Action line B5.4 of the action plan on Open Research Data: Establish ORD expertise (e.g. data stewardship) as an independent career path at HEIs by 2028

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FORS explore.understand.share.

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Table of content

Abbreviations

AI	Artificial Intelligence
ARDC	Australian Research Data Commons
BMBF	Bundesministerium für Bildung und Forschung
CARE	Collective Benefit, Authority to Control, Responsibility, Ethics
CAS	Certificate of Advanced Studies
CEPAL	Conference of Statistical Offices of Latin America and the Caribbean
CFRCB	Regional training centers for library careers
CIHR	Canadian Institutes of Health Research
CNIL	Commission Nationale de l'Informatique et des Libertés
CNRS	Centre national de la recherche scientifique
CORA	Catalan Open Research Area
CoSO	Comité pour la science ouverte
CRAI	Centre de Recursos per a l'Aprenentatge i la Investigació
CSUC	Consorci de Serveis Universitaris de Catalunya
DCN	Data Curation Network
DelC	Danish e-Infrastructure Cooperation
DelOS	Delegation Open Science
DM	Data Management
DPO	Data Protection Officer
DoRANum	Données de la recherche apprentissage numérique
DST	Department of Science and Technology
ENNSIB	Ecole nationale supérieure des sciences de l'information et des bibliothèques
EOSC	European Open Science Cloud
ERI	Education, Research, and Innovation sector
FAIR	Findable, Accessible, Interoperable, Reusable
FH	Fachhochschule
FNU	Fiji National University
FORS	Swiss Centre of Expertise in the Social Sciences
FTE	Full time equivalent

FUN MOOC	France université numérique – Massive Open Online Course
GAO	U.S. Government Accountability Office
GTSO Couperin	Groupe de travail science ouverte Couperin
HE	Higher Education
HEI	Higher Education Institution
HEIs	Higher Education Institutions
HEP	Haute école pédagogique
Huma-Num	Humanités numériques
ICSSR	Indian Council of Social Science Research
Inist-CNRS	Institut de l'Information scientifique et technique
LERU	League of European Research Universities
MAS	Master of Advanced Studies
MOOC	Massive Open Online Course
MOSP	Malaysia Open Science Platform
NCERT	National Council of Educational Research and Training
NCRIS	National Collaborative Research Infrastructure Strategy
NFDI	Nationale Forschungsdateninfrastruktur
NICT	Network ICT Services for Swiss Higher Education
NIH	National Institutes of Health
NII	National Institute of Informatics
NSERC	Natural Sciences and Engineering Research Council of Canada
NSF	National Science Foundation
NPOS	National Programme Open Science
OPIDoR	Outils et Plateforme pour l'Interopérabilité et la Diffusion des Recherches
ORD	Open Research Data
PNSO	Plan national pour la science ouverte
PH	Pädagogische Hochschule
RCOS	Research Center for Open Science and Data Platform
RDA	Research Data Alliance
RDM	Research Data Management
RDR	Repository of Research Data
RPO	Research Performing Organisations
SERI	State Secretariat for Education, Research and Innovation

SIB	Swiss Institute of Bioinformatics
SRDSN	Swiss Research Data Support Network
SSHRC	Social Sciences and Humanities Research Council of Canada
SUS	Unified Health System
UAS	University of Applied Sciences
UCPH	University of Copenhagen
UCT	University of Capetown
UNA-SUS	Open University System of Unified Health System
URFIST	Regional Training Units for Scientific and Technical Information
USAID	U.S. Agency for International Development
UTE	University of Teacher Education
UTS	University of Technology Sydney

1 Executive summary

This report examines challenges and needs of experts in Open Research Data (ORD) at Higher Education Institutions (HEIs) with a primary focus on Switzerland. It aims to serve as a foundation for future activities and measures within the Education, Research, and Innovation (ERI) sector for 2025-2028.

More precisely, swissuniversities tasked the Swiss Research Data Support Network (SRDSN) with assessing the current situation and developing recommendations to establish ORD expertise (e.g. data stewardship) as an independent career path at HEIs by 2028. The mandate was carried out by members of the University of Basel, University of Lausanne, University of Geneva, Università della Svizzera Italiana as well as the Swiss Institute of Bioinformatics and FORS from 1 October, 2024 to 30 June, 2025.

Despite the growing importance of Open Science and Open Research Data for scientific quality, career paths of ORD experts at HEIs are still a recent phenomenon and remain yet mostly unexplored. By examining what is needed, HEIs can support ORD experts to pursue a career path and effectively contribute to strengthening Open Science. The recommendations formulated in this report are based on a comprehensive literature review, an overview of national and international training programs, a quantitative survey among ORD experts in Switzerland, and interviews.

The literature review shows, that the creation of distinct professional profiles and career paths of ORD experts and in particular Data Stewards are linked to national initiatives. Countries, who strongly foster Open Science and ORD, also have and enable careers related to clear cut professional profiles since the last few years.

The quantitative survey illustrates that ORD experts are still a young professional group in Switzerland. Most of the respondents have been working as ORD experts only for the last two or three years. Most of them have a background in academia and research, and most of them are either still active in research or have positions in HEI libraries. The majority seems to be affiliated with universities. The career paths and professional profiles are neither clear cut at the moment, nor well established. Currently, there are hardly any statements possible about differences in career paths with regard to the various types of HEIs. The situation of ORD experts thus reflects, to a certain extent, the maturity of the general development of ORD in Switzerland. Much is in motion, but not yet firmly established.

The qualitative study supports the results of the quantitative survey and shows in particular that uncertain and temporary employment conditions cause uncertainty regarding career paths and, in particular, career planning.

Based on the results of our research methods, we present a set of six key recommendations to enhance ORD expert's career development and contributions to Open Science (see chapter 6). Below are the previews of the recommendations:

1. **Strengthen integration within the research community** (6.1.1) – ORD experts often work disconnected from the actual research process; building stronger ties and encouraging regular interactions with researchers is essential to ensure ORD practices are embedded in everyday research workflows. This recommendation serves as a foundational prerequisite for the success of all other recommendations.
2. **Strengthen institutional recognition of ORD practices and roles** (6.2.1) – To address the lack of recognition for ORD experts, it is recommended to strengthen their institutional role through sustainable and flexible funding, clearer job titles, and enhanced visibility within institutional hierarchies.
3. **Job security and clear, structured career advancement opportunities** (6.3.1) – Many ORD experts face unstable employment conditions and unclear career paths. Structural reforms and dedicated career support mechanisms are required to attract and retain talent in this critical area. This is clearly reflected in the survey results, where over 70% of respondents expressed dissatisfaction with current career opportunities — underscoring the urgent need for more secure funding and permanent positions to establish ORD expertise as a stable career path within Swiss HEIs.
4. **Broad access to advanced and domain-specific training** (6.4.1) – Institutions should offer structured, tailored onboarding programs for ORD experts, aligned with their specific roles, contexts, and backgrounds. Formal training opportunities—such as certified programs—should be accessible, recognized, and integrated into professional development. Lifelong learning must be supported through flexible, domain-specific training with financial and time-related resources, including participation in communities of practice like the SRDSN.
5. **Coherence and strategic consistency across institutions** (6.5.1) – To balance consistency with institutional diversity, a harmonized national definition of data stewardship is recommended, while respecting local contexts. A nationally coordinated training program should be developed, supported by a centralized platform—ideally in collaboration with the SRDSN—for sharing training materials for both initial and ongoing education.
6. **Supporting the Career Development of Data Stewards in Switzerland** (6.6.1) – Policymakers and funders should provide strategic support, resources, and incentives to embed data stewardship in Swiss research and education. Supporting the definition of the mission, roles, and skills of data stewards through guidelines will enable consistent recruitment, training, and recognition. Formal acknowledgment of data stewards as a profession — through inclusion in national occupational profiles and alignment with recognized qualifications — will support career development and mobility.

These recommendations provide the Open Science programme and the DelOS of swissuniversities with a clear framework to plan next steps with regard to the National ORD Strategy and the accompanying action plan. Furthermore, they offer insights for policymakers, funders and Swiss HEIs on how to strengthen ORD expertise as a recognized and sustainable career path. By implementing these measures, HEIs can enhance research quality, foster closer collaboration between ORD experts and researchers, and secure long-term success in Open Science initiatives.

2 Introduction

2.1 Mandate's anchoring in the Swiss National Open Research Data Strategy

In 2021, swissuniversities, under the mandate of the State Secretariat for Education, Research and Innovation (SERI), published a national Open Research Data (ORD) Strategy and a corresponding action plan[1]. That strategy outlines the overarching principles guiding the strategic direction of ORD implementation across Swiss Higher Education Institutions (HEIs) and establishes the governance framework for its execution. Measure B5 of the strategy's associated National Open Research Data Action Plan aims to enhance the role of ORD experts, i.e. data stewards, data scientists, IT specialists and other ORD support professionals or people entrusted with tasks related to data stewardship at universities and research institutions in Switzerland.

In 2024, as part of measure B5, three new ORD mandates were awarded to the Swiss Research Data Support Network (SRDSN), a community dedicated to fostering collaboration, knowledge sharing, and the development of best practices among Research Data Management (RDM) professionals from various disciplines and Swiss HEIs. The three mandates were:

- Mandate B5.1, which aims to identify best practices for the implementation and delivery of ORD support in Swiss HEIs. Best practices address issues such as establishing and coordinating sustainable services, workflows, and networks, as well as delivering ORD support, and conducting related communication and awareness-raising efforts.
- Mandate B5.4, which has the objective to assess the current status of ORD experts' careers, their needs, future challenges, and potential next steps and solutions to establish ORD expertise as an independent career path.
- Mandate C2.3, which seeks to define a framework for systematic communication between RDM trainers and RDM support professionals to facilitate the exchange of experiences and best practices in RDM training, and the promotion of RDM training at Swiss HEIs.

[1] <https://www.swissuniversities.ch/fr/themes/open-science/open-research-data/strategie-nationale>, last visited on June 6, 2025.

This document is thus the outcome of the Action Line B5.4 "Establish ORD expertise (e.g. data stewardship) as an independent career path at HEIs by 2028". It intends to serve as a basis for future activities and measures within the Education, Research, and Innovation (ERI) sector for 2025-2028.

The mandate was implemented from October 2024 until June 2025, and funded by swissuniversities with CHF 45'000.-. The University of Basel (UNIBAS) acted as the leading house of the mandate and had as partner institutions: the University of Lausanne (UNIL), Scuola universitaria professionale della Svizzera italiana (SUPSI), SIB Swiss Institute of Bioinformatics (SIB), Swiss Centre of Expertise in the Social Sciences (FORS), and the University of Geneva (UNIGE).

The group for the fulfilment of the mandate was composed of 9 members: UNIBAS (1 member), UNIL (3 members), UNIGE (1 member), SUPSI (1 member), SIB (2 members) and FORS (1 member).

2.2 On the importance and value of ORD experts

In 2020, Barend Mons highlighted a critical issue in the research landscape: the vast majority of research data remains unpublished and, therefore, unavailable for reuse (Mons 2020). This lack of accessibility not only hampers the reproducibility and reuse of scientific findings but also undermines ethical research practices. Moreover, it represents a significant waste of public resources, as valuable data generated through publicly funded research often goes lost.

In his influential paper, the author recommends that research institutions allocate at least 5% of their research budgets to data stewardship, supporting technologies, and infrastructure. He estimates that approximately 500,000 dedicated professionals in Europe—such as data stewards—will be needed to meet the growing demands of modern research, equating to one data expert for every 20 researchers. These roles are essential, as the complexity and time requirements of data management exceed what can reasonably be expected of researchers alone.

For the European Union, this 5% allocation would represent an investment of around 15 billion euros. However, this should be viewed not as a cost, but as a strategic investment. A 2018 EU report estimated that inefficiencies in the academic sector result in annual losses of up to 10 billion euros. Addressing these inefficiencies through robust data stewardship could therefore yield significant returns, both economically and in research quality and innovation capacity.

This perspective aligns closely with UNESCO's *Recommendation on Open Science*, which calls on its Member States to invest in "capacity-building on open science concepts and practices," including competencies in data stewardship (UNESCO 2021). UNESCO further encourages the development of a shared framework for open science skills and the implementation of comprehensive training programmes to support these competencies across the research ecosystem.

Importantly, UNESCO emphasizes that data stewardship skills should be systematically integrated into higher education curricula as part of core research training. This recommendation, also highlighted in Basalti et al. (2024, p.12), underscores the need for coordinated policy action to ensure that future researchers and support professionals are equipped to manage and share data effectively in an open science environment.

This call to action is echoed in Switzerland's set of recommendations[2] for advancing ORD, developed by the ORD Sounding Board of service providers under the mandate of the Swiss National ORD Strategy Council. The document advocates for the formal recognition of data stewardship as a professional role and recommends the establishment of clear career pathways within higher education institutions and organizations that host research data repositories. The considerations and recommendations outlined in this report are intended to inform and shape the next steps toward sustaining and promoting data stewardship as a recognised and valued professional career path in Switzerland.

3 Approach and deliverables

The swissuniversities mandate required a comprehensive overview of the status of ORD (Open Research Data) career paths and training, both nationally and internationally. This included an examination of how higher education institutions (HEIs) in Switzerland and abroad currently address education and career development in the ORD field. This work should include:

- A meta-study (landscape analysis) to synthesize existing reports, surveys, and studies from Switzerland, Europe, and other international contexts, common challenges and opportunities in the development of ORD careers.

[2] <https://openresearchdata.swiss/resources/enhancing-ord-switzerland-sounding-board-recommendations/>, last visited on June 6, 2025.

- An analysis of typical career paths for ORD experts at Swiss universities including data gathered e.g. through a survey, and a needs analysis to assess the demand for independent ORD career paths. This would help identify patterns and gaps in existing career trajectories.
- An overview of existing education and career paths at both Swiss and international HEIs.

The study should explore the specific needs and challenges faced by ORD experts at Swiss HEIs. This would help tailor strategies to different institutional contexts.

Key questions to be addressed in the needs analysis included identifying the target group, ensuring the attractiveness of the roles, and considering long-term sustainability.

Drawing on national and international experiences, the study should outline the next necessary steps for advancing ORD careers in Switzerland. This should include identifying actionable measures to be implemented during the SERI funding period 2025–2028 to ensure the permanent establishment of ORD roles at Swiss universities.

Finally, all the results of the study should be summarised in a report.

To answer the key questions outlined above, and maximise the time investment of the partners, the activities and tasks to perform the work were divided among the partners according to three main tasks: 1) the meta-study analysis, 2) the survey design and implementation, and 3) interviews with ORD experts of Swiss HEIs. In general, for the whole project, the partners contributed with the following roles:

Pedro Araujo: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Gérard Bagnoud: Conceptualization, Validation, Writing – review & editing.

Silke Bellanger: Supervision, Writing – review & editing.

Noémi Duperron: Conceptualization, Validation, Writing – review & editing.

Marielle Guirlet: Conceptualization, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing.

Carmen Jambé: Conceptualization, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing.

Loredana Martignetti: Conceptualization, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing.

Emanuele Meier: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Patricia M. Palagi: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing.

Monique Zahn: Conceptualization, Validation, Writing – original draft, Writing – review & editing.

4 Methods applied

4.1 Meta study

4.2 Definitions – terminology

During the development of the project, several key terms were identified that required clear definitions to ensure a common understanding among all participants. For example, the terms RDM, FAIR data, and ORD are often used interchangeably. While there is some overlap among these concepts, they have distinct meanings. The specific terms listed below were used throughout this project and shared among the other two mandates:

1. **Research Data Management** (RDM) can be defined as "the handling of research data (collection, organization, storage, and documentation) during and after a research activity" (source B5.1).
2. **Findable, Accessible, Interoperable and Reusable** (FAIR) principles aim at valorising data by permitting the higher level of their practical re-usability focusing on creating documentation, metadata, and provisions on technical and organizational levels. The aim is to allow for research data to be accessed and processed by both humans and computers (source B5.1).
3. **Open Research Data** (ORD) can be defined as "data produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such (source B5.1).
4. **Data Steward** (DS) supports and facilitates researchers for the management of research data (and metadata) throughout their research life cycle (SwissDS-ENV).

