environmental assessment (SEA), a mandatory requirement under European Union Directive 2001/42/EC and its transposition into Irish regulations, is a framework for the formal, systematic evaluation of the likely significant environmental effects of implementing a plan or programme, to ensure the integration of environmental considerations into decisions. It identifies likely significant effects on a range of environmental topics and the interrelationship among these. Importantly, it requires the consideration of the likely significant effects on human health.

The World Health Organization defines health as "a state of complete physical, mental, and social wellbeing, and not merely the absence of disease or infirmity".[1] This definition forms the foundation for public health policy in Ireland (i.e. the Healthy Ireland Framework). Social, economic and environmental factors play an important role in determining individual and population health. These factors are known as "determinants of health". Changes in determinants of health lead to changes in "health outcomes". Health effects and outcomes manifest differently for different individuals and populations, given their differing exposures to health determinants and sensitivities to change. Therefore, considering health equity or (in)equality in SEA is key. Environmental Protection Agency recommendations and resources for SEA of land use plans specifically note that "in addressing human health and quality of life, the plan should consider the socioeconomic status of the population within the plan area and in particular should consider any socioeconomic inequalities. This is important to ensure that the plan does not exacerbate any existing inequalities and ideally promotes and supports the balancing of existing socioeconomic inequalities".[2]

A proportionate approach to the assessment of significant impacts is imperative for the effectiveness of SEA. Proportionality means ensuring that assessment scope and detail are balanced with the issues being considered in the plan or programme. Thus, a proportionate consideration of health in SEA includes focusing on whether the potential impacts are likely to be significant (i.e. during SEA scoping); aligning it to the relevant planning tier at which SEA is prepared (ensuring that significant health effects are addressed at the appropriate administrative level); applying existing baseline data (on existing health determinants and outcomes patterns and trends); developing health-inclusive alternatives (e.g. identifying plan/programme changes to tackle adverse health effects and to enhance potential health benefits); and consulting stakeholders (to both enhance the evidence base and secure commitment to these changes and other SEA recommendations). In considering the above aspects, it is important to duly consider all population groups, vulnerable groups in particular, and transboundary effects.

This final report for the research project Consistent and Proportionate Consideration of Health in Strategic Environmental Assessment (Pro-Health SEA) summarises the methods and results that set the scientific basis for the development of the Health in SEA Toolkit. The toolkit has been published as a stand-alone document on the EPA website and should be referred to for detailed guidance and recommendations on the consistent and proportionate consideration of health in SEA.

1 World Health Organization, *Constitution of the World Health Organization*; https://apps.who.int/gb/bd/pdf_files/BD_49th-en.pdf#page=6 (accessed 10 November 2025).

2 Environmental Protection Agency, *SEA of Local Authority Land Use Plans – EPA Recommendations and Resources*; https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/sea-of-local-authority-land-use-plans---epa-recommendations-and-resources.php (accessed 10 November 2025).

1 Introduction and Research Project Objectives

The European Union (EU) Strategic Environmental Assessment (SEA) Directive (EU, 2001) requires that environmental considerations, including population and human health, are incorporated into the development of plans and programmes. Despite this, analysis of effects on the population and on human health remains deficient in SEA practice in Ireland. This is partly due to a lack of governance, know-how, and data and guidance on good practice approaches and methods for consistently and proportionately integrating health into SEA.

This research project, funded by the Environmental Protection Agency (EPA) and the Office of the Planning Regulator, aims to address the above deficiency by developing a toolkit to support the consistent and proportionate consideration of health in SEA. The research objectives are as follows:

- Objective 1: establish how the interrelationships between population and human health and other environmental topics are currently dealt with in practice when considering the significant health effects of plans and programmes in SEA, identifying good practice as well as any possible gaps and shortcomings based on peer-reviewed and grey literature and international SEA case studies.
- Objective 2: establish key aspects of proportionate coverage of population and human health in SEA, aligning with EPA guidance, the EU SEA Directive and the United Nations Economic Commission for Europe (UNECE) SEA Protocol, by systematically reviewing international SEA case studies that cover various planning hierarchies and sectors and consulting practitioners in Ireland and abroad.
- Objective 3: develop a Health in SEA Toolkit to enable competent authorities and practitioners to proportionately and consistently consider and assess population and human health in SEA.
- Objective 4: build the capacity of SEA and health stakeholders in the proportionate and consistent consideration of health in SEA, while raising awareness in the wider impact assessment community.

This report summarises the methods and results that provide the scientific basis for the development of the Health in SEA Toolkit. The toolkit has been published as a stand-alone document on the EPA website and should be referred to for detailed guidance and recommendations on the consistent and proportionate consideration of health in SEA.

2 Methodology

The development of the Health in SEA Toolkit was informed by a series of research tasks and associated methods. These included peer review of scientific and grey literature, including international guidance; selection and review of international and national SEA case studies; and stakeholder consultation through an international online survey and expert interviews. A national in-person workshop as well as an international online workshop were also held. These methodological research elements provided theoretical, conceptual and practical evidence on the consideration of health in SEAs, and are described in more detail below.

2.1 Review of Scientific and Grey Literature on Health in SEA

To obtain a comprehensive overview of how health is currently considered in SEA, an extensive review of the international scientific literature was undertaken. The review aimed to identify good practice and ongoing shortcomings. This also entailed identifying established interrelationships between environment and health in both legislative frameworks and environmental assessment literature. As the starting point to the literature review, how the environment and health are addressed in the various publications of the World Health Organization (WHO) was explored. This was done to identify good practice, professional boundaries and drivers that underpin and determine the scope of human health within SEA. In order to identify relevant documents, and also establish the types of links made between the environment and health in the current professional debate, a search was conducted that focused on documents concerned with the environment and health published by the WHO headquarters in Geneva and by the WHO Regional Office for Europe. In this context, the internal institutional libraries of the research team were searched along with WHO websites. The language was restricted to English and the time frame was 2018 to 2024. The time frame was set to capture work arising from, and conducted since, the 2017 Ministerial Conference on Environment and Health in Ostrava, Czechia.

To complement the WHO search findings, a review of guidance documents for SEA and health was subsequently conducted. Guidance documents published in the past 20 years (i.e. since 2004, the year the EU SEA Directive had to be transposed into national law by EU Member States) were included in this review. Guidelines released by UNECE, in support of the implementation of the UNECE SEA Protocol (UN, 1991); by the European Commission, in support of the implementation of the EU SEA Directive; and by the International Atomic Energy Agency (IAEA), in support of the application of SEA of nuclear power programmes, were considered, as well as Irish SEA guidelines.

Subsequently, a desktop search on the Scopus database was undertaken in January 2024. The objective of this scientific literature review was to identify the potential human health impacts associated with the environmental topics that are commonly included in SEA practice. As there is a large volume of relevant documents on the subject of the environment and human health, restrictions were set to focus the search of literature on the latest and most relevant publications. Therefore, the search was restricted to review articles and limited to reviews published within 3 years of January 2021, as a comprehensive literature review was already conducted in 2021 for the WHO and UNECE (WHO, 2022). However, in cases where insufficient information was available from the articles published in this time period, the search was extended to 6 years (2019–2024 inclusive). The literature search was also limited to the subjects of environmental as well as earth and planetary sciences (i.e. not conducted from an epidemiological point of view).

The search string for identifying documents on Scopus was designed with reference to the environmental issues listed in Articles 2–7 of the UNECE SEA Protocol (UN, 1991) and Annex I(f) of the EU SEA Directive (EU, 2001) and the Irish SEA guidelines (Department of Housing Local Government and Heritage, 2022). Repeated searches were conducted using the keywords of each environmental subject

listed, along with “human”, “health” and “review”. The following search string was used:

(KEY (*Environmental Subjects*)[3] AND KEY (human) AND KEY (health) AND KEY (review) AND (LIMIT-TO (SUBJAREA , “ENVI”) OR LIMIT-TO (SUBJAREA , “EART”))

The documents returned from this search were manually screened to select those relevant to SEA in terms of the subjects and scope of the study.

