



NEWSERA - Citizen Science as the  
new paradigm for Science  
Communication

# **Deliverable 7.1**

# **Data Management Plan**

Revision: v1.3



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# DELIVERABLE DETAILS

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**Concerned work package leader:** Ibercivis Foundation

## Dissemination level:

**PU:** Public (must be available on the website)

**CO:** Confidential, only for members of the consortium (including the Commission Services)

**CI:** Classified, as referred to in Commission Decision 2001/844/EC

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## STATEMENT OF ORIGINALITY

This deliverable contains original unpublished work except where clearly indicated otherwise.

Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

## SUMMARY

**This document contains the NEWSERA Project Data Management Plan (DMP). The tools and strategies used for providing open access to research data are also presented.**

The **main objective of the DMP** is to ensure that **all generated data is Findable, Accessible, Interoperable and Re-usable (FAIR)**. An analysis of the main elements of the data management policy that the consortium will use is provided.

The structure of this document responds to the **Open Research Data Pilot of the European Commission**, which seeks to enable open access and reuse of research data generated by Horizon 2020 projects. There are **two main pillars** to the Pilot: **developing a DMP** and **providing open access** to research data, if possible.

The overall objective of NEWSERA is to show the possibilities of **citizen science as an inclusive, broad and powerful channel of scientific communication**. Citizen science allows for increased trust in scientific communication and, in turn, in science in general. While opening up science and innovation to the whole society, citizen science improves scientific training and promotes critical thinking, reducing the possibilities of false news. NEWSERA will analyse and evaluate the complex and multidirectional science communication strategies, including digital and non-digital ones, addressed to **quadruple helix stakeholders** - that is, **communities** including the third sector, **the State** and public sector, **the market** and private sector, and **academia** - in citizen science projects across Europe, as the new paradigm for science communication.

As it is stated in the JRC document [Survey report on data management in Citizen Science Projects](#) (Schade et al., 2016), we will pay attention not only to the legal aspects regarding different countries and cities, but also to the socio-cultural characteristics. This is a minimum requirement for achieving our objective of **developing a co-created process**, based on **a bottom-up approach** as much as possible.

This deliverable is presented as a **living document**, which will be updated, according to the **cross-cutting nature of the ethical aspects**, during the development of the whole project and especially in view of the **emergence of the COVID-19 pandemic**.

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# 1. Acronyms

Acronym	Description
CitSciComm	Citizen Science Communication
DMP	Data Management Plan
EAB	External Advisory Board
FB	formicablu
FC.ID	FCIENCIAS.ID Associação para a Investigação e Desenvolvimento de Ciências
FECYT	Spanish Foundation for Science and Technology
GA	Grant Agreement
GDPR	General Data Protection Regulation
IBERCIVIS	Fundación Ibercivis
KPI	Key Performance Indicators
RRI	Responsible Research and Innovation
SfC	Science for Change
UNIPD	Università degli Studi di Padova
WP	Work Package

**Table 1:** Acronyms used in deliverable D7.1 on Data Management Plan

## 2. Introduction

This document contains the **NEWSERA Project Data Management Plan (DMP)**. The **tools and strategies used for providing open access** to research data are also presented.

The structure of this document responds to the **Open Research Data Pilot of the European Commission** [7], which seeks to enable open access and reuse of research data generated by Horizon 2020 projects. There are **two main pillars** to the Pilot: developing a Data Management Plan (DMP) and providing open access to research data, if possible.

**The first part of this deliverable** (sections: 2-7) specifically includes **all the issues regarding the DMP**. After briefly introducing the objectives and methodologies of the NEWSERA project and ethics as a cross-cutting issue embedding all the project, all the details on the generated data and the implementation of FAIR principles are explained.

**The second part** (sections: 8-10) corresponds to the **second pillar of Open Research Data Pilot of the European Commission about open access**. The sections addressed in the corresponding sections deals with some topics already covered in the DMP, but putting emphasize in crucial aspects of the FAIR approach: allocations of resources, data security, as well as other ethical topics including details of incidental findings, management of risks or disturbances, along with some final ethical considerations.

## 3. The NEWSERA project

The overall objective of NEWSERA is to show the possibilities of **citizen science as an inclusive, broad and powerful channel of scientific communication**. Citizen science allows for increased trust in scientific communication and, in turn, in science in general. While opening up science and innovation to the whole society, citizen science improves scientific training and promotes critical thinking, reducing the possibilities of false news.

