

Deliverable

D9.1 – Data Management Plan (DMP)

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Data Management Plan

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1. Executive Summary

This Deliverable (D9.1) specifies digital objects up to M6, either incoming or likely to be generated, and approaches for obtaining information in the future as well as strategies to enhance FAIRness and support exploitation for user communities.

The *Zero Hidden Hunger EU* data management plan (DMP) details how data are collected, generated, and processed throughout the project lifecycle. This includes FAIR principles (findable, accessible, interoperable, reusable), intellectual property (IP), and monitoring publications. Contrary to its name, the *Zero Hidden Hunger EU* DMP encompasses all digital objects, covering storage, preservation, resource allocation for data management, and ethical or security considerations.

To achieve a comprehensive overview of the digital objects involved in *Zero Hidden Hunger EU*, EuroFIR has initiated data collection from various sources. The primary source of information was the Grant Agreement, complemented by online searches. Additionally, a DMP workshop was held in May 2024 to introduce DMP requirements and activities to all project partners and gather their insights.

The next step will be to conduct guided interviews with providers to fill any missing information.

The DMP is a dynamic document that will be periodically revised as part of Task 9.1. The current document represents the first version of the DMP (D9.1) and will be continuously updated, resulting in an updated version (D9.2) due in Month 24 (December 2025).

2. Introduction

2.1 What is a data management plan?

A Data Management Plan (DMP) describes management of digital assets, i.e. ways in which data are collected, generated and/or processed throughout the lifespan of a project. Despite what the name indicates, the DMP covers all digital objects (i.e. data and research outputs) and includes compliance with FAIR principles¹ (findability, access, interoperability, and reuse; Figure 1), how data will be stored, published and preserved, resources for data management, and any relevant ethical or security issues.

The overall aim is to implement FAIR data and protecting private and sensitive information as well as intellectual property whilst also maximising exploitation of key research outputs.

A DMP is mandatory in all Horizon Europe projects and must be updated regularly and explain:

1. Data used or generated including type and format, purpose, size, origin, and potential
2. FAIRness – Findability, Accessibility, Interoperability, Reusability
3. Other research outputs – software, models, new materials, etc.
4. Allocation of resources – costs associated with compliance, responsible individuals, etc.
5. Data security – security, storage, and recovery during and after
6. Ethics – ethical or legal issues, GDPR (personal and sensitive data), consent
7. Other issues

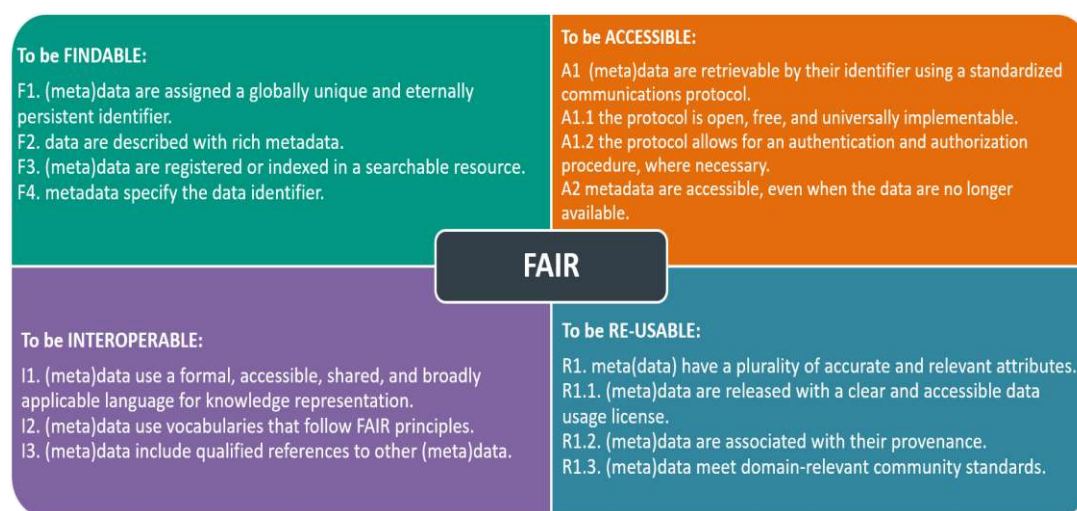


FIGURE 1. FAIR GUIDING PRINCIPLES

¹ Wilkinson et al. (2016) The FAIR Guiding Principle for scientific data management and stewardship Scientific Data 3: 160018 <http://doi.org/10.1038/sdata.2016.18>

2.2 Open Science

The DMP defines management of digital assets under the wider principles of open science, where sharing of knowledge, results, etc. is achieved as early as possible to maximise findability as well as re-use and to foster greater transparency and trust. Open science aims to encourage greater collaboration (access and interoperability), leading to greater transparency, impact, efficiency, and value for money. The open science concept also includes the practice of open access publishing, which means providing online access that is free-at-the-point-of-use. However, open science also recognises that some data and/or digital assets cannot be published immediately or in full because of factors such as personal and sensitive data (GDPR) or protection of intellectual property (i.e., trade secrets, trademarks, copyright, or patents). Thus, in practice, data including meta-data and digital objects should be ‘as open as possible and as closed as necessary’.

2.3 *Zero Hidden Hunger EU* DMP

Data and digital assets generated by *Zero Hidden Hunger EU* will be made available as early as possible and will be as open as possible but as closed as necessary. This will be achieved using, for example, trusted repositories (e.g., Zenodo) that ensure long-term preservation (min. 5 years), provide stable persistent identifiers (e.g. DOIs), and support open licences. All outputs (e.g., datasets, digital objects, publications) will be sign-posted from the project website (<https://www.zerohiddenhunger.eu>) regardless of where they are published/archived. Exceptions will be limited to datasets with proscriptive data transfer agreements that cannot be anonymised under the ‘motivated hacker’ principle described in Regulation (EU) 2016/679 (GDPR), or digital assets with intellectual property protection (trade secrets, trademarks, copyright, or patents) that is not yet complete. Regardless, metadata, specifically contact information for owners/providers, will be made available to promote findability and, subsequently, access and re-use.

Open access publications are required (see 2.5 Publication Monitoring), and submission of study protocol(s) and statistical analysis plan(s) are encouraged, based on study type and local rules. All articles and dissemination and communications materials will be published on the project website and in a [Zero Hidden Hunger EU Zenodo Community](#), as will public deliverables. Code and software will be published on GitHub or GitLab, as appropriate, but sign-posted from the Zenodo Community and project website. All publications will include a data availability statement, linked to digital objects and/or providers. To make data more interoperable, common format and standards used will be use throughout or elaborated as part of the meta-data.

Relevant datasets will also be listed in [FNS Cloud](#) catalogues, which signposts food and nutrition security user communities to FAIR resources.

2.4 Intellectual Property

The *Zero Hidden Hunger EU DMP* defines intellectual property (IP) and how it will be managed.

According to the World Intellectual Property Organization [WIPO] (2023), IP refers to “creations of the mind, such as literary and artistic works; designs; and symbols, names and images used in commerce”. In the case of universities and research institutes, IP disseminates knowledge and allows use in the economic sector (recognition and/or financial benefit) but also helps to protect provenance and reputation. Prevention of unauthorised exploitation is limited unless organisations are willing to engage in legal proceedings, but these proceedings are easier and simpler with pan-EU IP protections in place. IP law includes:

- Patent is an exclusive right granted for an invention that excludes others from making, using, or selling an invention for a limited period. In exchange, the patent owner makes technical information (enabling disclosure) about the invention publicly available.
- Trademark is unique symbol or words representing an organisation or product.
- Copyright describes rights that creators have over their works including computer programmes, databases, websites, etc.
- Trade secrets are IP rights on confidential information that may be sold or licensed.

As part of Task 9.1: Data and Innovation Management, and within the *Zero Hidden Hunger EU DMP*, information about Background IP (incoming data and digital objects) and Foreground IP (generated data and digital objects) will be elaborated fully to support exploitation (i.e., re-use, licencing, IP protection). The project Joint Coordinators (Máiréad Kiely and Kevin Cashman) have ownership of the DMP, supported by EuroFIR (BE; Siân Astley) and UCCAC (IE) with input from all partners. UCC (IE) will oversee IP protection (trade secrets, trademarks, copyright, or patents) and knowledge management with support of the UCC Technology Transfer Office (IE).

2.5 Publication Monitoring

Under open science, there is no obligation to publish, but results that are published must be open access. Providing open access to peer-reviewed publications is mandatory in Horizon Europe.

The *Zero Hidden Hunger EU DMP* includes aspects of monitoring publications, whether peer-reviewed or otherwise. To achieve this, partners need to provide prior notice of publications (not including social media posts) and report all dissemination and communication activities for Continuous and Periodic Reporting. Dissemination activities including but not restricted to publications and presentations are governed by the procedure of 8.4 Dissemination of the Zero Hidden Hunger EU Consortium Agreement and Articles 16 and 17 of the Grant Agreement. The *Zero Hidden Hunger EU Dissemination & Publication Guidelines* (Appendix B below), and also included in the Project Management Handbook, describe comprehensive rules for publishing outputs and other dissemination and communication activities. These guidelines will help avoid any

breaches of the Grant and Consortium Agreements, IP rights, or inaccurate or inconsistent representation of the consortium and project outputs.

2.6 Resources

The *Zero Hidden Hunger EU* DMP includes financial aspects of digital asset management. It will be necessary to define how publication and long-term preservation will be ensured, i.e., who decides, how and what data/other research outputs will be kept and for how long, and costs for making them FAIR (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.). Publication and curation costs are eligible under Horizon Europe and, whilst UCC is responsible for both digital asset management and quality assurance, costs are included under the WP budgets. Where these have not been foreseen, alternative funding will be identified in the DMP.

2.7 Data Security

The *Zero Hidden Hunger EU* DMP defines how digital assets will be secured, including what provisions are or will be in place for recovery as well as secure storage/archiving and transfer of sensitive data, and where data will be stored. The *Zero Hidden Hunger EU* Grant and Consortium Agreements govern interactions with and obligations of partners relating to confidentiality, data breaches, and data protection. More specifically, a data breach protocol has been developed (See Appendix D), to be circulated to the consortium, that describes implementation of relevant clauses in the *Zero Hidden Hunger EU* Grant and Consortium Agreements, legal obligations (e.g., General Data Protection Regulation [GDPR {EU} 2016/679], national laws [Data Protection Act 2018 (United Kingdom), Swiss Federal Data Protection Act 2020, Personal Data Protection Act (Article 23) (Republic of Serbia)], and partners' policies and procedures.

2.8 Ethical and Legal Issues

Zero Hidden Hunger EU will not use any data without explicit informed consent for future use(s) and protect the rights of individuals specified under data protection legislation regardless of location.

The *Zero Hidden Hunger EU* DMP considers ethical or legal issues potentially arising from research activities. These include applications for research activities and related governance (i.e., design and implementation of studies, respect towards society and volunteers or patients, use of resources and research outputs after completion of the study, scientific misconduct, etc.). They also include data management (i.e., privacy, confidentiality) and processing of personal or sensitive data.