In order to be able to set good practice standards for the future, it is important to understand the current level of assessment of health in SEA practice, as well as in other related environmental and health assessments. To do this, a scientific literature review was also conducted on other environmental impact assessments (EIAs) and health impact assessments (HIAs) using the following search string on Scopus:

(ABS (health) AND ABS (“strategic environmental assessment”)) AND PUBYEAR > 2004 AND (LIMIT-TO (SUBJAREA, “SOCI”), (ABS (health) AND ABS (“sustainability appraisal”)) AND PUBYEAR > 2004 AND (LIMIT-TO (SUBJAREA , “SOCI”), and (ABS (health) AND ABS (“Strategic Health Impact Assessment”) OR ABS (“Strategic Health Assessment”) AND PUBYEAR > 2004 AND (LIMIT-TO (SUBJAREA, “SOCI”)

The keyword search was limited to the article abstracts, excluded all but the subject area of “social science”[4] and focused on the publication period from 2004 (the year the EU SEA Directive came into effect) to January 2024. In addition to the Scopus search, articles from the literature review conducted in the 2022 report *Learning from Practice: Case Studies of Health in Strategic Environmental Assessment and Environmental Impact Assessment Across the WHO European Region* (WHO Regional Office for Europe, 2022) were included.

Following the literature search and narrowing of the results based on inclusion and exclusion criteria, the remaining articles were categorised according to the type of assessment (i.e. SEA, HIA, EIA, sustainability appraisal) and type of documentation (policy, plan, programme, project). Inclusion criteria included papers regarding SEA, HIA, strategic HIA, strategic health assessment, EIA, sustainability assessment, sustainability appraisal; papers relating to policies, plans, programmes, projects, proposals and assessments/appraisals; and papers discussing guidelines or exploring best practice for including and assessing health in impact assessments. Exclusion criteria included papers that pertained to social impact assessment, human rights impact assessment, economic assessment or life cycle assessment; papers only mentioning health as a side note (i.e. not assessing the level of health in impact assessments); and papers discussing general impact assessment guidelines or best practices (i.e. without a focus on health explicitly). Papers were analysed with regard to the inclusion of health, as follows: the wider determinants of health, indicators of health inequalities, the inclusion of health authorities or other health stakeholders in the assessment process, and significant findings of health.

2.2 Good Practice Case Studies of Health in SEA

For this research task, 20 case studies were selected for review (Table 2.1). The case studies were selected on the basis that they:

- included countries subject to the EU SEA Directive and also the UK (where SEA legislation had not changed since the country left the EU at the time of the research);
- covered a range of national, regional and local planning tiers;
- represented a range of different planning and policy areas/sectors.

The case studies were then reviewed in consultation with the project steering committee, and it was decided to have an equal balance of 20 case studies – with half of these using recent SEA environmental reports (ERs)

3 Environmental subjects were substituted with the following terms for repeated searches: Air pollution OR Air Quality/Water Pollution OR Water Quality/Flora OR Fauna OR Biodiversity/Climate/Material Assets/Culture OR Heritage/Landscape/Natural site/Noise.

4 When doing a Scopus search with “environmental assessment” in the title, the abstract or keywords, Fischer (2023) found that only about 10% of all hits applied to environmental assessment, while the rest fell into various other categories, in particular “environmental science”. By limiting the search to “social science”, the results conform closely to the 10%.

Table 2.1. Selected SEAs included in the review of case studies

No.	Origin	Level	Title	Year
1	Ireland	National	Common Agricultural Policy Strategic Plan 2023–2027	2023
2	Ireland	National	National Hazardous Waste Management Plan 2021–2027	2021
3	Ireland	National	Project Ireland 2040	2024
4	Ireland	National	National Roads 2040	2022
5	Ireland	Regional	Eastern and Midland Regional Spatial and Economic Strategy 2021–2027	2019
6	Ireland	Regional	Fingal Development Plan 2023–2029	2022
7	Ireland	Regional	Regional Water Resources Plan – Eastern and Midlands 2022	2022
8	Ireland	Local	Dublin City Council Climate Action Plan 2024–2029	2023
9	Ireland	Local	Dundrum Local Area Plan 2023	2023
10	Ireland	Local	Limerick Shannon Metropolitan Area Transport Strategy 2022	2022
11	Netherlands	National	Dutch Built and Biophysical Environment Vision 2018	2019
12	Sweden	National	National Transport Plan for 2018–2029	2017
13	France	National	Report of the Strategic Environmental Assessment of the National Low-Carbon Strategy 2019	2019
14	Portugal	Regional	Innovation and Digital Transition Program 2030 (Compete 2030)	2022
15	Czechia	Regional	Plan for the Development of Water Pipes and Sewers in the Ústí Region – Update 2020	2021
16	France	Regional	Occitanie Regional Biomass Plan 2020–2030–2050	2019
17	Sweden	Regional	Waste Plan for Eslöv, Höör and Hörby Municipalities – Action Plan for Resource Management and Circular Material Flows 2023–2026	2023
18	UK	Local	Glasgow City Region's Adaptation Strategy and Action Plan 2021	2021
19	UK	Local	Leeds Local Plan (Local Plan Update)	2023
20	Belgium	Local	Improving the Quality of Life for the Residents – Residential Area Klein-Rusland (Zelzate) 2017	2017

from Ireland to examine and establish current practice and the other half comprising good practice examples from other EU Member States and also the UK. The EU/UK case studies were selected by the project team in consultation with the project steering committee, on the basis of their identification of wider health determinants and assessment of health indicators (studies were translated into English, where necessary, using DeepL – a translation software).

The framework for assessing the consideration of health in SEA ERs (Table 2.2) was based on

Table 2.2. Concepts, assessment criteria and corresponding search terms

Concept	Assessment criterion	Search terms
1	Health	"*health*" OR "well*being" OR "welfare"
AND		
2	Health outcome	"death*" OR "mortalit*" OR "morbidit*" OR "disease*" OR "illness*" OR "injur*" OR "disab*" OR "mental" OR "physical" OR "well*being" OR "medic*" OR "psycho*" OR "soci*" OR "life*" OR "safe*" OR "case*" OR "incidence*" OR "prevalence*" OR "condition*"
	Health determinant	"soci*" OR "environment*" OR "economic*" OR "*financ*" OR "*employ*" OR "occupation*" OR "educat*" OR "*care" OR "capital" OR "secur*" OR "poverty" OR "climat*" OR "air*" OR "water*" OR "material" OR "soil*" OR "noise" OR "hous*" OR "land" "biodivers*" OR "inclus*" OR "exclus*"
	Health (in)equality/ (in)equity (within/between)	"*equalit*" OR "*equit*" OR "differen*" OR "vulnerabl*" OR "exposur*" OR "sensitivity*" OR "access*" OR "accept*" OR "avail*" OR "quality" OR "depriv*" OR "*advantage*" OR "marginal*" OR "exclu*" OR "*privilege*" OR "vari*" OR "gradient" OR "disparit*"
	Health impact	"impact*" OR "effect*" OR "positive" OR "negative" OR "major" OR "minor" OR "significan*"
	Health expertise	"engag*" OR "inclu*" OR "involv*" OR "lead*" OR "collaborat*" OR "stakeholder*" OR "authorit*" OR "expert" OR "department" OR "minist*" OR "council*" OR "team*" OR "*care" OR "service*" OR "unit*"

assessment criteria identified in the scientific and grey literature review previously conducted, as summarised in Table 2.2. Primary searches were conducted using the assessment criteria or keyword for concept 1 – "health" – through an online data extraction and mining platform (Sysrev; https://www.sysrev.com/). This identified general locations within the SEA ERs from where relevant content and data were extracted. The keywords for concept 2 – health "impact", health "outcome", health "determinant" and health "(in)equality" – were used as a reference guide for identifying written content/data specific to each assessment indicator within larger blocks of text. Data concerning potential negative as well as positive health effects (i.e. (co)benefits) of a plan, programme or policy, or the lack thereof, were also included.

2.3 Review of International Guidance on Health in SEA

Given the specific focus of our study – addressing the integration of health into SEA, which is usually associated with HIA practice and is influenced by the unique planning characteristics of each context – criteria were established for identifying and selecting the guidelines to be analysed. The guidelines had to:

- have a focus on the integration of health into SEA practice;
- be HIA-specific but include recommendations on health in SEA;
- have been prepared by national or international institutions and organisations;
- represent different European environmental planning contexts and have been developed after the publication of the EU SEA Directive.

The criteria for the analysis of the consideration of health in SEA were based on the preliminary recommendations for good practice (Box 2.1) identified in previous research tasks.