Our challenge is to promote citizen science as a tool for scientific communication, defining specific strategies together with the **quadruple helix stakeholders** -that is, **communities** including the third sector, **the State** and public sector, **the market** and private sector, and **academia** - as well as science and data journalists.

### 3.1 Objectives

The specific objectives are the following:

1. Evaluate the current effectiveness of science communication and the perception of stakeholders participating in citizen science projects.

2. Create five Science Communication Labs -the #CitSciComm Labs- addressed to quadruple helix stakeholders and science and data journalists, in order to advance the state-of-the-art of science communication.
3. Interlink data journalism principles and citizen science and find new ways to explore common goals and collaborative efforts between citizen scientists and data journalists.
4. Develop improved ways to measure and assess science communication.
5. Identify good practices to ensure quality, reliability and increased trust in science communication and science.
6. Produce five innovation blueprints, addressed to quadruple helix stakeholders and science and data journalists, to guarantee project replicability.
7. Provide policy guidelines to increase trust in science communication.
8. Provide new contents and methodologies for formal and informal teaching in science communication within scientific disciplines.
9. Suggest new incentive mechanisms to involve academic scientists in science communication.
10. Use advanced data mining techniques to provide a framework to evaluate the effectiveness of the different science communication strategies; the impact and efficiency of such strategies will be validated through the definition of KPIs.
11. Communicate and disseminate the project actions to replicate NEWSERA findings and science communication strategies in citizen science projects and beyond.
12. Embed and put into practice a highly inclusive engagement model, based on mutual learnings.
13. Embed the ethics dimension in relation to the participation of citizens in research, data protection aspects, and in relation to the perception of science and science communication of quadruple helix stakeholders.

## 3.2 Methodology

NEWSERA analyses and evaluates the strategies addressed to quadruple helix stakeholders in citizen science projects as the new paradigm for science communication. NEWSERA will use a bottom-up approach to co-design strategies for selected Citizen Science projects, in order to improve their science communication practices and their impact towards each **quadruple helix stakeholder group**. These strategies will be developed with the involvement of science and data journalists and science communicators, to propose innovative

ways to open up science and innovation to the whole society, industry and policy makers, and increase trust in science communication.

Methodologies used in NEWSERA imply generation and/or management of data in diverse ways. The origin and generation of this data will be analyzed through the survey on citizen science and communication, through the #CitSciCom Labs and through the analysis obtained by functionalities of the Kampal tool.

### 3.2.1 The survey on ‘Science Communication through Citizen Science’

The survey on ‘Science Communication through citizen science’ (available at <https://bit.ly/2TI3NVw>) is addressed to responsables for citizen science projects based in EU and UK and it includes some general information about the project and about the ways used to communicate and engage with its communities and other stakeholders. The aim of the survey is to paint a clearer picture of the science communication strategies carried out by citizen science projects and to get in touch with projects to include in the co-creation Labs that will be organized as part of NEWSERA. **Complete details** on ethical issues and data management about the survey are **included in deliverable D8.3 H-POPD Requirement No 3**.

### 3.2.2 The #CitSciComm Labs

The **five NEWSERA #CitSciComm Labs aim at co-designing innovative strategies** that help to improve the quality and the effectiveness of science communication, and the perception of and trust in science.

In the co-design process, both **digital communication strategies and non-digital participatory strategies** have been considered and targeted for the specific audiences.

The main **objectives** of #CitSciComm Labs are:

- Creating a dialogue with all the stakeholders to improve engagement, effectiveness and trust in science communication and citizen science.
- Defining and assessing the concepts of Citizen Science Communication and Citizen Science Journalism in each of the labs.
- Using citizen science as an innovative tool to open up science and innovation to the quadruple-helix stakeholders.
- Developing formal and informal training for citizen and career scientists in science communication.
- Analysing the current reward mechanisms for scientists to get involved in science communication outside academia and co-create alternatives for recognition.

- Evaluating citizen science as a tool to fight misinformation in the post-factual era.

During the #CitSciComm Labs, **photographs will be taken and interviews and recordings will be carried out**, according to the informed consent of the participants. Corresponding details on the procedures of informed consent have been also included in deliverable D8.3 H-POPD Requirement No 3.

So far, the published information about the Labs is available on the website (<https://newsera2020.eu/labs/>).

