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D. 1.4 Open Science Plan and activities

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Contents

Summary

The main objective of the Open Science Plan is to ensure that the SMILE Project contributes to the broader goals of advancing science, fostering innovation, and addressing societal challenges while ensuring that research is conducted transparently and with widespread accessibility. To this end, the Open Science Plan provides a comprehensive study of the guidelines and principles necessary for the project's context (Chapter 2) and an applied description of the promoted open science practices including an estimative roadmap (Chapter 3). The Open Science Plan is elaborated in order to provide insights on our strategy to enhance and prove the credibility and relevance of our project's research outcomes, and addressing mental health challenges through transparent and inclusive practices. This document (D 1.4) covers the first version of the Open Science Plan elaborated in the first 6 months of the project, while the next iteration of the document (D 1.5) will cover an extensive final version that will be finalised after obtaining more in-depth information regarding the progress of the project from multiple directions (clinical guidelines, technical progress, data management, privacy persevering mechanisms, etc).

1. Introduction

1.1 Purpose of the Open Science Plan

The Open Science Plan, along with the Data Management Plan, is an important pillar of the SMILE project's data strategy. The Open Science Plan contributes to our dedicated approach to providing knowledge into advancing mental health research with a focus on open and responsible scientific practices. Its primary purpose is to raise the quality of research while expanding its influence. By adhering to open science principles, the SMILE Project aims to instil transparency, collaboration, and accessibility at its core.

Open science, as a guiding principle, encourages the sharing of research data, methodologies, findings, and other outputs with the broader scientific community and the public [1]. This plan is designed to outline the objectives, strategies, and key components for implementing open science practices that align with the goals of the SMILE project.

For the Open Science Plan, the most important outcomes of the SMILE project are:

- evidence-based knowledge;
- innovation procedures and adhere to existing framework approaches;
- interoperability and data exchange of digital tools;
- privacy-preserving data sharing mechanisms;
- tools and methods for self-assessment and external assessment.

The above-mentioned results are analysed, filtered and prepared for different paths:

- sharing results with the research community in order to help others understand, promote and continue our research;
- explore the commercialization potential of the tools, methodologies and data.

The SMILE project is dedicated to advancing mental health management and well-being by promoting resilience and increasing young people’s cognitive flexibility, self-efficacy, critical thinking, self regulation and self confidence. To achieve this mission, the project recognizes the importance of integrating open science into its research framework and ensures that research outcomes are accessible to all stakeholders, including educators, healthcare professionals, policymakers, parents and other individuals that are responsible for mental health assessment and support for adolescents.

The Open Science Plan for the SMILE Project aims to address specific challenges. Some of these challenges include tackling technical interoperability, ensuring data and information interoperability, fostering collaborative ways of working, and addressing privacy and legal issues within the healthcare systems of different EU countries.

1.2 Objectives related to the open science approach

In a pragmatic display, these are the SMILE project's objectives related to the open science approach:

- **Open access to publications**: ensure that research publications resulting from the project are made openly accessible to the public; publishing in open-access journals, repositories, or preprint servers;
- **Transparency and reproducibility**: cultivate a shared vision that reflects our commitment to open and transparent scientific practices and reproducible research practices by providing detailed information about methods, protocols, and software tools used in the project;
- **Collaboration and engagement**: encourage collaboration with other research institutions, both within and outside the project consortium; contribute to the unification of efforts from multiple stakeholders and attempt to summarise such practices into tangible outcomes: digital tools, procedures, data sharing agreements, publications, strategies for mental health prevention etc.;
- **Open access to research data**: make research data generated during the project open and accessible, preferably through data repositories; benefit and contribute to the increase of data sharing accessibility;
- **Science communication**: develop a strategy for effectively communicating research findings to the public, policymakers, and other stakeholders; engage in science outreach and education to increase scientific literacy; organise public events for training and capacity building;
- **Inclusivity and diversity**: promote diversity and inclusivity in research teams and ensure that research benefits are widely distributed; provide data that ensures an equal representation across genders, age groups, socio-economic backgrounds and nationalities, as well as provide evidence for tracking the data provenance;
- **Ethical and responsible research**: ensure that research conducted under the project adheres to the highest ethical standards, especially responsible conduct in research, data protection, and ethical considerations when including under-age participants in research.