Personal data is any information related to an identified or identifiable natural person (i.e., name, number, location, online identifier, or characteristics that express physical, physiological,

commercial, cultural or social identity; e.g., telephone no., credit card, personnel number, account data, number plate, appearance, customer number, timesheets, IP address, written answers, opinions, etc.). Sensitive data (i.e., genetic, biometric and health data, as well as personal data revealing racial and ethnic origin [ancestry information], political opinions, religious or ideological convictions or trade union membership) are subject to greater protection. Regulation (EU) 2016/679 (GDPR) requires anonymisation or pseudonymisation of stored data. Anonymised personal data have no identifiable object(s) (encrypted or removed) with the purpose of preserving privacy and is not subject to GDPR regulations. Where personal data are kept separately, and subject to technical and organisational measures to ensure non-attribution to an identified or identifiable individual, data are under pseudo-anonymisation, i.e., a motivated individual could identify an individual, and GDPR remains applicable. Most sensitive data can only be pseudo-anonymised, meaning publication, transfer, etc. require informed consent.

3. Zero Hidden Hunger EU DMP

By design, *Zero Hidden Hunger EU* is a highly data-rich project and thus a comprehensive DMP is of paramount importance. The *Zero Hidden Hunger EU* DMP outlines ways in which digital objects (i.e., datasets, databases, algorithms, code, software, etc.) are Background (incoming) or Foreground (collected or generated) and processed to maximize FAIRness. In parallel with this DMP, EuroFIR is also elaborating potential exploitation pathways for results including digital objects to benefit user communities.

This first iteration (D9.1) will be elaborated continuously, leading to the updated *Zero Hidden Hunger EU* DMP (D9.2) in M24. Subsequent activities in Task 9.1 will elaborate digital objects brought into or generated by the project including owner(s)/provider(s), source, format, size, location (i.e. repository [e.g. Zenodo, GitLab], server (e.g. beneficiary URL), standards applied (e.g. FAIR & TRL assessments), and terms and conditions for use (e.g. Open, licence, trademark, copyright), and whether personal and sensitive data are included (in line with GDPR and country of origin regulations) or other confidential information, informed consent for re-use, dissemination/exploitation plans, and any associated costs for maintenance, update, and ongoing security.

Zero Hidden Hunger EU is using diverse types of observation and experimental data including:

- 1) Re-use of existing individual-level micronutrient (MN) intake and status from representative nutrition surveys; epidemiological cohort studies, research databases, and biobanks;
- 2) Re-use of existing MN data from the [EFSA Comprehensive European Food Consumption Database](#) and associated [EU Menu Food Consumption Database](#); detailed consumption data from 34 national food consumption surveys representing 66,492 individuals from 22 EU member states.

Specifically, *Zero Hidden Hunger EU* will generate individual-level MN data for:

- 1) Status via *de novo* biochemical analysis of biobanked samples from representative nutrition surveys and epidemiological cohort studies.
- 2) Intake with 400 migrant volunteers in Spain and Greece.
- 3) Vitamin K bioavailability from a cross-over design intervention study.

All existing MN status and newly measured status values will be anonymised or pseudo-anonymised – as achievable – in the master GDPR-compliant database (*Zero Hidden Hunger EU* Individual Participant Database [IPD] database) hosted by UCC (IE; WP2). Further, to enable prediction of prevalences of MN deficiency in European countries and regions, advanced prediction modelling will be developed to exploit the *Zero Hidden Hunger EU* IPD datasets (WP4). Two-dimensional spatial modelling and smoothing will be used to generate maps of Europe showing how MN deficiencies vary overall and within population subgroups. Data on usual nutrient

intakes and estimates of inadequate intakes will be produced (WP3) and strategies to prevent MN deficiency using diet optimisation and other food intake data modelling techniques will be developed (WP6).

Currently available and future information will be added to the comprehensive DMP Excel spreadsheet (Appendix A), which considers all aspects of *Zero Hidden Hunger EU* digital assets.

3.1 Methodology

To get a comprehensive overview of diverse digital objects associated with *Zero Hidden Hunger EU* (both incoming and likely to be generated), EuroFIR started collecting information about development and management using the Grant Agreement (Table 1.2). Building on this information, online searches were performed to complete missing information such as owners and terms and conditions for use. This proved to be challenging as most websites do not state such information explicitly or mention only organisations that conducted and/or funded surveys. Information will be checked with providers directly during guided interviews.

Some information was obtained during the DMP workshop (7th May 2024, 10:30-13:00 CEST), where the underlying concepts of open science and the *Zero Hidden Hunger EU* DMP specifically were explained (Appendix C). Partners were asked several questions to gain insights into their overall understanding of the concepts and related activities. Answers are not included in this Deliverable as they are not anonymised to allow follow-up. However, in general, participants showed good understanding of data management and agreed to participate in guided interviews to share information about digital assets they are using or will generate during the project.

The final step in gathering information will be guided interviews, reaching out to providers directly to inquire about missing information. Starting from September 2024 (M9), EuroFIR will undertake a series of online meetings with providers guiding them through a discussed designed to elicit information about their digital object (e.g., owner, provides, FAIRness, IP, resources, data security and ethics) before, during, and after the project.

4. Conclusions

Zero Hidden Hunger EU is a highly data-rich project, and the comprehensive DMP is a living document describing, primarily, data and digital objects coming into or being generated by the project. As part of Task 9.1 activities, however, EuroFIR is also elaborating exploitation pathways for key results and other outputs and monitoring dissemination and communication. To get a comprehensive overview of diverse digital assets associated with *Zero Hidden Hunger EU*, information was collected from the Grant Agreement (Table 1.2) and expanded using targeted online searches. Some details were also obtained during the DMP workshop (7th May 2024), when partners showed good understanding of data management and agreed to participate in guided interviews, which will elicit more information about development and exploitation of data and key exploitable results before, during, and after the project that is essential for exploitation including re-use. All currently available information is in the comprehensive DMP Excel spreadsheet (Appendix A). This is the first version of the mandatory comprehensive DMP, which will be updated continuously throughout the project, leading to the updated DMP (D9.2, M24).

5. Appendix A – Zero Hidden Hunger EU digital objects

5.1 Datasets coming into Zero Hidden Hunger EU [note: detailed characterization of these planned for DMP V2 (Deliverable 9.2)]

| Dataset | Country | Age Group | Datapoints | Funding | MN status | Biosamples | LINK | Owner |
|---|---------|-----------|------------|----------|--------------------------|------------|--|---|
| Children and adolescents | | | | | | | | |
| The Cork Baseline Birth Cohort Study (Baseline) | IE | 2 & 5y | 1.200 | National | Yes | Yes | https://www.infantcentre.ie/research/research-studies/baseline/ | This research was funded by the National Children’s Research Centre. |
| GENESIS Study (2004-2005) | GR | <1-5y | 2.300 | Private | No (MN intake estimates) | No | Link to article PDF: https://www.researchgate.net/publication/46108083_Comparison_of_two_methods_for_identifying_dietary_patterns_associated_with_obesity_in_preschool_children_The_GENESIS_study | Harokopio University of Athens The GENESIS study was supported by a Research Grant from Friesland Foods Hellas. |
| CORALS study | ES | 3-6y | 2.000 | National | No (MN intake estimates) | Yes | https://corals.es/ | CORALS is a joint initiative of the Danone Institute and CIBERobn. CIBER, the Spanish Biomedical Research Centre in Physiopathology of Obesity and Nutrition, is a public research consortium which was founded on November 28, 2006, and financed by the Instituto de Salud Carlos III and the Ministerio de Ciencia e Innovación. |

| | | | | | | | | |
|--|----|---------|--------|----------|-----------------------------|-----|---|---|
| National Diet and Nutrition Survey (NDNS): Rolling Programme | UK | 1.5-18y | 3000 | National | Yes (+ MN intake estimates) | No | https://www.gov.uk/government/collections/national-diet-and-nutrition-survey | Responsibility for the National Diet and Nutrition Survey moved from Public Health England to the Office for Health Improvement and Disparities (OHID) on 1 October 2021. OHID and the UK Food Standards Agency (FSA) jointly fund the UK NDNS. |
| Study on the health of children and adolescents in Germany (KIGGS) | DE | 3-17y | 10.000 | National | Yes | No | https://www.rki.de/EN/Content/Health_Monitoring/HealthSurveys/Kiggs/Kiggs_no_de.html#:~:text=The%20KIGGS%20baseline%20study%20was,from%20167%20communities%20were%20enrolled. | The data was collected by the Robert Koch Institute. |
| Healthy Growth Study (HGS) | GR | 9-13y | 2.300 | National | Yes (+ MN intake estimates) | Yes | Link to article PDF: https://www.sciencedirect.com/science/article/pii/S2214750021001554#:~:text=The%20Healthy%20Growth%20Study%20(HGS,2006) | Conducted by - International Hellenic University (Thessaloniki), Aristotle University of Thessaloniki, Harokopio University (Athens), La Trobe University (Victoria, Australia) and Institute of Agri-food and Life Sciences, Hellenic Mediterranean University Research Centre (Heraklion, Greece). This study was co-financed by the European Union (European Social Fund e ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) - Research Funding Program: Heraclitus II. Investing in knowledge society through the European Social Fund. |

| | | | | | | | | |
|--|-------|--------|---------|----------|-----------------------------|-----|---|---|
| National Teens' Food Survey II [2019] | IE | 13-18y | 246 | National | Yes (+ MN intake estimates) | No | https://www.cremeglobal.com/iuna-irish-universities-nutrition-alliance-national-teens-food-survey-database-intake-and-exposure-datasets/ | The survey was planned and carried out by the nutrition units in University College Cork and University College Dublin, which are a part of the Irish Universities Nutrition Alliance (IUNA). |
| UK Royal College of General Practitioners (RCGP) cohort | UK | 1-18y | 198.000 | National | Yes (+ MN estimates) | No | | University of Surrey |
| Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) | Multi | 12-17y | 1.006 | EC FP6 | Yes (+ MN intake estimates) | Yes | https://cordis.europa.eu/project/id/7034 | Funded under - FP6-FOOD - Food Quality and Safety: Thematic priority 5 under the Focusing and Integrating Community Research programme 2002-2006. Coordinated by University of Zaragoza |
| Dutch National Food Consumption Survey 2012-2016 (DNFCS) | NL | 1-18y | 2.235 | National | No (MN intake estimates) | No | https://www.rivm.nl/en/dutch-national-food-consumption-survey/overview-surveys/dnfcs-2012-2016 | Conducted by - National Institute for Public Health and the Environment, RIVM Performed by order and for the account of Ministry of Health, Welfare and Sports within the framework of 5.4.1. Monitoring food consumption in the domain of Nutrition and Health. Co-supported by EFSA, under contract CFT/EFSA/DCM/2012/01-CT02 'Support to national dietary surveys in compliance with the EFSA Guidance on General principles for the collection of national food consumption data in the view of a pan-European dietary survey'. |