### 3.2.3 Research based on the Kampal tool

As we indicate in the Grant Agreement (GA) (pp. 27 and 28, Part B), **NEWSERA will use and adapt the Kampal Research Tool for data analysis and visualization**. It will benefit from the analytical service and visualization tools that allow multiple factors to be analysed and plotted in at the same time, such as the evaluation of the productivity of a researcher, the effectiveness of the communication tool, the research publication impact and links between different researchers. Several indicators have been used to quantify, in simple terms, the quality of the scientific production of a researcher, or the efficiency of a communication campaign in a citizen science project, as shown in Figure 1. The Kampal tool offers advantages in relation to other similar tools, since it is more complete, flexible, incorporates social media, and it has been developed to analyse and complement the work in citizen science projects by NEWSERA partner IBERCIVIS.

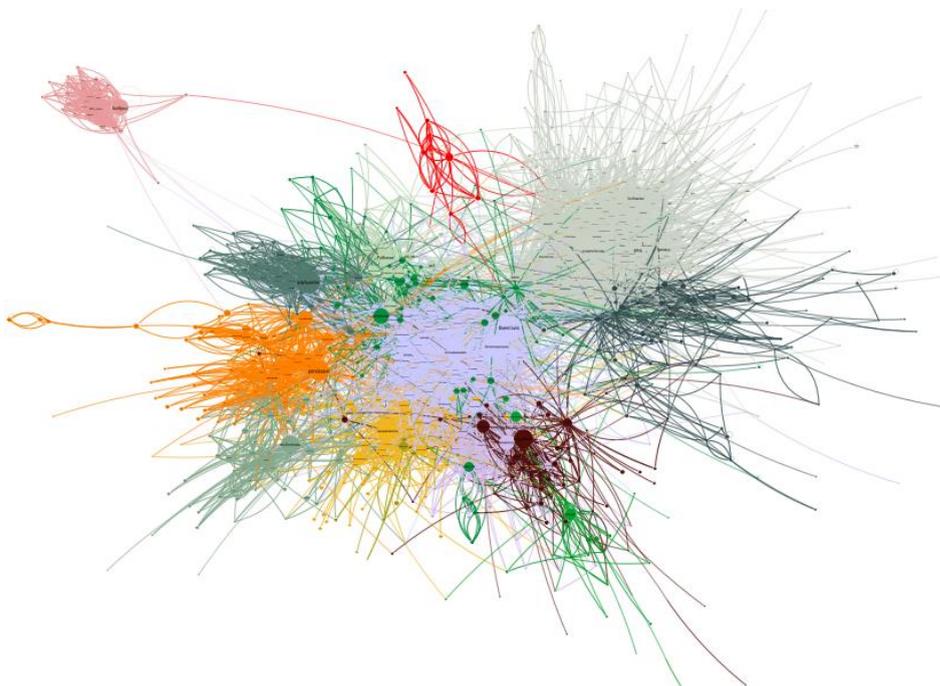
Data from the different stakeholders, before and after a communication action has been performed in the #CitSciComm Labs, will be plotted to show the network change. **Kampal allows the extraction of data from open data repositories and existing platforms**, such as:

- Research project web pages or repositories where citizen science information is stored and where citizens work with researchers.
- Research networks where researchers publish their publications (Google scholar).
- Research or Innovation repositories where volunteers and companies participate: GitHub.
- Social networks as the main bidirectional channel for communication between all the actors, i.e. Twitter.
- European Commission open access services for public data.

Finally, **Kampal** with its associated tools **will provide Key Performance Indicators about the impact of the communication strategies** designed and implemented in WP3 and WP4 and evaluated under WP5. **The topology of the network** (such as centrality, relevance of a certain node, etc.) will help in further iteration cycles in the design of the communication strategy in order to improve the desired impact.

As an example of the results that Kampal tools can provide, we briefly mention here only **the concept of clustering**. With this technique, we will identify different citizen science communities, their size, how many of the elements of a network collaborate with each other, who is the leader, or associated subcommunities. That can support checking for example, if each citizen science community interacts with the subcommunities of the quadruple helix (academic scientists, industry, policy makers, civil society).

In Figure 1, the interaction of citizens and researchers in Twitter for a citizen science project for FECYT is shown below:



**Figure 1:** Citizen Science study for FECYT (2016-2017). The graph represents the interactions of citizens and researchers in Twitter. Each node is a user, the links between nodes are the mentions or retweets between them. In this case, several communities are identified with their respective leaders, number of members and productivity indicators.

All data that Kampal will handle - obtained from sources such as CORDIS, RedIRIS, Twitter - will be treated according to the current European regulations contained in the GDPR, [Regulation \(EU\) 2016/679](#). IBERCIVIS has experience in this respect in scientific publications together with the Institute for Biocomputation and Physics of Complex Systems (BIFI) of the University of Zaragoza (Álvarez et al, 2015). Databases that may contain personal data or that allow for the identification of individuals will be anonymized, and on the other hand, will be sought to comply with FAIR principles as well as open access as much as possible.