5. **Higher Education Institutions** (HEI) are universities and federal institutes of technology (ETH Zurich/EPFL), universities of applied sciences and universities of teacher education. They follow the international three-tier model, with programmes for bachelor, master and doctorate levels (only universities can award PhDs). They also carry out research, offer continuing education programmes and provide third-party services (source EDA)[3].
6. **Open Research Data (ORD) experts** are data stewards, data scientists, IT specialists and other ORD support professionals or persons entrusted with tasks related to data stewardship at Swiss Higher Education and research institutions (source swissuniversities mandate).
7. **Career path** is the series of jobs or roles that constitute a person's career, especially one in a particular field (source Oxford Dictionary)[4].

4.3 Scope and implementation

We have noted that the term "ORD experts" can be quite broad, encompassing many potential training and career paths. This could result in an overwhelming number of possibilities that would hinder the finalisation of the report in the given time frame. Therefore, for the purpose of this mandate, we have narrowed our focus to Data Stewards. We aimed to identify any formal certifications that could support this profession and to explore what typical career paths might lead an individual to become a Data Steward.

The methodology employed to analyse the current landscape of Data Stewards and their career trajectories within research institutions across the globe was based on literature and online information reviews. For the literature review, we used as starting points the reports and literature consulted for the SwissDS-ENV project[5], led by UNIL, and the development of the Certificate of Advanced Studies (CAS) in Data Stewardship (Guirlet 2024). We extended the literature review by using the advanced search techniques on platforms such as Google Scholar and Google Advanced Search to identify a broader range of pertinent academic papers, reports, and articles related to ORD.

In addition to traditional research methods, generative AI models—including Copilot, ChatGPT, and Perplexity—were integrated into the data-gathering process. These AI tools broadened the scope of information collection and found additional information not captured through conventional methods.

3 <https://www.aboutswitzerland.eda.admin.ch/en/universities-and-other-higher-education-institutions>, last visited on June 6, 2025.

4 <https://www.oed.com/dictionary/career-path_n?tab=meaning_and_use#1339523290100>, last visited on 22 June, 2025.

5 <https://unil.ch/swissds-env/en/>, last visited on June 6, 2025.

Each output generated by these AI systems was subjected to meticulous manual verification to ensure its accuracy, validity, and relevance to the study.

For the Google Advanced searches, we use keywords such as: Open Research Data, Data Steward, Data Stewardship, career path, and filtered to specific countries (region=investigated country). For the generative models, we used prompts such as:

- What is the current situation of Open Research Data (ORD) experts and their career trajectories within research institutions in country x. Refine the results to only the results found in that country x or continent y.
- Are there any certifications to become a Data Steward in Research in country x?
- What are the common career paths followed by Data Stewards in country x?
- Who is responsible for research data management in research institutions in country x?
- Do research institutions in country x have Data Stewards that carry on research data management? And if yes, what type of career path do they follow?

4.4 Survey

4.4.1 Survey design

To address the research questions outlined in the mandate, an online survey was conducted between November 22, 2024 and January 10, 2025. This survey was developed in collaboration with the two other projects funded by swissuniversities, i.e. B5.1 and C2.3.

The survey was administered using the LimeSurvey platform hosted on a secured server at SUPSI. It primarily consisted of closed-ended questions, supplemented by a few open-ended questions. Respondents had the option to skip certain questions, leading to variations in participation rates across the different sections. The survey had 44 questions and was structured into 5 sections. The first and last sections were common to all three projects, followed by project-specific blocks of questions.

1. Background information (questions 1-4)
2. Questions for mandate B5.1 (questions 5-14)
3. Questions for mandate B5.4 (questions 15-30)
4. Questions for mandate C2.3 (questions 31-43)

5. Questions regarding availability for follow-up interview or focus group interviews (question 44)

The questions for mandate B5.4 are provided in the Appendix I.

4.4.2 Target population

The survey was designed for a specialized population of professionals working on RDM and ORD-related topics within Swiss HEIs. This group includes a wide range of roles, such as coordinators, IT specialists, librarians and archivists, as well as support specialists. To reach this target population, the strategy adopted was to contact all members of the Swiss Research Data Support Network (SRDSN), who could themselves contact their colleagues and institutional network who would be interested in taking part in the survey.

The first announcement of the survey took place during an SRDSN meeting on November 7, 2024. Following this, an email was sent to all SRDSN members (n=171), encouraging them to participate in the survey. Multiple responses per institution were allowed, as many Swiss HEIs have more than one staff member affiliated with the SRDSN.

A total of 106 respondents began the survey. However, 16 skipped all the pages, providing no answers throughout, leaving 90 participants who engaged with the questions. Of these, 53 completed the survey in its entirety. The participants come from six types of institutions (Table 1; n=85, 5 participants did not specify their institution).

Table 1. Number of individual answers by institution type

Institutions	Total
Universities	
University of Basel (UNIBAS)	6
University of Bern (UNIBE)	6
University of Geneva (UNIGE)	4
University of Lausanne (UNIL)	6
University of Lucerne (UNILU)	3
University of Neuchâtel (UNINE)	1
University of St. Gallen (UNISG)	1
University of Zurich (UZH)	7
Federal institutes of technology	
Federal Institutes of Technology Lausanne (EPFL)	9
Federal Institutes of Technology Zürich (ETHZ) and ETH Domain	7
Universities of applied sciences	
Chur University of Applied Sciences (FHGR)	1
Lucerne University of Applied Sciences (HSLU)	1
University of Applied Sciences Northwestern Switzerland	1
University of Applied Sciences and Arts of Southern Switzerland (SUPSI)	1
University of Applied Sciences and Arts of Western Switzerland	3
Zurich University of Applied Sciences (ZHAW)	5
Zurich University of Arts (ZHdK)	3

Universities of teacher education	
HEP Vaud	2
HfH	3
PH Graubünden	1
PH Luzern	1
PH Schaffhausen	1
PH Schwyz	1
PH Thurgau	1
PH Zug	1
PH Zurich	1
Other institutions	
Agroscope	1
FORS	1
Geneva Graduate Institute	1
Swiss Academies of Arts and Sciences	1
Swiss National Science Foundation (SNSF)	1
Total of individual answers	85
Total of institutions	31

Note: We decided to retain the local names of the universities of teacher education as they are primarily known by their local names. For abbreviations, for all institutions we use their official abbreviation.

4.5 Interviews

To complement[6] the quantitative data collected through the online survey, the working groups B5.1, B5.4 and C2.3 decided to conduct qualitative interviews with ORD experts of Swiss HEIs in March 2025. The aim was to gather more in-depth insights into the issues raised in the survey as well as address questions that were not raised in the survey. The interview session involved 15 representatives from various types of Swiss HEIs. The interviews were conducted online using Zoom, hosted on a channel provided by the University of Bern. Participant's informed consent was obtained before the interviews.

A total of 9 interview sessions, 3 for each interviewees group and mandate, were collected. All interviews were recorded locally by the respective mandates and then uploaded to a password-protected folder on SWITCHdrive. Access to the secure folder was restricted to project team members only. Each mandate independently managed its own recordings and organization of the interviews, including the number of interviewers, moderation style, and questions asked.

The participants were divided into three groups of five by following the principle of maximum heterogeneity which meant ensuring a diverse mix of institutions in terms of type (cantonal universities, ETH,

6 This chapter is based on parts of the final report of mandate C2.3, reproduced with the kind permission of the project group.

universities of teacher education, universities of applied sciences), dimension and location. The represented HEIs were: EPFL, ETHZ, FH Graubünden, HEP Vaud, Lib4RI (ETH Domain, Eawag, Empa, PSI & WSL), PH Luzern, PH Zug, Unibas, UNIGE, UNIL, ZHAW.

5 Results

5.1 Meta-study: Training and career paths of ORD experts

5.1.1 Towards Data Stewardship: Challenges and strategies in professional education and career path

Applying the methodology described for the literature review, we explored all continents where research is ongoing. Antarctica was discarded as most of the research there is funded and managed by universities and research institutions from the nations which have made territorial claims to parts of the continent.

1. Asia

In Japan, the behaviour[7] towards data stewardship was described by Ikeuchi and colleagues in 2022 (Ikeuchi 2022) and the lack[8] of RDM support in 2024. In this country, research institutions do not explicitly use the term "Data Steward" as a formal role akin to some Western universities, but responsibilities for RDM are distributed among researchers, institutional support staff, and specialized services. For instance, Kyoto University has a Research Data Management support[9] service. The University of Tokyo has defined a policy for Research Data Management and Utilisation dating from 2023, but no associated service(s), such as data stewards. The Research Center for Open Science and Data Platform (RCOS)[10] at the National Institute of Informatics (NII)[11] develops and operates a research data infrastructure, presumably laying the foundation of Open Science in Japan - however due to the language

7 <https://zenodo.org/records/6592094>, last visited on 27 June 2025.

8<https://figshare.com/articles/poster/RDM_Service_for_Trust_Data_Sharing_Bridging_the_Gaps_between_Researchers_and_Institutions/25251376?file=44612554>, last visited on June 6, 2025.

9<https://rdm-kyoto--u-ac-jp.translate.goog/docs/support/?_x_tr_sl=ja&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp#%E7%A0%94%E7%A9%B6%E3%83%87%E3%83%BC%E3%82%BF%E7%AE%A1%E7%90%86%E3%81%AB%E9%96%A2%E3%81%99%E3%82%8B%E3%81%94%E7%9B%B8%E8%AB%87>, last visited on June 6, 2025.

10 <https://rcos.nii.ac.jp/en/>, last visited on June 6, 2025.

11 <https://www.nii.ac.jp/en/>, last visited on June 6, 2025.

barrier, it's difficult to estimate if it's a national service adopted and used by researchers. We didn't find any certifications or specific formal training in Japan on Data Stewardship or RDM.

In 2021-2022, the Malaysia Open Science Platform (MOSP)[12] offered structured training programs for librarians and researchers to become certified Data Stewards, and 231 individuals have been trained, with 12 achieving certification. This project, funded by the Malaysian Ministry of Science, Technology and Innovation to harness the potential impact of Open Science, seems to have been discontinued since then. We have contacted the program organisers to enquire about the status of the program and the reasons for the possible discontinuation, but at the closure of writing, we didn't receive an answer.

India has increasingly shown commitment to open science and open data, with the Department of Science and Technology (DST) endorsing open access and data sharing policies, and is home to several national research data repositories. In India, organizations like the Indian Council of Social Science Research (ICSSR) and the National Council of Educational Research and Training (NCERT) conduct capacity-building activities to promote good RDM practices among researchers (Singh 2023). However, these training activities are ad hoc and informal.

2. Oceania

In Australia, the Australian Research Data Commons (ARDC)[13] is Australia's research data infrastructure facility enabled by the Australian Government's National Collaborative Research Infrastructure Strategy (NCRIS)[14]. The ARDC collaborates with research communities and industries to apply these regulations, and enhance data management and accessibility. While universities and research institutions provide the framework and infrastructure for research data management, researchers are responsible for the day-to-day management of their research data within this framework. Data Steward roles may be assigned to existing researchers or staff members. For instance, at University of Technology Sydney (UTS), the research project leader often serves as the data steward[15]. At Macquarie University, Research Data Stewards are designated by the Deputy Vice-Chancellor[16] or their nominee, suggesting that this role might be part of a broader research management career path.

A review of New Zealand's research data landscape was published in 2023, emphasizing the importance of data as a strategic asset in that country and the need for improved infrastructure, governance, and culture to support ethical, inclusive, and impactful research practices (Sterling 2023). In this

12 <https://www.akademisains.gov.my/mosp/>, last visited on June 6, 2025.
13 <https://ardc.edu.au/>, last visited on 11 June 2025.
14 <https://www.education.gov.au/ncris>, last visited on 11 June 2025.
15<https://www.uts.edu.au/about/leadership-governance/policies/a-z/research-data-management-procedure>, last visited on 11 June 2025.
16 <https://policies.mq.edu.au/document/view.php?id=300>, last visited on 11 June 2025.

report, the requirements to support data education and training initiatives are recognized, and the development of training programs and educational materials for research data are promoted. In New Zealand as well, research data management is a shared responsibility between universities, researchers, and other stakeholders. Key institutions such as Massey University[17], the University of Auckland[18], and Victoria University of Wellington[19] have established policies to guide research data management. While the term "Data Steward" is not explicitly used across institutions, roles akin to stewardship exist at Massey University, researchers often act as custodians of their research data, supported by university infrastructure and policies. The New Zealand Research Information System[20] employs data custodians and data stewards to oversee the governance of research data across organizations.

In other countries across the Oceanian region, research data management responsibilities vary significantly, often influenced by local capacity, infrastructure, and governance frameworks. At Fiji National University (FNU)[21], research data management is governed by institutional policies. The Data Steward is recognised at that university, however not with a research data support role, but institutional role (governance of institutional data, excludes research data).

Regarding training or certifications, the Charles Sturt University in Australia is the single institution which has a Certificate of Data Management[22] running. However, several universities have short and ad hoc courses for researchers.

3. Africa

The challenges of open data sharing and the Global South were examined in a 2018 study (Serwadda 2018) which highlighted the need for enhanced training in data analysis and improved infrastructure for data handling and storage in low- and middle-income countries to promote equity and reciprocity. Nevertheless, a 2020 report by Chiware (Chiware 2020) found that open science and research infrastructures in Africa were still at developmental stages. These infrastructures continue to face funding and technical barriers. Data management services are in formative stages with progress reported in a few countries where open science and research data management policies have emerged, cyber and data infrastructures are being developed and limited data librarianship courses are being taught.

17 <https://www.massey.ac.nz/study/library/researcher-support/research-data-management/>, last visited on 13 June.
18<https://www.auckland.ac.nz/en/about-us/about-the-university/policy-hub/research-innovation/research-data-management/research-data-management-policy.html>, last visited on 13 June 2025.
19 <https://libguides.victoria.ac.nz/research-data-management/research-data-management>, last visited on 13 June 2025.
20 <https://www.mbie.govt.nz/assets/5daf24525c/NZRIS-and-data-management.pdf>, last visited 13 June 2025.
21 <https://www.fnu.ac.fj/wp-content/uploads/2022/11/Data-Governance-and-Management-Policy.pdf>, last visited on 13 June 2025.
22 <https://study.csu.edu.au/courses/graduate-certificate-data-management>, last visited on June 22, 2025.

When searching more broadly, we found that there are only a few initiatives around training and capacity building. For instance, H3ABioNet[23] and Elwazi[24] offer short courses for RDM, though these programs do not provide formal certification. Some universities, such as the University of Cape Town (UCT[25]), have established communities of practice where Data Stewards work on tasks such as curating data, reviewing DMPs, and ensuring compliance with FAIR principles. These efforts are inspired by European models, including those at Delft University of Technology and University of Cambridge.

4. North America

In Canada, the Canadian Institutes of Health Research (CIHR[26]), the Natural Sciences and Engineering Research Council of Canada (NSERC[27]), and the Social Sciences and Humanities Research Council of Canada (SSHRC[28]) are federal granting agencies that promote and support research, research training, knowledge transfer and innovation within Canada. They have been collaborating on RDM policy-related work since 2013 and formed the Tri-Agency framework, which requires each post-secondary institution and research hospital that is eligible to administer Tri-Agency funds to publicly post an institutional RDM strategy. All Canadian Universities have since then developed their own RDM strategies[29], meeting the Tri-Agency RDM Policy[30]. When looking into some of these RDM strategies, we can see that providing training to researchers is an important component, however we can't find any Canadian certifications or tailored training for data stewards or any actions taken in that direction. Institutions like the University of Alberta provide infrastructure for data storage, sharing, and preservation. Digital Research Alliance of Canada[31] has plenty of training resources (materials, courses), and in their plan for 2025-2026 they listed the intention to create a national digital research infrastructure training program for researchers.