| | | | | | | | | |
|---|----|--------|--------|----------|-----------------------------|----|---|---|
| EFSA EU Menu - infants, toddlers, and children (BE, CY, EE, FR, HU, IT, LV, PT, SI, ES, RS, ME, MK) | EU | 0-10y | 13.415 | EFSA | No (MN intake estimates) | No | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |
| EFSA EU Menu - adolescents (AT, BE, CY, EE, FR, GR, HU, IT, LV, NL, PT, RO, SI, ES, RS, BA, ME) | EU | 10-18y | 9.674 | EFSA | No (MN intake estimates) | No | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |
| Women of reproductive age* and elderly | | | | | | | | |
| Austrian National nutrition survey 2012 | AT | 6-80y | 872 | National | Yes (+ MN intake estimates) | No | Link to PDF in German - https://ernaehrungsbericht2016.univie.ac.at/fileadmin/user_upload/dep_ernaehrung/forschung/ernaehrungsberichte/oesterr_ernaehrungsbericht_2012.pdf | Conducted by - Institute of Nutritional Sciences, University of Vienna, on behalf of the Federal Ministry of Health |

| | | | | | | | | |
|--|----|----------|---------|----------|-----------------------------|-----|---|---|
| National Adult Nutrition Survey (NANS) | IE | 18-90 y | 1.200 | National | Yes (+ MN intake estimates) | Yes | Link to Report PDF - https://irp-cdn.multiscreensite.com/46a7ad27/files/uploaded/The%20National%20Adult%20Nutrition%20Survey%20Summary%20Report%20March%202011.pdf | Conducted by - Irish Universities Nutrition Alliance (IUNA). The funding was provided under the Food for Health Research Initiative (FHRI). The FHRI is a joint initiative established by the Department of Agriculture, Fisheries & Food, the Department of Health & Children, and the Health Research Board. The FHRI is supported by funds provided under the Strategy for Science, Technology and Innovation 2006-2013 for linked public sector research, the Food Institutional Research Measure and the HRB. |
| National Diet and Nutrition Survey (NDNS): Rolling Programme | UK | 18+ y | 5.000 | National | Yes (+ MN intake estimates) | No | https://www.gov.uk/government/collections/national-diet-and-nutrition-survey | Responsibility for the National Diet and Nutrition Survey moved from Public Health England to the Office for Health Improvement and Disparities (OHID) on 1 October 2021. OHID and the UK Food Standards Agency (FSA) jointly fund the UK NDNS. |
| UK Royal College of General Practitioners (RCGP) cohort | UK | All ages | 344.000 | National | Yes (+ MN intake estimates) | No | | University of Surrey |
| Study on the Health of Adults in Germany (DEGS) | DE | 18-89y | 7.000 | National | Yes | No | https://www.rki.de/EN/Content/Health_Monitoring/HealthSurveys/Degs/degs_no_de.html#:~:text=The%20aim%20of%20the%20DEGS,risk%20factors%20and%20healthcare%20problems. | The data was collected by the Robert Koch Institute. |

| | | | | | | | | |
|---|-------|--------|--------|----------|-----------------------------|-----|---|--|
| Healthy Finland 2022-23 | FI | 18+y | 1.700 | National | No (MN intake estimates) | Yes | https://thl.fi/en/research-and-development/research-and-projects/healthy-finland-survey | Conducted by - Finnish Institute for Health and Welfare (THL) |
| European Prospective Investigation into Cancer & Nutrition (EPIC) | Multi | ≥35y | 3.400 | WHO | Yes (+ MN intake estimates) | No | https://epic.iarc.fr/ | The coordination of EPIC-Europe is financially supported by the International Agency for Research on Cancer (IARC) and also by the Department of Epidemiology and Biostatistics, School of Public Health, Imperial College London (United Kingdom), which has additional infrastructure support provided by the National Institute for Health and Care Research (NIHR) Imperial Biomedical Research Centre (BRC). The national cohorts are supported by: https://epic.iarc.fr/funding/ |
| Folate-women-Serbia | RS | 18-64y | 216 | National | No (MN intake estimates) | No | Link to possible article PDF - https://faseb.onlinelibrary.wiley.com/doi/abs/10.1096/fasebj.27.1_supplement.lb289 | Institute for Medical Research, Belgrade, Serbia. Source of research support: Ministry of Science, Serbia. |
| EFSA EU Menu - elderly (NL, HU, FR, IT, LV, ME, RS, CY, RO, SI, ES, GR) | EU | 65 y + | 4.498 | EFSA | No (MN intake estimates) | No | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |
| EFSA EU Menu - women aged 18-64 y | EU | 18-64y | 10.000 | EFSA | No (MN intake estimates) | No | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |
| Pregnancy | | | | | | | | |

| | | | | | | | | |
|---|-------|--------|-------|---------------|--------------------------|-----|--|--|
| IMproved PRegnancy Outcomes by Early Detection (IMPROVED) | Multi | 18-47y | 4.063 | EC FP7 Health | Yes | Yes | https://cordis.europa.eu/project/id/305169 | Funded under - FP7-HEALTH - Specific Programme "Cooperation": Health Coordinated by University College Cork |
| EDIA Study | FI | Adult | 300 | NIH | No | Yes | https://www.tuni.fi/en/research/early-dietary-intervention-and-later-signs-beta-cell-autoimmunity-edia | Tampere University (to be confirmed) Contact person - Suvi Virtanen, Research professor / Corresponding of the nutrition part of the study - suvi.virtanen@thl.fi |
| Pregnancy - North and South Finland | FI | Adult | 2.000 | National | No (MN intake estimates) | No | | University of Surrey |
| Spanish National dietary survey - pregnant women (ENALIA 2) | ES | Adult | 133 | EFSA | No (MN intake estimates) | No | https://www.aesan.gob.es/en/AECOSAN/web/seguridad_alimentaria/subdetalle/enalia_2.htm Link to PDF - https://www.aesan.gob.es/AECOSAN/docs/documentos/seguridad_alimentaria/evaluacion_riesgos/Spanish_National_dietary_survey_adults_elderly_pregnant.pdf | Developed by the Spanish Agency for Consumer Affairs, Food Safety and Nutrition, within the European framework, and was co-financed by the EFSA). |
| EFSA EU Menu pregnant-Serbia | RS | 15-49y | 145 | EFSA | No (MN intake estimates) | No | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |
| EFSA EU Menu | ME | 15-49y | 200 | EFSA | No (MN intake) | No | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |

| pregnant-Montenegro | | | | | estimates) | | | |
|--|----|--------|-----|------|--------------------------|----|---|------|
| EFSA EU Menu pregnant-Bosnia & Herzegovina | BA | 15-50y | 134 | EFSA | No (MN intake estimates) | No | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |

| Nutritionally vulnerable due to ethnicity or socioeconomic reasons | | | | | | | | |
|--|-------------------------|----------|---------|----------|-----------------------------|-----|---|---|
| Healthy Life in an Urban Setting (Helius) Study | NL | 18-70y | 24.789 | National | Yes (+ MN intake estimates) | No | https://www.heliusstudy.nl/ | HELIUS is an EU-funded initiative of Academic Medical Center (AMC), Amsterdam University Medical Center (Amsterdam UMC) and Public Health Service of Amsterdam (GGD Amsterdam). |
| UK Biobank Ethnic subgroups | UK | 40-69y | 5.300 | National | Yes (+ MN intake estimates) | Yes | Link to possible PDF article - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10892867/pdf/nutrients-16-00523.pdf | Conducted by - University of Surrey Funding: This research received no external funding. |
| UK Royal College of General Practitioners (RCGP) cohort: Ethnic | UK | All ages | 110.000 | National | Yes (+ MN intake estimates) | No | | University of Surrey |
| Feel4 diabetes-study (low SES, immigrant/migrant) | Multi | 6y + | 850 | EU | Yes | Yes | https://feel4diabetes-study.eu/ | Project Office: Harokopio University (Project Coordinator: Professor Yannis Manios - manios@hua.gr) EU-funded study (HORIZON2020) |
| Chance -Risk of Poverty and Affluent | RS | Adults | 450 | Serbia | No (MN intake estimates) | No | | |
| MNs database of the WHO Vitamin and Mineral Nutrition | 53 countries of the WHO | | | | | | https://www.who.int/teams/nutrition-and-food-safety/databases/vitamin-and-mineral-nutrition-information-system | World Health Organisation (WHO) |

| Information System | European region | | | | | | | |
|---|-----------------|--|--------|--|--|--|---|---|
| ODIN project vitamin D database | | | | | | | https://cordis.europa.eu/project/id/613977 | Funded under - FP7-KBBE - Specific Programme "Cooperation": Food, Agriculture and Biotechnology Coordinated by University College Cork |
| EFSA Comprehensive European Food Consumption Database | 22 EU MS | | 66.492 | | | | https://www.efsa.europa.eu/en/data-report/food-consumption-data | EFSA |

| | | | | | | | | | | | | | | | | | | | | |
|--|------|---------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| WP2 - Micronutrient status in Europe - Biomarker data collection and analysis | T2.1 | | Coordination of MN status activities. | | | | | | | | | | | | | | | | | |
| | T2.2 | Master IPD database | Acquisition of existing MN status IPD. Existing IPD on status markers and associated intake estimates for priority MNs in available studies will be acquired (via Data Transfer Agreements) and transferred to a master IPD database. | | | | | | | | | | | | | | | | | |
| | T2.3 | Master IPD database | De novo analysis of MN status markers. Bio-fluid/biospecimen samples will be received for analysis (under Material Transfer Agreements) from relevant surveys, studies and biobanks and will undergo MN marker analysis. | | | | | | | | | | | | | | | | | |
| | T2.4 | Master IPD database | MN status marker data handling and management. All existing MN status marker and intake values (Task 2.2) and newly measured status marker values (Task 2.3) will be included in the master IPD database. | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|------|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| WP3 - Micronutrient intakes in Europe - Dietary analysis | T3.1 | | MN Intake Data Management and Transfer. | | | | | | | | | | | | | | | | | |
| | T3.2 | | Analysis of the EFSA Comprehensive European Food Consumption Database. Will match available food consumption data from EU Menu with EuroFIR food composition data to obtain estimates of MN exposure and food sources at the IPD level. | | | | | | | | | | | | | | | | | |
| | T3.3 | | MN intakes in population cohorts. This analysis will be repeated in population cohorts deemed suitable based on meeting the minimum level of detail needed for intake assessments. | | | | | | | | | | | | | | | | | |
| | T3.4 | | Dietary data analysis. Distributions of nutrient intakes will be generated and the prevalence of inadequate intakes of MNs using EFSA DRVs will be calculated, and sensitivity analysis will be conducted using adapted DRVs based on population characteristics. | | | | | | | | | | | | | | | | | |
| | T3.5 | | Supplemental literature review. Comprehensive systematic literature review will be designed based on data gap analysis outcomes to ensure completeness of the coverage provided. | | | | | | | | | | | | | | | | | |
| | T3.6 | | Multi-site dietary study among targeted migrant groups. New dietary data will be collected among 400 first generation migrant groups in Greece and Spain, using standard EFSA dietary data collection methods compatible with EU Menu specifications, and supported by metadata collection. | | | | | | | | | | | | | | | | | |