2.4 Health Expert Interviews

Interviewees were identified based on the list of 20 representative case studies (Table 2.1). Challenges with interviewing SEA practitioners engaged in the case studies led to modifying the participant selection strategy to include HIA experts with experience in and familiarity with SEA. Four practitioners associated with five SEA case studies reviewed from Ireland and one HIA expert with SEA experience in Ireland were interviewed, as well as four practitioners associated with four SEA case studies from European countries and six international HIA experts with SEA experience.

The semi-structured interviews focused on the consideration of health in SEA, linking, where relevant, to practical examples associated with selected SEA case studies. Moreover, the interviews explored definitions of "health", "good practice" and "relevant health expertise" as they were applied in practical examples from key informants' practice and experience. Interviews were conducted online and transcribed in real time using the built-in closed caption feature in Zoom/Microsoft Teams. Text files were downloaded and cleaned for coherence, and key content relating to the state of current practice, challenges and recommendations was identified.

2.5 International Expert Survey

An international online survey was developed using SurveyMonkey and widely circulated through social media (i.e. the project's X account and project team members' LinkedIn accounts) and via the e-lists of the International Association for Impact Assessment (IAIA), the Institute for Environmental Management and Assessment (now named the Institute of Sustainability and Environmental Professionals), and the National SEA Forum of Ireland, to gain further insights from international practice. The survey was based on a total of 15 quantitative and qualitative questions. The questions aimed to capture respondents' views on the current level of health consideration in SEA and which parts of the SEA process pose the biggest challenges in terms of integrating health, and to identify how integration of health into SEA can be improved. In particular, the questions asked respondents to identify the main benefits of incorporating health into SEA, which SEA stages present greatest difficulty in considering health, what aspects of human health should be systematically considered, what content should be critical in any health in SEA guidance, and which health professionals should be involved.

Closed-ended and ranking questions were analysed using percentages, frequency counts and grouped ranking. This helped to identify trends and priorities in the responses, such as the most and least important indicators for health considerations in SEA. Through

Box 2.1. Guidance review criteria and questions

Criterion/question
Brief overview of the guidance document.
What is the scope of the guidance?
Who is the guidance directed at?
How does it define the concept of health? (Exact quote.)
Is this definition close to one of the following conceptualisations of health: WHO definition, One Health, planetary health, environmental health, environmental health inequalities or public health?
What environmental topics are discussed? For example, are the following mentioned: air, biodiversity, chemical pollution, climate change, cultural heritage (e.g. architectural and archaeological heritage), fauna, flora, food, land use, landscape, material assets, noise, population, soil and water, and the interrelationship between these factors?
What health and wellbeing topics are discussed? For example, is there mention of economic security and equity, education, diseases or injuries, health care, healthy behaviours, infections and parasitic diseases, neonatal and nutritional diseases, non-communicable diseases, physical environment, social and community context or other considerations?
Are there recommendations for indicators on the topics mentioned above (e.g. health, social, education, economic) to be used to monitor changes in health? Are there any information sources, datasets, key questions, references, good practice examples or other elements that could serve as potential references for recommending indicators or topics in the guide?
Are there clear recommendations on the importance of environmental impacts on health and relationships with communicable and non-communicable diseases resulting from environmental impacts?
Are there any recommendations, if applicable, on the importance of considering inequalities within populations or communities, with a special focus on vulnerable people?
Is the participation of health/expert actors encouraged?

deductive reasoning, open-ended responses were categorised into thematic areas. For example, the benefits of incorporating health into SEAs were grouped into six categories (i.e. enhancing strategic and systemic approaches to health; addressing health impacts of environmental factors; promoting health as a cross-cutting theme; improving public engagement and decision-making; supporting liveability, resilience and equity; and specific health-promoting features in spatial planning). Explanations for ranked choices and recommendations were synthesised to highlight recurring challenges and suggestions, and specific answers from the respondents were used as examples where relevant. These combined approaches allowed for a comprehensive understanding of both the numerical data and the nuanced perspectives provided by the respondents.

3 Key Research Findings

3.1 Literature Review

3.1.1 World Health Organization

The WHO defines health as "a state of complete physical, mental, and social wellbeing, and not merely the absence of disease or infirmity" (WHO, 1946, p. 1). For the WHO, the consideration of health and the environment is not restricted to the physical environment but encompasses the social and economic environments, and health and wellbeing are closely linked. The WHO definition of 1946 still stands today and forms the basis for most health-related policies and guidelines, including the public health policy in Ireland (i.e. the Healthy Ireland Framework). The WHO Regional Office for Europe states that the environment is a major determinant of health, estimated to contribute to almost 20% of all deaths in the WHO European Region (WHO Regional Office for Europe, 2024). In addition, the WHO Regional Office for Europe (2019) has published its second assessment of environmental health inequalities across its region. The WHO also identifies an active role for the health sector and encourages cross-sectoral working with the sector. These considerations are of relevance in SEA, particularly given that the 2004 Budapest Declaration included a commitment to taking significant health effects into account in the assessment of strategic proposals under the UNECE Protocol on Strategic Environmental Assessment (WHO Regional Office for Europe, 2004).

In 2023, UNECE, in collaboration with the WHO, published the information document *Assessing Health Impacts in Strategic Environmental Assessment* (UNECE, 2023). Importantly, this suggests that the health focus in SEA practice should be on population health, which could be defined geographically or by shared characteristics. In the scoping process, the SEA should consider if the plan or programme (and, to the extent appropriate, legislation or policy) would have impacts on health inequalities, healthy lifestyles, safe and cohesive communities, socioeconomic conditions, environmental conditions, and health and social care services.

3.1.2 Guidance documents

The guidance document for the EU SEA Directive (EU, 2003) reaffirmed that risks to human health should be considered in SEA, and that a comprehensive and systematic approach is needed to determine the effects. However, it does not explain further the definition or scope of human health risk. The IAEA published SEA guidelines for nuclear power programmes (IAEA, 2018), with the approach to health outlined as follows: "Public health, wellbeing and safety are key aspects for consideration in SEA for nuclear power programmes. With regard to physical determinants of health, radiological aspects are of particular importance" (p. 25). The guidelines further state that "When considering health in SEA, it is not only the physical determinants that require attention but also various social aspects. In this context, the 'health determinants' approach promoted by the World Health Organization can be applied […]. As regards the development of nuclear energy, other health aspects that may need to be taken into account include mental health, as perceptions of threats posed by nuclear energy may have a very real impact on the health of local or regional populations" (p. 25).

The document *Strategic Environmental Assessment: Guidelines for Regional Assemblies and Planning Authorities* (Department of Housing Local Government and Heritage, 2022) lists the characteristics of the effects and of the area likely to be affected, "having regard, in particular, to […] the risks to human health or the environment (for example, due to accidents)". The guidelines also provide examples of how health has been addressed in good practice SEAs (e.g. the Clare County Development Plan 2017–2023 identifies existing environmental issues relating to population and human health, and the Dublin City Development Plan 2016–2022 lists densities, the number of residential properties and "percentage increase in the

number of schools, crèches, community parks, sports facilities and primary health centres"[5]).

The Institute of Public Health in Ireland has issued guidance for HIA (Pyper *et al*., 2021). It notes that health should be considered in environmental assessment at both strategic and project levels, and it provides guidance and tools to enable this to happen (e.g. templates to help identify "likely" and "potentially significant" health determinants at scoping stage). It emphasises the importance of a proportionate approach to assessing impacts on human health and it makes the case that HIA approaches can – and should – be applied whether the assessment is a stand-alone HIA or is part of an environmental assessment. It provides guidance on ways to identify likely significant effects as per the SEA and EIA Directives. In this context, this includes a focus on vulnerable groups and the general population. It also encourages health authorities to participate in the preparation of environmental assessments (see Pyper *et al*., 2021).

3.1.3 Scientific literature

The literature review search keywords were defined by the environmental topics identified in the UNECE SEA Protocol (UN, 1991), the EU SEA Directive (EU, 2001), the EU SEA Guidance (EU, 2003) and the Irish SEA guidelines (Department of Housing Local Government and Heritage, 2022). The Scopus search identified health and environment linkages for the following environmental topics: air quality; water quality; soil; flora, fauna and biodiversity; natural sites; landscapes; noise; climate; and radiation (i.e. radon and electromagnetic fields). There were no results for health–environment linkages for soil, cultural heritage, material assets and Seveso sites.