## 4. Ethics at the NEWSERA project

### 4.1 Social justification of working with human beings

As we stated in preliminary documents as well as in the NEWSERA GA, while science communication and citizen science can play a role in participatory democracy and active citizenship, decisions may involve **important ethical questions** for the **advancement of science**, for **meeting societal challenges**, and for the **development of new policies**.

In consequence, aspects such as data quality and integrity, data sharing and intellectual property, conflicts of interest, and potential exploitation of participants in citizen science projects (Resnick et al. 2015), are evaluated from the very beginning. Following the participatory governance approach - a characteristic of citizen science - the establishment of agreements and guidelines for ethical conduct must also be a co-created process whenever possible.

Given the ethical requirements within communication following citizen science projects, a co-creation process is being developed with NEWSERA participants - defining new ethics criteria in a bottom-up process. In addition to issues related to data protection and the recruitment of participants, these ethics requirements are also being developed. Both the procedure and the results will serve as an adaptable guide for each citizen science project, with the necessary changes.

We are aware that **ethical aspects are at the core of citizen science, science communication and dissemination**, and therefore, they consist of a **cross-cutting issue in the NEWSERA project**. We understand citizen science and science as a service for addressing current societal challenges, including its communication and dissemination. Therefore, we want this deliverable to be a **living document, which is able to adapt to new social and community needs**, also during the development of the own project.

### 4.2 Executive summary of deliverables related to D7.1

As we have indicated, D7.1, together with D7.2, D8.1, D8.2 and D8.3, include the main aspects of data management and ethical requirements of the NEWSERA project.

- **D7.2. Report on ethical aspects as a cross-cutting issue in NEWSERA actions.** It consists of a report on the ethical aspects co-identified with citizen science participants, following the participatory governance approach through a co-creation process, and including inclusiveness aspects.
- **D8.1. H-Requirement No. 1** focuses on the **procedures and criteria that will be used to identify/recruit research participants** that must be applied.



Copies of opinions/approvals by ethics committees and/or competent authorities for the research with humans will be obtained and kept on file.

- **D8.2. POPD-Requirement No. 2** implies that the **contact details of the Data Protection Officer (DPO)** are **available** to all data subjects involved in the research. For host institutions not required to appoint a DPO under the GDPR, a detailed data protection policy for the project is kept on file.
- **D8.3. H-POPD-Requirement No. 3** deals with the **informed consent procedures implemented** for the participation of humans. NEWSERA develops the necessary **informed consent/assent forms and information sheets** (in language and terms intelligible to the participants). Children can be involved in activities, due to the close connection between citizen science and STEM education. Details on how they assent as well as the consent of legal representatives are required by NEWSERA.

## 5. Data management at the NEWSERA project

### 5.1 Data quality and integrity

The **'Ambition'** relevant section within the GA (pp.30-32) refers to the idea of **'NEWSERA: Beyond the state-of-the-art in Science Communication'**. One of the issues deals with the topic 'Addressing ethical and governance issues in science communication and citizen science'. We highlight here **the most relevant information regarding data quality and integrity, under the NEWSERA approach.**

In order to make **citizen science** increasingly **reliable** (as to its understanding as true science) and **legitimate** (as to its use in policy making), citizens should acquire knowledge about the conditions to make **citizen science highly relevant and performed by applying the necessary ethical standards.** It is important to notice that by saying 'citizens' we here refer to professional scientists, politicians, representative of companies and industry, along with the rest of society including citizen scientists, as in the end, we are all citizens.

We would like to reinforce the idea that ethical aspects range from raising awareness about **science integrity, accuracy, reliability, precision, objectivity, sustainability,** and other elements of research ethics, to values involved in performing research with human subjects and data. While recognizing the important benefits that citizen science offers to science and the whole society, some experts on ethical aspects of science (Resnik et al, 2015) have pointed out that "citizen science also raises ethical issues that should be addressed before projects begin and throughout the course of scientific investigation". In particular, they highlight **aspects related to data quality and integrity, data sharing and intellectual property, conflicts of interest, and potential exploitation of participants.** So, they explain that **"to promote ethical research, scientists should develop guidelines** for involvement of citizens in research, communicate effectively with participants at the outset of their involvement in research projects, carefully oversee their work, develop appropriate publication practices, take steps

to address conflicts of interest, and provide lay volunteers with education and training on the responsible conduct of research" (Resnik et al, 2015).