| | | |
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| WP4 - Prevalence of micronutrient deficiencies in Europe: Characterization and mapping | T4.1 | Data cleaning and harmonization. The IPD database from WP2 will be cleaned to detect incomplete, incorrect, biologically implausible, or other data quality issues, and data will be harmonized (all to be documented in the DMP). |
| | T4.2 | Definition of MN deficiency. Using the final IPD database, individuals with deficiencies in each of the MNs will be identified through dichotomization by applying existing sex- and other population-subgroup specific deficiency thresholds to biomarker concentrations. |
| | T4.3 | Imputation of unmeasured deficiencies. Applying multiple imputation methods will compensate for the uncertainty involved in imputing unmeasured values. Missing data for some MNs in some surveys can be compensated using complete data from other surveys within the overall database. |
| | T4.4 | Estimation of the true prevalence of MN deficiency for Europe. Hierarchical logistic mixed-effects regression models will be fitted to fully exploit the IPD database to provide accurate and representative global estimates for Europe. |
| | T4.5 | Mapping the prevalence of MN deficiency in European countries and regions. Prediction modelling extrapolation using matching on key summaries will enable prediction of estimated MN deficiency prevalences for countries and regions not covered by the surveys included in the IPD data. |
| | T4.6 | Prediction of MN deficiencies. With machine learning approaches using metadata from the constituent WP2 and WP3 population studies and surveys, as well as outcomes of the dietary predictors of inadequate MN intakes in WP3, to inform WP5 and WP6. |

| | | |
|--|------|--|
| WP5 - The economic cost of micronutrient deficiencies and prevention in Europe | T5.1 | Data Identification and Collection. A comprehensive review of the published and grey literature will be conducted to identify relevant studies and data sources on cost of MN deficiencies and health impacts in Europe. |
| | T5.2 | Cost-of-illness Analysis. The prevalence of MN deficiency will be translated into disease categories using the Global Burden of Disease methodology and further translated into health expenditures using the OECD's method of calculating disease expenditures under the System of Health Accounts framework. |
| | T5.3 | Economic Evaluation. A decision analytic model will be used to compare the costs and health outcomes associated with the proposed strategies and compare them to the current practices. |
| | T5.4 | Policy Recommendations. The most cost-effective strategies will form the basis of recommendations for reducing the burden of MN deficiency in Europe with guidance on allocation of resources. |

| | | | |
|--|------|---|---|
| WP6 - Dietary modelling to shift towards healthier diets and reduce nutritional inequalities: Impact on micronutrient deficiencies in Europe | T6.1 | Databases of individual participant food and nutrient intake data and/or biomarker status | Assembling suitable database(s). Databases of individual participant food and nutrient intake data and/or biomarker status data will be compiled from the outcomes of WP2, WP3, and WP4 and prepared for dietary modelling. |
| | T6.2 | | Develop integrated dietary modelling strategies. Identifying, accessing, and integrating vulnerable populations in a multi-stakeholder process towards defining acceptable and feasible dietary approaches that respect human health and planetary boundaries. |
| | T6.3 | | Expanding current modelling tools. Construct dose-response models to enable impact assessment of dietary models on nutrient intakes and biomarkers of status, both contributing to the estimates of MN deficiencies. Develop models to estimate the time required to recover from MN deficiencies. |
| | T6.4 | | Dietary modelling and scenario analyses. Scenarios emerging from Task 6.2 will be constructed as integrated dietary models, using diet optimization by multiple goal linear programming. |
| | T6.5 | Update current available composition tables | Intakes of bioavailable iron and zinc from future diets. Expand data on the nutrient composition of foods to include dietary factors that modify Fe & Zn bioavailability (e.g. polyphenols and phytate), to estimate Fe/Zn bioavailability in foods, and update current available composition tables. |

| | | | |
|---|------|--|---|
| WP7 - Micronutrient bioavailability and metabolism, role of the gut microbiome, and novel biomarkers for micronutrient status | T7.1 | | Contribution of vitamin K2 to overall vitamin K status – bioavailability. The cross-over design study will assess 72-hour post-prandial response using ¹³ C-labelled vitamin K compounds to investigate bioavailability of vitamin K vitamers. |
| | T7.2 | | Point-of-collection analytical methods for population micronutrient status assessment. Pilot study to advance the development of less invasive methods to collect biological specimens and minimize the amount of material that is required for laboratory analyses. |
| | T7.3 | | Defining functional micronutrient deficiencies using biomarker-based algorithms. Develop predictive risk indicators of functional deficiency that can be applied to various population groups with valid biomarker data and functional outcomes available. |
| | T7.4 | | Novel metabolomic markers of Ca nutritional status. A robust strategy for biomarker identification and validation with metabolomics will be performed on an existing well-identified biobanked blood samples from the EPIC cohort and used to develop new metabolite patterns associated with Ca intake/status. |

6. Appendix B – Zero Hidden Hunger EU Dissemination & Publication Guidelines

[Note: Some information has been redacted from this version of the Publication Guidelines to support confidentiality and security of project data.]

Zero Hidden Hunger Dissemination & Publication Guidelines

The following definitions are used in these guidelines.

Dissemination: public disclosure of the results by appropriate means (other than resulting from protecting or exploiting the results), including by scientific publications in any medium.

Exploitation: use of results in further research and innovation activities other than those covered by the action concerned, including among other things, commercial exploitation such as developing, creating, manufacturing, and marketing a product or process, creating, and providing a service, or in standardisation activities.

Results: any tangible or intangible effect of the action, such as data, know-how or information, whatever its form or nature, whether it can be protected or not, as well as any rights attached to it, including intellectual property rights.

Dissemination activities including but not restricted to publications and presentations are governed by the procedure of 8.4 Dissemination of the Zero Hidden Hunger EU Consortium Agreement and Articles 16 and 17 of the Grant Agreement.

Prior notice of most planned publications (see types 1-10 below) shall be made at least 45 calendar days before submission of the publication and at least 15 days before submission of poster presentations, slides, and abstracts for oral presentations at scientific meetings (type 11 below).

Any objection to planned publications for types 1-10 shall be made in accordance with the Consortium Agreement in writing to the Joint Coordinators at the Coordinating Organisation and to the Party or Parties proposing the dissemination within 30 calendar days after receipt of the notice. Any objection to planned publications for types 11 shall be made in accordance with the Consortium Agreement in writing to the Joint Coordinators at the Coordinating Organisation and to the Party or Parties proposing the dissemination within 10 calendar days after receipt of the notice.

If no objection is made within the time limit stated above, the publication is permitted.

Zero Hidden Hunger EU intends that the contributions of all consortium members are recognised and that joint efforts are acknowledged appropriately. These guidelines aim to support publications of all types whilst ensuring fairness for all consortium members and the quality of publications.

Following these guidelines will help to avoid any breach of the Grant and Consortium Agreements, intellectual property rights and agreements, and inaccurate or inconsistent representation of the consortium members or the project.

1. Types of publication

These guidelines cover all dissemination and most communications derived from activities funded by Project No. 101137127 Zero Hidden Hunger EU including but not limited to:

1. Scientific publications prepared using data or other results derived from Zero Hidden Hunger EU
2. Articles appearing in trade journals and other magazines including online
3. Book chapter(s) describing *Zero Hidden Hunger EU* activities
4. Software, source code, algorithms, dataset (as part of a publication or independently) including collaborative workspaces accessible by organisations that are not Zero Hidden Hunger EU Participants
5. Critical reviews or other publications appearing in peer-reviewed journals including online
6. Doctoral and Master theses
7. Patents
8. Press releases and other media activities including television, radio and online media (not including social media)
9. Technical reports (confidential and non-confidential)
10. Webpages or other online publications
11. Written or oral/ poster abstracts/ presentations given at conferences, symposia or meetings at the local, national, regional or international levels.

2. Open Science

For more information, visit <https://bit.ly/4aoG7KE> (accessed 24.03.2024)

Providing open access to peer-reviewed publications is mandatory in Horizon Europe.

In fact, Horizon Europe moves beyond open access to open science.

Mandatory open science practices in *Zero Hidden Hunger EU* include:

- Open access to scientific publications
- Responsible management of research data in line with the FAIR principles
- Information about research outputs needed to validate conclusions
- Digital or physical access to the results needed to validate the conclusions of scientific publications unless exceptions apply.

Open access publication can be achieved through preregistration, registered reports, and pre-prints as well as open access journal publication. If open access is not achieved, a justification must be provided including that for data (e.g., disclosure of sensitive data).

Open access to other research outputs such as software, models, algorithms, workflows, protocols, simulations, electronic notebooks, and others is not required but is strongly recommended. Access to 'physical' results like cell lines, biospecimens, compounds, materials, etc. is also strongly encouraged.

Disclosure information must be included for any publication to be valid.

3. Disclosure

Otherwise known as acknowledgement of funding - for more information, visit <https://bit.ly/3vgcVGV> (accessed 24.03.2024)

Disclosures must be of good quality, especially if included as an image in PowerPoint or similar.

The project name is "Tackling micronutrient malnutrition and hidden hunger to improve health in the EU" (Project No. 101137127). The Grant Agreement number is 101137127.

The project acronym is "Zero Hidden Hunger EU" - no underscores²

Participants are reminded there is a contractual obligation to acknowledge EU funding.

Dissemination of information and/ or knowledge generated by the Consortium shall explicitly state it was developed/ undertaken/ completed by Zero Hidden Hunger EU.

Tackling micronutrient malnutrition and hidden hunger to improve health in the EU (Zero Hidden Hunger EU) has received funding from the European Research Executive Agency Topic: HORIZON-CL6-2023-FARM2FORK-01-10 under Grant Agreement No. 101137127 - www.zerohiddenhunger.eu

Where possible the following disclaimer should also be included, i.e.,

Disclaimer: Co-funded by the European Union. The views and opinions expressed are however those of the author(s) and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

² Other acronyms are used internally (e.g., ZeroHH, ZHH, Zero-HH, etc.) and the official EC acronym includes the underscores. These should not be used for dissemination and communication outputs.