There are numerous interlinkages between the environmental topics and health (Table 3.1). Environmental impacts have a wide range of potential health effects, affecting physical and mental health as well as wellbeing. These tend to be addressed as direct impacts in SEA, e.g. air and water pollution or noise having potentially direct health impacts (most immediately through poisoning or immediate deafness). However, linkages are not always explicitly explained. In many cases, certain air and water quality standards and noise targets may be acknowledged without any further investigation of what not meeting them could potentially mean for human health. Furthermore, the main focus of SEA with regard to an assessment of the causes of significant health impacts is clearly on those (biophysical) environmental topics mentioned in the EU SEA Directive and UNECE SEA Protocol, as well as European and Irish SEA guidelines. While wider (socioeconomic) determinants of health are only occasionally included, they do play a role in SEA when found to be relevant.

Connections with specific diseases (communicable and non-communicable) are made only occasionally in SEA. These can range from infectious diseases and respiratory and coronary diseases to insomnia and, associated with this, anxiety, depression and neuropsychiatric disorders. Possible longer-term effects can include cancers, asthma and hearing impairment or loss. Furthermore, plans and programmes (and, to the extent applicable, legislation and policies) can have more indirect effects in terms of their ability to influence human behaviour (e.g. active travel such as walking and cycling), with health implications, as they can potentially address issues such as obesity, diabetes and other related illnesses/ non-communicable diseases. With regard to both direct and indirect health impacts, these differ between different groups in society, with certain groups, such as the elderly, pregnant women, children and people with pre-existing health issues, often being more vulnerable than others.

Determinants of health are acknowledged to include social and economic environments, the physical environment and a person's individual characteristics and behaviours. While environmental topics form part of the physical environment, they are firmly connected with the social and economic context within which plans and programmes (and, to the extent appropriate, legislation and policies) are prepared. Furthermore, as actions assessed by SEA can influence individual behaviours, all determinants of health need to be carefully considered in SEA. In this context, the One Health concept (WHO, 2023), acknowledging important linkages between environmental and human health, should be considered in relevant plans and

5 Dublin City Council, *Dublin City Development Plan 2016–2022*; https://www.dublincity.ie/dublin-city-development-plan-2016-2022 (accessed 10 November 2025).

Table 3.1. Key environmental health risks and vulnerable groups identified in the scientific literature

Environmental topic	Health risks and opportunities	Vulnerable groups identified (not exhaustive)
Air quality (particulate matter and chemical pollution)	Disease risks: cardiovascular (Markozannes *et al*., 2022); respiratory (Markozannes *et al*., 2022; Wyer *et al*., 2022); other diseases and body functions (Pritchett *et al*., 2022; Rasking *et al*., 2022) Unfavourable birth outcomes (Markozannes *et al*., 2022; Song *et al*., 2023; Zhu *et al*., 2023) Mental health (e.g. depression and anxiety) (Davoudi *et al*., 2021; Q. Liu *et al*., 2021; Chen *et al*., 2024) Psychological functions (Thompson *et al*., 2023) Development of obesity in children (Zheng *et al*., 2024) Deterioration of conditions for those with existing respiratory diseases (Hernandez Carballo *et al*., 2022; Verscheure *et al*., 2023)	Children (Wyer *et al*., 2022; Zhang *et al*., 2022; Zheng *et al*., 2024); pregnant women (Song *et al*., 2023; Zhu *et al*., 2023); the elderly (J. Liu *et al*., 2021; Sun *et al*., 2023)
Flora, fauna and biodiversity	Ecosystem services (Marselle *et al*., 2021; Giglio *et al*., 2023) Contamination of food web and microbial resistance (Ding *et al*., 2023; Liang *et al*., 2024) Affecting the immune and digestive system (Marselle *et al*., 2021; Potter *et al*., 2023)	No vulnerable groups specified
Climate	Heat-induced non-communicable disease risks (e.g. cardiovascular and kidney disease) (J. Liu *et al*., 2021; Faurie *et al*., 2022; Jurgilevich *et al*., 2023) Unfavourable birth outcomes (Haghighi *et al*., 2021; Dalugoda *et al*., 2022; Syed *et al*., 2022) Extreme climate events, such as flooding, heatwave and wildfire, leading to injuries and mental health risks and exacerbating existing health conditions (Anderson *et al*., 2022; Jurgilevich *et al*., 2023; Jiao *et al*., 2024)	Pregnant women (Haghighi *et al*., 2021; Dalugoda *et al*., 2022; Syed *et al*., 2022)
Noise	Sleep disturbance (Smith *et al*., 2022; Ata Teneler and Hassoy, 2023) Cognitive functions (Thompson *et al*., 2022) Impact on central nervous system and brain (Hahad *et al*., 2022)	Children (Dohmen *et al*., 2022; Thompson *et al*., 2022)
Radiation	Cancer risks, especially lung cancer (Hanninen *et al*., 2014; Li *et al*., 2020; Nayak *et al*., 2022; Ngoc *et al*., 2022; Su *et al*., 2022)	No vulnerable groups specified
Water	Non-communicable disease risk (damage to internal organ and cancer risk) (El-Nahhal and El-Nahhal, 2021; Syafrudin *et al*., 2021; Picetti *et al*., 2022; Derbalah and Sakugawa, 2023) Microbial infections (Kristanti *et al*., 2022) Waterborne disease transmissions (Lee *et al*., 2023) Antimicrobial resistance (Farrell *et al*., 2021; Grenni, 2022)	No vulnerable groups specified

programmes (and, to the extent appropriate, legislation and policies) in order to help avoid the spread of emerging infectious diseases and prevent disease outbreaks.

3.2 Review of Case Studies

Of the 20 case-study SEA ERs reviewed (Table 2.1), only 4 contained an explicit definition of human health. All four of those ERs were European and UK case studies. Nevertheless, even without an explicit definition, many SEA ERs highlight the links between human health and environmental quality (e.g. water quality, housing), as well as standards that are important for public health – ranging from the quality of immediate shared and lived environments in terms of housing and neighbourhoods, and urban and rural communities, to the status and quality of air and surface water and groundwater. In numerous SEA ERs, there is an attempt to define health in more than just individual and physical terms. For example, one case prioritises the collective wellbeing of neighbourhood residents in terms of their shared and lived environments. All 20 case-study SEA ERs considered physical forms of health, while 18 cases considered mental forms of health and 17 cases considered social forms of health.

All SEA ERs included references to health impact and the wider determinants of health. Although references to health determinants were not always explicit, there was recognition of the wider underlying components and context that can influence health and wellbeing, both negatively and positively. For example, the quality and liveability of an environment (i.e. the social and physical connectivity of a community, or access to adequate health services, employment, education

and other amenities). Other SEA topics where health determinants and impact pathways were frequently considered were air (and noise), water and climate. In contrast, the impact on health or determinants of health were rarely or never considered within SEA sections on biodiversity, cultural heritage and landscape.

There was a prioritisation of the health effects of more direct exposure pathways. For example, SEA ERs of transport system plans and road strategies explored the direct health effects of exposure to air and noise pollution from increasing road and rail traffic. SEA ERs of waste management and waste water system plans explored the direct health effects of exposure to chemical contamination of water and soils from fertilisers, pesticides, herbicides, heavy metals and pharmaceuticals, or the biological contamination of water and soils from verotoxigenic *Escherichia coli* or *Cryptosporidium*. SEA ERs assess these health impact pathways through infrastructural and environmental determinants, such as the number of new connections to the water supply system, the total population connected to good quality water supply networks, and the number of situations where droughts had affected drinking water supply in terms of quality or quantity of water. In terms of these impact pathways, many SEAs ERs also acknowledged that national, European and international environmental directives and standards, such as air quality limits on nitrogen dioxide and fine particulates, are important for protecting and determining public health.

Just over half of the case studies ($n = 11$; 7 international and 4 Irish) contained references to the significance of potential health effects – be they positive or negative. For example, improving access to quality green and blue spaces resulted in significant positive effects for wellbeing and inequalities. Other SEA ERs assessed details of the scale, directness, duration and combination of a health effect associated with a proposed programme or policy. For example, an assessment of the likely significant effect of ammonia atmospheric emissions on health determined the impact to be low/negative, indirect, temporary and short term, with no cumulative effect with other plans, schemes or programmes.