In the USA, in the Biomedical domain, National Institutes of Health (NIH) recently released a document with the Strategic Plan For Data Science[32] for 2025-2030 where one of the aims is to establish a data steward program to guide data sharing and leverage existing activities at the NNLM National Center

23<https://www.h3abionet.org/categories/event/workshop/h3abionet-research-data-management-rdm-short-course-2022>, last visited on 13 June 2025.
24 <https://elwazi.org/trainings/26>, last visited on 13 June 2025.
25 <https://lib.uct.ac.za/digitalservices/data-stewards>, last visited on 13 June 2025.
26 <http://www.cihr-irsc.gc.ca/e/193.html>, last visited on 13 June 2025.
27 <http://www.nserc-crsng.gc.ca/index_eng.asp>, last visited on 13 June 2025.
28 <http://www.sshrc-crsh.gc.ca/home-accueil-eng.aspx>, last visited on 13 June 2025.
29<https://science.gc.ca/site/science/en/interagency-research-funding/policies-and-guidelines/research-data-management/published-institutional-research-data-management-strategies>, last visited on 13 June 2025.
30 <http://science.gc.ca/eic/site/063.nsf/eng/h_97610.html>, last visited on 13 June 2025.
31 <https://alliancecan.ca/en/latest/news/alliances-corporate-plan-2025-2026-improving-and-investing-dri>, last visited on 13 June 2025.
32 <https://datascience.nih.gov/nih-strategic-plan-data-science>, last visited on 13 June 2025.

for Data Services and support additional partnerships, including with societies and associations, for training.

The 2019 report[33] by the U.S. Government Accountability Office (GAO) emphasised the importance of supporting training, education, and workforce development related to scientific data management, analysis, storage, preservation, and stewardship. In alignment with this, the National Science Foundation (NSF[34]) expanded its public access repository to include metadata records about data that support publications resulting from NSF-funded research and U.S. Agency for International Development (USAID) established data management plan requirements for extramural researchers, but none has developed data steward programs.

Individual USA institutions and universities have been taking action towards open research data. For instance, hosted by the University of Minnesota Libraries in the USA, the Data Curation Network (DCN[35]) is a network of professional data curators, data management experts, and data repository administrators from various domains. It brings together institutional and nonprofit data repositories to enhance the quality and accessibility of research data. The DCN provides data curation services, which include organizing, validating, and enhancing datasets to ensure they are well-documented and usable for future research. For DCN, data stewardship is part of the activities in data curation, and DCN offers training opportunities for data curators focusing on best practices in data management and curation. Additionally, the DCN works as a community of data professionals, fostering the sharing of knowledge and resources to improve data curation practices. The network also provides various resources to support data stewards' curation activities, including guidelines, tools, and templates.

5. South America

The Conference of Statistical Offices of Latin America and the Caribbean (CEPAL[36]) has worked on defining a regional concept of Data Stewardship. While not yet tied to formal certifications, this initiative promotes professionalization in data stewardship across the region of Latina America and Caribe.

In Brazil, informal and short training is provided by national institutions such as Fiocruz[37] (life and biomedical sciences) on a regular basis. The Open University System of the SUS (UNA-SUS[38]) also provides

33 <https://www.gao.gov/products/gao-20-81>, last visited on 13 June 2025.
34 <https://www.nsf.gov/digital/data>, last visited on 15 June 2025.
35 <https://datacuration.network/about-the-dcn/>, last visited on 13 June 2025.
36<https://rtc-cea.cepal.org/es/documento/diagnostico-sobre-administracion-de-datos-data-stewardship-en-america-latina-y-el-caribe>, last visited on 13 June 2025.
37 <https://www.icict.fiocruz.br/gestao-de-dados-de-pesquisa>, last visited on 13 June 2025.
38 <https://www.unasus.gov.br/cursos/curso/47007>, last visited on 13 June 2025.

short courses on research data management for professionals who work in the Unified Health System (SUS).

Latin America is becoming more mainstream in policy, legal, and regulatory documents supporting open science as noted by Biernacka in their PhD Thesis (Biernacka, 2024). While networks dedicated to RDM, and training and certifications are not yet documented and we could not find in our searches, their absence in the literature does not preclude their existence.

6. Europe

The situation in the European countries has been analyzed and reported in detail by Basalti et al. (2024). Here we summarize some of the key features highlighted in their extensive review and focus on a selection of the European countries which, in our opinion, are the most relevant. This may be for language or geographical reasons (Austria, Germany, France) or because they present inspiring approaches or useful resources.

a. Austria

According to Basalti et al (2024, p.27, p.71), the Austrian landscape of data stewardship was examined through the FAIR Data Austria project[39], which employed surveys, interviews and workshops. The findings revealed that Austrian universities are at varying stages of implementation and exhibit significant diversity in their visions, needs, expected competencies, institutional contexts, and funding strategies. Moreover, there is a notable lack of consensus among institutions regarding these aspects. As a consequence, clearly defining the roles, responsibilities, tasks, and required competencies of Data Stewards remains a complex challenge, as does identifying their training needs. Additionally, the source of funding for Data Steward positions plays a critical role, with project-based funding often hindering the development of a sustainable knowledge base.

Hasani-Mavriqi et al. (2022) introduced the different data stewards models[40] (data steward contact point, data steward office, data steward network) present in Austria and the associated roles depending on the university specificities (size, resources, training). These models can be used as a guide for universities to choose the best implementation strategy depending on their context. Their report emphasized that only a team of data stewards can cover all competencies identified (technical skills, soft

39 <https://forschungsdaten.at/en/fair-data-austria/>, last visited on 13 June 2025.
40 <https://forschungsdaten.at/report-data-stewardship-in-the-making-2/>, last visited on 13 June 2025.

skills, domain expertise). It stressed the importance of training in research data management and open science, but also in technical skills and domain expertise.

Actively engaged in the European Open Science Cloud (EOSC) and its national implementation[41] in Austria, and as a key contributor to the FAIR Data Austria project, the University of Vienna was among the authors of the data stewardship models presented in Hasani-Mavriqi et al. (2022). In 2023, the University also launched the first European certificate course "Data Steward," designed for participants from both Austria and abroad. In parallel, it established a faculty-embedded network of data stewards to support institutional implementation. Further details about the course are provided in the inventory of training and education resources (see Appendix III).

b. Denmark

According to Basalti et al. (2024, p. 52), Denmark is projected to face a shortage of 22,000 IT specialists by 2030, highlighting an urgent need to educate and train professionals in data and IT-related fields. Properly educating data stewards can help alleviate this shortage by allowing computer scientists and developers to focus on their core responsibilities. Moreover, various industries in Denmark have expressed a growing demand for data stewards, highlighting the relevance and importance of this emerging role.

In 2020, the Danish e-Infrastructure Cooperation (DeIC), with support from the National Forum for Research Data Management (DM Forum), released a report entitled "National Forum for Research Data Management" (Wildgaard 2020). This publication examines the state of data steward education across both public and private sectors and provides several recommendations regarding curricula, career paths, and teaching methodologies for data stewards. These include: 1) Developing curricula and career pathways for data stewards across policy, research, and infrastructure domains; 2) Providing training that encompasses both technical expertise and soft skills; and 3) Promoting the use of flexible teaching formats, such as online, blended, and on-demand learning. Recognizing that prospective data stewards come from diverse backgrounds and have varying goals, the report also proposes differentiated educational models tailored to distinct target audiences:

- A pre-master upskilling programme followed by the one-year master's study programme,
- A one-year master's study programme to contribute to educating professionals with already basic programming skills,
- A two-year university curriculum,

41 <https://eosc-austria.at/>, last visited on 13 June 2025.

- And part-time training (as an alternative career path for PhDs or postdocs).

Despite this demand, opportunities for competence development in data stewardship remain limited. Currently, there are no full-time programs dedicated to data stewardship, and existing training options are generally restricted to professionals affiliated with universities.

To address the gap of data stewards and supported by the report above, the University of Copenhagen (UCPH) has taken a leading role by designing a prequalification framework for a one-year master's program in Data Stewardship. This initiative, launched in the spring of 2020, is open to individuals holding a bachelor's degree or higher and aims to contribute to a more flexible and responsive labor market. Other Danish universities are encouraged to apply for the qualification to establish and replicate similar programs. Further details about the program are available in the inventory of training and education resources (see Appendix III).

However, several challenges remain. The program is currently limited to university students and does not yet accommodate candidates from outside academia. Although data stewardship represents a viable alternative career path for PhD graduates and postdoctoral researchers, the program does not specifically target these groups. Moreover, while the one-year program provides a foundational step, it must be complemented by continued professional development to build the maturity, accountability, and practical experience required for the role. Additionally, the courses are currently offered only in Danish, which limits accessibility for international participants and English-speaking sectors of the Danish labor market. However, they intend to expand the program to include English-language instructions.

c. France

Since the mid-2010s, France has developed its national public policy to promote open science, research data management, and open research data. A key milestone was the adoption of the Loi pour une République numérique[42], promulgated on 7 October 2016. For the first time in French legislation, this law introduced a default openness policy for data, source code, and software produced by public administrations, including academic research institutions. Following this legislation, the Plan national pour la science ouverte[43] (PNSO) was launched in 2018 by the Ministry of Higher Education, Research and Innovation. Its second pillar, "Structuring and opening up research data," was accompanied by the establishment of a Comité pour la science ouverte[44] (CoSO) to support its implementation. Updated

42 <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000033202746>, last visited on 13 June 2025.
43 <https://www.ouvrirlascience.fr/deuxieme-plan-national-pour-la-science-ouverte-pnso/>, last visited on 13 June 2025.
44 <https://www.ouvrirlascience.fr/le-comite-pour-la-science-ouverte/>, last visited on 13 June 2025.

for a second phase (2021–2024), the revised PNSO outlines in its fourth pillar, "Transforming practices to make open science the default principle" that "Managing and opening up research data requires new skills and has led to the emergence of new professions that need to be developed, recognised, and promoted."

Support for RDM and ORD across the country has therefore been initiated through the creation of Ateliers de la Donnée[45], funded annually since 2021 by the Ministry. Structured as a network led by a coordinating bureau and hosted by HEIs, these ateliers serve as regional hubs for expertise and services in RDM and ORD. To date, 19 ateliers have been officially recognised, with 3 more currently in the process of being labelled. Since 2022, a dedicated CoSO working group titled "Defining and recognising data management and dissemination activities" has been established. Its mission is to "Qualifying the activities, skills, and training of those responsible for the invisible work of managing and describing data will make it possible to recognise their contributions to research and to create career paths."[46]

Between April and June 2023, a survey of 15 Ateliers de la Donnée was conducted, with the main goal of co-constructing a training offer for atelier members (i.e. RDM and ORD experts), in collaboration with the Data Gouv Research resource centres (see Moalic, A., et al., 2023). The survey explored several key areas, such as (1) the training courses offered, (2) the courses attended by atelier members (the topics and the training organisations), (3) the self-training resources used, and (4) the training needs of atelier members. One of the main conclusions of the survey was that the high level of skills already acquired by atelier members has created a significant demand for more specialised training courses. These would complement the generalist offerings that have so far enabled support staff to build expertise and successfully launch their services.

Among the various training organisations listed offering training for RDM and ORD experts, the main ones are the Regional training centres for library careers (CFRCB[47]), Regional Training Units for Scientific and Technical Information (URFIST[48]), Academic institutions (in-house training), CNRS[49], Huma-Num[50], Inist-CNRS[51], Recherche Data Gouv[52], GTSO Couperin[53], and ENNSIB[54].

45 <https://recherche.data.gouv.fr/fr/ateliers-de-la-donnee>, last visited on 13 June 2025.
46 <https://www.ouvrirlascience.fr/definir-et-reconnaitre-les-activites-de-gestion-et-diffusion-des-donnees>, last visited on 25 June, 2025.
47 <https://www.crfcb.fr/#/program/6702/14842/?from=network.list>, last visited on 18 June 2025.
48<https://sygefor.reseauurfist.fr/#/training?q=%7B%22keywords%22:%22donn%C3%A9es%20recherche%22,%22filters%22:%5B%5D,%22aggs%22:%7B%7D,%22sort%22:%7B%22_score%22:%22desc%22%7D,%22size%22:20,%22page%22:1%7D>, last visited on 18 June 2025.
49 <https://www.science-ouverte.cnrs.fr/formation/>, last visited on 18 June 2025.
50 <https://www.huma-num.fr/formations/>, last visited on 18 June 2025.
51 <https://www.inist.fr/services/accompagner/webinaires/>, last visited on 18 June 2025.
52 <https://recherche.data.gouv.fr/fr/page/centres-de-ressources>, last visited on 18 June 2025.
53 <https://gtso.couperin.org/groupe-donnees/>, last visited on 18 June 2025.
54<https://www.enssib.fr/l-offre-de-formation/formation-tout-au-long-de-la-vie/acces-pardate?combine=donn%C3%A9es>, last visited on 18 June 2025.

Concerning self-training, the most popular platforms are: DoRANum[55], Couperin[56], FUN Mooc[57], CoSO Ouvrir la science[58], Recherche Data Gouv[59], CNIL[60], OPIDoR[61].

Additionally to the training offer targeting staff, RDM and ORD experts, specific actions aim at raising awareness, educating and training doctoral students to open science (Basalti et al. 2024, p.29). These actions include the publication of the practical guide Passport to open science, practical guide for the doctoral students[62]. This guide presents the principles of Open Science and some good practices as well as tools agnostic of discipline. Further to the passport for PhDs students, a new guide aiming at doctoral schools has been released: Train to open science, throughout the thesis[63]. This guide identifies the skills corresponding to each stage of the thesis and directs to the adequate training resources (online or onsite in a French university).

d. Germany

In Germany, the Research Data Action Plan 2021–2025[64] published by the Federal Ministry of Education and Research (BMBF[65]), addresses data expertise as part of its third strategic objective, "Data Competencies": "Researchers must possess and acquire the necessary skills to work with digital data." The plan emphasizes that, for the widespread adoption of digital technologies by academically qualified professionals, it is essential that they combine specialized data science skills with domain-specific knowledge relevant to the challenges they face. Moreover, graduates must be capable of communicating effectively with data specialists about subject-specific issues and potential digital solutions. While professionals in supporting roles (e.g. data stewards, RDM/ORD specialists) are not explicitly mentioned, they are implicitly included—particularly through references to advanced training, industry participants, and continuing education. Nonetheless, the primary focus remains on students, doctoral researchers, and academically trained experts.

55 <https://doranum.fr/>, last visited on 18 June 2025.
56 <https://gtso.couperin.org/groupe-donnees/>, last visited on 18 June 2025.
57 <https://www.fun-mooc.fr/fr/>, last visited on 18 June 2025.
58 <https://www.ouvrirlascience.fr/category/ressources/>, last visited on 18 June 2025.
59 <https://recherche.data.gouv.fr/fr/page/centres-de-ressources>, last visited on 18 June 2025.
60 <https://www.cnil.fr/fr/professionnel>, last visited on 18 June 2025.
61 <https://opidor.fr/>, last visited on 18 June 2025.
62 <https://www.ouvrirlascience.fr/passport-for-open-science-a-practical-guide-for-phd-students/>, last visited on 15 June, 2025.
63<https://www.ouvrirlascience.fr/wp-content/uploads/2021/10/Guide-formation_science_ouverte_ED_web_DP-003.pdf>, last visited on 15 June, 2025.
64<https://www.bildungforschung.digital/digitalezukunft/shareddocs/Downloads/files/163_20_faktenblatt_aktionsplan_3_final.pdf?__blob=publicationFile&v=2>, last visited on 18 June 2025.
65 <https://www.bildung-forschung.digital/digitalezukunft/de/wissenschaft_und_forschung/forschungsdaten/aktionsplan-forschungsdaten-uebersicht/aktionsplan-forschungsdaten-uebersicht.html>, last visited on 18 June 2025.

It should also be noted that many RDM strategies are implemented at the level of the federal states, (Bundesländer[66]), for example Baden-Württemberg, Brandenburg, Hesse, Lower Saxony, Saxony-Anhalt and Thuringia). A wide range of Data Policies[67] are also established at various levels (e.g. interdisciplinary, disciplinary, and institutional).

A central element of the German national plan is the Nationale Forschungsdateninfrastruktur (NFDI[68]), which was founded in October 2020. This initiative brings together over 300 members, including universities, research institutions, data centres, and research museums, to coordinate efforts and develop common standards for RDM. Its EduTrain section[69], which includes "actors from university teaching and research, libraries and computing centers, as well as from non-university research institutes and state initiatives [...] emphasizes the relevance of building data literacy in all areas of research and higher education teaching and opens a path to cross-disciplinary sustainability of research data management and the development of a contemporary data culture"[70]. As a mandated organisation, the NFDI is also involved in the development of EOSC.

To clarify the roles, profiles and competences of data stewards, as well as the implementation of data stewardship, within the German context, the BMBF-funded DataStew[71] project was conducted in 2022. The preliminary results (see Seidlmayer, E. and Dierkes, J., 2022) highlight the diverse responsibilities and services provided, as well as the training paths followed (e.g. Bachelor's and/or Master's programmes, certificate courses, and/or further training).