2. Relevant open science insights for SMILE - Guidelines and principles

2.1 Horizon Europe requirements

Open Science principles have been an integral component of European project grant agreements for an extended period, reflecting the European Commission's unwavering commitment to fostering open science practices. This dedication is driven by the Commission's broader objectives:

- boost the visibility of the results;
- amplify the impact of research;
- ensure the transparency of the work;
- increase the overall excellence of research outcomes.

The influence of open science can be discerned across all stages of a project's life cycle, from inception to completion.

This integration of open science practices signifies a transformative shift from traditional research practices to a more open, collaborative approach, aligning with the global push for open access, data sharing, and transparent research methods. As highlighted in Table 1, Open science is no longer optional; it is a foundational element of research excellence within Horizon Europe [2].

What?	How?	Classification	Novelty
Early and open sharing of research	Preregistration, registered reports, preprints, etc.	Recommended	New
Research output management	Data management plan (DMP)	Mandatory	Reinforced from H2020
Measures to ensure reproducibility of research outputs	Information on outputs / tools/ instruments and access to data/results for validation of publications	Mandatory	Reinforced from H2020
Open access to research outputs through deposition in trusted repositories	Open access to publications	Mandatory for peer-reviewed publications (including books for ERC projects)	Reinforced from H2020
	Open access to data	Mandatory for research data but with exceptions (‘as open as from H2020 possible...’)	

	Open access to software, models, algorithms, workflows etc.	Recommended for other research outputs	New
Participation in open peer-review	Publishing in open peer-reviewed journals or platforms	Recommended	New
Involving all relevant knowledge actors	Involvement of citizens, civil society and end-users in co-creation of content (e.g. crowd-sourcing, etc.)	Recommended	Reinforced from H2020

Table 1. Open Science practices and requirements

2.2 Open science principles

Open Science is not merely a concept, but rather a collection of fundamental principles that define the manner in which research is carried out and disseminated in order to be easily accessible by future researchers, serve the communities of experts in the targeted field, offer educational and research materials for education and provide a series of resources for the general audience.

The principles detailed in Table 2, aim to promote openness, cooperation, and availability in research activities.

Principle	Detailed description of the principle
Transparency	Research data, methods and findings should be made publicly available so that they may be independently verified.
Collaboration	Researchers are encouraged to collaborate, exchange knowledge and participate in interdisciplinary partnerships to enhance scientific comprehension.
Accessibility	Open science ensures that research outputs, such as publications, data and methodologies, are accessible to the widest possible audience, thereby eliminating barriers to the dissemination of knowledge.
Data sharing	The FAIR Data Principles (Findable, Accessible, Interoperable, Reusable) guide the management of research data by emphasising the significance of data sharing and reusability.
Open access publishing	Researchers are expected to implement open-access publishing options in order to make their research freely available and easy to disseminate.

Open science practices	Several practices, such as the sharing of research software and code, open peer review, preregistration of research protocols and early sharing initiatives, improve the quality of research.
Stakeholder engagement	Open science involves collaboration with different stakeholders, including healthcare professionals, scientists, policymakers, businesses and citizens.
Vision for open science	Open science envisions contributing to broader initiatives and creating a secure, inclusive research environment.
Addressing challenges	Open science recognizes and addresses potential challenges, providing strategies to ethical, legal and technical concerns.

Table 2. Open Science principles and descriptions

2.3 FAIR data principles and open access compliance

In 2016, the FAIR data principles were introduced as the 'FAIR Guiding Principles for Scientific Data Management and Stewardship.' In the context of scientific data management, their primary objective was to provide a set of guidelines for improving the Findability, Accessibility, Interoperability and Reusability (FAIR) of digital assets. These principles, emphasised in Figure 1, place a heavy emphasis on machine-actionability, which illustrates that computational systems must be capable of locating, accessing, integrating and reusing data without much human involvement. This is especially essential given the increasing volume, complexity and velocity of data generation [3].