Although this proposal is necessary, **NEWSERA takes a step further**, also adopting the **complementary bottom-up approach**: the definition and establishment of ethical guidelines is not an issue that should be dealt with exclusively by one of the parties. On the contrary, according to the **participatory governance approach** the establishment of agreements and guidelines for ethical conduct must also be a **co-created process whenever possible**, in which it is not taken for granted that professional scientists are always the best able to lead the process. In any case, the presence of people with expertise - and experiential - knowledge in ethics is undoubtedly required. Alignment as (and where) appropriate in the collaborative relationship between citizens and scientists will be at the basis of this objective, in order to co-create good practices, skills, and trust. **Existing norms and practices both in creating good science and ethical research will be discussed and shared**, particularly during the #CitSciComm Labs. The goals are both to improve citizen science and citizens (professional scientists or not) awareness about it, and to make the exchanges and interactions between society as a whole and professional scientists. These collaborations will allow, on the one hand, nonprofessional scientists to acquire - or improve - all relevant scientific knowledge and skills, and on the other hand, everyone to acquire - or improve - their ethical training in order to further organize and perform research by confidently establish relationships among all the parties.

## 5.2 Protection of personal data

In accordance with NEWSERA GA (p. 81), adequate measures to ensure personal data protection and confidentiality will be taken, according to [Regulation \(EU\) 2016/679](#) on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and the national implementations on personal data protection law when approved.

General procedures to be included in the research protocol to safeguard the privacy of study subjects are as follows:

- Written informed consents will be obtained from all participants in the study to use their personal data.
- All materials obtained in the framework of the project (questionnaires, sensors) will be identified through a code - the name and/or other personal data that could allow the identification of the participant will never be indicated. This unique identifier will link all basic data required for the study. The master key file linking the centre's study numbers with personal identifiers will be maintained in a password protected file with limited access.

- All files containing personal data will be stored in encrypted and password-locked files. Access to these files will be limited to authorized project personnel.
- Only researchers linked to the project will have access to personal data. Participants will know from informed consents who has access to the data, the name of the responsible and the personnel in relation to their positions.
- Reported study results will pertain to analysis of aggregate data. No individual's name will be associated with any published or unpublished report of this study.
- All project personnel will be trained in the importance of confidentiality of individual records and required to sign a confidentiality agreement.

In all EU countries, the General Data Protection Regulation (GDPR) - [Regulation \(EU\) 2016/679](#) on the protection of natural persons with regard to the processing of personal data and on the free movement of such data will apply.

More details in this respect are provided in next sections and in deliverables corresponding to WP8 on Ethics requirements.

### **5.3 Main guidelines to elaborate the DMP**

In order to create this DMP we are mainly following the next references (see section 12):

- [Regulation \(EU\) 2016/679](#) on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, (GDPR)
- The guidelines provided by the European Commission on [FAIR Data Management in Horizon 2020](#)
- The [guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 v3.2](#)
- The JRC Technical Report [Survey report: data management in Citizen Science Projects](#) (Schade et al, 2016)
- The [Report from CSA 2017 and Future Outlook](#), by Citizen Science Association Data & Metadata Working Group (Bowser et al, 2017)
- The [Geneva Declaration on Citizen Science Data and Metadata standards](#) (Ceccaroni et al, 2018)
- The [ECSA principles for citizen science](#)

## 6. Data summary at NEWSERA

The data set to be generated during the project is shown below; the partner responsible for managing it is also indicated as well as the WPs related to their generation. IBERCIVIS is the partner responsible of all the Data management, albeit some concrete datasets are also managed together with other partners, as it is indicated in next subsection. More details on the work of the Data Protection Officer (DPO) are provided in deliverable D8.2. POPD-Requirement No. 2.

### 6.1 Type of data

The types of data collected, generated, analysed and managed in the NEWSERA project as well as the origin of the data, both personal and non-personal, are detailed in section 3 of this document. Their treatment is extensively explained in the WP8 deliverables. The destination, place and time period of conservation of the data are detailed in deliverables D8.1, D8.2 and D8.3.

The objectives and methodologies of NEWSERA absolutely exclude both the collection of biological samples and sensitive information on humans, which would require special treatment.