Due to the wide-ranging nature of data stewardship, various institutions and initiatives in Germany facilitate knowledge exchange and ongoing specialisation by holding regular networking events and offering training opportunities. One such example is the Landesinitiative für Forschungsdatenmanagement – fdm.nrw[72], whose primary objective is to support the implementation of North Rhine-Westphalia's state strategy for RDM. The initiative provides a framework for strengthening RDM infrastructure, expertise, and practices across the region, by facilitating the exchange of information on current developments, connecting key stakeholders, and promoting collaboration between institutions. It also offers further training courses on RDM[73], primarily designed to support staff from infrastructure services and research institutions.

66 <https://www.forschungsdaten.org/index.php/Forschungsdaten-Strategien#Bundesl%C3%A4nder>, last visited on 18 June 2025.
67 <https://www.forschungsdaten.org/index.php/Data_Policies>, last visited on 18 June 2025.
68 <https://www.nfdi.de/>, last visited on 18 June 2025.
69 <https://www.nfdi.de/section-edutrain/>, last visited on 18 June 2025.
70 For details of the section concept, see Herres-Pawlis, S., et al., 2021.
71 <https://ub.uni-koeln.de/forschen-publizieren/forschen/forschungsdaten-managen/projekt-datastew>, last visited on 18 June 2025.
72 <https://www.fdm.nrw/>, last visited on 18 June 2025.
73 <https://www.fdm.nrw/weiterbildungen>, last visited on 18 June 2025.

e. The Netherlands

According to Basalti et al. (2024, p.37), the National Programme Open Science (NPOS)[74] was launched in 2017 to coordinate the transition to Open Science. The NPOS2030 Ambition document (NPOS 2022), released in 2023, identifies strategic goals and associated progress areas, with in particular the need to make progress about the "development of open knowledge practice skills in the relevant scientific communities" (Basalti et al. 2024, p.37). A specific objective in its Rolling Agenda is formulated as "In 2030, a professional community of well-trained data stewards has been established, and there is enough structural capacity (in FTEs, as well as in expertise) at Research Performing Organisations (RPOs) to facilitate making digital scientific objects FAIR. There is a nationally coordinated training programme for Data Stewards" (Basalti et al. 2024, p.37).

Professionalising data stewardship started with the specification of the roles of data stewards in Dutch research institutes throughout two projects: "Data Stewardship on the map" (Verheul et al. 2019) and "Towards FAIR data steward as a profession for the life sciences" (Scholtens et al. 2019). Verheul et al. (2019) that specify the responsibilities of Data stewards, make it clear that they are needed both at the generic and the embedded levels, and specify their tasks according to these levels. Complementary to the report by Verheul et al., a competency framework for data stewardship in life sciences is delivered by Scholtens et al. (2019). This framework identifies three roles (policy, research and infrastructure) and specifies eight competence areas for the data steward roles. It describes three other data professions, clarifying the respective roles, the differences with the data stewards and the space for possible collaborations between those professionals. These roles and tasks are translated into competences and learning objectives. The report also presents the synthesis of data collected from data stewards about their training path, their views on the current training offer in their domain and their recommended resources for basic training in data stewardship.

The project "Professionalising data stewardship in the Netherlands: competences, training and education – Dutch roadmap towards national implementation of FAIR data stewardship" (Jetten et al. 2021) builds on the two previous projects. It provides recommendations about professionalizing data stewardship in terms of job profiles, training and education. A major outcome is that the data steward profile is now implemented in the Dutch job classification system for universities (UFO).

Progress made during the two previous years was discussed in 2023 during the workshop: "Data Stewards Job Profiles: Build and Sustain Capacity for FAIR Implementation" (Schoots et al. 2023). In terms of education and training, the first national course on data management was set up in 2013 and yearly

[74] <https://www.openscience.nl/en>, last visited on 29 June 2025.

workshops are available. However, some certified professional education is missing. Regarding career paths, the contribution of data stewards to the research team's work should be more recognized.

Community-building has developed with the Data Stewards Interest Group initiated in 2017, first for the Life Sciences and Health domain, later extended to other domains. It is now a community hub, facilitating discussion and experience and knowledge sharing between peers. It is also open to data stewards from abroad and provides useful material for setting up a similar community.

f. Spain

According to Basalti et al. (2024, p.42), in 2022, a revised version of the national law on science, technology and innovation incorporated measures to facilitate access to data from public research. The same year, the new organic law of the university system also incorporated measures to promote open science. One consequence of this change of context is that researchers need to adopt good practices or to improve their practices in terms of research data.

Also, the National Strategy for Open Science (ENCA, 2023-2027)[75] adopted in 2023 calls for providing "training to all personnel (researchers, managers, funders, evaluators) to align their professional performance with the principles of open science". It recommends including the "assessment of transversal skills related to open science" in the accreditation of doctoral degrees and to provide training in open science "in the form of micro-credentials" (Basalti et al. 2024, p.17).

The CSUC (Consorci de Serveis Universitaris de Catalunya)[76] is a consortium of universities created in 2013 for the cooperation and the coordination in the management of Catalan Universities (Basalti et al. 2024, p.42). CSUC, among other tools, provides the data repository CORA.RDR[77] (Repository of Research Data). Building on the observation that the services provided by librarians to researchers need to be more adapted to the "generalization of digital and online information" (Basalti et al. 2024, p.17), CSUC set up a training program to reskill library staff with a particular focus on RDM. It was first mainly theoretical but was later made more practical and took the form of "practical self-learning labs" (Basalti et al. 2024, p.43).

One objective of the working plan of the Open Science Area 2017-2019 of the CSUC is to elaborate a training program in Open Science for staff supporting researchers in RDM. It recommends distinguishing "between advanced users, young researchers and support staff from universities." (Basalti et al. 2024, p.43)

75 <https://www.ciencia.gob.es/InfoGeneralPortal/documento/e5b759a4-d756-4af9-89b0-a8cf5fd28e20>, last visited on 15 June, 2025.
76 <https://www.csuc.cat/en>, last visited on 15 June, 2025.
77 <https://cora.csuc.cat/en/>, last visited on 15 June, 2025.

In 2021 and 2022, 11 self-learning labs were organised by CSUC for the institutions included in CORA.RDR. The objective was to provide them with common tools to curate the data sets deposited in CORA.RDR. Each institution presented practical cases and solutions to share experience. The next step is to add a more technical part into these self-learning labs.

The University of Barcelona has shown an early and continuous commitment to open science, with its Open Science policy (2011), the management of an institutional repository, its cooperation with CSUC, and its involvement with LERU's recommendations on "Open Science and its role in universities" (Basalti et al. 2024, p.59). This University has opened the course "Open Science: promotion, support and evaluation" in 2022. The course is aimed at staff involved in "research assessment, research support and knowledge management" (Basalti et al. 2024, p.59) (librarians, management staff). Considering the feedback from the students of the first edition, the next editions include more practical cases on data management and more focus on specific skills for research support. More details on the course content and its modalities are given in the inventory of training and education resources (see Appendix III).

The University of Seville (Universidad Pablo de Olavide) has launched a RDM Service (Learning and Research Resource Centre) based at the library/CRAI (Basalti et al. 2024, p.62). This service provides a portal for access to guides, tutorials and other information materials, as well as training and consultancies for researchers. The library/CRAI also provides to researchers and doctoral students a series of training in RDM. The University also opened the postgraduate course on "Research support services: information, data, evaluation and scientific publication" in 2021-2022. The course is mainly aimed at research support professionals to bring them some complementary training. Those professionals can be employed in an academic environment, in the private sector, or be independent ones. They can also be willing to reorientate their career. The objectives of the course are to teach the necessary knowledge basis with a theoretical approach but also to develop digital skills, tools and methods of the students with real cases and an approach "learning by doing". In particular, students are asked to develop a project about support services for researchers. More details on the course content and its modalities are given in the inventory of training and education resources (see Appendix III). Some of the training content developed by the library/CRAI or for the course has been adapted and transferred for other programs or audiences (training program in digital competence for undergraduate and master's students in particular).

g. Switzerland

In Switzerland, there are regulated professions which are subject to legal restrictions and requirements. As such, they can only be carried out by holders of specific qualifications (e.g. degree, certificate, proficiency credentials) or titles. Data stewards are not listed but could be added to the Technical professions, as noted in the swissuniversities website[78]; however this lack could be palliated in the future.

As noted in Basalti et al. (2024, p.48), the primary objective of the Swiss ORD strategy measures were to ensure that professional data stewardship becomes an established and recognised career path by 2028 in Switzerland. To support this goal, a call for proposals was issued in 2022, inviting institutions to outline their plans and strategies for developing data stewardship roles. In response, 25 Swiss higher education institutions began implementing their respective data stewardship plans. Additionally, eight institutions launched the SwissDS-ENV project aimed at developing a dedicated Certificate of Advanced Studies (CAS) in Data Stewardship (see below). Since 2022, and thanks to the swissuniversities calls, there has thus been a gradual increase in ORD-related practices and the development of data stewardship roles in Switzerland.

Even before 2022, several Swiss higher education institutions have introduced short, informal, ad hoc training courses on RDM and data stewardship practices, and they are listed in the inventory of training and education resources (see Appendix III).

Some others developed certification programs to support the development of competencies required for managing research data in line with open science principles. A number of Certificate of Advanced Studies (CAS) and Master of Advanced Studies (MAS) programs have been established, covering areas relevant to data stewardship and data management. These are:

- The CAS/MAS in Data Science and Data Management offered by UNIL-EPFL, which combines elements of data analytics with data governance and management.
- The CAS in Data Management and IT at the University of Zurich (UZH), which integrates data stewardship with information technology topics.
- The CAS in Applied Data Science at the University of Bern, which includes modules that are relevant to data stewardship, such as data ethics and reproducibility.
- The CAS in Artificial Intelligence and Data Analysis at ZHAW, which also has a component of data management.

78<https://www.swissuniversities.ch/en/service/swiss-enic-evaluation-of-foreign-diplomas/regulated-professions>, last visited on 15 June 2025.

The CAS in Data Stewardship by UNIL is today the single certified training in Switzerland fully dedicated to Data Stewardship. The SwissDS-ENV project, which initiated and produced the CAS, has contributed to defining the role of data stewards in Switzerland, including outlining relevant tasks and competencies.

5.1.2 SwissDS-ENV project and the CAS UNIL in Data Stewardship

SwissDS-ENV[79] has been funded by swissuniversities in the frame of the call for projects to contribute to the B5.2 action line of the Swiss National Strategy on ORD and its Action Plan (swissuniversities 2021). UNIL/UNIRIS is the leading house for the project and the partner institutions are HEP-Vaud, HEG HES-SO, ZHAW, FORS, SIB, UNIGE and UZH.

In the first phase of the project, partners characterized in detail the mission, the role and the tasks of data-related typical professionals, including Data Stewards (SwissDS-ENV 2023). The partners then moved to the definition of the competences needed from Data Stewards to perform these tasks, and to the level of the Bloom taxonomy for each competency. The competences were then translated into learning objectives to be addressed by the final deliverable of the project, i.e., the Certificate of Advanced Studies in Data Stewardship (Guirlet 2024). It is worth emphasizing that Data Stewards of UNIL significantly contributed to the design and development of the course. Their involvement makes the most of their field experience and allows the course to address their specific training needs as best as possible.

This CAS, the first one of its kind in Switzerland, will provide a recognized qualification to the Data Stewards already holding a position. It will also contribute to making the career of Data Steward more visible and more attractive for young researchers, for researchers in reconversion or for other professionals in data-related jobs. The first edition opened in October 2024 and will end in July 2025. The feedback from participants about the course structure and its content will be analyzed and used to improve the next editions.

More details on the learning path and details on the module content are given in the inventory of training and education resources (see Appendix III)

79 <https://unil.ch/swissds-env/en/>, last visited on 13 June 2025.

5.1.3 Inventory of training and education resources

An inventory of training and education resources in Data Stewardship/Research Data Management or in topics closely related to Data Stewardship and/or Research Data Management is presented in the Appendix III.

This inventory is limited to a selection of European countries, primarily those discussed in the literature review. Narrowing the scope of the inventory was necessary due to our limited resources. However, focusing on European countries and on Swiss neighbouring countries provides the resources that we believe are of most interest for the objectives of this mandate.

This inventory is based on the list of RDM training and e-learning resources provided by Bari, Bezzi and Guirlet (2020). After reviewing these resources, we supplemented the list with additional resources including those focusing specifically on Data Stewardships. These are the ones presented in the literature review above, additional resources from the main Swiss HEIs if not already included, and other resources we deemed essential, possibly from European countries not included in the above case studies (e.g., United Kingdom: MANTRA; Finland, University of Tampere).

These training resources can be categorised according to various criteria and features, such as:

- main topic
- target audience: e.g. research students, senior researchers, Data Stewards, Professionals of data-related domains, Information Professionals
- level of specialisation
- format: e.g. course, workshop, online module
- assessed or not (certificate or not)
- duration
- country
- language
- fees: enrollment fees or free
- others

In some cases, the format of the training resource is not understood the same way by all institutions or training centers. For instance, what is presented as a workshop in one institution may be presented as a course in another.

In the absence of standardisation, we present the resource using the same term used by the entity providing it (e.g., “workshop”, “seminar”). We have also chosen to present these resources from the most formal ones (e.g., CAS) to the most informal ones (e.g., coffee lectures or lunch talks). The final category of this inventory presents a selection of reusable resources, which are easily adaptable to another context by design. For each resource, some key features are provided in a table (seeTable 1.). If available, more details on the content outline are also provided.

We acknowledge several limitations of this inventory.

Firstly, we do not claim to be exhaustive, even for the limited number of countries covered.

Also, some of the training programs or events listed here may now be discontinued (4.1, 5.12 and 5.13 for instance, which are discussed in the literature review). However, we have included them because we believe they may be relevant to the study's objectives, in terms of content and/or of approach.

This is, of course, only a snapshot of the resources at present, presented in a very basic form. In order to add value and increase its visibility, it would need to be regularly updated, possibly in a collaborative way, and made available online with search functionalities (facets, keywords, filters, etc.). This should be coordinated from a single resource center, e.g., SRDSN platform[80].

Number of ECTS/certificate	Fees	First date of release	Time span (duration), work effort	Language
Onsite/online			Target audience	
Reference				
Additional note (reusability of resources …)				

Table 1: Table template for key features of training and education resource.

5.1.4 Summary table with main features by country

To obtain a global picture, we summarized our literature review in terms of the national strategies, institutional policies, DM services, training and certification for data stewardship in the table below. We have also integrated in that table information found in the RDMkit[81] and personal communications with colleagues from the European countries listed there. Austria, Germany and Switzerland have national strategies, institutional ORD/RDM policies, DM services, training and certification in place. However, not all HEIs in Switzerland have implemented RDM policies, a situation that is also observed in other countries listed in the table. It is important to clarify that a "Yes" in that column indicates that at least some institutions within the respective country have an RDM policy in place.

80 <https://www.researchdatasupport.ch/rdmresources>, last visited on 18 June 2025.
81 <https://rdmkit.elixir-europe.org/national_resources>, last visited on 16 June 2025.

Table 2. Summary of ORD/RDM frameworks: Policies, services, trainings, certifications by country

Continent	Country	National ORD/RDM Strategy or Program	Institutions with RDM Policy	DM Support Services	Data Stewardship Training	Data Stewardship Certification
Asia	Japan	No	Yes	Yes	No	No
	Malaysia	No	Yes	Yes	Yes	Yes (discontinued)
	India	Yes	No	Yes	Yes	No
Oceania	Australia	Yes	Yes	Yes	Yes	No
	New Zealand	No	Yes	Yes	No	No
	Fiji	No	Yes	No	No	No
Africa	South Africa	Yes	Yes	Yes	Yes	No
North America	Canada	Yes	Yes	Yes	Yes	No
	USA	No	Yes	Yes	Yes	No
South America	Brazil	No	Yes	No	Yes	No
Europe	Austria	Yes	Yes	Yes	Yes	Yes
	Denmark	No	Yes	Yes	Yes	Yes
	France	Yes	Yes	Yes	Yes	No
	Germany	Yes	Yes	Yes	Yes	Yes
	Netherlands	Yes	Yes	Yes	Yes	No
	Spain	Yes	Yes	Yes	Yes	No
	Switzerland	Yes	Yes	Yes	Yes	Yes

We also note that countries with a national ORD strategy or program in place tend to foster the professionalisation of ORD experts. The literature review indicates that the development of career paths for ORD experts, particularly Data Stewards, is closely tied to national initiatives. Countries that strongly promote Open Science and ORD also show an increase in diverse ORD expert positions and emerging training options for distinct Data Steward career profiles.