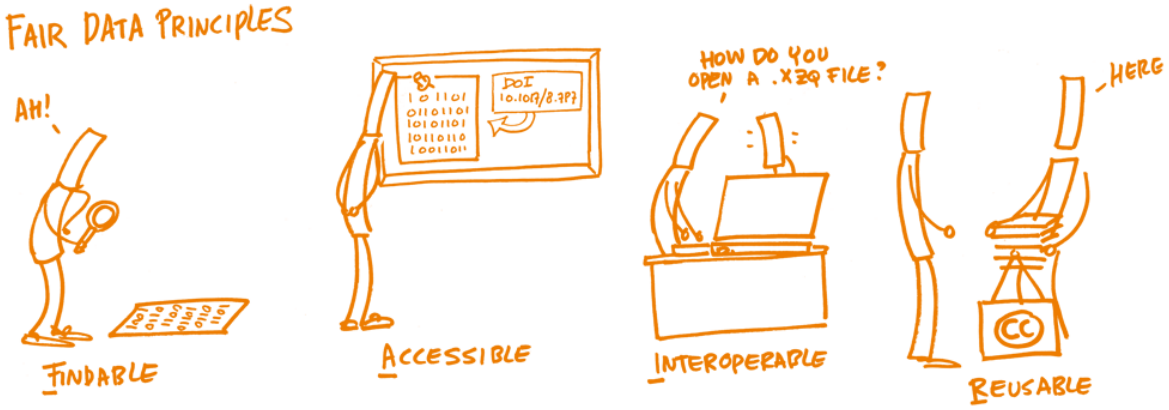


Figure 1. FAIR Principles

The FAIR principles promote **Findability**, which involves ensuring that data is readily accessible to both humans and machines, facilitating the automated discovery of datasets and services. Additionally, **Accessibility** plays a crucial role by ensuring that researchers can efficiently access the identified data. This component entails fulfilling authentication and authorization prerequisites, facilitating seamless accessibility of data for the intended users. **Interoperability** is an essential aspect that enables the

integration of data with different datasets and applications, facilitating complete analysis and utilisation. Finally, **Reusability**, the ability to repurpose research data is vital for prolonging its lifespan and maximising its influence. Comprehensive data descriptions enhance the ability to reproduce data and integrate it effectively in various settings, providing a broad spectrum of potential applications and research endeavours. Implementing these standards improves the credibility and effectiveness of research findings.

Open access compliance is intricately connected to the FAIR data principles, highlighting the significance of ensuring that research publications and data are broadly accessible. This guarantees that key ideas and discoveries are available to both the scientific community and the general public, in accordance with the concepts of Accessibility and Reusability. The integration of FAIR data practices and open access compliance enhances the transparent and collaborative essence of open science.

2.4 Legal and ethical principles guiding open science

Since the open science approach is growing, it is important to take into consideration valid concerns about data privacy and data sharing. From a legal standpoint we are transitioning through a period of changes and it is the right time to set the principles that are shaping open research. The EU General Data Protection Legislation (GDPR) may be officially enacted, but its substance is continuously changing through the interpretations of courts and data protection authorities in specific circumstances, as well as any auxiliary state legislation. Researchers should keep an eye out for chances to have their voices heard in these proceedings and use lessons learned from open records laws to help them craft interpretations that strike a fair balance between protecting people's privacy and fostering an environment where researchers can freely share data and collaborate on scientific discoveries [4].

Having in mind the open science principles, the legal framework applied to the outcomes of open science approaches is difficult to be framed based on traditional legal procedures. Due to interpretations or incorrect data sourcing, this situation could be the result of incomplete data, partial context descriptions and sometimes even unknown authors.

Based on the data referencing articles incorporated into GDPR essential Data Processing Principles [5] and the Charter of Fundamental Rights of the European Union [6] and the Declaration of Helsinki [7], for this report, we have identified the following relevant key legal principles:

- Mandatory purpose limitation of processed data;
- Informed consent for both subjects and researchers;

- Ensure that any third-party data, tools, or software used or integrated into the project respects copyright laws, patents, trademarks, or any other form of intellectual property rights;
- When publishing data or research outputs in the public domain, appropriate open licences (such as Creative Commons licences) should be applied, ensuring clarity on reuse, modification, and distribution;
- Apply data protection methods like data pseudonymization and anonymization and be open about the process used to apply these methods;
- For every resource that is released under the open science umbrella make sure you provide the following:
    - list of authors and affiliations;
    - recommend areas where the resource could be used without loosing the context;
    - recommend proper citation models;
    - document the context that was used when the open science results were published.

Ethical principles of open science are in line with or go beyond legal principles. Such principles are guided by a list of questions that have to be answered, reflected and they need to be accessible in any of the resources shared under the open science umbrella. Some of the relevant questions for our project are:

What is the purpose and nature of the research itself?
Is there any hidden or secondary purpose?
During the data collection procedures, what is the nature of consent obtained (e.g. opt-in, opt out participation, random, mandatory, etc.) ?
What data needs to be tracked during analysis and what portion of the data needs to be destroyed after it is used?
What is considered context-sensitive data and why?
If a certain result is considered and described as open science, what is a counterpart result - what is not open science? What is kept under commercial licence or private access?