All reasonable efforts should also be made to include the following where appropriate:

- Tackling micronutrient malnutrition and hidden hunger to improve health in the EU (Zero Hidden Hunger EU) OR Zero Hidden Hunger EU
- Zero Hidden Hunger EU – see [branding guidelines](#) [*Link Redacted*], available in the WP8 Dissemination, Communication & Education folder on the project SharePoint
- Logo(s) from Zero Hidden Hunger EU consortium members, where relevant
- Website details – www.zerohiddenhunger.eu
- Keywords should include Zero Hidden Hunger EU, micronutrient(s) deficiency/ies, hidden hunger
- Co-funded by European Union and
 1. UKRI (logo [here](#) and brand information [here](#))
 - Quadram Institute Grant Number: 10109719
 - University of Surrey Reference Number: 10108303 under Competition: 1389: Horizon Europe Guarantee Extension.
 2. Secrétariat d’Etat à la formation, à la recherche et à l’innovation (SEFRI/SERI) Contract number 23.00649; Financement de la participation du/de la bénéficiaire au projet << Zero_HiddenHunger_EU >> de programme-cadre pour la recherche et l’innovation de l’Union européenne Horizon Europe sur le mode << projet par projet >> (SEFRI)/ This work has received funding from the Swiss Secretariat for Education, Research and Innovation (SERI) – logo and branding information [here](#)

Internal publications (e.g., presentations at meetings) are collective and should include the Zero Hidden Hunger EU logo and use the Zero Hidden Hunger EU Microsoft Office templates; this does not exclude additional of other logos. These activities should not be reported as dissemination and communication. Activities within an organisation might constitute dissemination or communication (e.g., departmental presentation) and should be reported.

Further information may be added if additional financial support was obtained from other sources. Where organisations and individuals are acknowledged their location or affiliation should be included, e.g., “This research was undertaken by EuroFIR AISBL (BE), a beneficiary in Zero Hidden Hunger EU, which has received funding from European Research Executive Agency Topic: HORIZON-CL6-2023-FARM2FORK-01-10 under Grant Agreement No. 101137127 – www.zerohiddenhunger.eu”

or

This work was undertaken within Zero Hidden Hunger EU WP2: Micronutrient status in Europe – Biomarker data collection and analysis (www.zerohiddenhunger.eu), which has received funding from European Research Executive Agency Topic: HORIZON-CL6-2023-FARM2FORK-01-10 under Grant Agreement No. 101137127 – www.zerohiddenhunger.eu

Where an individual from Zero Hidden Hunger EU is invited by an external organisation (i.e., not Zero Hidden Hunger EU consortium members), acknowledgments should detail the contribution of Zero Hidden Hunger EU funding and acknowledge the funding source, e.g., “Siân Astley (EuroFIR, BE) undertook dietary data analysis, nutrient content and contribution to the diet, described in this publication as a partner in Zero Hidden Hunger EU, which has received funding from European Research Executive Agency Topic: HORIZON-CL6-2023-FARM2FORK-01-10 under Grant Agreement No. 101137127 – www.zerohiddenhunger.eu”

4. Notification and Reporting

All publications arising from Zero Hidden Hunger EU must be approved prior to publication.

4.1 Notification – 45/15 days in advance of submission

Those engaging in dissemination and communication activities are asked to comply with Section 8.4 of Consortium Agreement, namely that prior notice of any planned publication shall be at least 45 calendar days before submission of the publication (Types of Publication 1-10) and at least 15 days before submission of abstracts and presentations (Types of Publication 11).

In addition, Participants must obtain the agreement of authors and other interested parties.

Notification and Reporting Processes

Submit a copy of the draft publication to the Joint Coordinators (UCC) (*Names and Emails Redacted*), Project Management Team (*Names and Emails Redacted*), and Task 8.1 Leader (*Names and Emails Redacted*) not less than (i) 45 days (publication types 1-10) or 15 days (publication type 11). You must also complete a notification form for peer-reviewed articles [*Link Redacted*] or similar at or communications activities [*Link Redacted*].

- Notification cannot occur without the draft publication, but consortium members are welcome to discuss pending publications, based on early notification (email) to the Coordinator and WP8 Leader.
- Authors and other interested parties' email addresses must be included with the notification.
- WPL for your Task must be informed regardless of whether they are an author.
- Publications may be circulated to the General Assembly, Executive Board and/or other project body for review and comments.
- Decisions arising from notification will come from the Joint Coordinators (*Emails Redacted*) and might include further changes before a publication can be presented/ submitted. A member of the Project Management Team may send the email on their behalf.
- For publication type 11, where the notification is 15 days, comments will be returned as soon as possible to ensure sufficient time to make any necessary changes.
- Publications must be revised as indicated and include any additional information.
- The amended publication must be sent to the Joint Coordinators (*Emails Redacted*) and WP8 Leader (*Name and Email Redacted*) prior to submission.

- Unless major changes and review have been recommended, the Joint Coordinators or WP8 Leader (either not both) will reply in the affirmative as soon as possible.

Reporting: AFTER publication a final copy must be reported online ([PEER-REVIEW](#) [*Link Redacted*] OR [COMMUNICATIONS](#) [*Link Redacted*]) as well as via email to the UCC Joint Coordinators (*Emails Redacted*), Project Management Team (*Names and Emails Redacted*), Task 8.1 Leader (*Names and Emails Redacted*) and WP8L via [*Name and Email Redacted*].

Notification and reporting forms are not the same

Any problems with submission should be directed to WP8 Leader [Name and Email Redacted].

All outputs must be indexed in the [Zero Hidden Hunger EU Zenodo Community](#), even if published elsewhere (e.g., GitHub). Outputs uploaded to Zenodo by the consortium must be linked to the Zero Hidden Hunger Zenodo Community. Otherwise, WP8 will upload outputs.

Social media posts must be reported as communications, but notification is not required.

If large numbers of social media posts are being generated, these can be bulk reported to [*Name and Email Redacted*] once a month or once a quarter.

The Joint Coordinators and WP8 Leader are willing to offer advice and help if these guidelines are not clear or authors have questions. Further, the role of the Joint Coordinators, jointly and severally with WP8 including Task 8.1 Leaders, is to encourage and support Zero Hidden Hunger EU consortium to disseminate, communicate and engage with stakeholders, rather to inhibit or block the process, but also to:

- Assure compliance with the Grant and Consortium Agreements
- Protect the Intellectual Property Rights of Zero Hidden Hunger EU and Zero Hidden Hunger EU consortium members
- Ensure accuracy and consistency of publications including branding and content
- Identify overlap with published papers or other publications in preparation.

Authors must ensure disseminated information/ published papers are freely available for internal use via the Zero Hidden Hunger EU SharePoint (*Link Redacted*), irrespective of publication embargoes.

Participants should inform the Joint Coordinators (*Emails Redacted*) and WP8 (*Emails Redacted*) about any other relevant information including but especially media coverage.

Project funded by

Schweizerische Eidgenossenschaft
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Swiss Confederation

Federal Department of Economic Affairs,
Education and Research: EAER
State Secretariat for Education,
Research and Innovation SERI

5. Check list (for each publication)

- Agreed authorship
- Draft publication
- Established notification period (45 or 15 calendar days)
- Complete notification form [*Link Redacted*] (peer-reviewed) or [*Link Redacted*] (communications)
- Informed Joint Coordinators (*Emails Redacted*) and Task 8.1 Leaders (*Names and Emails Redacted*), with Project Management Team on cc (*Emails Redacted*)
- Received comments
- Revised publication (if necessary)
- Submitted publication and determine date of publication
- Reported publication [[PEER-REVIEW](#) [*Link Redacted*]] OR [COMMUNICATIONS](#) [*Link Redacted*] as well as Joint Coordinators (*Emails Redacted*) Task 8.1 Leader (*Names and Emails Redacted*) and WP8L via (*Name and Email Redacted*), and Project Management Team (*Emails Redacted*)
- Publication is in the public domain
- Uploaded publication to [Zero Hidden Hunger EU Zenodo Community](#)

6. Rights to authorship

Acquisition of funding, collection of data or general supervision of the research group does not constitute authorship. Those designated as authors should qualify for authorship, as defined below, and all those who qualify should be listed. Each author should be willing and able to take public responsibility for appropriate portions of the content and must be informed in advance of submission for publication. Authorship should be based on:

- Substantial intellectual contribution to concept and design, and acquisition, analysis, or interpretation of data and/ or
- Drafting of the article or revising it critically for important content

When a large, multi-centre group has conducted the work, the group should identify individuals who accept responsibility for the content: these individuals should meet the criteria for authorship and complete journal-specific author and conflict-of-interest disclosure. Selection of contributing author(s) is at the discretion of the contributing institution, but consortium members are expected to nominate individuals who have made the most substantial contribution and qualify as authors as defined above. The corresponding author is responsible for identify authors clearly with the correct affiliations, and acknowledgements. Some journals place limits on numbers of authors for their publications. In these circumstances, it is necessary to:

- Agree the relative importance of each contributor to arrive at the final (limited) author list;
- Publish as *Zero Hidden Hunger EU Consortium*, where individuals and their affiliations are identified elsewhere in the manuscript;
- State the publication was in cooperation with [Insert names of individuals and their organization] *Zero Hidden Hunger EU* consortium members, as early as is reasonable possible (i.e., front page of the article);
- Include additional contributions in the acknowledgements.

Where possible, individuals or organisations that have provided products or services to generate results and/ or data should be recognised through acknowledgements.

Where an individual from *Zero Hidden Hunger EU* is invited by an external organisation (i.e., not Zero Hidden Hunger EU consortium members) to contribute to a publications using data generated during Zero Hidden Hunger EU and authorship offered (rather than

acknowledgements), activities of the Zero Hidden Hunger EU beneficiary must be elaborated in the acknowledgments. The aim should be to clarify the contribution of Zero Hidden Hunger EU funding in the scientific information that is published subsequently, e.g., analysis of data.

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Swiss Confederation

Federal Department of Economic Affairs,
Education and Research: EAER
State Secretariat for Education,
Research and Innovation SERI

7. Disputes and objections

Any objection to publications should be made in accordance with the Consortium Agreement, specifically in writing to the Joint Coordinators and to any Party concerned within 30/10 calendar days of notice.

If no objection is made within the stated time limit, the publication is permitted. However, the absence of an objection is not considered approval; Consortium Members must seek to obtain approval.

An objection – as defined by the Consortium Agreement – is justified if the:

- a) Protection of the objecting Party's Results or Background would be adversely affected;
- b) Objecting Party's legitimate interests in relation to the Results or Background would be significantly harmed;
- c) Proposed publication includes Confidential Information of the objecting Party.

Background: Information and knowledge including inventions, databases, etc. held by participants prior to their accession to the Grant Agreement of a project

Foreground: Results including information materials, knowledge, etc. generated in a project, which includes tangible (e.g. prototypes) and intangible (IPR) assets of a project.

The objection must include a precise request for necessary modifications.

The objecting Party can request a publication delay of not more than 90 calendar days from the time an objection is raised. After 90 calendar days, publication is permitted.

If an objection has been raised, the involved Parties must discuss how to overcome the objection (e.g. amendment including removal of disputed information) in a timely fashion (e.g. 45 days). The objecting Party must not continue opposition unreasonably if appropriate actions are performed.

Parties are requested to avoid publishing others' Foreground or Background even where Foreground and/ or Background is amalgamated with theirs without prior written approval. However, Parties also undertake to cooperate and allow timely consideration and submission of all dissemination including those containing Foreground and/ or Background.

Confidentiality and publication clauses must be respected. Organisations must not use the name, logo, or trademarks of other consortium members without their prior written approval.