5.1.5 Data Stewards as a career beyond the HEIs and research

As supported by this landscape analysis, there is a growing need for data stewardship and specific careers in this field, not just within the research domain. In 2020, the Australian government, through the Australian Public Service Commission[82], published its Data Professional Stream Strategy[83]. Among its objectives was the goal to retain and expand a data workforce, with clearly defined career pathways promoted across various data job roles. The skills identified for Data Professionals in this strategy align with those outlined in the SwissDS-ENV project and the CAS in data stewardship provided by the University of Lausanne (SwissDS-ENV 2023).

In the United States, the government is also advocating for data stewardship, as reported by the U.S. Government Accountability Office[84]. This report encourages government agencies to support training, education, and workforce development related to scientific data management, analysis, storage, preservation, and stewardship. The Congressional Research Service (CRS) reported[85] in 2024 on "Federal Data Management: Issues and Challenges in the Use of Data Standards." and the Congress entrusted USA federal agencies to be effective stewards of public data.

In Switzerland, the Ville de Genève has initiated an Open Data Policy[86] and has the potential to become an employer of Data Stewards in the future, as indicated in the Open Data Maturity Report 2024, similar to other Swiss cities and cantons. This clearly demonstrates a need for data stewardship and the opportunities to develop a career track in this field.

As part of an empirical investigation, we conducted a brief search for job descriptions related to "data stewards" on platforms such as LinkedIn and Jobup. The objective of this search was to gather insights into the job market and to determine the recognition of the "data steward" role, including the countries and sectors where it is found. This search was carried out on April 14, 2025.

On that day, LinkedIn listed six job postings for "data steward" positions in Brazil. In European countries like Germany and France, we found data steward roles available at major companies such as Novartis and Bayer. Additionally, there were two job offers in Switzerland specifically for a Data Steward: one at the Faculty of Biology and Medicine at the University of Lausanne and another at HUBER+SUHNER.

82 <https://www.apsc.gov.au/publication/aps-data-professional-stream-strategy>, last visited on 15 June 2025.
83 <https://www.apsc.gov.au/publication/aps-data-professional-stream-strategy>, last visited on 15 June 2025.
84 <https://www.gao.gov/products/gao-20-81>, last visited on 15 June 2025.
85 <https://crsreports.congress.gov/product/pdf/R/R48053/2>, last visited on 15 June 2025.
86 <https://www.geneve.ch/publication/politique-donneees-2024-ville-geneve>, last visited on 15 June 2025.

It is essential that the development of future training courses in data stewardship addresses the needs expressed by the private sector, ensuring that it is not limited solely to the public sector and academia.

5.2 Survey of ORD experts of Swiss HEIs

5.2.1 Profile of ORD experts in Switzerland

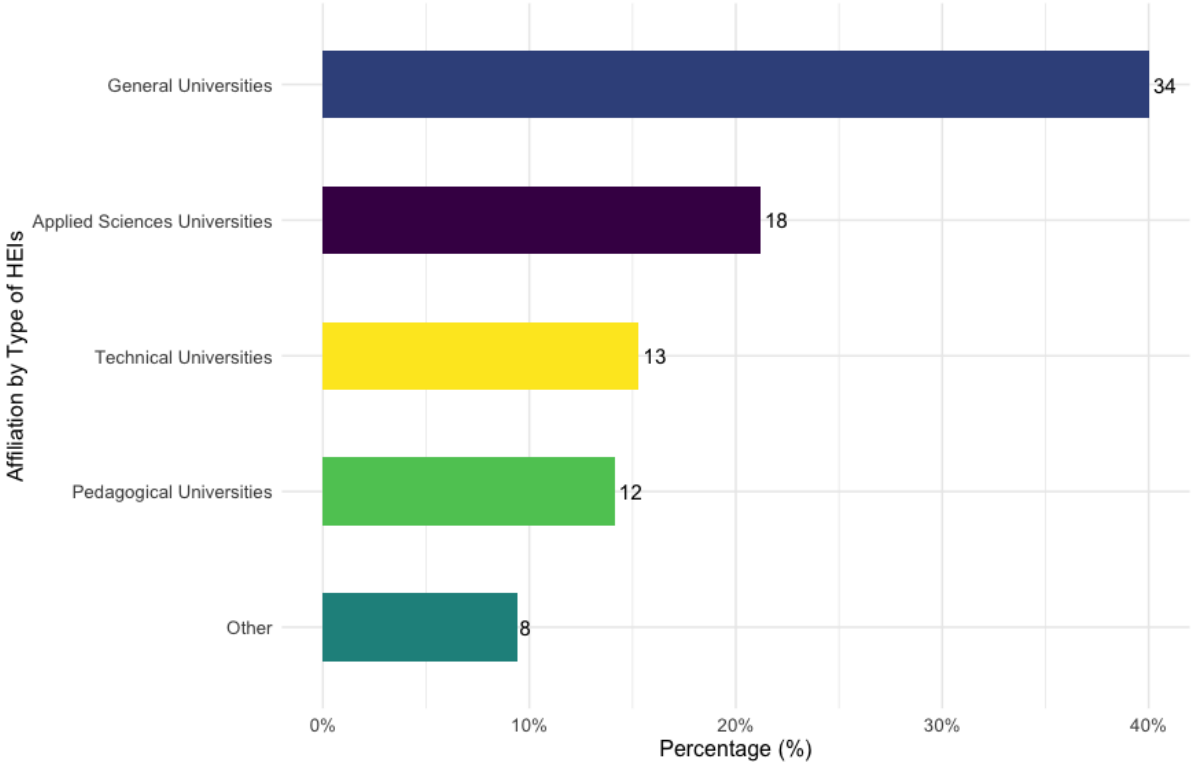
In this section, we describe the profile of ORD experts working in Swiss HEIs. First, we examine the general characteristics of their roles (5.2.2), focusing on their institutional affiliation, current employment status, educational background, age, and type of working contract. Then, we analyse their ORD expertise (5.2.3), exploring their self-perception of their role, the time that they allocated for support activities, the extent of their experience in ORD, and their engagement actions. Finally, we analyse their career paths (5.2.4), focusing on their previous experience and their professional development in ORD. This section aims to provide a comprehensive overview of how ORD experts are currently positioned within HEIs and the extent to which their roles are professionalized.

5.2.2 General characteristics of ORD experts

The respondents come from a range of research-performing institutions, reflecting a diverse landscape of ORD support. As outlined in the section on the target population (4.4.2), we categorize these institutions into five types: universities, universities of applied sciences, federal institutes of technology, universities of teacher education and other institutions (Figure 1).

Most respondents work at a university (n=34), with the University of Zurich having the highest number of respondents within this category (n=7), followed by the universities of Basel (n=6), Bern (n=6), and Lausanne (n=6). ORD experts from universities of applied sciences form the second-largest group (n=18). Interestingly, experts from federal institutes of technology make up the third-largest group, even though they represent only two institutions (ETHZ, EPFL). This suggests a strong development of ORD support within these institutions. Pedagogical universities constitute the fourth group (n=12), while other institutions represent the smallest group (n=8).

Figure 1. Affiliation of ORD experts (n=85)



Note: The numbers shown next to the plots indicate the number of individuals.

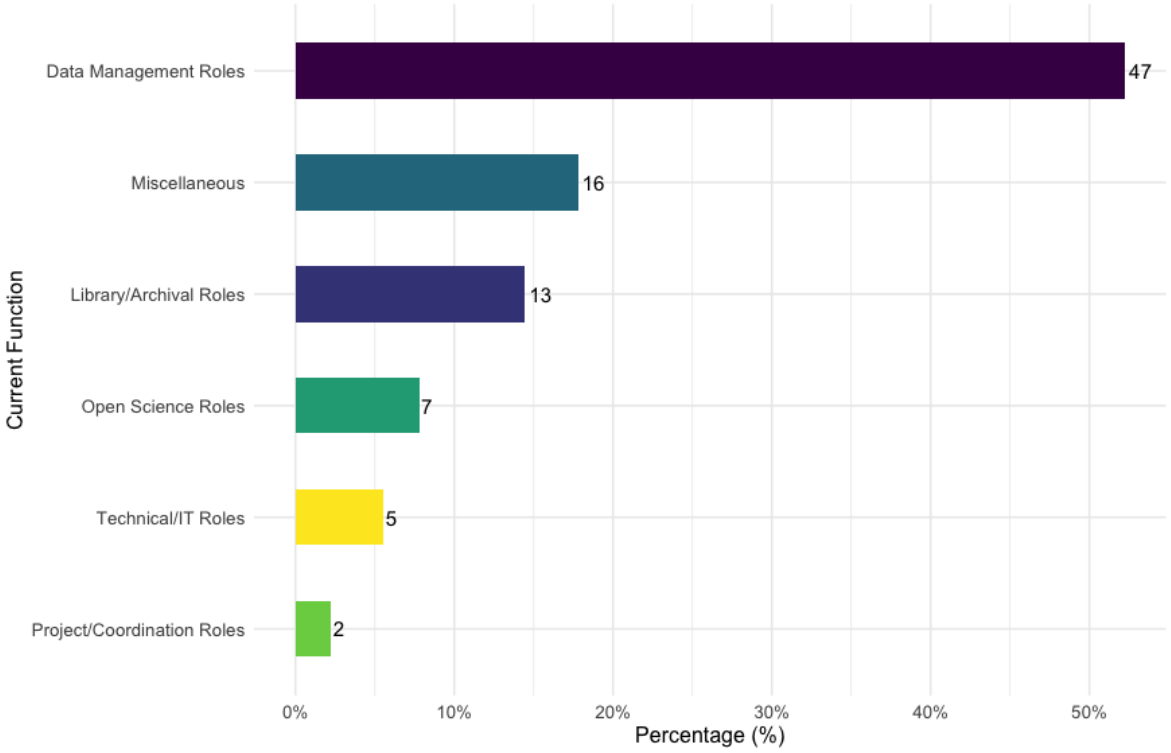
Respondents were asked how they identify their main current function, either by selecting a job title from a predefined list or by providing one themselves. We consolidated the answers into six categories for greater clarity (Table 3).

Table 3. Types of role and job titles

Types of role	Job titles
Data Management	Data Manager, Data Steward, Data Stewardship Coordinator, Data Consultant/Data Steward, Data Specialist / Head of Team, Data Librarian, Data Archivist, Data Curator, RDM Specialist, Research Data Management Specialist, Research Management
Open Science	Open Science Manager, Head of Open Science, Specialist Open Science, Professor of Data Management, Responsible for the Data Stewardship Action Plan, Head of ORD
IT	IT Specialist/Expert
Library and archive	Archivist, Librarian
Project coordination	Project Manager, Project Coordinator, National Coordinator of Swiss Node of an European Digital Research Infrastructure
Miscellaneous	Scientific Collaborator, Alumni/Startup, xxx, Training Specialist, Head of Unit

Most respondents (52%, n=47) identify their current role as a data management role, whether as data steward, research data management (RDM) specialist, or another function centred on data handling (Figure 2). Only a small portion (7%, n=7) occupy roles explicitly dedicated to ORD practices. This highlights that ORD expertise is often embedded across a wide range of professional profiles, such as librarian or archivists, rather than being confined to specialized ORD positions.

Figure 2. Current functions of ORD experts (n=90). The numbers shown next to the plots indicate the number of individuals.



In terms of education, nearly all ORD experts hold a university degree (96.5%, n=83), most often an advanced degree beyond the bachelor's level (Figure 3). A majority of respondents (53%, n=46) hold a PhD. This indicated that ORD experts often have concrete experience in scientific research and are familiar with all stages of the research production process. Regarding their field of study, ORD experts come from a wide range of disciplines, covering most major academic fields (Figure 4). The two largest groups are from the social sciences (n=20) and the natural and environmental sciences (n=19). Some disciplines, such as art, music and design – where research activities tend to be less data-driven than in the two main groups – are less represented.

Figure 3. Highest level of education of ORD experts (n=86). The numbers shown next to the plots indicate the number of individuals.