The scientific community's goal in adopting open science principles is dependent on the legal and ethical principles to increase the accessibility of research findings, promote reproducibility, and most importantly foster collaboration across disciplines. Addressing societal issues, encouraging innovation and speeding up scientific discovery are all bigger goals that benefit from these concepts. Open science is more

than a collection of procedures; it is a paradigm shift in the way scientists collaborate and disseminate their findings to enhance societal progress.

2.5 Open access publishing options

Open access publishing enables unrestricted access to many forms of academic literature without any cost and typically involves less limitations on copyright and licensing compared to conventionally published materials, benefiting both readers and writers. Open access journals often derive their revenue from article processing charges, which are levies imposed on authors, rather than relying on subscription fees for funding their operations. Consequently, the expenses associated with editing the journal are transferred from readers, or more specifically from academic libraries that have subscriptions to scholarly literature, to the writers.

Over time, multiple parallel variants of open access have been promoted. Research funding institutions often provide guidelines and limitations in their financing terms but new variations and categories are always showing from the following sources:

- various publishers change their rules based on their success;
- in certain countries, some universities or groups of universities are promoting distinct national standards;
- domain-level research groups may also promote their own policy requirements regarding various types of open access publishing.

To cover the publishing of our project's outcomes, for this report, in Table 3, we have displayed 4 types of open access publishing [8]:

Green Open Access	Publishing entails the act of freely making available published or prepublication works for public use through self-archiving. Authors grant access to preprints or postprints (with the publisher's consent) in an institutional or disciplinary repository.
Gold Open Access	Publishing includes the dissemination of works through an open access journal and its accessibility through the journal's or publisher's website. Authors are responsible for paying article processing charges.
Hybrid Open Access	Provides authors with the opportunity to choose open access for their work, subject to a payment. Journals that provide hybrid open access are essentially subscription-based journals and offer open access publication for selected articles. These journals do not meet the criteria for being considered truly open access journals, but the outcome is the same: the work is available free of charge for readers.
Diamond Open Access	This type of open access refers to journals that are both

	free to publish in and free to access. The expenses associated with the upkeep and dissemination of the journal are often covered by the organisation that supports the publication. The Diamond Open Access status does not affect the journal's peer review procedure. This type of open access effectively achieves the objectives of democratising and extensively disseminating academic scholarship by allowing papers to be published and accessed without any cost.

Table 3. Open access publishing types

2.6 Research data management

Responsible and transparent scientific processes need careful handling of research data. The key actions described in Table 4 must be carried out to achieve this goal and to make scientific research open and accessible [2]:

Data Management Plan	Beneficiaries are required to create and consistently revise a data management strategy (DMP) for the data produced or gathered throughout the project. This plan outlines the methodology for organising, documenting and disseminating the data to the scientific community.
Data repository	As an essential measure to support open access, data must be stored in reliable repositories. By doing this, the project guarantees that the data will be easily accessed for future research and verification, aligning with the principle of being "as open as possible, as closed as necessary."
Information sharing	Beneficiaries shall submit complete information regarding any research outputs, tools, or instruments that are necessary for the efficient use of the data through the repository. This will help to support the reusability of the data as well as the validation of the data. This action contributes further to the idea of encouraging the reusability of data and guarantees that the data continue to be open and accessible to the public.
Metadata accessibility	The metadata linked to the research data must be openly accessible in accordance with the FAIR principles. Also, the metadata must be shared freely under a Public Domain Dedication from Creative Commons or similar licence. Metadata plays a crucial role in providing essential details about the data, such as licence terms and persistent identifiers, which enable academics and the wider community to easily locate and access it.

Table 4. Research data management actions

3. Open science practices and activities for SMILE

3.1 Overview of Open Science activities for SMILE

The SMILE project consortium is committed to supporting mental health in young people and we aim to do this by developing an integrated methodology for clinical decisions that relies on a digital ecosystem (a set of digital tools working together).

The data measurements, data flows and data-related processes within the digital ecosystem involve a complex mix between the following tasks described in Table 5.

Data collection activities	Technical tasks	Clinical mapping
● clinical trials; ● workshops and focus groups; ● feedback sessions; ● demo sessions; ● other pilot-related or pilot-specific activities.	● data exchange between various digital tools; ● data storage; ● data access policy; ● data access rights; ● data management.	● data analysis; ● understand the correlations and mechanisms of change; ● propose matching clinical procedures; ● test and perform risk assessment.