### 6.2 Databases generated within the NEWSERA project

nº	Dataset name	Institution in charge	Related WPs
1	List of consortium partners and EAB members	SfC/IBERCIVIS	1, 7, 8
2	List of projects to contact with	IBERCIVIS	1, 6, 7, 8
3	Data generated through the survey	UNIPD/IBERCIVIS	2, 7, 8
4	List of participants in activities	IBERCIVIS	1, 3, 7, 8
5	Data generated through #CitSciComm Labs	IBERCIVIS	1, 2, 3, 4, 5, 7, 8
6	Newsletter subscribers	FB/IBERCIVIS	6, 7, 8
7	Data generated by navigating on web	FB/IBERCIVIS	6, 7, 8
8	Data generated by Kampal tool	IBERCIVIS	3, 4, 5, 7, 8

**Table 1.** Databases generated, responsible partners and WPs involved

As we can see, datasets 3, 5 and 8 are related to research data.

The corresponding eight WP are devoted to:

*WP1 - Coordination and project management*

*WP2 - Analysis of Citizen Science as a Science Communication Tool*

*WP3 - Co-design of innovative strategies in Citizen Science Communication*

*WP4 - The NEWSERA Pilots: Implementing the concepts of Citizen Science Communication and Citizen Science Journalism*

WP5 - Evaluation and impact assessment: the legacy of NEWSERA

WP6 - Dissemination and Communication Actions

WP7 - Ethics and Data Protection strategies in NEWSERA

WP8 - Ethics requirements

## 7. FAIR Data

Here a specific subsection is devoted to each one of the FAIR - Findable, Accessible, Interoperable and Re-usable - Data properties, putting an special emphasis in open access to data research, as the Open Research Data Pilot of the European Commission recommends.

In this section, the working scheme of the DMP published by [EU.Citizen-Science](#) has been followed, in which IBERCIVIS is working. The necessary modifications and adaptations to the aspects and peculiarities of NEWSERA have been made.

### 7.1 Making data findable, including provisions for metadata

The concept of findability refers to the viability of the information to be located by other users. To achieve this goal we will provide the necessary metadata to help in the identification of the different datasets generated during the project.

As provided by the open document The FAIR Guiding Principles for scientific data management and stewardship (Wilkinson et al. 2016) we will, where possible:

- assign a globally unique and persistent identifier to (meta)data
- describe data with rich metadata
- include clearly and explicitly in the metadata the identifier of the data it describes
- register on index (meta)data in a searchable resource

This data will be stored in SQL and noSQL database, linked to the web page and downloadable openly and anonymously in csv and json format during the life of the project. **Anonymized data and metadata will be uploaded to Zenodo, providing a DOI (Digital Object Identifier) for each dataset generated.** Using DOI will allow us to edit/update those files after they have been published.

**We will search for other datasets which can be used for the purposes of the project.** As it is indicated in the GA (p.17), NEWSERA works in close collaboration with five projects funded in the topic SwafS-19 in 2018 and 2019 in order to **create synergies, join efforts and avoid duplication:** [RETHINK](#), [CONCISE](#), [QUEST](#), [ParCos](#), and [TRESCA](#). Like these projects, NEWSERA is complying with the dissemination obligations and making active efforts to freely share, in a timely manner and as appropriate, the research strategies, methodologies, and raw and analysed data

deriving from our activities, including evaluation, with the other projects funded under the SwafS call. In addition, NEWSERA will join efforts with [EU-Citizen.Science](#), the CSA mapping the landscape of citizen science in Europe, to enrich their activities in communication in citizen science, or the mutual-learning platform. This will allow to select ongoing H2020 citizen science projects under which to execute the NEWSERA pilots and Science Communication Labs, such as [D-NOSES](#), [CitieS-Health](#) or [ACTION](#). NEWSERA takes into account that there are six projects, so far, funded between 2018 and 2019 under the H2020-SwafS-2018-2020 Topic 19. All of them will benefit from cooperation in certain areas; these projects being QUEST, RETHINK, CONCISE, along with TRESKA and ParCos for the time being. With a special interest we will share the information collected and non-personal data that support the synergies between these projects, according to FAIR principles.

All this **data** will be **useful for quadruple-helix stakeholders** - communities, Public Authorities, Business, and academia - related to citizen science, **as well as science and data journalists**.

## 7.2 Making data openly accessible

### 7.2.1 Which data will be made available to the public

**All data will be made available except those containing personal data and personally identifiable information.** Personal data will not be openly accessible, nor available to third parties to protect participants' privacy.

The personal data processed in the project is not made publicly accessible, but kept closed and unavailable to third parties, in particular:

- the **identity of participants** - including audios, videos and images - in personal interviews and in group activities such as #CitSciComm Labs (online or offline), unless they explicitly indicate that they can be made public, through written informed consent (provided in deliverable 8.2).
- **personal email addresses** voluntarily provided through the survey in order to participate in the project activities.