All SEA ERs included explicit references to specific health outcomes. These ranged from physical health outcomes, such as all-cause mortality (i.e. from any cause – high blood pressure, cardiovascular disease, respiratory disease, waterborne diseases, vector-borne diseases and road traffic-related injury), to mental health outcomes (e.g. stress, anxiety and depression), as well as to social aspects that are acknowledged to have an explicit link to health (e.g. social inclusion, community cohesion and the social value of residential areas). Occasionally, specific health outcomes were accompanied by means of measurement, such as disability-adjusted life years for heart attacks, strokes, hypertension, sleep disturbances and general disturbance. However, fewer than one-third ($n = 6$) of the SEA ERs (all of which were international) included any indication of a quantitative and/or qualitative assessment of health outcomes.

Of the reviewed case studies, 70% ($n = 14$; 7 international and 7 Irish) made explicit reference to health equity. Most references to health equity were found in the reference to the baseline, with very few arising elsewhere. In 30% of the case studies ($n = 6$; 1 international and 5 Irish), equity was generalised in terms of “vulnerable populations” or “disadvantaged people”, while 40% ($n = 8$; 6 international and 2 Irish) drew specific attention to existing vulnerable groups, such as persons living with disability or elderly people. Examples included how transport-related strategies might create health inequalities by making certain road users more vulnerable to injury or death. Other examples included reference to elderly farmers being at higher risk of accidents, and gender equality and the health disparities between men and women.

A quarter of the reviewed SEA ERs ($n = 5$; 3 international and 2 Irish) referred to the engagement of health expertise during the SEA process. Examples included reference to an online scoping workshop that included consultees from national institutes for public health, and consultation with national health services on the potential health effects resulting from plan/programme implementation. In addition, other SEAs included acknowledgements of the contributions of health experts and institutions, including individuals from the Ministry of Health and regional health administrations.

The consideration of health was greatest, in terms of both quantity and quality, in the baseline phase of the case studies. The baselines of all 20 SEA ERs reviewed contained references to health impacts, outcomes and determinants. References to health

equity were found in the baselines of 15 case studies. However, fewer SEAs maintained that consideration of health throughout the consideration of alternatives ($n = 13$), mitigation ($n = 10$) and monitoring ($n = 13$) phases. Overall, the SEA case studies from other European nations performed better in terms of their coverage and consideration of health than those from Ireland. This is consistent with the international European case studies representing good practice examples.

3.3 Review of International and National Guidance

Seven international and national guidelines were selected for review (Table 3.2). These guidelines presented recommendations for national and international planning levels. The analysis of these guidelines is intended to capture how it has been recommended that health is addressed in SEA.

3.3.1 Scope of the guidelines

International guidelines tend to have a broader scope and therefore often take a more generic/strategic approach, introducing concepts related to environmental impacts, their relationship with health, and the role of SEA and/or HIA. In contrast, national guidelines tend to have a more specific scope, tailored to local legislative contexts and requirements (e.g. more specifically defining the concept of health and the scope of application of SEA in their national context).

3.3.2 Definition of health

In the reviewed guidance documents, the concept of health was predominantly grounded in the WHO definition. However, most guidelines built on this definition by integrating broader frameworks, such as environmental health, public health, health inequalities and planetary health, to address the complex interplay between health and environmental factors.

3.3.3 Target audience

The reviewed guidelines target different audiences. In the national context, this involves specific stakeholders responding to local needs to ensure their relevance to the specific regulatory and social contexts. Furthermore, the effective implementation of the guidelines depends on the formulation of

Table 3.2. Selected guidance documents for review

No.	Title	Year	Country/ organization	Reference	URL
International					
1	*Assessing Health Impacts in Strategic Environmental Assessment*	2023	UNECE – WHO – Note by the Bureau	UNECE (2023)	https://unece.org/environment/documents/2023/09/session-documents/assessing-health-impacts-strategic-environmental
2	*Health Impact Assessment International Best Practice Principles*	2021	IAIA	Winkler *et al.* (2021)	https://iaia.org/wp-content/uploads/2025/02/BEST-PRACTICE-HIA.pdf
3	*Resource Manual to Support Application of the Protocol on Strategic Environmental Assessment*	2012	UNECE – Annex A1.1	UN (2012)	https://unece.org/sea-protocol-resource-manual-0
National					
4	*Health Impact Assessment Guidelines in Georgia*	2024	Georgia	Roue Le Gall *et al.* (2024)	https://www.expertisefrance.fr/en/fiche-projet?id=861905
5	*Health Impact Assessment Guidance: A Manual and Technical Guidance*	2021	Ireland	Pyper *et al.* (2021)	https://www.publichealth.ie/sites/default/files/resources/HIA%20Guidance%20A%20Manual_0.pdf
6	*Guidance on Consideration of Human Health in Strategic Environmental Assessment*	2019	UK (Scotland)	SEPA (2019)	https://www.sepa.org.uk/media/219433/lups-sea-gu5-consideration-of-human-health-in-sea.pdf
7	*Draft Guidance on Health in Strategic Environmental Assessment: Consultation Document*	2007	UK	Williams and Fisher (2008)	https://healthimpactassessment.pbworks.com/f/Draft+guidance+on+health+in+SEA+-+DH+England+-+2007.pdf

recommendations that promote awareness among both environmental and health professionals, considering the diversity of contexts and actors involved.

3.3.4 Environmental topics

Guidelines cover environmental topics in relation to health in different ways. While some provide detailed examples and strategies for linking environmental issues to health impacts, others take a more general or indirect approach. These variations reflect how the different regional contexts and different levels of recommendations shape the ways in which guidance is developed.

The topic of "population" is addressed consistently in most guidelines. It is considered a cross-cutting element, as it relates to various environmental factors and impacts on health. This cross-cutting approach helps to incorporate broader health determinants into the environmental assessment framework, highlighting the importance of population-based considerations (e.g. deprivation index) as a way of achieving health-related aspects.

Environmental topics such as air, water, climate change and soil are frequently mentioned in guidelines, indicating their importance in SEA. However, complex issues, such as biodiversity, chemical pollution, landscape and cultural heritage, are often neglected or only partially addressed – mostly through examples. This suggests gaps in the way in which these issues are integrated, despite their relevance to the consideration of health in SEA.

Irrespective of the varying depths of treatment of environmental topics, all guidelines acknowledge the importance of linking environmental factors to human health. The analysis suggests that there is a need for more integrated and detailed approaches in future guidelines, ensuring that all relevant environmental topics, especially those that are complex and less directly related to health, are systematically included and addressed in the context of health assessments.

3.3.5 Health and wellbeing considerations

Most guidelines address health and wellbeing topics indirectly, framing them within health determinants. This approach highlights the connection between health and environmental issues, but does not provide for detailed discussions of specific wellbeing aspects, such as economic security, education and social contexts.

There is a general acknowledgement across the reviewed guidelines that integrating both health and wellbeing into SEA is complex. It is underlined that predicting the direct impacts of plans and programmes on health often requires detailed studies that are not always feasible (nor necessary) within an SEA context. The main strategy to steer the approach to health and wellbeing consists of presenting general examples of application, describing case studies and providing templates. Health and wellbeing are often framed by/with examples of determinants of health, using frameworks or tables to help identify and assess impacts. This approach, however, results in a diluted treatment of certain issues.

3.3.6 Proposed indicators

The guidelines highlight the relevance of indicators for monitoring changes in health, although their definitions, scope and applications vary considerably. While some guidelines present detailed approaches, with practical examples, suggestions for standardised systems and the recommendation to involve health professionals in the formulation of indicators, others offer more generic approaches. A common challenge is to balance the use of generic and specific indicators, ensuring their applicability to SEA of both national/regional and local plans/programmes. In addition, it is emphasised that the choice of indicators should be based on robust evidence, considering the causality of impacts and the objectives of SEA, which requires effective monitoring systems and careful data management.

3.3.7 Environmental impacts on health, and relationships with communicable and non-communicable diseases

Across the reviewed guidelines, there is a fragmented approach to addressing the relationships between environmental impacts, health, and communicable and non-communicable diseases. While some guidelines provide clear and actionable recommendations supported by detailed tools and examples, others approach the topic more indirectly, relying on illustrative examples.

A common theme among the guidance documents is the acknowledgement of the importance of environmental determinants of health, including their influence on communicable and non-communicable diseases. However, the connections with these health outcomes are usually implicit rather than explicit. This underscores a need for more comprehensive and detailed guidance to bridge the gap between general recognition and actionable integration of health determinants into SEA.