Table 5. Digital ecosystem Open Science activities

The data operations related to the clinical trials represent a complex mix among the following tasks described in Table 6.

Pilot-site data management	Cross-pilot data management
● ethical committee procedures and approvals; ● country/region specific informed consent to match the legislation and organisation rules for each pilot site (Italy, Cyprus, United Kingdom, Spain, Poland, Germany, Slovenia).	● data exchange agreements; ● multi-layer data access rights; ● decentralised governance for data access policy; ● data ownership; ● agreement on common data insights ownership and dissemination procedures.

Table 6. Clinical trials Open Science activities

The data perspectives presented above are preliminary in nature. They have been introduced as input materials for open science initiatives. More details about the data management evolution and data operations in each work package can be found in the Data Management deliverables (D 1.2 and D1.3).

Based on the inputs available from the digital and clinical streams, we have identified the following types of open science outputs for SMILE:

Open workflows	Open access publications and dissemination
Open data sets	Open source software

Each of the above will be further detailed in the next sub-chapters.

3.2 Open workflows

Open workflows refer to the transparent sharing of the methods, processes and steps undertaken during the research. For SMILE we plan the following stages:

- **Documentation**: ensure that every step of the research, from data collection to analysis, is thoroughly documented;
- **Standardisation**: adopt widely accepted standards or protocols, ensuring that the workflow is comprehensible to other researchers or professionals;
- **Collaborative tools**: use platforms like GitHub or GitLab for version-control and share the workflow. This allows for contributions, modifications, or corrections from the community.

We intend to organise communication and operational processes within SMILE and make them available through various means, including websites, publications, webinars and training sessions in which we present some of the project workflows. We consider that these lessons from our multidisciplinary research will be crucial for ensuring the reproducibility of results and guiding future work.

3.3 Open access publications and dissemination

Open access publications entail publishing research findings in journals or platforms where they are freely accessible to the public, without paywalls and according to one of the 4 standard open access licences (green, gold, hybrid, diamond) that were previously detailed in Sub-chapter 2.5. The SMILE consortium acknowledges the enhanced impact of open access publications and has already allocated a specific budget for covering the fees for peer-reviewed journals and conferences that offer open access licensing options.

For SMILE we also plan to follow the procedures required for open science pre-registration of materials and data that can be done through some platforms such as:

- Zenodo - operated by EU Cern Data Center and funded by EU
- Open Science Framework - operated by the Center of Open Science
- AsPredicted - operated by the University of Pennsylvania
- ClinicalTrials.gov - operated by the US National Library of Medicine
- Deutsches Register Klinischer Studien - operated by the German Institute for Medical Documentation and Information

We envision that for SMILE, the materials submitted to those platforms could provide detailed information about the study, versions, portions of the state of the art research, hypotheses, study design, sample size, statistical analysis plan, or expected outcomes.

As part of the dissemination of open science results, the SMILE consortium plans to organise or participate in public webinars, training sessions, workshops and conferences to disseminate findings and specific issues tackled within the project.

3.4 Ensuring transparency and reproducibility

Transparency and reproducibility are inherent in fundamental scientific ideals, such as communality, universalism, disinterestedness and organised scepticism. Transparency in research refers to the practice of making all aspects of your research process, methods and results as clear and understandable as possible. The term reproducibility means that another researcher, using the same data, methods and procedures, should be able to recreate the results.

Transparency and reproducibility ensure that research is conducted in a manner that allows others to understand and replicate the work. Namely, by applying the two concepts researchers can verify the work of others. Verifiability relates to the ideal of science as “self-correcting,” which means the scientific community governs itself in order to calibrate evidentiary claims and limit unavoidable errors, thereby safeguarding credibility and instilling trust in the scientific literature.

In SMILE we will ensure that the following aspects of transparency are facilitated in all research:

- **Methodology**: the methods, procedures and techniques used in SMILE research will be clearly described. This includes providing detailed step-by-step explanations so that others can replicate the work. All SMILE studies involving human subjects will deliver detailed study protocols, clearly describing the study methodology;

- **Data**: transparent and clear description of the data collected or used in the research. This includes data sources, data collection methods and any data preprocessing or cleaning that was performed;
- **Assumptions and limitations**: the assumptions made during the research and any limitations of the studies will be clearly defined. Transparency about these aspects helps others interpret findings correctly and within the correct context;
- **Documentation**: thorough records of the research process, including lab notes, code comments and detailed documentation of experimental setups. This will ensure that multicentric studies in SMILE are conducted with consistent assumptions, making the results comparable. It will also ensure other researchers can understand and trust work carried out within the studies;
- **Code and software**: if the research will involve software or code, the SMILE consortium will share it openly. Naturally, provisions can be made concerning the background and foreground IPR if the sharing is in direct conflict with the interests of (commercial) partners in SMILE. Make sure the code is well-documented and includes comments to explain its functionality and usage.