The Coordinator (UCC, IE) will consider disputes and objections. Where a conflict of interest arises (e.g. objection is sourced from UCC), another member of the Executive Board may be nominated.

Decisions will be returned in 45 calendar days from notification of objection or dispute.

7. Appendix C – Zero Hidden Hunger EU DMP workshop 7 May 2024

Introduction to Zero Hidden Hunger EU Data Management Plan

When - Tuesday 7th May 09:30-12:00 BST/10:30-13:00 CEST

Where - Microsoft Teams - **Join the meeting now** [[Link redacted](#)]

Objective: To provide participants with a comprehensive understanding of data management plan (DMP) for EU-funded projects generally and Zero Hidden Hunger EU specifically, including the key components, importance, and what is needed for every digital object coming into or generated by the project to deliver an effective DMP.

1. Introduction

2. Understanding Data Management Plans

3. Key Components of a DMP

Break (15 minutes)

4. Creating an Effective DMP for *Zero Hidden Hunger EU*

5. Hands-on Activity: Drafting your DMP

6. Sharing and Feedback

7. Q&A and Closing Remarks



Introduction to Zero Hidden Hunger EU Data Management Plan

Siân Astley, Hana Mušinović, Paul Finglas – EuroFIR (BE)
UCC, UCCAC, EUFIC, EPHA, CHX



UK Research
and Innovation

Project funded by
Schweizerische Eidgenossenschaft
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Tackling micronutrient malnutrition and hidden hunger to improve health in the EU (Grant Agreement No. 101137127)



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Swiss Confederation

Federal Department of Economic Affairs,
Education and Research: EAER
State Secretariat for Education,
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Introduction

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What does the term “data management plan” mean to you?



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- Describes ways in which data are collected, generated and/or processed throughout the lifespan of a project
- Mandatory component in all Horizon Europe projects involving data
- Detailed DMP must be delivered by M6

- Advance Open Science policies and practice
- Maximise access and re-use of data



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Initial data management plan

- Briefly cover the types of data/research outputs, compliance with the FAIR data principles, and how data will be stored and preserved ... (p126)

Data summary: To fulfil the objectives of *Zero Hidden Hunger EU* (Section 1.1), the following types of data will be used or generated:

Observational data:

- 1) *Re-use of existing individual level data* on MN intake and status from 6 representative nutrition surveys; 6 epidemiological cohort studies, and a research database and biobank*.
- 2) *Generation of new individual level data* on MN intake via *de novo* biochemical analysis of biobanked samples from 2 representative nutrition surveys, 6 epidemiological cohort studies, and a biobank*.

*Details of these population samples are shown in Table 1.2. These individual level data representing a total of ~1M individuals will be used to estimate the prevalence of MN deficiencies and inadequate intakes in Europe, as well as their associated costs.

- 3) *Re-use of existing data* from the EFSA Comprehensive European Food Consumption Database and associated EU Menu Food Consumption Database; detailed consumption data from 34 national food consumption surveys representing 66,492 individuals from 12 EU Member States.
- 4) *New intake data* from 400 migrant people in Spain and Greece (Task 3.6)

Experimental data:

- 4) *Feeding study* on vitamin K bioavailability arising from a cross-over design intervention study with 12 participants.

FAIR management of data: Data will be as open as possible and closed as necessary, and comply with the FAIR data principles. **Findability, Accessibility and Reusability of data/research outputs:** Based on the Consortium Agreement and source provider governance conditions, data generated in *Zero Hidden Hunger EU* will be accessible to the greatest extent possible, using repositories (e.g., Zenodo) that ensure long-term preservation in their published form (min. 5 years after publication), provide stable persistent identifiers for individual datasets (e.g. Datacite DOIs), allow access to data without/unrestricted barriers, support open licenses (CC-BY, or equivalent). Exceptions will only be for conditions to meet data transfer agreements. However, metadata, including contact information for owners/providers, web pages, publications, will be made available. Open access (green and gold) publications will be required, supporting provision of aggregated data. Study protocols and statistical analysis plans will be published (e.g., *Systematic Reviews, Trials*, protocol-focused journals). All articles and dissemination and communications materials will be published on the project website and in a *Zero Hidden Hunger EU Zenodo* Community, code and software will be published on GitHub, GitLab or OSF, but linked to the Zenodo Community and project website. All publications will include an article data availability statement, which will link to digital objects and/or providers.

Interoperability of data/research outputs: To make data interoperable, format and standards used within datasets will be described (metadata) and data from WP2-4 harmonized to common formats and standards. To facilitate dissemination and re-use of data across *Horizon Europe* projects, following an initial Cluster Meeting as part of the Clustering and joint activities (WPs), the DMP will be revised to provide the appropriate FAIR standards and enhanced interoperability. Datasets will also be listed in INSPIRE catalogues, which support food and nutrition security user communities to FAIR resources, providers, and terms & conditions for use.

Curation and storage/preservation costs: UCC as the project coordinator, assisted by EuroFER, will be responsible for the data management and quality assurance. Datasets will be managed in line with all local and EU legal and ethical requirements and protocols, including GDPR 2016/679 as well as IT management processes. Costs for data curation and preservation are included under the WP budgets.



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Comprehensive DMP

- More detailed including all digital objects (despite being a data management plan) and include resources allocation for data management and any relevant ethical or security issues.
- Must be updated regularly, in line with progress and explain:
 1. Data used or generated incl. type and format, purpose, size, origin, and potential
 2. FAIRness, i.e., findability (identifiers, keywords, metadata standards, etc.), accessibility (i.e., repository, access T&Cs, access protocols and restrictions, metadata accessibility and availability, justification), interoperability (i.e., vocabularies, standards, formats or methodologies to enable exchange and reuse), reusability (i.e., documentation, e.g., explaining methodology, codebooks, variables)
 3. Other research outputs (e.g., software, models, new materials)
 4. Allocation of resources, i.e., costs associated with compliance, who is responsible for data management
 5. Data security, i.e., security, storage, and recovery during and after
 6. Ethics, i.e., ethical or legal issues, GDPR (personal and sensitive data), consent
 7. Other issues



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Does ZeroHH need a DMP?

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Is the DMP only for data?

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All data must be made open access

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Audience Q&A Session

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Understanding DMPs

Open Science policies and practice



Legal obligation under Horizon Europe to foster greater transparency and trust



What is open science?
Sharing of knowledge, results, and tools as early as possible



What is open access?
Providing online access that is free of charge and reusable incl. peer-reviewed publications and associated data, other datasets and meta data as well as digital objects



What are the benefits?
Encourages collaboration, which increases creativity and trust in science and leads to greater transparency, impact, and efficient research processes and more opportunities for global scientific collaboration.

- Results and data may be kept closed if making them open access is against your legitimate interests, e.g., commercially exploitation, obligations in the Grant Agreement, or include personal and sensitive data

- Not obliged to publish results, but if you do so it must be open access
ZeroHH publication guidelines
- Data* must be FAIR (findable, accessible, interoperable, re-useable)



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[2024-03-31 Zero Hidden Hunger EU Publication Guidelines v2.pdf](#)



| | | | | |
|--|---|---|---|--|
| Findable Magnifying glass icon | Persistent Identifiers (PIDs) ID icon | Rich metadata Document icon | Indexed data repositories Database icon | PIDs in metadata ID icon |
| Accessible Hand cursor icon | Standard communications protocol Network icon | Open, free protocol No dollar sign icon | Authentication, where necessary User icon | Metadata is always available Infinity icon |
| Interoperable Gears icon | Vocabularies Diagram icon | Vocabularies are FAIR Gears icon | Linked metadata Network icon | |
| Reusable Recycling icon | Metadata have multiple attributes List icon | Usage license Checkmark icon | Provenance Timeline icon | Community standards Document icon |

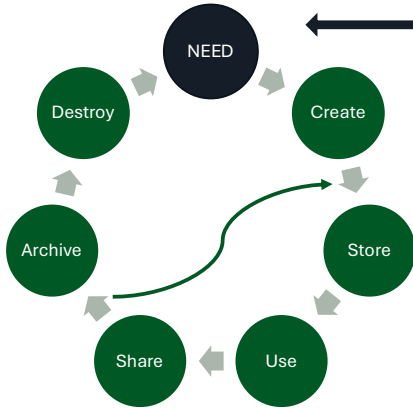
Australian National Data Service

[ANDS]



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INTEGRITY: Is there a need for data?




- Before generating, capturing or re-using data, established there is a need and informed consent
 - WMA Declaration of Helsinki, Hippocratic Oath, etc: → minimise risk and burdens, maximise benefit
 - **Informed consent:** decision capacity, documentation of consent, disclosure, competency
 - Lack of understanding amongst data providers and users and citizens about *informed consent, risk, ownership* ...
- **Permission** to re-use in original consent as well as licence or sharing agreement
- **Documentation**, i.e., meta data,
- **Limitations**, i.e., take data ZeroHH needs


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FINDABLE: Data are. Meta-data are FAIR






Any data that are stored, transferred, read, and used by networks, computers, and other machines



Text, figures, images, or symbols in a form that is efficient for processing and/or movement (binary)

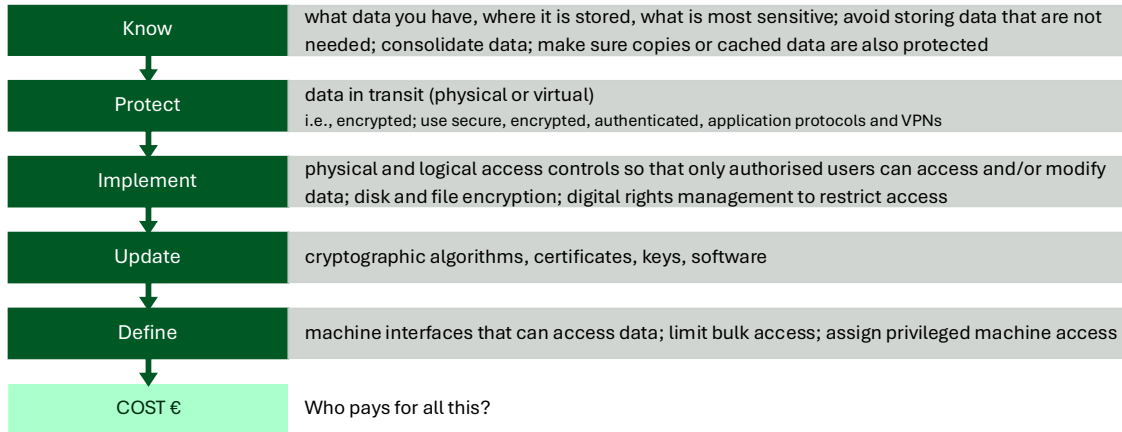


Metadata are data that provide information about other data ...
Also underpins interoperability

- **Descriptive** – describes the resource; used for discovery and identification, e.g., title
- **Structural** – describes containers and how compound objects are put together, e.g., pages in a chapter
- **Administrative** – helps manage a resource, e.g., when and by whom it was created
- **Reference** – contents and quality
- **Statistical** – how collected or processed
- **Legal** – provider, creator, copyright, licensing

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ACCESS: Protect data where vulnerable






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Control and sustainability



- 1. Usernames, passwords, IP addresses; monitor for unusual queries, bulk exports; assign (admin) privileged roles
- 4. Have multiple backups in different locations (3 copies-2 devices-1 offsite and offline; restrict access to backups; retain backups for a period rather than overwritten but ensure redundant backups are destroyed; test backups!
- 6. Destroy physically incl. storage media and devices that store data, e.g., printers, photocopiers; remove labels; check third parties!