Data resulting from individual forms - for surveys, interviews and group activities - used for research publications will be **anonymized prior to online storage**.

Transcriptions and questionnaires, as well as the photographs and recordings of those who do not give their explicit consent to publication, will be stored on secure space by the indicated relevant WP leaders.

## 7.2.2 How the data will be made available

During the development of the project, various data and partial results (e.g. statistics of visitors to #CitSiComm Labs and documents on its development) will be made available to interested parties, through one of the following means:

- Newsletters, reports and/or other publications on the NEWSERA website
- Local partner's websites
- Partner's social media
- Collaborative platforms (Zoom, Padlet, Mural or similar)
- Zenodo repository

The detailed data will be available to all partners of the consortium through the shared project unit (with the exception of personal data stored in the premises of each partner, as indicated in the previous section). Access to this unit is restricted to project partners. If co-researchers participants wish to access data that may be shared for research purposes during the project, these will be openly shared upon request. At the end of the project, the data to be stored will be kept in the Zenodo data repository.

## 7.2.3 What methods or software tools are needed to access the data

Data will be published in standard file formats (txt, pdf, csv, json, etc.) and will also be accessible using standard tools (as the indicated ones in previous section).

## 7.2.4 Where data, metadata, and documentation are deposited

Personal data will be stored on a local secured server by the partner responsible depending where the data comes from in each case. Responsible partners are indicated in *Table 1. Databases generated, responsible partners and WPs involved, within subsection 2.2.*

Data and associated metadata to be public are stored on a central drive, on the project platform and on Zenodo.

## 7.2.5 How access will be provided in case there are any restrictions

No restrictions are foreseen; if required, the appropriate open software will be provided to access the data or export it to standard formats.

## 7.3 Making data interoperable

In order to achieve the interoperability among data, every dataset generated within NEWSERA will have the necessary metadata.

For all types of data we use standard vocabularies according to PPSR\_CORE in case of citizen science projects and other ontologies such as provided by schema.org for other kind of data which was developed for research on and with citizen science.

In the very unlikely case of using uncommon vocabulary or to generate project specific ontologies or vocabularies, we will provide mapping of them.

## 7.4 Increase data re-use

In order to achieve the widest re-use possible, **diverse Creative Commons Licenses will be used** for all data to be preserved, depending on the different data types.

The data collected and analysed during the project will be made **openly available alongside the project** in the way is indicated in next section 8 on 'allocation of resources'. That is, deliverables and publications will be uploaded at Zenodo no later than 3 months after release or whenever we have the OK from the reviewers, whereas datasets will be uploaded at the end of the project, within 3 months by the closing of project activities (M36). As for patents, NEWSERA project does not foresee this type of products.

For **shared information**, standard format, open source software, and proper documentation will guarantee **re-usability by third parties**. No Personal Identifiable Information will be shared with third parties.

A **quality assurance process** is being developed from the beginning of the project, through the work of partners and Project Coordinator, who are experts on the diverse matters.

As for the length of time for which the data will remain re-usable, the project ends at December 2022, in addition **IBERCIVIS guarantees 10 years since the end of the project**.

As we have stated at the introduction, accordingly to Open Access H2020 Pilot, NEWSERA's aims go **further to the FAIR principles**. Therefore, the DMP also addresses next points: allocations of resources, data security, ethical aspects and other considerations.

## 8. Allocations of resources

**IBERCIVIS servers** will be used by the Consortium to store the data in SQL and noSQL databases in a FAIR way.

The data obtained during the project could also be uploaded **-previously anonymized-** to the Zenodo repository. The handling of the local servers and Zenodo repository as well as all data management issues related to the project fall in the responsibility of the Data Protection Officer (DPO), that is, Mr. Francisco Sanz from Ibercivis.

Data and/or deliverables will be uploaded at Zenodo by the coordinator with the support of FB, responsible leader of WP6 on dissemination and communication actions. Public deliverables will also be uploaded at the NEWSERA website.

Deliverables and publications will be uploaded no later than 3 months after release or whenever we have the OK from the reviewers, whereas datasets will be uploaded at the end of the project, within 3 months by the closing of project activities (M36).

Regarding costs:

- The data is guaranteed for **10 years on unfunded effort by IBERCIVIS**.
- Archiving at **Zenodo is free of charge**, so there are no additional costs for its usage.
- Deliverables will be published under a **Creative Commons license**, therefore **free of charge**.

**The responsible partner for Data Management is Ibercivis.** The contact details will be provided to all the participants in each one of the activities, as it is indicated in deliverable **D8.2 POPD Requirement No.2**.