In SMILE, we will guarantee that all research supports the following aspects of reproducibility:

- **Open data**: whenever possible and in accordance with legal and ethical standards, we will provide access to the raw data used in the study. Such access can include datasets, survey responses, or any other data collected or used in the analysis; (*See Section 3.5*)
- **Open access to software**: considering any confidentiality agreements and intellectual property rights restrictions, we will share the software and tools developed for research as open-source whenever possible; (see Section 3.6)
- **Detailed methods**: clear explanation on how the experiments, surveys, or analyses were conducted will be given. All SMILE studies involving human subjects will deliver detailed study protocols. The protocols will also identify equipment, materials and settings so that others could replicate the experiments accurately;
- **Peer review**: the work will be submitted to peer-reviewed journals or preprint servers where other experts can scrutinise both methods and results. Peer review helps further validate the reproducibility of the work;
- **Checklist for replication**: SMILE consortium will create a checklist or a set of instructions for all SMILE researchers and external researchers who want to replicate the work. This will include guidelines and key parameters;
- **Versioning**: a version control system for code and data will be used. Tools like Git enable researchers to track changes in code and data, making it easier to identify and reproduce specific versions of the work.

3.5 Open data sets

Open data sets involve making the research data collected or generated available to the public, allowing for verification, replication, or further analysis by other researchers. For SMILE we plan to perform the following:

- **Data anonymization**: given the sensitivity of mental health data, we will make sure that all datasets are appropriately pseudonymized or anonymized;
- **Metadata**: accompany datasets with thorough metadata to ensure understandability and reusability;
- **Repository choice**: use recognized data repositories (like Zenodo, Dryad, or others specific to healthcare) to host datasets, ensuring longevity and accessibility;
- **Licensing**: decisions and justifications for open data licences that define how the data can be used, shared, or modified;

As work is ongoing to ensure compliance with legal and ethical procedures, at this point it is yet unclear how the open data sets will reflect the technical and clinical processes, but further deliberations on this topic will be included in upcoming versions of this deliverable.

3.6 Open source software

Open source software refers to the software or tools developed during the research, where the source code is made available to the public. For SMILE we plan to perform the following:

- **Code quality**: ensure that the software code is clean, well-commented and follows standard coding practices;
- **Documentation**: accompany the software with comprehensive documentation, including installation guidelines, usage instructions and examples;
- **Repository choice**: platforms like GitHub or GitLab are excellent for sharing open-source software, allowing for community contributions and version control;
- **Licensing**: study and adopt open-source licences (like MIT, GPL, or Apache) that dictate how the software can be used, modified or redistributed.

Most of the digital tools developed within SMILE will be exploited as commercial tools or services. However, during the development of these tools, some algorithms, methods or libraries will be made by using or re-using already existing open source materials. Those who were developed with open source components will be made open source (completely or partially) while also respecting their existing licensing constraints.

3.7 Science communication strategy

Science communication is the practice of conveying scientific information and concepts to various audiences, including the general public, policymakers and other stakeholders. Effective science communication is essential for making scientific knowledge accessible and understandable. Effective science communication involves using language that is clear and jargon-free, utilising visuals and analogies to aid understanding and understanding the needs and interests of the target audience. It also involves actively listening to feedback and questions from the public and being open to dialogue and discussion about scientific topics.

Ultimately, the science communication approach of SMILE is summarised in Deliverable D8.1: Communication, engagement, dissemination and exploitation plan. In the context of Open Science practices, the SMILE strategy for bridging the gap between the scientific community and the wider public will encompass the activities described below in Table 7.