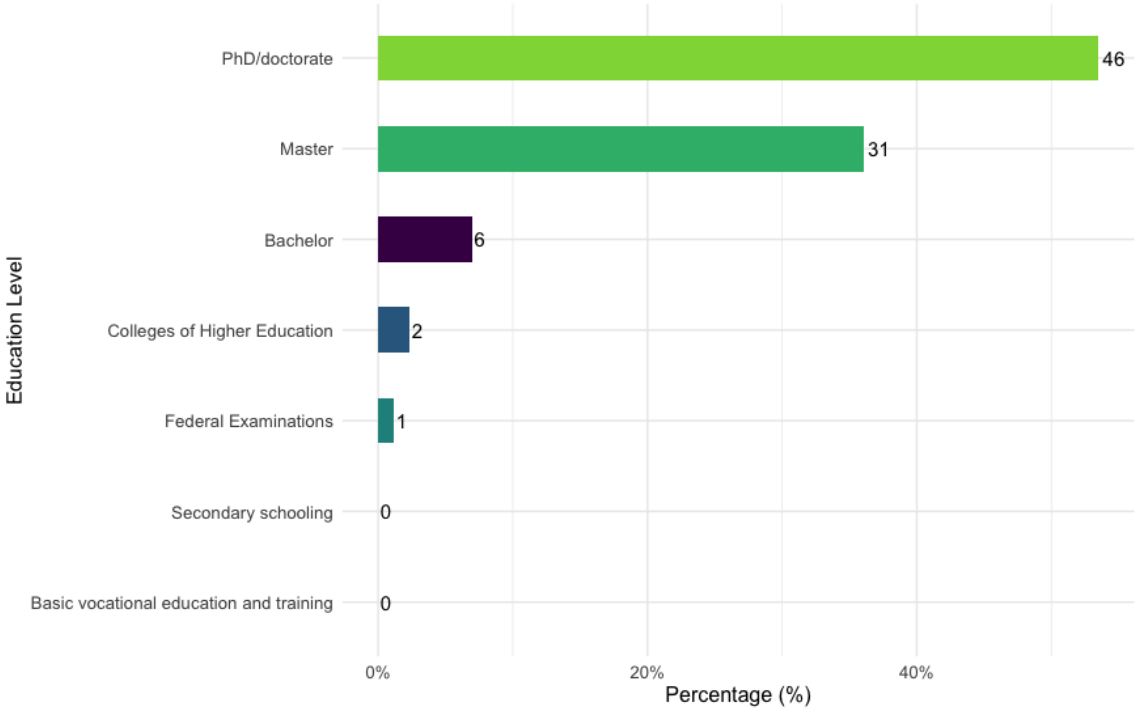
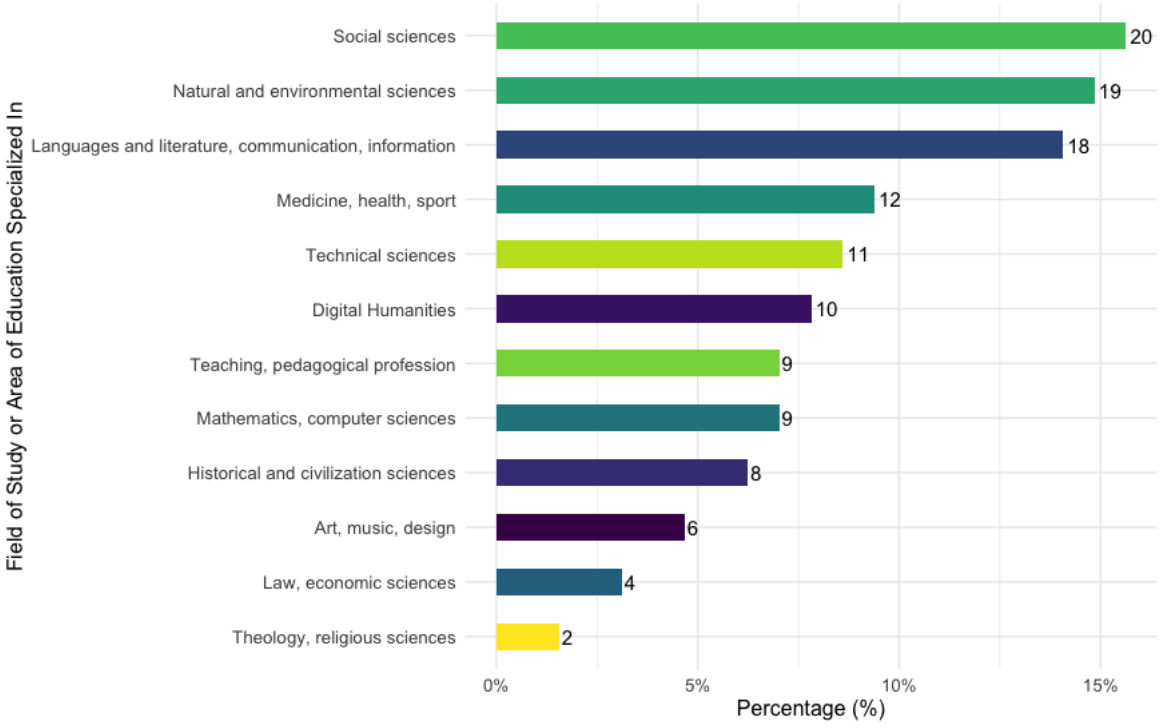
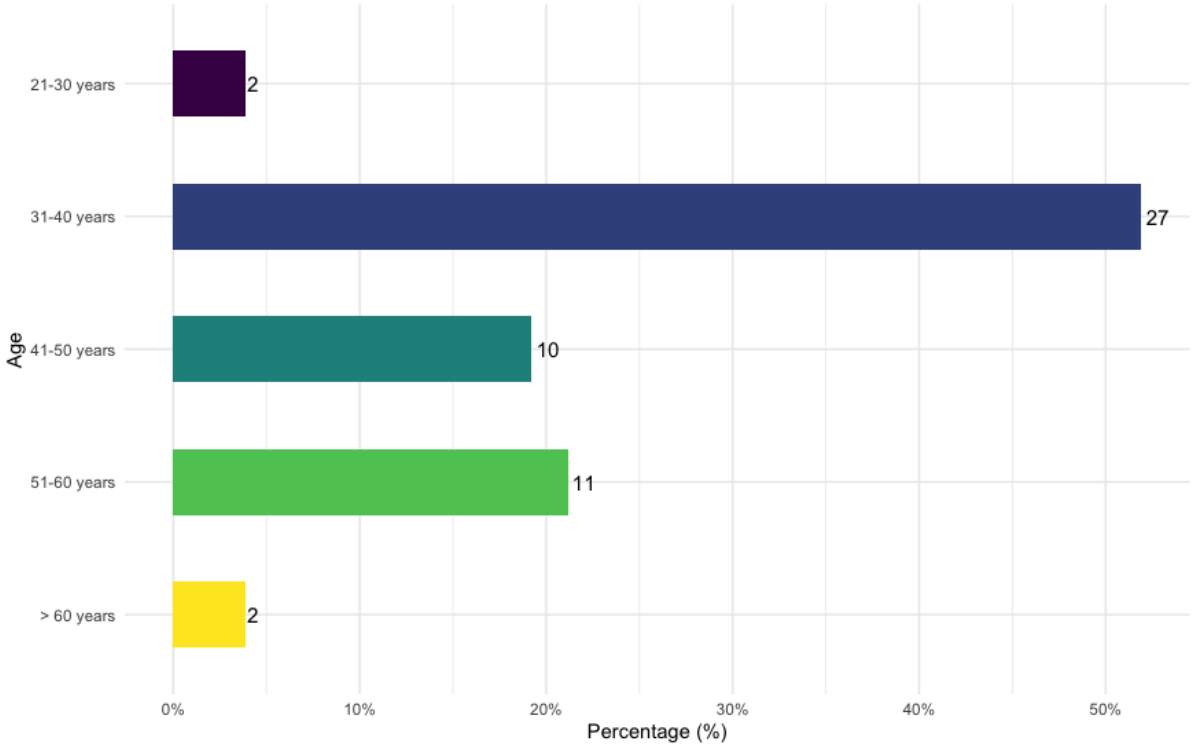


Figure 4. Discipline(s) of study (n=83). The numbers shown next to the plots indicate the number of individuals. One individual can choose several disciplines.



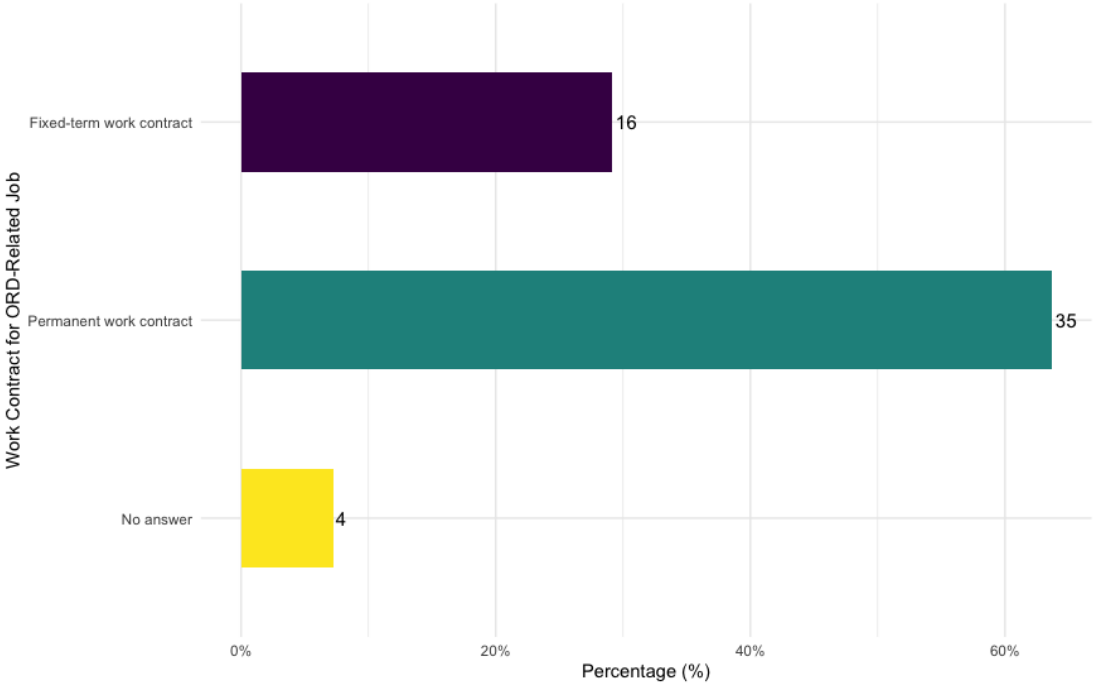
The distribution of respondents by age shows a strong concentration in the 31-40 age group (52%, n=27). This is followed by two similar sized groups: those aged 41-50 (n=10) and 51-60 (n=11). This suggests that ORD-related roles are primarily held by early- to mid-career professionals.

Figure 5. Age distribution of ORD experts (n=52). The numbers shown next to the plots indicate the number of individuals.



Around two thirds of the respondents have a permanent contract (63,6%; n=35). 29% are on fixed-term contracts (Figure 6). This indicates a mix of stability and temporary positions. Temporary roles reflect emerging policies within Swiss HEIs aimed at supporting ORD by hiring specialists on a trial basis. These arrangements allow institutions to assess how such roles are received within the academic community, while avoiding long-term budgetary commitments related to the sustainability of ORD-focused positions.

Figure 6. Types of contracts of ORD experts (n=55). The numbers shown next to the plots indicate the number of individuals.

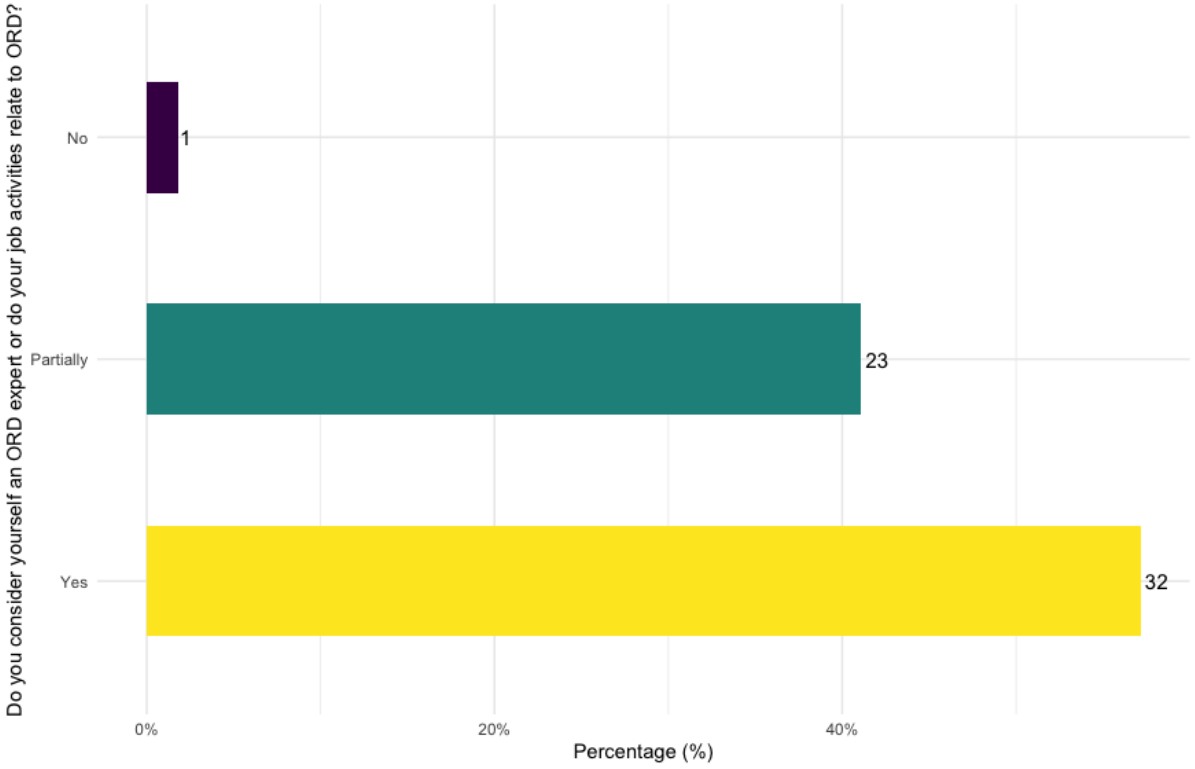


5.2.3 ORD expertise

We further categorize ORD expertise by highlighting specific characteristics of the respondents' professional practices. The goal is to provide an objective view of the types of support tasks ORD experts perform, and how long they have been engaged in these activities.

When it comes to self-perception of expertise, a slight majority of respondents engaged in ORD roles (57%; n=32) consider themselves to be ORD experts, while 41% (n=23) describe themselves as only "partially" expert or involved with ORD (Figure 7). The significant proportion of respondents who view themselves as only partially expert can be explained by two main factors. First, as previously noted, ORD expertise is often integrated into broader job roles, where ORD constitutes just one among several areas of responsibility. Given the wide variation in the level of involvement with ORD-related tasks, the sense of expertise may vary accordingly. Second, and as we will explore in more detail later, ORD expertise often relies heavily on self-training. The absence of formal certification may lead some professionals to perceive themselves as only partially qualified in their field.

Figure 7. Self-perception of ORD expertise by the respondents (n=56). The numbers shown next to the plots indicate the number of individuals.

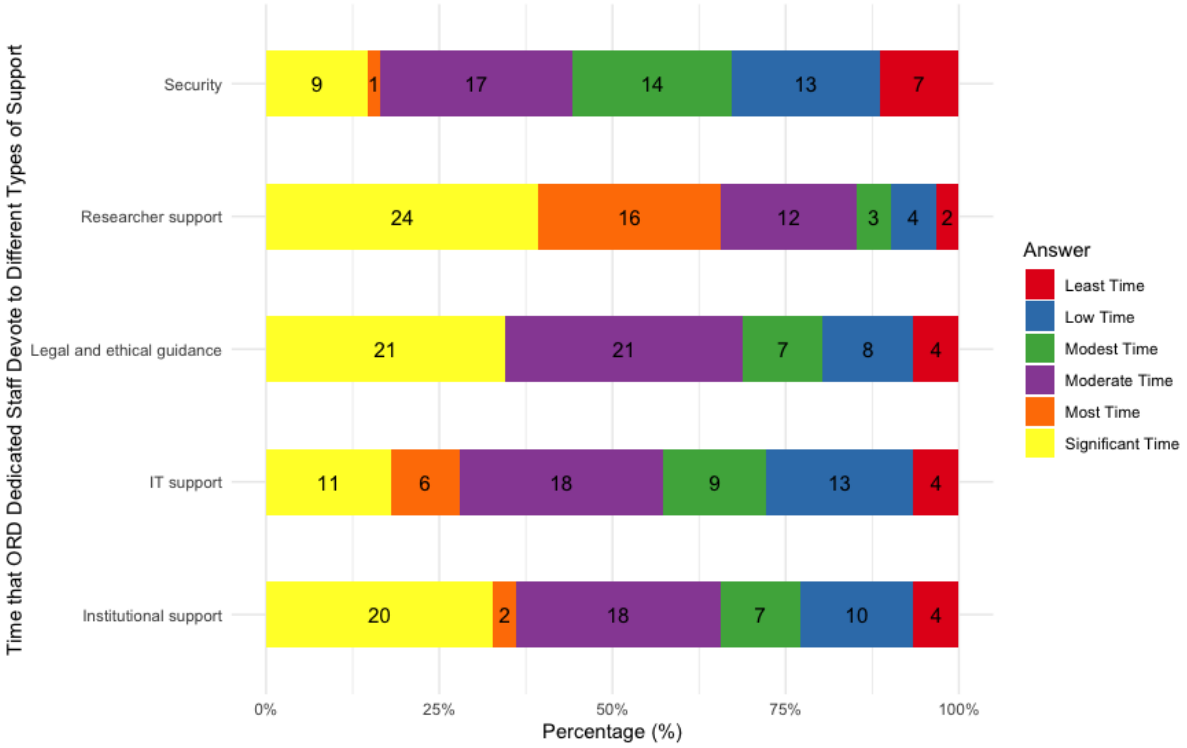


General support for researchers is the type of activity receiving the most attention, with the largest number of respondents allocating either “significant time” (n=24) or “most of the time” (n=16) to it (Figure 8). With the recent introduction of Data Management Plans (DMP), assisting researchers in drafting these documents still requires substantial support. Offering consultations and training sessions remains a core aspect of research support services.

Legal and ethical guidance is also a major area of support, with 21 respondents reporting that they devote “significant time” to it. Issues such as data privacy, ethics compliance, and adherence to the Data Protection Acts increasingly demand researchers’ attention and often require external expertise.

Institutional support activities, such as compliance activities, show a more mixed distribution, with a notable number of respondents spending “significant time” (n=20), but very few allocating “most of their time” (n=2) to this area. In contrast, IT support and data security receive comparatively less emphasis, with most respondents indicating they spend only “modest time” or less on these activities.

Figure 8. Time dedicated to different types of support (n=61). The numbers shown in the plots indicate the number of individuals. One individual can choose several types of support.



Respondents' experience with ORD-related support activities varies considerably (Figure 9). About 41% have been working in this area for between 1 and 3 years, making this the largest group and highlighting the relatively recent emergence of this type of expertise. The second-largest group consists of those with 4 to 6 years of experience (27%; n=15), followed by a third group with 7 to 9 years of experience (14%; n=8). Overall, more than 83% of respondents have less than 10 years of professional experience in ORD.

Another indication of the emerging nature of ORD expertise is the wide variation in how prominently it features in respondent's job descriptions (Figure 10). For many, ORD-related activities remain a limited part of their overall workload. Nearly 42% (m=23) dedicate only 0 to 20% of their working time to ORD tasks. However, 20% (n=11) report spending up to 80% of their time on ORD. Overall, around 42% (n=23) dedicate between 41 % and 100% of their working time to ORD activities. This reflects a certain polarization between individuals with limited involvement in ORD and those for whom it represents a substantial or even primary part of their work.

Figure 9. Years of experience within ORD (n=55). The numbers shown next to the plots indicate the number of individuals.