3.3.8 Consideration of inequalities within populations or communities

There is a shared acknowledgement across the reviewed guidelines of the importance of addressing health inequalities and vulnerabilities in populations as a fundamental component of SEA. However, the depth of recommendations varies. National guidelines provide more detailed advice, often offering practical tools like templates, mapping strategies and data sources to assess inequalities. They emphasise the need for tailored assessments that consider socioeconomic factors, age, gender and other determinants, highlighting the value of inclusive and equitable planning processes. In contrast, international guidelines take a broader approach, linking health inequalities to principles of public participation and governance without delving deeper into specific methodologies. Despite these differences, the collective message is clear: addressing health inequalities is critical for ensuring equitable outcomes in SEA, and stronger, more explicit integration of these considerations is necessary to enhance the effectiveness of assessments.

3.3.9 Participation of health experts/actors

The reviewed guidelines consistently emphasise the importance of involving health actors and experts in the assessment process. The general message is that the inclusion of health professionals can ensure that health determinants are integrated into decision-making processes, ultimately supporting more comprehensive SEAs. While cross-sectoral collaboration remains a challenge due to limited capacity or expertise within public health authorities, most guidelines advocate introductory approaches for building awareness of the importance of involving health experts in SEA.

3.4 Expert Interviews

3.4.1 State of current practice

The interviews with Irish SEA experts revealed that the consideration of health in SEA is currently narrow and superficial. When asked to describe how health was currently considered within SEA practice, all five interviewees said that practice focuses on health only through other interrelated environmental topic areas. Some comments highlighted this, for example:

> There [isn't] the threat of health really having much influence, you know – as ever, it continues to be seen as, oh, well, haven't we already covered that through air quality and noise and soils and so on?

> [Health] may just become diluted … if at least it was considered on its own, it would give it more prominence.

In addition to defining health in physical terms within SEA practice, four out of five Irish interviewees discussed the consideration of social, economic, emotional and psychological aspects of health, including the wider determinants of health – always acknowledging that these considerations are currently weak in practice. This is succinctly captured by one particular observation:

> I think the official guidance has to say, in covering the statutory requirement for human health, you have to take a wider determinants of health approach and you need to include technical topics in health impact assessment … to really move us away from just considering health in a very narrow sense.

The interviews with international SEA experts highlighted the importance of governance and legislation, and the remit of the organisation promoting the policy or plan, to the scope of the SEA and the way in which health is approached. The interviewees described how this can lead to a narrow consideration of health in SEA practice:

> … it boils down to what the mandate of the transport system is … And then health

> becomes very much an issue of noise and vibrations …

The HIA experts described how the standard scope of health in SEA does not align with the way in which health is addressed in the field of public health (and HIA):

> Most of the time … [health is defined] … in terms of environmental hazards. Air quality, for example. If there are cross-border implications then health is considered very vaguely.

> We have tried to broaden the understanding of health in SEA. It is traditionally quite narrow – for example, air quality, water and soil. For many years we have tried to influence this and we have had some success but not as much as I would like to have had.

> The directive and protocol talk about health but does not define it. WHO has an internationally agreed definition of health. It goes beyond environmental determinants of health, and as health is influenced by environmental determinants we think this is the one to use.

Each of the HIA interviewees described how they used determinants of health to conceptualise the ways in which the policy or plan might affect health. For example:

> The way I think about HIA and health in other impact assessments is you don't start with outcomes, you start with health determinants – at least consider, while scoping, a range of different determinants to health related behaviour.

> It should be considered more broadly and not just human health but population health with a definition – social determinants, commercial determinants, inequalities and not just environmental health determinants.

One interviewee described good practice as when SEA uses pathway analysis to show how determinants of health affected by the policy or plan are linked to changes in health outcomes. However, the HIA experts also recognised that it is not a straightforward matter to assess health within SEA:

> … how do we understand health, are we able to go to a specific health outcome? For example, asthma or injuries or any other health outcome? Or do we just keep the overall health with a single measure? To my knowledge, most of the impact assessments, and on the level of assessing health, indicate the determinant [the risk factor] and not really how the incidence of a disease is changing or how mortality is changing. And it's very logical that not going that far because it's unlikely anyone would do an investment which is doing major change in mortality, but there might be changes in morbidity. So I mean go to the very end with health: define the health outcome. I try to find the health outcome as detailed by the ICD [International Classification of Diseases] but it is very hard.

The HIA experts also acknowledged the importance of a pragmatic approach that adheres to a timeline and a budget:

> … [a full assessment of each determinant is] definitely not necessary in every single case. I think here we need really to stick to the classical HIA methodology: screening, scoping, etc., and sort out when do we need to go to the health outcome, to a specific individual health outcome, and where we are satisfied with the broader level.

3.4.2 Current practice challenges

The Irish expert interview results highlight some of the methodological and practical limitations to the requirement for health in SEA. One interviewee critically reflected on the existing challenge of having a single methodology to assess different types of data in different areas and equate outputs across all SEA topics when there is simply so much diversity, ranging

from health to biodiversity and cultural heritage. The same interviewee outlined how data limitations on strategic alternatives, leading to a limited subset of comparable health indicators, are often the reason why health is considered so broadly, perhaps superficially, in SEA.

However, two of four SEA practitioners indicated that they failed to see how proportionate and effective consideration could work in practice, with one noting that:

> ... there's a bit of a disconnect there between the objective health of people in general and what planning is supposed to do about it. And then how SEA is supposed to assess that and actually affect a material or a tangible change in that planning.

The Irish interviews also revealed that the effective consideration of health in SEA is missing a connection with quantitative and qualitative human health measurements. This finding was also supported by the 20 SEA ER case studies reviewed, with less than one-third of the ERs including reference to the quantitative or qualitative assessment of health outcomes. Two interviewees alluded to a bias towards the prioritising of quantitative measurement set out in other topic areas (e.g. air and water quality), as well as a knowledge gap around how qualitative and mixed methodological approaches could be applied for the scientific assessment and measurement of health. One interviewee observed that:

> Maybe taking the more 'science-based' approach, as opposed to a kind of qualitative assessment-based approach, that's hard to do when you're dealing with plans and policies.

Two of four SEA practitioners indicated how health as a concept and policy base was also associated with uncertainties about where health begins and ends, and how to include the broader determinants of health within the existing SEA process. One interviewee highlighted, in particular, the challenges of addressing human wellbeing:

> I think it would be a challenge if wellbeing was to be brought in to the scope of the directive explicitly … Wellbeing is something that is much more challenging to address because of the lack of clear standards, the lack of clear enforceable standards and associated indicators. The ambiguity and the reason why we focus on the environmental vectors like air, soil, and water is, I guess, one of the reasons is that the European SEA guidelines and guidance point us in that direction.

The Irish interviews revealed a range of understandings of the level of specialised experience and knowledge needed for the effective and proportionate consideration of health. Two interviewees openly acknowledged the limits of having generalists (or specialists in disciplines other than health, such as biological or environmental sciences) in SEA practice to provide health expertise, with one noting that:

> As a general SEA practitioner, we know a little bit about a lot of things, but we'll always need to defer to our colleagues that have more expertise.

Interviewees also offered rationales as to why the engagement of appropriate health expertise was missing:

> There's no requirement to include specialists. Therefore, it doesn't happen very often … A lot of it comes down to resources, you know – it's a competitive commercial venture to bid to do an SEA. So I think there is a pressure for the work to be undertaken by generalists.

The international SEA experts considered that practice challenges relate to involving the correct public sector authorities and the absence of clear linkages and/or working practices between environmental authorities (including planning) and health authorities. This was highlighted, in particular, by two interviewees:

> I would say we don't have good practice on this. We have an authority for health, but they are not any more at all involved in impact assessments. The health [case in SEA] boils down to 'can we meet the standards of noise?'.

> … one of the reasons also that SEA doesn't come out as it could, or as it should, is the health authorities are not completely prepared to act on the SEA and so they don't have a strong word to say. Very often they are contacted but they don't respond through the public consultation process.

This observation applies also to identifying the specialists to prepare the assessments:

> I would really like to see people that are much more into public health in this process – we don't have them at all at the moment there.

> The skills of the people who work on these [SEA environment–health link] subjects are not complete enough to bring a real in-depth knowledge and we base ourselves on a lot of guides that bring a sufficiently simplified vision so that it can be treated and exploited, but we lack a lot of knowledge and a certain technical value in these subjects.