What are the costs associated with this?






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CONFIDENTIALLY : Data Protection & Privacy Legislation



Regulation (EU) 2016/679 (General Data Protection Regulation), Data Protection Act 2018 (United Kingdom), Swiss Federal Data Protection Act 2020, Personal Data Protection Act (Article 23) (Republic of Serbia)

Applies to the processing of **personal data** wholly or partly by automated means and to the processing other than by automated means of personal data which form part of a filing system or are intended to form part of a filing system.



- Legal act that is enforceable in all EU MS (minimum requirement)
 1. Lawfulness, fairness and transparency processing
 2. Purpose (specified, explicit and legitimate)
 3. Data minimisation (adequate, relevant and limited)
 4. Accuracy (and up-to-date)
 5. Storage limitation (only as long as is necessary)
 6. Integrity and confidentiality (protection against unauthorised or unlawful processing and against accidental loss, destruction or damage)
 7. Accountability (data controller, data processor, regardless of location)

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ACCESS: What is personal data?



- **Personal data is any information related to an identified or identifiable natural person**
 - Begins at birth and is extinguished at death (“ legal capacity”)
 - Privacy and confidentiality still apply after death
 - Regardless of geographical location
- **Identifiable (directly or indirectly) by an “object”**
 i.e., name, number, location, online identifier or characteristics that expresses physical, physiological, commercial, cultural or social identity, e.g., telephone no., credit card, personnel number, account data, number plate, appearance, customer number, timesheets, IP address, written answers, opinions ...
- **Sensitive personal data subject to greater protection**
 i.e., genetic, biometric and health data (**personalised nutrition**), as well as personal data revealing racial and ethnic origin (**ancestry information**), political opinions, religious or ideological convictions or trade union membership

| | |
|--|---|
| Consent :Processing personal data is prohibited unless expressly allowed by law, or the data subject has consented | Encryption, i.e., digital information security |
| Data protection | Right of access |
| Right to be forgotten | Right to be informed |

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 <https://edpb.europa.eu>

Anonymisation vs. pseudonymisation



Anonymisation

- Encrypted or removed identifiable object(s) with the purpose of preserving an individual’s privacy.
 - GDPR requires anonymisation or pseudonymisation of stored data; GDPR does not apply to anonymised datasets
 - An individual may be directly identified from their name, address, postcode, telephone number, photograph or image, or some other unique personal characteristic ...
 - An individual may be indirectly identifiable when linked with other sources of information such as place of work, job title, salary, postcode, **diagnosis or condition** ...
- Redacting, reidentification, reporting ranges (blurring), post-analysis manipulation (Barnardisation), rounding, sampling, synthetic data, tabular reporting, ...

Pseudo(ano)nymisation

- Processing of personal data such that data can no longer be attributed to a specific subject without additional information, which is kept separately and subject to technical and organisational measures to ensure non-attribution to an identified or identifiable individual” (Article 4(3b)).
- Pseudo(ano)nymised data is subject to GDPR
- Motivated intruder test
- Most sensitive data are only pseudo(ano)nymised, which requires informed consent under GDPR
 - There are exceptions for research, but the processing must not cause substantial damage or distress ...
 - **Impacts interoperability**



AVAILABILITY: Open science



- Focus on sharing knowledge as soon as available
- No opting out of research data management; **data must be managed under FAIR principles**
 - *“as open as possible as closed as necessary”*

- Peer-reviewed scientific publications
 - Immediate open access through trusted repository
 - Publication licensed under CC BY (or equivalent)
 - Information provided about any research output, tool, or instrument needed to validate the conclusions of a publication
 - Beneficiaries/authors must retain sufficient IPR to comply with OA
 - Metadata licensed under CC0 or equivalent and PID

- Data (and meta-data)**
- Deposit data in a trusted repository and provide access & provider details
 - CC BY or CC 0 (or equivalent)
 - Information about any other research outputs or tools and instruments needed to re-use or validate data
 - Meta data CC0 and PIDs
 - Exceptions to open access specified



Legitimate interests, risk to exploitation (e.g., patent), national security, not compatible with **protecting personal data** ...



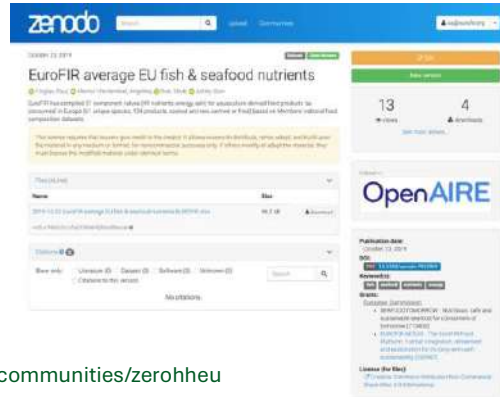
Creative Commons licencing: Sharing



- Creative Commons tools help share work
 - ✓ Free, easy-to-use, standardised licenses specify conditions of re-use
 - ✓ Recognised globally
 - ✓ Cannot be revoked
 - ✓ You must own or control the 'object'



<https://creativecommons.org>



<https://zenodo.org/communities/zerohheu>



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What does the 'I' stand for in the FAIR data principles?

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What term describes the practice of using existing data for new research purposes?

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What does GDPR stand for in the context of data protection?

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Audience Q&A Session

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Key components

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Data summary



Will you re-use any existing data? What will you use it for? Was any existing data considered but discarded.



What types and formats of data will the project generate or re-use?



What is the purpose of data generation or re-use and its relationship to objectives of the project?



What is the expected size of data that you intend to generate or re-use?



What is the origin/provenance of the data, either generated or re-used?

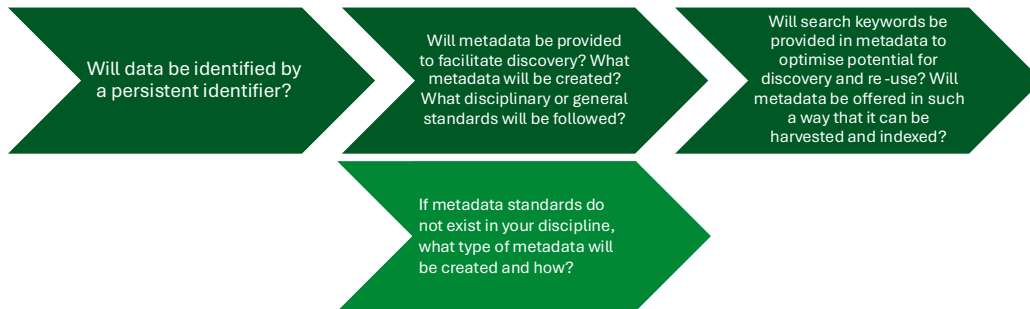


To whom might your data be useful ('data utility'), outside your project?



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FAIR data: Making data findable



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Making data accessible



Repository:

Will data be deposited in a trusted repository? (e.g., Zenodo, journal)

Have you explored appropriate arrangements with the identified repository where data will be deposited?

Does the repository ensure data are assigned a permanent identifier? e.g., DOI

Will the repository resolve the identifier to a digital object?



Data:

Will all data be made openly available? If not, explain why.

If an embargo is applied, specify why and how long this will apply.

Will data be accessible through a free and standardised access protocol? If there are restrictions, how will access be provided during and after the project?

How will identities of users be ascertained?



Metadata:

Will metadata be made licenced under CC0? If not, please clarify why.

Will metadata contain information to enable users to access data?

How long will the data remain available and findable?

Will metadata be guaranteed to remain available after data are no longer available?

Will documentation or reference about any software be needed to access or read the data be included?

Will it be possible to include the relevant software (e.g., open source code)?



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Does ZeroHH need a data management committee?

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Making data interoperable



What data and metadata vocabularies, ontologies, standards, formats or methodologies will be used to make data interoperable (i.e., allow data exchange and re-use within and across disciplines)?
Will you follow community-endorsed interoperability best practices? Which ones?



Where it's not possible to use common ontologies or vocabularies, will you provide mappings?
Will you publish project-specific ontologies or vocabularies to allow reusing?



Will data include qualified references to other data (e.g., from ZeroHH or other datasets)?



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What data and metadata vocabularies, ontologies, standards, formats or methodologies will be used?

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Will data include qualified references to other data?

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Increasing re-use



How will you provide documentation needed to validate data analysis and facilitate data re-use (e.g., readme files)?



Will data be made freely available in the public domain to permit the widest re-use possible?
Will data be licensed using standard reuse licenses?



Will the provenance of data be thoroughly documented using the appropriate standards?



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What data quality assurance processes will you use?

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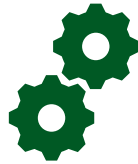
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Will your data be open access after the project? If not, why not?

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Other research outputs



Other research outputs are **digital** (e.g., software, workflows, protocols, models, etc.) or **physical** (e.g., new materials, antibodies, reagents, samples)

We must also consider how these can be made **FAIR** or exploited (commercial or re-use)



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What other research outputs do you anticipate will be generated?

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Allocation of resources



Costs for making data or other research outputs FAIR/exploitable are eligible under Horizon Europe



How will preservation be ensured?
(e.g., who decides and how, what data/other will be kept and for how long)



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Who is responsible for data management in ZeroHH?

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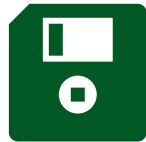
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What costs do you anticipate in making data or other research outputs FAIR/exploitable?

① Start presenting to display the poll results on this slide.

Data security



What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?



Will data be safely stored in trusted repositories for long term preservation and curation?



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What data security protocols or best practice will be used for ZeroHH?

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Data security



Are there ethical issues in ZeroHH?

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Are there legal issues to consider, besides protection of personal and sensitive data?

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Other issues



Are there other issues we must consider?

① Start presenting to display the poll results on this slide.



Take a break (15 min)



What T9.1 is doing

T9.1 Data and innovation management



1. Develop, share and update continuously DMP (D9.1)
2. Establish information about datasets, tools, and services



Elaborate re-use for exploitation: Datasets or databases, algorithms, code, or software, protocols, etc.

IP protection: patents, trademarks, copyrights and trade secrets
Open science: research incl. publication, societal, political, public knowledge



Mother of all spreadsheets ...
Hana Mušinović



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Guided interviews (60-120 min)

| | | |
|---|--|--|
| What is it? | Where in the process are you now? (i.e., still collecting data, usability) | How will it be accessed? |
| Where do you get the inputs from (i.e., users, databases, data from other projects, db) | What do you do? (i.e., order, rename, curate it, combine it with other data) | Would you share the digital object? What are the conditions? |
| What elements make up the digital object? (i.e., software, code, db, algorithm) | Who is the digital object for? | Do you use personal data? If so, do you consider GDPR? |



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Before ZeroHH



Was there any element of the tool that preceded ZeroHH? If yes, what?