## 9. Data security

With respect to data recovery, personal or non-personal, **IBERCIVIS is the partner responsible for data management:** complete contact details as well as all rights of participants regarding their data are provided in each one of the project activities.

The main features, as it is indicated in the GA (p. 36), are the following:

- No data of a citizen will be collected without his/her permission
- Information will be only used for the purposes covered by agreement, and will not be retained except as required for these purposes

- Information will not be made public or provided to third parties without explicit permission
- Contractual and technical controls will be applied to prevent information becoming inadvertently available to third parties

As far as the secure storage and transfer of sensitive data is concerned, it must be stressed that **no sensitive data will be collected during the NEWSERA project**. The project is focused on citizen science as a tool for better science communication, so the topics addressed will not be related to any sensitive data (as, for example, health, religion, or political ideas of participants).

**Children and young minors** could be involved in activities, due the close connection between citizen science and STEM/STEAM education, which involves Science, Technology, Engineering, Mathematics, along with Arts and creativity. Details on how they assent as well as the consent of legal representatives are provided in deliverable **D8.3 H-POPD-Requirement No.3**. NEWSERA similarly proceeds in case of **vulnerable adults**. The double objective is to **promote maximum inclusiveness, together with maximum protection of privacy of each singular person**.

The **Protection of Personal Data** will be guaranteed through the actions explained in deliverables included in WP8. Specifically **D8.2 Report on POPD Requirement No. 2** and **D8.3 Report on H-POPD Requirement No. 3**, which will include data sharing, data collection, storage, protection, retention and destruction of personal data, as well as templates of the informed consent forms and information sheets (in language and terms intelligible to the participants).

## 10. Other ethical aspects

All the ethical requirements in relation to data management are covered by the closely related deliverables D8.1, D8.2, D8.3 and D7.2 together with this document D7.1 on DMP.

### 10.1 Details of incidental findings

Foreseeing possible contingencies of all kinds, these documents cannot consist of static texts. On the contrary, they must be periodically reviewed by the coordinating partner of the project in collaboration with the leaders of the different WPs as well as with the members of the Executive Advisory Board.

For the purposes of this project, 'incidental findings' are findings about illegal/unethical acts by individuals or groups, as well as information from workshops that may concern third-parties. That is the reason for, on the one hand, we guarantee our ethical-legal behaviour in all activities. On the other side, we asked for participants - co-researchers - their informed consent including their compromise of not providing false information.

All these documents, are therefore, living documents, which will be updated, according to the cross-cutting nature of the ethical aspects, during the development of the whole project and especially in view of the emergence of the COVID-19 pandemic and the necessity of methodological adaptations.

## 10.2 Management of risks or disturbances

Regarding risks, we can affirm that they are minimal at NEWSERA. That is, the possible risk is one that does not exceed in probability or magnitude the one that could be expected in the daily work activity, including routine checks.

The only disturbance may be the use of participants' time, but they provide it voluntarily as co-researchers within the project. On the other hand, potential and necessary travel or other expenses will be covered by the project. In the case of journalists providing their professional services, they will be properly paid.

As far as NEWSERA activities are concerned, conducting surveys (which are anonymised for storage purposes) and interviews on topics that do not include any sensitive information does not involve more than the above mentioned minimal risks. Therefore, no prevention mechanisms are proposed in this regard.

As for protection of vulnerable groups -children, young minors, vulnerable adults - it has been explained in previous section on Data security and it is more detailed in deliverable **D8.3 H-POPD-Requirement No.3**.

## 10.3 Other considerations

Finally, as it is stated in the JRC document Survey report on data management in Citizen Science Projects, we will pay attention to “the variation in ethical and legal issues related to data gathering, sharing and storage depending on countries and cultures and promote best practices for addressing them.” (pag. 44). The consideration of the different cultures and backgrounds is a minimum requirement for achieving our objective of developing a co-created process, based on a bottom-up approach as much as possible.

# 11. Key Performance Indicators (KPIs)

Key Performance Indicators (KPI) will be defined to validate the impact and efficiency of decisions made. Examples of KPIs related to the DMP include:

### Personal

- Number of registered participants, that is, quantity of personal data
- Number of participants who request their personal data and download it
- Number of participants who request to withdraw from the project

## Statistics

- Space (in GB) occupied by the databases
- Number of requests for access to anonymized project information
- Number of data repositories in Zenodo with DOI (Findable)
- Number of Open Access data repositories (Accessible)
- Number of times that the data is used in other projects (Interoperable + Reusable)

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