One Irish interviewee described how they overcame this by explicitly involving the public health authority in preparing the SEA:

> We worked with the [representative body of local health agencies] – they are the health agency of cities … They were involved in the scoping note – and in discussions about how we should define health as a topic …

The HIA experts considered SEA to be a high-level assessment that needs to be conducted in a specific time frame and to a specific budget. This means that there are, of necessity, some broad informed judgements being made. It is interesting to note that this applies even within a topic that is amenable to quantification:

> The other problem with noise is exactly the health outcome, because there are several health outcomes starting with sleep disturbance, which is very hard to measure, and ending maybe with stroke, which we can measure based on hospitalisation, based on mortality … But the decision pathway from that point, which health outcome to follow, how often, and when it is relevant and when it is not relevant, that is very complicated, even in case of noise …

3.4.3 Recommendations to improve practice

In addition to considering determinants of health (the "what"), interviewees stressed the importance of considering which population groups (the "who") are likely to be affected by the policy or plan:

> Three indicators of good practice that I like to see [in health in SEA]: holistic approach to health; attention to the wider determinants; and consideration of population groups.

> [SEA] should always look at the population that is affected and at vulnerable groups – the distribution of effects and how it can be managed. Then have to see dependencies on the plan, and to see what can be done and how it can be managed. Also – do not only look at negative effects.

HIA experts were unanimous that public health is the field from which expertise on human health should be sought:

> A health expert, I would define a person who has a very good knowledge of broad public health … And also a person with open mind and open eyes, respecting the needs of development and the population.

3.5 International Expert Survey

The international expert survey was active from 14 October to 1 November 2024, and 42 responses were received. The respondents mainly worked in Europe in the private and academic sectors. They had high levels of knowledge across different types of impact assessments, with advanced knowledge in environmental assessment and HIA. Most of the respondents reported that health is not always covered

in SEA. Their responses highlighted that the main benefits of incorporating health into SEAs include:

- enhancing strategic and systemic approaches to health;
- addressing health impacts of environmental factors;
- promoting health as a cross-cutting theme;
- improving public engagement and decision-making;
- supporting liveability, resilience and equity;
- providing specific health-promoting features in spatial planning.

Respondents said that the two stages of scoping and impact assessment were the most difficult in terms of integrating health. They mentioned a lack of clear methodologies, guidelines and data, along with financial constraints, as reasons for this difficulty.

The respondents emphasised the need to consider both physical and mental health in SEA. Some respondents also noted that, in addition to economic, environmental and built environment considerations, it is important to include the wider determinants of health. Such determinants include social/cultural considerations, e.g. education, food (in)security, housing, beliefs and social norms. While the respondents noted that such wider determinants of health are already considered in SEA to some degree, there is a need to standardise the determinants.

The survey responses suggest that there is a clear need for step-by-step recommendations on the integration of health at each SEA stage, and that these should be supported by a set of principles and resources, such as links to existing guidance. Case studies were also found to be a good way to exemplify the more theoretical parts of SEA. Moreover, respondents consider it crucial to include public health personnel with professional SEA training when assessing health in SEA.

4 Recommendations

The various research tasks undertaken led to the development of a series of specific recommendations for the consistent and proportionate consideration of health in SEA. The key recommendations are summarised in Box 4.1.

Box 4.1. Summary of key recommendations resulting from the various research tasks/methods

International scientific and grey literature review

- Provide a consistent definition of health and its scope within the context of the plan, based on the WHO definition.
- Direct and indirect health effects and outcomes from environmental determinants and impacts should be explicitly identified and stated in SEA ERs.
- The WHO definitions of “health” and of environmental risk factors for disease and injury should be carefully considered and adopted as appropriate.
- Inequalities within populations should be duly considered, with a particular focus on vulnerable groups.

Review of case studies

- Include health impacts, determinants, outcomes, equity and experts in the baseline phase all the way through to the mitigation and monitoring phases.
- Define conceptual, methodological and policy boundaries.
- Engage relevant and focused health expertise throughout the different stages of the SEA process.

Review of international SEA guidance

National SEA guidance should:

- define a clear and specific scope that reflects local environmental and health challenges while maintaining flexibility to address emerging issues;
- integrate health with broader conceptual approaches that encompass physical, mental, social and environmental dimensions, based on the WHO definition of health;
- define clearly the target audience, tailoring the content to stakeholders, especially health and environmental professionals, policymakers and community representatives;
- focus on integrating environmental factors systematically and provide practical tools (e.g. template indicator tables, support assessment sheets) to link environmental and health impacts;
- prioritise practical frameworks and methods to enable a more complete assessment of the determinants of health and wellbeing when defining the scope of SEA;
- strongly encourage the use of evidence-based indicators to monitor health change that are appropriate to the relevant plan/SEA tier;
- provide clear and comprehensive advice to explore and determine the relationship between environmental determinants and health outcomes;
- address explicitly any health inequalities and vulnerabilities, with a focus on vulnerable populations;
- encourage the proactive participation of health professionals and specialists at each stage of the SEA process as appropriate.

Box 4.1. Continued

Expert interviews

- There is a need for specific and supportive legislation and statutory process.
- Provide a consistent definition of health and its scope within the context of the plan.
- Engage individuals with specific human health expertise, within an interdisciplinary team, early in the SEA process.
- Specify information needs when making requests for assistance and/or input from public health teams and/or specialists.
- Apply a consistent and shared methodology.

International expert survey

- SEA processes should systematically include both physical and mental aspects of health.
- Key indicators in SEA, such as the physical environment (e.g. water and air quality), health care and social/cultural contexts, should be assessed regarding health.
- Wider determinants of health should be included to a higher degree in SEAs.
- Developing step-by-step guidance for each SEA stage is crucial.

5 Health in SEA Toolkit

Based on the research findings and the associated recommendations, summarised in Chapters 3 and 4, respectively, a Health in SEA Toolkit was developed. This has been published as a separate stand-alone document.

The toolkit provides "pick and choose" procedural and methodological recommendations for the proportionate consideration of human health, including both physical and mental health, in SEA. Table 5.1 summarises the key good practice recommendations for consistently and proportionately considering health at each SEA stage (the Health in SEA Toolkit should be referred to for a full description and elaboration).

Table 5.1. Key good practice recommendations for consistently and proportionately considering health at each SEA stage

Stage	Recommendations
Screening	• Consider the significant positive/negative implications of the plan/programme or policy for human health and wellbeing. • Ensure that screening is carried out in a proportionate way (i.e. that potential implications are judged in line with the conventions of the sector, administrative level and decision tier). • Provide the opportunity for specialist/expert input on human health where health is a relevant topic.
Scoping	• Adopt an explicit definition of human health (e.g. the WHO definition). • Identify health determinants, associated potential significant effects and affected population groups (in line with the intentions and actions of the plan, programme or policy) that may directly/indirectly affect health and wellbeing. • Develop human health-related SEA objectives that include improvements in physical, mental and social wellbeing. • Engage relevant public health experts/stakeholders and use existing data/information sources to inform scoping. • Issue a scoping notification/report to relevant and informed public health representatives.
Baseline	• Establish a health-focused baseline, clearly and proportionately identifying determinants for the significantly affected population (i.e. include only information that reinforces and refines the aspects identified during scoping). • Identify relevant and proportional interrelationships between the environmental topics, health determinants and any significant effects on the population (including source–pathway–impact links). • Provide a proportionate description of population groups, including vulnerable populations (the potential for health inequalities should be linked to the identified potential significant impacts only).
Alternatives	• Integrate health considerations into the development of alternatives to foster positive long-term effects and reduce health inequalities/vulnerabilities. • Ensure that the chosen alternative addresses health considerations in a way that is appropriate to the planning level and sector. • Engage relevant health experts/stakeholders to ensure that the proposed alternative promotes health and wellbeing outcomes for all.
Impact assessment	• Develop indicators that capture both determinants significantly affecting health and affected population groups. • Determine the significance of impacts on human health (based on magnitude – e.g. exposure, scale, severity and reversibility – as well as the sensitivity of a population). • Ensure that the level of assessment detail on the likely significant effects on health is reasonable and proportionate to the plan/programme (e.g. capturing previously identified links between environmental topics, determinants and significant effects as identified in scoping and validated in the baseline stage). • Apply assessment methods that are inclusive of health and wellbeing, and that can capture potentially significant (positive/negative) health and wellbeing outcomes.