Who created it?

What are the conditions of use (for your organisation and ZeroHH)?

Do you have any written and signed proof of this agreement? (i.e., contract, licence)




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During ZeroHH



Which aspects of the digital object are being developed under ZeroHH?

- Who has contributed and to what?
- Do these elements have formal agreement? (aside from the CA, i.e., contract, licence)

Are these elements interoperable within ZeroHH digital objects and/or other tools outside ZeroHH?

Has any of these elements been already published or available to the public (i.e., GitHub, Zenodo, any other repository)? → Is ZeroHH funding clearly acknowledged? Do you plan to publish these elements? Where?

When you develop it, do you use any kind of common repository? i.e., Github, Gitlab, etc.

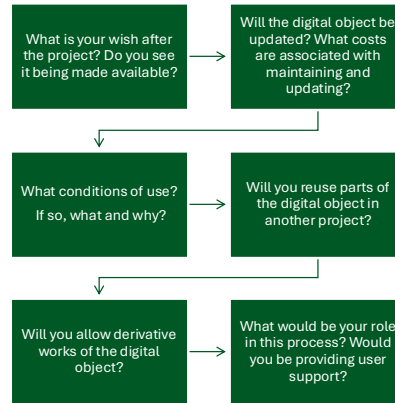
How have you developed your digital object? Is it a team? What are the contractual relationships? IP ownership?




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After ZeroHH



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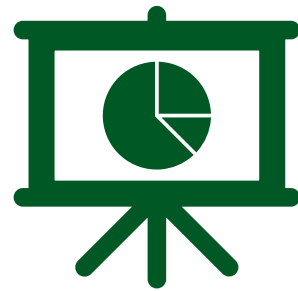
Who will bring in or generate a digital object? (name and email)

① Start presenting to display the poll results on this slide.

Hands on

Cast into the abys ...

- **Chose one dataset either coming in or generated by ZeroHH from your group**
- Describe the dataset, i.e., type of data, format, purpose, size, origin, and potential for re-use
- Is the resulting dataset FAIR? i.e., findable, accessible, interoperable, and re-usable
- 15 minutes



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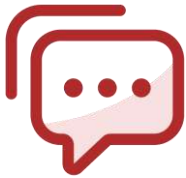
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Feedback and sharing



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Audience Q&A Session

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8. Appendix D – *Zero Hidden Hunger EU Data Breach Protocol*

Zero Hidden Hunger EU – Data Breach Protocol

5.2.1 Author's name: EuroFIR AISBL and UCC Academy

Date: 19.08.2024

5.2.2 Version 1.0

Contributors

| NAME | ORGANISATION |
|-----------------|---------------|
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Revision history

| VERSION | DATE | REVIEWER | MODIFICATIONS |
|---------|------------|---------------------------------|---|
| 0.1 | 19/03/2024 | Jennifer Browne | Initial Draft |
| 0.2 | 29/04/2024 | Jennifer Browne and Siân Astley | Modifications based on structural changes suggested by SA |
| 0.3 | 30/05/2024 | Siân Astley and Jennifer Browne | Review and input from SA with minor edits from JB |
| v.1 | 19/08/2024 | Kevin Cashman and Máiréad Kiely | Review and sign off |

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6 Introduction

The Zero_HiddenHunger_EU Grant and Consortium Agreements are the primary documents that govern the interactions with and obligations of consortium partners relating to confidentiality, data breaches and data protection. The purpose of the following Data Breach Protocol is to support the implementation of the relevant clauses in the Zero_HiddenHunger_EU Grant and Consortium Agreements, relevant legal obligations (including the General Data Protection Regulation [GDPR {EU} 2016/679] and related national laws), and partners' policies and procedures.

7 Roles and Responsibilities

- **Lead partner:** The *partner that identifies or otherwise becomes aware of the (potential or actual) breach* is responsible for leading the response and is thus the lead partner for managing the breach event.
- **Consortium member:** Every consortium member is responsible for responding appropriately to any potential or actual data breach.
- **Affected partner:** An affected partner is implicated in the breach. Every affected partner is responsible for responding in a timely manner to the incident in line with:
 - i) national and organizational policies and procedures, and
 - ii) this data breach protocol.
- **Project Management Team (UCC Academy):** The Project Management Team for the Zero Hidden Hunger EU project will:
 - Support the lead partner with documentation and implementation of agreed project-level immediate and future actions responding to the breach event.
 - Support documentation of the breach event in the Zero Hidden Hunger EU Issue Log and support updates to the Risk Register as appropriate.
- **Project Data Management Lead (EuroFIR):** Data Management Lead for the Zero Hidden Hunger EU project will:
 - Support assessment of the scope and impact of the breach, identifying affected systems and data, and implementing measures to mitigate further damage.
 - Support notification of stakeholders, including affected individuals and regulatory bodies about the breach and the steps being taken to address it.

- Support investigation to determine the cause of the breach, how it occurred, what data was compromised, and how this can be prevented in future.

8 Identification and Assessment:

Without undue delay, the lead partner must:

- *Immediately identify the breach:* Determine what data was compromised, how it happened, and when it occurred.
- *Assess the severity:* Determine the potential impact on individuals' rights and freedoms.
- *Complete a risk assessment:* In line with their organization's policy, complete a risk assessment including the following mandatory items:
 - A risk rating/score
 - Proposed risk mitigation actions
 - An agreement on the appropriate regulatory response

9 Containment and Mitigation:

- *Take immediate steps to contain the breach:* This might involve isolating affected systems, changing passwords, restricting access to collaboration spaces, or temporarily shutting down affected services.
- *Mitigate further damage:* Implement measures to prevent further unauthorized access or data loss.

You may require support from other members of the consortium including the Project Management Team and/or Data Management Lead to implement containment and mitigation measures.

10 Notification:

Without undue delay the lead partner must:

- *Notify their organisation's data protection office* (and/or other (e.g. senior management, IT/security teams, legal counsel, and PR/Communications teams as

ap-proprate) to review the risk assessment and proposed mitigation actions and reg-ulatory responses. Ensure that their DPO informs the national authority.

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- **Notify the Zero_HiddenHunger_EU Joint Coordinators** (Professor Kevin Cashman and Professor Máiréad Kiely, UCC), **the Project Management Team** (UCC Academy), the **project's data management lead partner EuroFIR** (Siân Astley), and **any affected partners** whose data may be implicated in the breach.
- **Convene a meeting** to be held among affected partners (including, as necessary, their data protection staff and partner leads), with the project's Joint Coordinators, Project Management Team, and EuroFIR also in attendance. The meeting objectives will be as follows:
 - Review and sign off on the risk assessment, proposed mitigation actions (immediate and future), and the appropriate regulatory response.
 - Establish and assign actions relating to the two primary obligations relating to the GDPR:
 - a) Notifying the relevant Data Protection Authorities and other relevant bodies about the personal or sensitive data breach, unless it is possible to demonstrate that the breach is unlikely to result in a risk to data subjects, and
 - b) Communicating the breach occurrence to relevant data subjects when the breach is likely to result in a high risk to data subjects.
 - **Notify all consortium partners of the breach.**
- **If required, notify the Data Protection Authority/ies** (organisational and national) **within 72 hours of becoming aware of it** unless the breach is unlikely to result in a risk to the rights and freedoms of individuals.
- **Notify affected individuals:** If the breach is likely to result in a high risk to individuals' rights and freedoms, inform them without undue delay, providing clear and transparent information about the breach, its potential consequences, and any measures they can take to mitigate the risk.

11 External Communication:

If appropriate, the *lead partner* will:

- In collaboration with their national authority and organisation, prepare a public statement addressing the breach, ensuring transparency and clarity while adhering to legal requirements.
- Translate this statement into English for the project's data management lead partner EuroFIR (Siân Astley); the statement will be posted on the project website.

12 Investigation and Remediation:

Without undue delay, the lead partner will:

- *Conduct a thorough investigation:* Determine the root cause of the breach and identify any vulnerabilities in systems or processes that need to be addressed.
- *Remediate vulnerabilities:* Implement appropriate security measures to prevent similar breaches in the future, such as software patches, updated security protocols, or training.

Affected partners, the Joint Coordinators, the Project Management Team, and Data Management Lead will, where necessary, support these activities.

13 Documentation and Record-Keeping:

The *lead partner* will:

- *Document key information related to the breach*, including the following:
 - The risk assessment
 - A detailed description of:
 - how the breach occurred,
 - how and when they became aware of the breach, and
 - the source of the breach.
 - How many data subjects are affected.
 - Data categories (types) affected.
 - Immediate actions that were undertaken upon discovery of the breach, including those related to containment and mitigation actions, notifications, investigation and remediation of the breach.
 - Any future actions to be undertaken and related timelines.
 - If all relevant information has been retained.
 - Data processing records
 - Any other relevant documentation, including those on policies and procedures.
- *Keep records for compliance:* Ensure documentation aligns with GDPR requirements for accountability and transparency. Ensure documentation is stored in line with appropriate retention policies.

Affected partners, the Joint Coordinators, the Project Management Team and Data Management Lead will, where necessary, support these activities and retain documentation in line with their organisations' policies and other legal requirements

including GDPR.

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14 Review and Update Policies:

The project's Data Management Lead will:

- *Review existing data protection policies and procedures at consortium-level:* Identify areas for improvement based on lessons learned from the breach.
- *Update consortium policies as necessary:* Implement changes to policies, procedures, and security protocols to enhance data protection and minimise the risk of future breaches.
- *Circulate relevant updates and/or reminders.*

The Joint Coordinators, the Project Management Team and consortium members, where necessary, will support these activities.

15 Monitoring and Continuous Improvement:

Every consortium member should:

- *Monitor for further breaches:* Implement ongoing monitoring and detection measures to identify any potential breaches promptly.
- *Continuously improve security practices:* Regularly review and update security measures to adapt to evolving threats and regulatory requirements.

16 Legal Compliance:

Every consortium member should:

- *Ensure compliance* with GDPR and other data protection laws (which for the Zero Hidden Hunger EU project may include laws in Switzerland, the United Kingdom and Republic of Serbia) and fulfil obligations under applicable regulations.
- *Cooperate with regulatory authorities:* Collaborate with Data Protection Authorities and other relevant authorities throughout the investigation and remediation process.

16.1 Post-Incident Analysis:

Without undue delay, the project's Data Management lead will:

- *Conduct a post-incident analysis:* Evaluate the consortium's response to the breach, identifying strengths and areas for improvement.
- *Implement lessons learned:* Use insights gained from the incident to enhance incident response capabilities and strengthen overall security posture.

The Joint Coordinators, the Project Management Team and consortium members, where necessary, will support these activities.