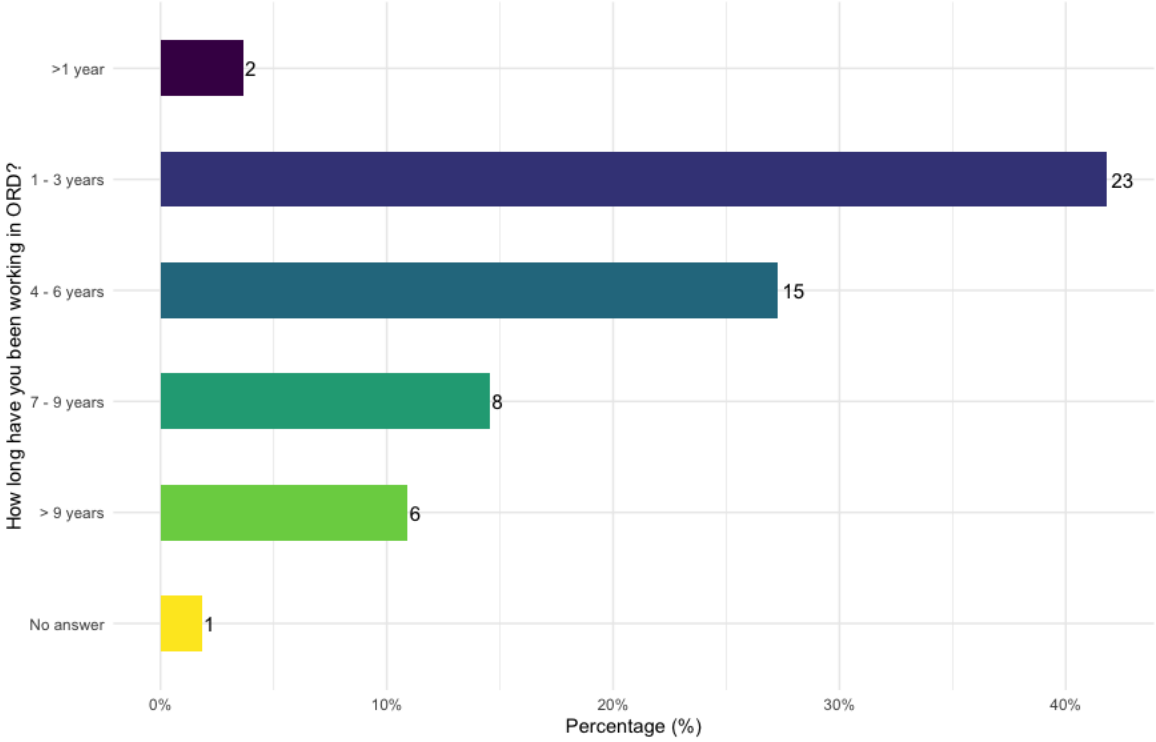
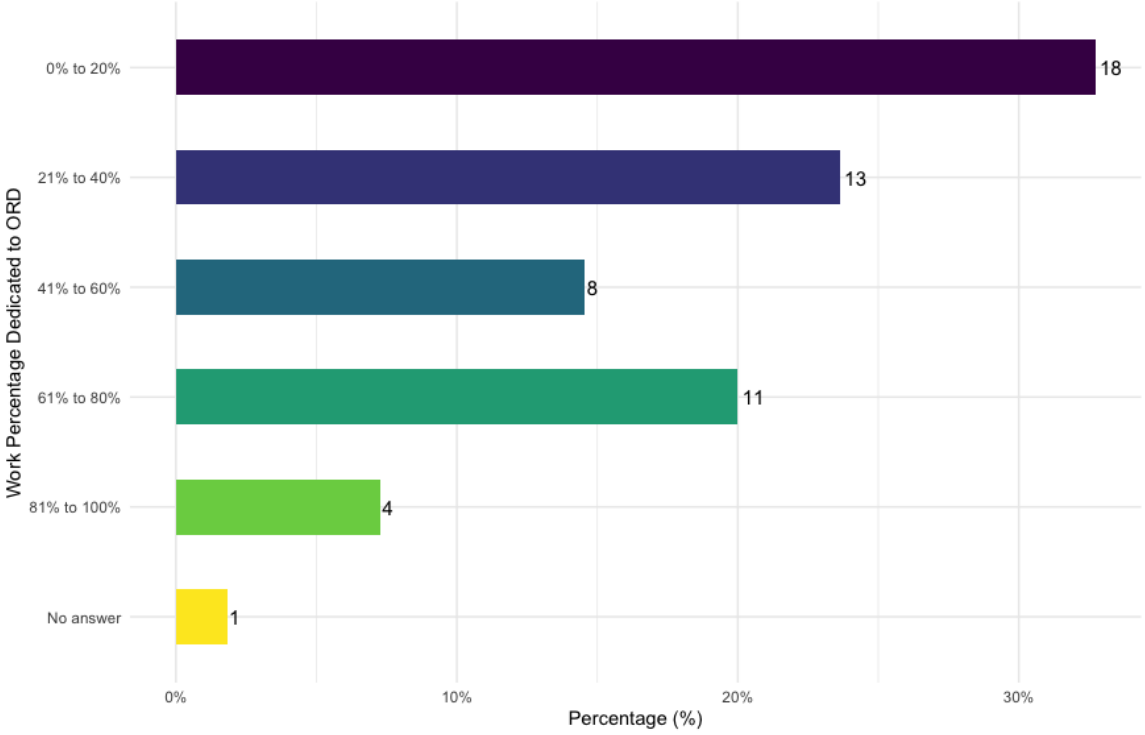


Figure 10. Time devoted to ORD-related activities (n=55). The numbers shown next to the plots indicate the number of individuals.



When asked to identify the most important knowledge, skills, or abilities for their roles, respondents highlighted a combination of technical, ethical, and disciplinary competencies (Figure 11). “Research Data Management” and “Open Science/Open Research Data” were cited most frequently (47 mentions each), even though, as noted earlier, ORD is not necessarily a prominent part of every respondent’s workload. These were followed by skills in data protection and ethics (35 mentions) and knowledge of research operation and life cycle across disciplines (36 mentions). Legal expertise and familiarity with FAIR data principles also stood out (30 mentions each), reflecting the growing regulatory and interoperability challenges faced by ORD professionals. Other skills mentioned include IT, social and interpersonal abilities, and long-term data preservation, showing that ORD expertise spans both technical domains and human-centered competencies.

Figure 11. Most Important knowledge, skills or abilities for ORD roles (n=55)

Note: The numbers shown next to the plots indicate the number of individuals. One individual can choose several answers.

5.2.4 Career paths of ORD experts

This section examines two aspects of the careers of ORD experts. First, we analyse their previous professional experience. Then, we look at how they have developed professionally within ORD roles. We draw on a mix of qualitative and quantitative responses.

1. Previous roles before entering ORD

In our survey, we asked one open-ended question about respondents' prior professional experiences, inviting them to describe their three most recent job positions, the type of organization, and the time period for each. This yielded 37 usable responses, which we analyze qualitatively here. The experiences described can be grouped into three broad categories: academic research, library and information science, and technical roles.

A significant number of respondents transitioned into ORD roles after academic research. This aligns with earlier findings on respondents' educational backgrounds – most ORD experts hold a PhD. Many reported previous roles such as PhD student, postdoctoral researcher, or senior research assistant, typically within Swiss HEIs. These roles were often held between 2015 to 2022, suggesting a relatively recent move into ORD. This pathway confirms that ORD professionals frequently have a background in research, sometimes still being engaged in research networks. This experience equips them with direct knowledge or research workflows, including data production and management within the academic environment.

Another substantial group of respondents has a background in library and information science. Roles such as *subject librarian*, *systems librarian*, or *specialist librarian for digital resources* were commonly cited. These professionals often worked in federal institutes of technology or Swiss universities. Many had already taken on responsibilities related to digital access, metadata, or open access into their work prior to their formal ORD roles. Compared to those from research backgrounds, these individuals tend to not be directly involved in research activities and are less likely to hold a doctoral degree. This pathway reflects the traditional alignment between data stewardship and library sciences.

A third group of respondents comes from technical and data-centric roles, including data analytics, biostatistics, scientific computing, or IT. These included job titles such as *data analyst/curator*, *UX scientific designer*, *scientific computing expert*, and *biostatistician*. These roles were typically based in

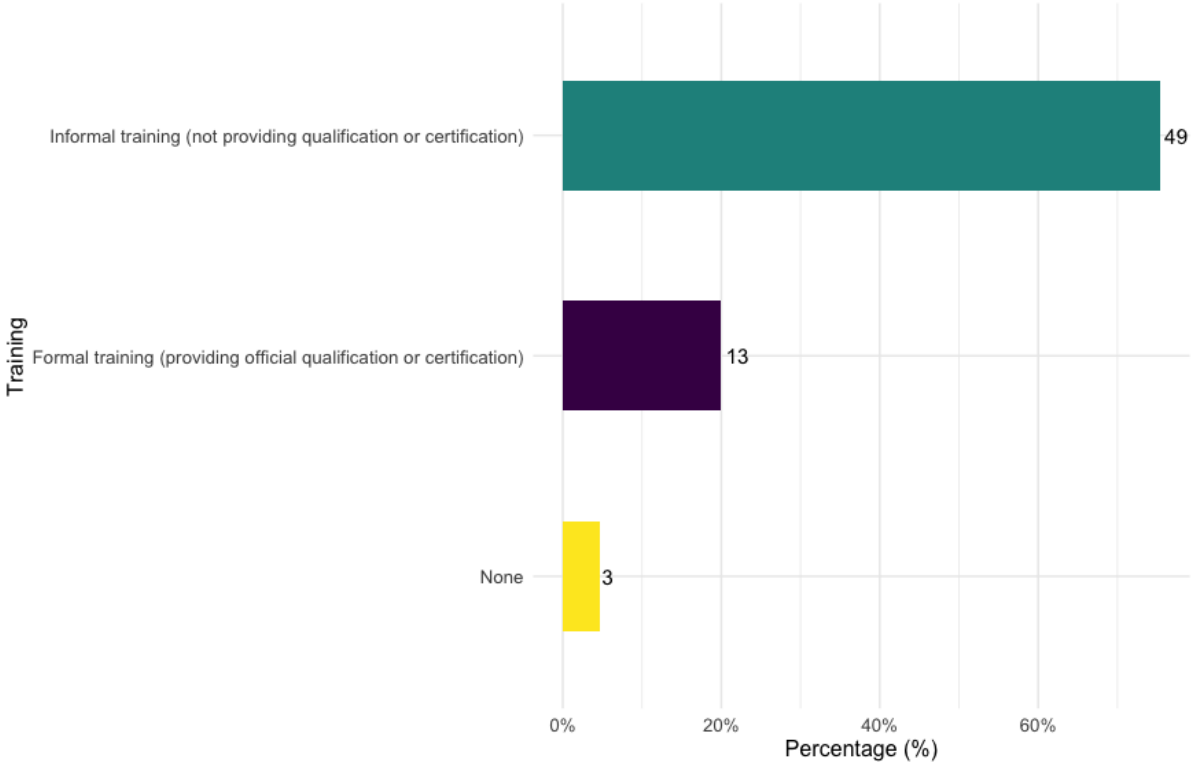
hospitals, biomedical institutes, or institutional IT environments. Their presence underscores the technically grounded competencies required in many ORD functions, particularly for institutions with strong infrastructure or FAIR compliance requirements like in natural and biomedical sciences.

Overall, the career paths into ORD are marked by fragmentation, but also by convergence around data-centered tasks. Whether emerging from research, library sciences, or technical and computing domains, respondents share one commonality: their professional history includes a strong engagement with research data, infrastructures, or knowledge systems. The absence of standardized pathways into ORD positions suggests that the field is still undergoing professionalization, relying largely on lateral movements from adjacent domains rather than clearly defined career tracks.

2. Training and professional development

The absence of standardized pathways into ORD is also reflected in the training and professional development of the respondents (Figure 12). Qualified or certified training in ORD is still relatively rare, with only 13 individuals reporting having received such training. Around 75% of the respondents (n=49) developed their ORD expertise through informal training. This suggests a need to legitimize the skills of those working in ORD through the development of certifications that highlights expertise in ORD.

Figure 12. Type of training followed by the ORD experts (n=65)

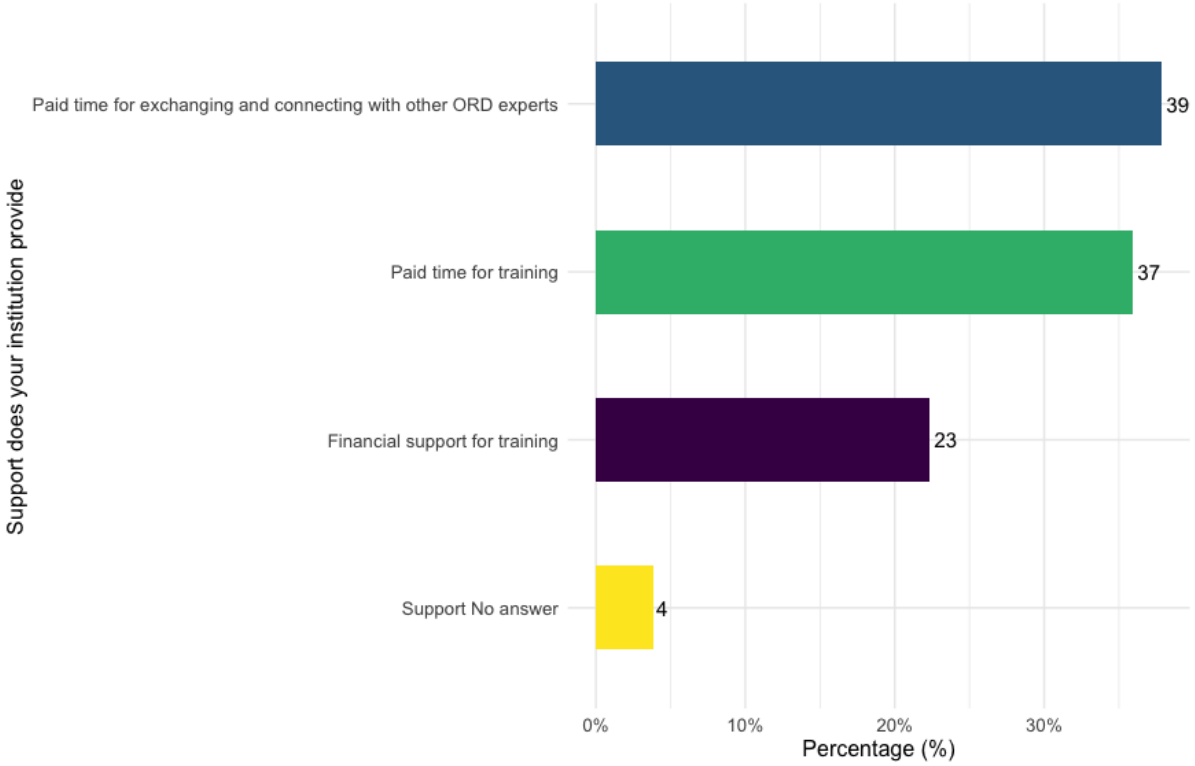


Note: The numbers shown next to the plots indicate the number of individuals.

In addition to the lack of formal certification for ORD expertise, institutional financial support for training also appears to be limited (Figure 13). Only 23 respondents reported receiving financial support to attend training on ORD-related topics. The most common forms of support for developing expertise in ORD include paid time for self-training, access to free courses, and peer-to-peer exchanges with other professionals in the field.

This limited financial support may reflect a broader institutional hesitation to invest strategically in ORD-related roles. While informal and self-guided learning is valuable, the lack of structured and funded development opportunities may hinder the professionalization and long-term recognition of ORD expertise.

Figure 13. Final support for training (n=55)



Note: The numbers shown next to the plots indicate the number of individuals. One individual can choose several answers.

5.3 Interviews with ORD experts of Swiss HEIs

5.3.1 Summary of the interviews

We addressed the participants in the interviews as Open Research Data (ORD) experts and the questions related to ORD. The participants mostly referred to Research Data Management (RDM) in their answers. We have mostly retained this in this summary.