Public outreach	**Science blogs**	SMILE partners will deliver articles to explain complex scientific concepts in an understandable and engaging manner.
	Social engagement	SMILE Partners will host online webinars or discussion panels to engage with the public and answer questions about topics related to mental health of children and adolescents.
	Social media	SMILE partners will use platforms, such as Twitter, Instagram, LinkedIn and TikTok to share short, visually appealing science snippets or engage in science discussions with the public.
	Science festivals and events	SMILE partners will participate in or organise science festivals, exhibitions and public lectures to engage with the community directly.
	Public lectures and talks	Delivering public lectures at universities, events organised by other EU projects and other public venues to share research findings and insights with a scientific, but also non-specialist audience.
	News articles	In addition to scientific publications the SMILE partners intend to disseminate results and research findings and scientific developments in newspapers, magazines and online news outlets.
Education	**Educational materials**	SMILE partners will develop educational materials to make scientific knowledge

		accessible to students of all levels and ages.
	Interactive workshops	SMILE partners will organise workshops and hands-on activities for students and the general public to learn about mental health in an engaging and interactive way.
Policy Advocacy	**White papers and reports**	SMILE partners will write policy briefs, white papers and reports to communicate research findings and recommendations to policymakers and government agencies.
	Consultation	SMILE partners will provide expert testimony and consultations to inform the development of policies and regulations related to mental health of children and adolescents.
Visual media	**Infographics**	As part of the identity of SMILE project, visually appealing and informative infographics to simplify complex scientific data and concepts will be created.
	Animation and videos	SMILE partners will develop informative animations and videos to explain scientific processes and discoveries in a way applicable to wider public and especially children and adolescents.