Table 5.1. Contined

Stage	Recommendations
Mitigation	• Include mitigation measures that address potentially significant adverse health outcomes and enhance positive ones. • Ensure that the proposed mitigation measures are proportionate to the scope of the plan/programme (e.g. local plans should focus on green infrastructure and air quality and not national-level actions) and that they are viable/implementable (e.g. in line with the plan's timing and institutional capacities).
Monitoring	• Use clear health indicators and targets (in line with those identified in the impact assessment stage) and identify the responsible agency for monitoring each indicator. • Use existing health monitoring data that are appropriate to the administrative level, sector and decision tier (e.g. Central Statistics Office health data at regional level and epidemiological records at local level). • Report on monitoring and identification of thresholds that will prompt remedial action.
Consultation	• Identify relevant health experts/stakeholders early in the assessment process (e.g. a public health team). • Engage with the identified health experts/stakeholders at key assessment stages (at a minimum, at the scoping and alternatives stages).
Reporting	• Ensure that population health and wellbeing are duly, yet proportionately, reported on within all relevant SEA topics (i.e. not only within the "population and health" section). • Use plain language that ensures accessibility to and understanding by different audiences in line with universal design principles and policies.

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Abbreviations

EIA	Environmental impact assessment
EPA	Environmental Protection Agency
ER	Environmental report
EU	European Union
HIA	Health impact assessment
IAEA	International Atomic Energy Agency
IAIA	International Association for Impact Assessment
SEA	Strategic environmental assessment
UNECE	United Nations Economic Commission for Europe
WHO	World Health Organization

An Ghníomhaireacht Um Chaomhnú Comhshaoil

Tá an GCC freagrach as an gcomhshaol a chosaint agus a fheabhsú, mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ar thionchar díobhálach na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialáil: Rialáil agus córais chomhlíonta comhshaoil éifeachtacha a chur i bhfeidhm, chun dea-thorthaí comhshaoil a bhaint amach agus díriú orthu siúd nach mbíonn ag cloí leo.

Eolas: Sonraí, eolas agus measúnú ardchaighdeáin, spriocdhírithe agus tráthúil a chur ar fáil i leith an chomhshaoil chun bonn eolais a chur faoin gcinnteoireacht.

Abhcóideacht: Ag obair le daoine eile ar son timpeallachta glaine, táirgiúla agus dea-chosanta agus ar son cleachtas inbhuanaithe i dtaobh an chomhshaoil.

I measc ár gcuid freagrachtaí tá:

Ceadúnú

- Gníomhaíochtaí tionscail, dramhaíola agus stórála peitril ar scála mór;
- Sceitheadh fuíolluisce uirbigh;
- Úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe;
- Foinsí radaíochta ianúcháin;
- Astaíochtaí gás ceaptha teasa ó thionscal agus ón eitlíocht trí Scéim an AE um Thrádáil Astaíochtaí.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Iniúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- Cur i bhfeidhm an dea-chleachtais a stiúradh i ngníomhaíochtaí agus i saoráidí rialáilte;
- Maoirseacht a dhéanamh ar fhreagrachtaí an údaráis áitiúil as cosaint an chomhshaoil;
- Caighdeán an uisce óil phoiblí a rialáil agus údaruithe um sceitheadh fuíolluisce uirbigh a fhorfheidhmiú
- Caighdeán an uisce óil phoiblí agus phríobháidigh a mheasúnú agus tuairisciú air;
- Comhordú a dhéanamh ar líonra d'eagraíochtaí seirbhíse poiblí chun tacú le gníomhú i gcoinne coireachta comhshaoil;
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Dramhaíola agus Ceimiceáin sa Chomhshaol

- Rialacháin dramhaíola a chur i bhfeidhm agus a fhorfheidhmiú lena n-áirítear saincheisteanna forfheidhmithe náisiúnta;
- Staitisticí dramhaíola náisiúnta a ullmhú agus a fhoilsiú chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Guaisí;
- An Clár Náisiúnta um Chosc Dramhaíola a fhorbairt agus a chur i bhfeidhm;
- Reachtaíocht ar rialú ceimiceán sa timpeallacht a chur i bhfeidhm agus tuairisciú ar an reachtaíocht sin.

Bainistíocht Uisce

- Plé le struchtúir náisiúnta agus réigiúnacha rialachais agus oibriúcháin chun an Chreat-treoir Uisce a chur i bhfeidhm;
- Monatóireacht, measúnú agus tuairisciú a dhéanamh ar chaighdeán aibhneacha, lochanna, uiscí idirchreasa agus cósta, uiscí snámha agus screamhuisce chomh maith le tomhas ar leibhéil uisce agus sreabhadh abhann.

Eolaíocht Aeráide & Athrú Aeráide

- Fardail agus réamh-mheastacháin a fhoilsiú um astaíochtaí gás ceaptha teasa na hÉireann;
- Rúnaíocht a chur ar fáil don Chomhairle Chomhairleach ar Athrú Aeráide agus tacaíocht a thabhairt don Idirphlé Náisiúnta ar Ghníomhú ar son na hAeráide;
- Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

Monatóireacht & Measúnú ar an gComhshaol

- Córais náisiúnta um monatóireacht an chomhshaoil a cheapadh agus a chur i bhfeidhm: teicneolaíocht, bainistíocht sonraí, anailís agus réamhaisnéisiú;
- Tuairiscí ar Staid Thimpeallacht na hÉireann agus ar Tháscairí a chur ar fáil;
- Monatóireacht a dhéanamh ar chaighdeán an aeir agus Treoir an AE i leith Aeir Ghlain don Eoraip a chur i bhfeidhm chomh maith leis an gCoinbhinsiún ar Aerthruailliú Fadraoin Trasteorann, agus an Treoir i leith na Teorann Náisiúnta Astaíochtaí;
- Maoirseacht a dhéanamh ar chur i bhfeidhm na Treorach i leith Torainn Timpeallachta;
- Measúnú a dhéanamh ar thionchar pleananna agus clár beartaithe ar chomhshaol na hÉireann.

Taighde agus Forbairt Comhshaoil

- Comhordú a dhéanamh ar ghníomhaíochtaí taighde comhshaoil agus iad a mhaoiniú chun brú a aithint, bonn eolais a chur faoin mbeartas agus réitigh a chur ar fáil;
- Comhoibriú le gníomhaíocht náisiúnta agus AE um thaighde comhshaoil.

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta agus nochtadh an phobail do radaíocht ianúcháin agus do réimsí leictreamaighnéadacha a mheas;
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha;
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta;
- Sainseirbhísí um chosaint ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Ardú Feasachta agus Faisnéis Inrochtana

- Tuairisciú, comhairle agus treoir neamhspleách, fianaise-bhunaithe a chur ar fáil don Rialtas, don tionscal agus don phobal ar ábhair maidir le cosaint comhshaoil agus raideolaíoch;
- An nasc idir sláinte agus folláine, an geilleagar agus timpeallacht ghlan a chur chun cinn;
- Feasacht comhshaoil a chur chun cinn lena n-áirítear tacú le hiompraíocht um éifeachtúlacht acmhainní agus aistriú aeráide;
- Tástáil radóin a chur chun cinn i dtithe agus in ionaid oibre agus feabhsúchán a mholadh áit is gá.

Comhpháirtíocht agus Líonrú

- Oibriú le gníomhaireachtaí idirnáisiúnta agus náisiúnta, údaráis réigiúnacha agus áitiúla, eagraíochtaí neamhrialtais, comhlachtaí ionadaíocha agus ranna rialtais chun cosaint chomhshaoil agus raideolaíoch a chur ar fáil, chomh maith le taighde, comhordú agus cinnteoireacht bunaithe ar an eolaíocht.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an GCC á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóir. Déantar an obair ar fud cúig cinn d'Oifigí:

1. An Oifig um Inbhunaitheacht i leith Cúrsaí Comhshaoil
2. An Oifig Forfheidhmithe i leith Cúrsaí Comhshaoil
3. An Oifig um Fhianaise agus Measúnú
4. An Oifig um Chosaint ar Radaíocht agus Monatóireacht Comhshaoil
5. An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tugann coistí comhairleacha cabhair don Ghníomhaireacht agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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