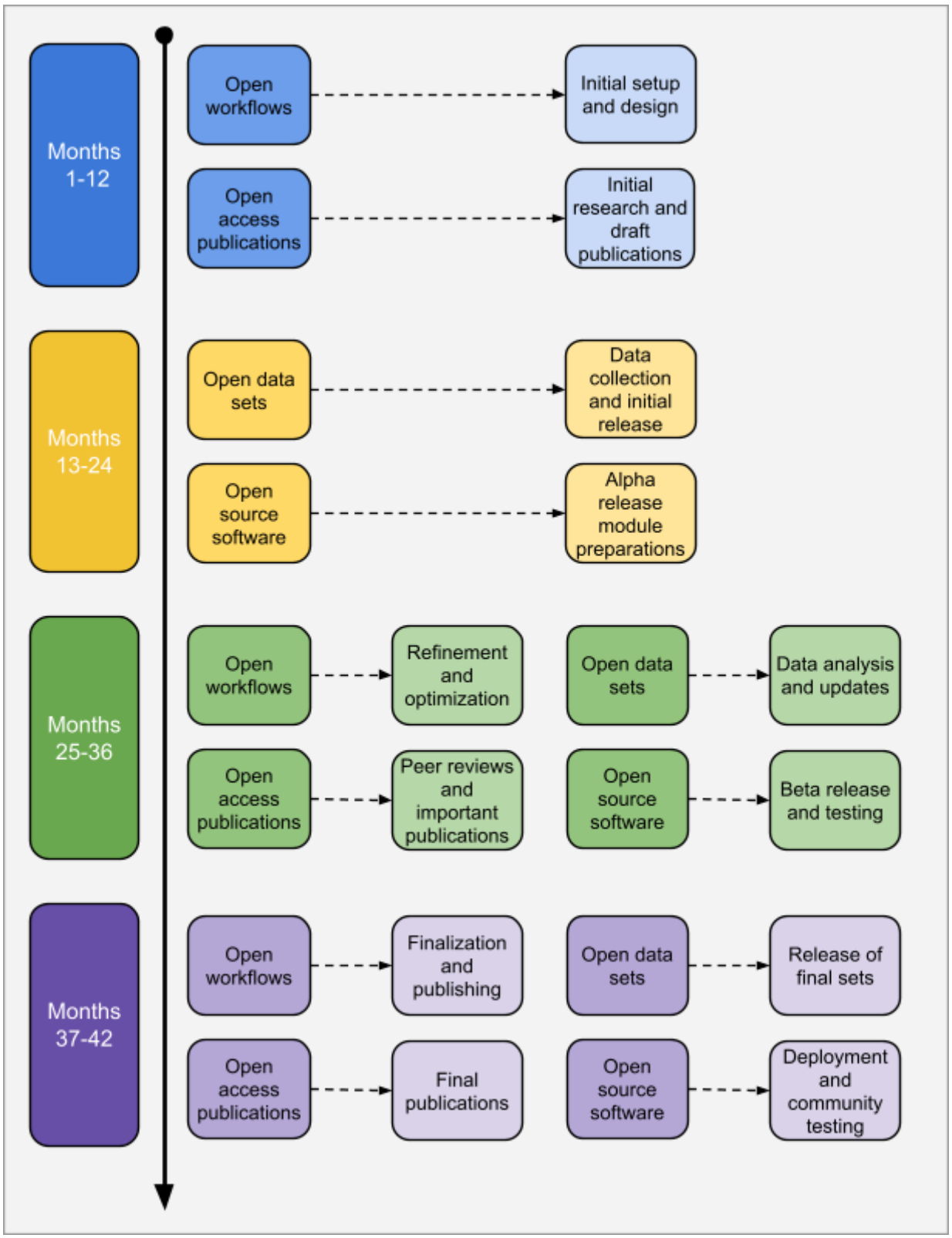
Table 7. Science communication strategy

3.8 Roadmap

As part of this open science plan and activities, until *Month 6*, the SMILE consortium has prepared a roadmap for open science that is displayed in the diagram below.

The presented timeline is considered to be an operational draft and is based on the estimations, operations and knowledge that the consortium has after the first 6 months of the project. The roadmap can be revised and improved in the future versions of this deliverable.

This roadmap will help us steer our open scientific activities in the right direction, allocate our resources wisely, and encourage teamwork among our multidisciplinary team. It provides a methodical structure that aids in goal-setting and progress tracking, and it encourages openness and responsibility in our research procedures. This plan will be a living document that will be updated as we learn more and make progress throughout the project's duration. This strategy is not meant to be a static document, but rather a live document that will change and grow as needed to optimise the impact of open science on our collective objective to advance research into mental health.


Months 1-12
Open workflows
Initial setup and design
Open access publications
Initial research and draft publications
Months 13-24
Open data sets
Data collection and initial release
Open source software
Alpha release module preparations
Months 25-36
Open workflows
Refinement and optimization
Open data sets
Data analysis and updates
Open access publications
Peer reviews and important publications
Open source software
Beta release and testing
Months 37-42
Open workflows
Finalization and publishing
Open data sets
Release of final sets
Open access publications
Final publications
Open source software
Deployment and community testing

4. Conclusions

Embracing open science principles entails embracing a set of core beliefs and practices that foster transparency, cooperation, and accessibility in research. Open science promotes the dissemination of research results, data, methodology and conclusions to the wider scientific community and the general public. The open science principles aim to improve the quality and influence of research by promoting a culture of transparent and accountable scientific methodologies. Researchers are encouraged to provide transparency in their work, disseminate their results and engage in interdisciplinary collaboration. In addition, open science advocates for the utilisation of open-access publication, data sharing and community participation to guarantee that research results are accessible and practical for a broad audience.

All SMILE consortium members firmly believe in the importance of open science practices for creating a bigger impact and creating more value as regards European research. At this early stage of the project, the SMILE consortium has already prepared a roadmap for open science. This will serve as a permanent guideline for the future activities and will help the consortium partners conduct the project activities in accordance with the open science principles. The SMILE partners with technical capabilities, piloting responsibilities and clinical expertise are working on methods to improve and contribute to project outcomes that will motivate stakeholders to exchange knowledge and conduct responsible research in the European mental health expert groups.

References

[1] Miedema, F. (2022). Transition to Open Science. In: Open Science: the Very Idea. Springer, Dordrecht. https://doi.org/10.1007/978-94-024-2115-6_7

[2] Alea Lopez de San Roman, Dagmar Meyer, Emilie Hermans, & Ellen Leenarts. Horizon Europe train-the-trainer workshop. Open Science Fair 2021 (OSFair2021). Zenodo. https://doi.org/10.5281/zenodo.5549524

[3] Go-Fair 2023, released under Creative Commons Attribution 4.0 Licence. Fair principles. https://www.go-fair.org/fair-principles/

[4] Phillips, M., & Knoppers, B. M. (2019). Whose Commons? Data Protection as a Legal Limit of Open Science. The Journal of Law, Medicine & Ethics, 47(1), 106-111. https://doi.org/10.1177/1073110519840489

[5] General Data Protection Regulation GDPR reading format https://gdpr-info.eu/ and Official document https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679

[6] Charter of Fundamental Rights of the European Union https://www.europarl.europa.eu/charter/pdf/text_en.pdf

[7] Declaration of Helsinki. Medical Research Involving Human Subjects https://www.wma.net/what-we-do/medical-ethics/declaration-of-helsinki/

[8] H2020 Project - Research & Innovation For Cities and Citizens Deliverable 7.3 Open Science guidebook https://ec2u.eu/wp-content/uploads/sites/709/2023/05/D7.3-Guidebook-for-Open-Science-champions1.pdf