1. Self-directed RDM learning prior to current position

Most interviewed participants currently working in the field of RDM or ORD have not received formal training prior to taking up their positions. Instead, they typically acquired their knowledge through self-directed learning. This includes online courses, YouTube tutorials, MOOCs, presentations at other HEIs (e.g. HEI libraries), attending workshops, reading relevant literature, and learning by doing in the context of previous jobs. Early experiences often came during their studies, such as through internships, master's theses, or PhDs, particularly in data-intensive disciplines like the sciences. Postdoctoral

work or roles in libraries also contributed to their skill development, for example by organizing RDM trainings, supporting data organization in research projects, or assisting principal investigators in writing data-related grant proposals. Formal training in RDM or ORD is generally not part of library and information science curricula, or only covered to a very limited extent.

2. Diverse entries into RDM careers

There are many factors that contributed to individuals obtaining their current positions in the field of RDM. For some, previous roles in libraries served as a stepping stone, gradually leading to positions with a stronger focus on RDM. In other cases, experience in areas such as data preservation or metadata management laid the foundation for transitioning into RDM-related roles. Since around 2020/21, RDM has increasingly been integrated as an additional responsibility within library roles, particularly in the context of third-party funded projects such as those focused on data stewardship.

Research experience, especially in data-driven fields, also played a significant role, as did personal motivation, whether it was the desire to improve data handling practices, an interest in project management, or alignment with the values of Open Science. Networking and prior hands-on experience with RDM in earlier positions further opened doors to new opportunities. Entry into current roles occurred both through formal recruitment processes, such as responding to job postings, and through internal recruitment without the need for a formal application. Overall, a combination of professional background, personal motivation, and evolving institutional priorities contributed to the path into RDM-related positions.

3. From self-directed learning to formal training in current RDM position

Some participants have completed formal training during their current positions, but the majority continue to rely on informal, self-directed learning. This includes attending webinars, participating in workshops, watching presentations from other institutions, engaging in internal and external knowledge exchange, reading, and learning by doing in their daily work. In many cases, their job roles themselves involve organizing RDM training sessions, which often also serve as a learning opportunity for the individuals involved.

Employers are generally seen as supportive when it comes to professional development. This support is most commonly expressed through financial assistance for formal training or for attending conferences and workshops, allocating work time for participation in such activities, and allowing for self-directed learning when time permits.

All participants who have pursued formal training, such as the DLCM training, CAS in Data Stewardship, or training through the Swiss Data Center focusing on data management and data management plans for grant applications, have received financial support and/or dedicated time from their employers to complete the programs.

There is a need for specific, and targeted training (e.g., in areas like sensitive medical data and large collaborative projects), therefore, training should be less generic over time. Also, there is the need for continuous education to keep up with the researcher's needs, since technologies develop very quickly. This should be considered more in the job description.

4. Calls for institutional, structural and cultural reforms of RDM careers

The future development of careers ORD and RDM is currently perceived as uncertain and in need of significant structural, institutional, and cultural improvements. One of the main concerns expressed by professionals in the field is the lack of clear career paths and long-term job opportunities. Much depends on how the role of data stewards will evolve within research units. Without stable and consistent funding—particularly at the federal or institutional policy level—RDM-related jobs are often perceived as unstable, risky, and niche. As a result, some suggest combining RDM work with a more secure profession, such as data science.

Career movement within the field is often limited to horizontal transitions—shifting from one institution to another to perform essentially the same tasks. These transversal changes are not widely viewed as true career progression, especially when they only result in better working conditions (e.g., higher salary or improved team dynamics), rather than a real development of responsibilities or roles.

On the **individual level**, full-time and permanent contracts are already considered a significant step forward in career development. There is also a desire for positions with a higher workload percentage dedicated specifically to RDM, or for more advanced roles such as RDM team managers or group leaders. Having clearly defined job roles and sufficient time allocated to RDM tasks is seen as essential for both individual growth and institutional effectiveness.

On the **structural level**, a key improvement would be a shift in how RDM and ORD roles are perceived—from purely administrative functions to integral components of the scientific process. These roles should be recognized as supportive of research output and not merely as back-office services. More intermediate career profiles are needed between the levels of technical staff and professorships, providing a continuum of professional development within research support roles. Examples from countries like Finland suggest that reducing fragmentation—such as by consolidating Open Science

units into autonomous structures—could offer more stability in terms of funding, project management, and long-term planning.

Furthermore, establishing mandatory RDM practices, such as requiring approval from a data steward for data management plans (DMPs) before research funding is granted, could elevate the importance of these roles. Ultimately, a broader **cultural change** within the research community is necessary—one that values and integrates data management as a core component of high-quality, reproducible, and collaborative science.

In addition to the need for clearer career paths and more stable structures, there is a strong call for **greater recognition and visibility of RDM and ORD professionals**. Many participants emphasized that the work done in this field—often behind the scenes—deserves far more acknowledgment, both within academic institutions and the broader research community.

This recognition should extend to the training and expertise required to perform RDM roles effectively. The effort and skill involved in providing high-quality support, developing data policies, and enabling good data practices must be formally appreciated. Furthermore, the qualitative contributions of research data managers and researchers alike should be valued more—especially in terms of how data is handled, curated, and made reusable. One important step in this direction is the establishment of agreements on co-authorship, where RDM professionals are acknowledged as contributors to scientific publications when they play a significant role in managing and preparing data.

Making RDM and ORD more visible and better understood is also essential. This includes raising awareness of their impact on research quality and reproducibility. Importantly, this shift in perception and appreciation must come from the top. Institutional leaders and research management must actively recognize that research and society as a whole rely on well-managed, trustworthy data—an area that requires specialized expertise.

Ultimately, elevating the status and perceived value of RDM and ORD roles will not only strengthen individual career development but also contribute to a more sustainable, transparent, and data-literate research culture.

6 Navigating ORD career paths: Challenges, needs and recommendations

In this section, we summarise the challenges and needs for ORD career development raised by participants of our study. Our analysis is based mainly on two sources, which are discussed in more detail in the chapters 5.2 and 5.3: a survey question asking participants to describe what they see as the main challenges to building a long-term career as an ORD expert, and the results of an interview session conducted with selected survey participants. Based on this, we formulate recommendations and, where appropriate, also consider the findings from our meta-study on how to establish ORD expertise (e.g. data stewardship) as an independent career path at HEIs by 2028. Our six recommendations build on each other and follow a "layered approach": strengthening the integration of the ORD experts within the research community, institutions lay the groundwork for strengthening institutional recognition of ORD practices and roles, as well as improving job security and clear, structured career advancement opportunities. Following up with providing broad access to advanced and domain-specific training at the national level will lead to ORD career evolution and coherence and strategic consistency across institutions, thereby establishing the career trajectory of ORD experts at Swiss HEIs.

6.1 Challenge: Difficulty integrating with the research community

Several respondents expressed difficulty in gaining legitimacy or influence within the research community. This is particularly the case for those employed in libraries or central services, who report challenges in convincing researchers of their relevance. One participant noted, “I am employed by the library, and that is not the institute that people associate with ORD or RDM.” Others mentioned that researchers often undervalue data management and continue to prioritize traditional outputs like journal articles over data publication, which is rarely recognized in academic career advancement.

In this context, researchers may question the value of investing significant time and effort into data sharing. While data creation is often legitimized and rewarded through publication, data publication and reuse are less visible and less valued. This misalignment reduces the incentive to engage with ORD practices and hinders the ability of ORD experts to collaborate meaningfully and gain institutional traction.

6.1.1 Recommendation 1: Strengthen integration within the research community

We recommend that institutions act to strengthen the ties between their ORD experts and research community, as it is difficult to envision ORD career development without ORD experts working hand-in-hand with the research community. The relationship/career paths/development between ORD experts and researchers should be understood as a continuum, rather than entirely distinct or separate roles, as we can see below.

The role of librarians in providing training in ORD should be pursued as they provide the first notions of ORD to early stage researchers.

On the organizational level, we propose to position ORD experts (other than librarians) closer to the research units, thereby achieving more proximity and thus more daily interactions between ORD experts and researchers. The ties between ORD experts and the research community could also be strengthened by organizing yearly workshops, along the lines of the "Ateliers de la Donnée" in France (5.1.1, 6. c.).

6.2 Challenge: Lack of institutional recognition of ORD practices and roles

One of the most recurring concerns in the survey responses is the absence of formal recognition for ORD – both as a set of research practices and as a professional role within academic institutions. Regarding ORD practices, respondents emphasize the "lack of (flexible) funding for implementing ORD in research projects" and the "lack of incentives for researchers". Sharing data requires substantial time and resources from researchers. Without financial support and formal recognition of these efforts in academic career progression, it is difficult for ORD to establish itself as a sustainable research output.

This lack of recognition also extends to ORD-related roles. Many respondents note that ORD expertise is still perceived as a *support function* rather than a distinct professional domain. As a result, opportunities for career advancement remain unclear. Several participants report that ORD tasks are often added as secondary responsibilities – sometimes with "low job percentage" – rather than being acknowledged as central or strategic. As one participant put it, "ORD/RDM is not really an independent career step, but one task among many." This perception undermines long-term professional development and discourages talent retention in the field.

6.2.1 Recommendation 2: Strengthen institutional recognition of ORD practices and roles

The lack of recognition of ORD experts leads to the recommendation to strengthen their role on the institutional level with sustainable yet flexible funding to support ORD practices in research.

On the level of their professional role, it is recommended to increase ORD expert's visibility in the institution's hierarchy (e.g., through job titles, clearer job descriptions, etc.). We also advocate for RDM/ORD professionals to be acknowledged as contributors to scientific publications when they play a significant part in managing and preparing data. Furthermore, it is recommended to place the strategic importance of these experts for scientific success on the same level as that of the scientists themselves. This might be achieved by offering a salary which is more aligned to that of researchers. Finally, by evaluating candidates to new institutional positions involving data for their awareness and ability to manage, share and archive data for long-term use, institutions would send a clear signal that ORD is critical to their mission. This is in line with what is recommended by the Coalition for Advancing Research Assessment (CoARA), which recognizes that current research assessment methods rely heavily on publication-based metrics such as citation counts, and often fail to recognise the wide array of contributions made by researchers and ORD experts.

By raising awareness within their research community of good data management practices and the expertise of the ORD experts at their institutions, they could improve recognition of the ORD experts at their institutions, promote the inclusion of ORD experts as authors in publications, and ensure that data generated at their institutions are available for re-use by current and future generations of researchers.

6.3 Challenge: Precarity and limited career progression opportunities

A major concern is the precarious nature of ORD positions. Many respondents mention that their roles are either temporary or part-time, making it difficult to plan for a long-term career: *"There are many short-term contracts. And even if this is not the case, the room for manoeuvre is not guaranteed and depends on the rector and the institutional resources available".*

A number of ORD roles are dependent on short-term funding schemes, pilot projects, or central budgets that can shift with institutional priorities. One respondent emphasized that many sources of funding are only "temporary," making it hard to build continuity or embed ORD expertise within departments.

A resounding 44% (n=24) of the respondents of the survey feel that they are not offered enough professional development opportunities. If one adds the 27% (n=15) who believe that they are only partially offered enough professional development opportunities, over 70% of respondents are not satisfied with the current career opportunities of their job. This is a relevant indicator for the establishment of ORD experts as stable careers within Swiss HEIs. Without more secure funding and permanent contracts, professionals find it difficult to commit fully to this field or build long-term strategies.

6.3.1 Recommendation 3: Job security and clear, structured career advancement opportunities

On the institutional level, job security can be achieved by providing long-term funding resulting in long-term working contracts for ORD experts. Without sustainable funding, institutions risk losing their ORD experts and their knowhow, and likely be unable to offer stable, long-term career perspectives. We also recommend that career paths be established to provide ORD experts a perspective on which next career step(s) are possible and what needs to be accomplished to achieve the next career level. While it is not possible at this point to outline the specific structure of the career path, we found career opportunities not only in academia, but also in industry and government.

6.4 Challenge: Limited access to advanced training

Respondents also highlight a lack of systematic, advanced training opportunities for ORD professionals. While introductory courses on RDM or ORD are increasingly available at Swiss HEIs, there is still a gap when it comes to deeper, specialized learning or formal certification. Professionals are largely dependent on what is offered by their institution or accessible through conferences and peer exchange. As one participant noted, “a lot of it is learning on the job.” This reliance on informal and institution-specific training can lead to unequal skill development and missed opportunities for professional growth.

6.4.1 Recommendation 4: Broad access to advanced and domain-specific training

On the institutional level, we recommend institutions provide structured onboarding programs with clearly defined objectives and tailored content in terms of the ORD expert’s position, context and personal background. These programs must be adapted to the specific role, institutional context, and the

individual's professional background to ensure effective integration and alignment. This means that formal training opportunities, such as participation in certified programs (e.g., the CAS in Data Stewardship at UNIL), should be made available to support skill enhancement and career progression. These should be recognized and integrated into the professional development framework.

On the level of lifelong learning, continuous access to flexible and domain-specific training is essential. Institutions should offer both financial and time-related support to enable ongoing domain-specific education. This includes allowing protected time for specialized training and covering associated costs where possible, and for participation in dedicated Community of Practices of Data Stewards such as the one from the SRDSN. We think that our inventory in training and education resources could also bring an efficient contribution to this effort. The list of material it provides, if regularly checked and completed, can provide significant resources to institutions so that they use it for their training programs, even possibly on an individual scale. SRDSN could centralize this material in its dedicated hub of resources for the RDM community in Switzerland, and maintain it as a collaborative effort as suggested above (5.1.3). Furthermore, institutions should try to coordinate advanced training and advancement opportunities for ORD experts. Sharing these tasks would reduce the burden on individual institutions, transform the current fragmented approach to a more unified, national approach, and support clear career progression, be it in academia, industry or government.

Given the fast-paced evolution of digital and data-related technologies, training strategies must remain agile and forward-looking. Institutions should regularly assess emerging needs and integrate up-to-date content and tools into their training offers to ensure ORD experts remain equipped for future challenges.

6.5 Challenge: Fragmentation and evolving institutional strategies

Lastly, some respondents point to strategic uncertainty as a barrier. Many institutions are still developing their ORD frameworks, which results in a high degree of fragmentation. Strategies, policies, and support structures are evolving rapidly, creating unstable conditions for professionals trying to define their roles or build institutional momentum. One respondent reflected that this situation "makes it more difficult to work with a long-term strategy in mind." Without greater institutional clarity, ORD professionals often find themselves working reactively, rather than proactively shaping their roles and contributions.

6.5.1 Recommendation 5: Coherence and strategic consistency across institutions

To ensure both consistency and contextual relevance, it is recommended to harmonize the definition of Data Stewardship while respecting local institutional contexts. A nationally coordinated training program should also be established to align education and training efforts across institutions. This should be supported by the development of a centralized platform, in collaboration with the SRDSN national initiative, for coordinating training materials and resources for both initial education and continuous professional development. Finally, institutions should encourage their ORD experts to participate in national and international initiatives that improve making data FAIR (Findable, Accessible, Interoperable and Reusable).

6.6 Challenge: National Governance Strategy

The recommendations outlined above are aimed at HEIs; however, national policymakers, funding bodies, and coordinating organizations—such as the Swiss National Science Foundation (SNSF), the State Secretariat for Education, Research and Innovation (SERI), and swissuniversities—also play a crucial role in supporting and promoting the career development of data stewards. While HEIs are well-positioned to implement necessary measures—such as creating dedicated positions, offering professional development, and integrating data stewardship into research support structures—these efforts will be sustainable only if they are supported by national-level coordination and advocacy.

6.6.1 Recommendation 6: Supporting the career development of Data Stewards in Switzerland

Policymakers and funders must provide the incentives, resources, and strategic direction needed to embed data stewardship into the fabric of Swiss research and education. It is essential that these bodies support the establishment of guidelines that define the mission, roles, competencies, and skills of data stewards. Establishing a shared understanding of what a data steward does will provide a foundation for consistent role descriptions, recruitment, and training across institutions. Additionally, promoting the formal recognition of the data steward profession within the Swiss education system is crucial. This includes advocating for its inclusion in national occupational profiles and aligning it with existing frameworks for adult education and professional certification, such as the brevet fédéral and other federally recognized qualifications. Such recognition would validate the expertise of data stewards and open pathways for structured career progression and mobility. We recommend that the Swiss

ORD Strategy Council (StraCo[87]) and swissuniversities continue to coordinate these efforts, bringing together stakeholders from academia, government, and industry, while supporting existing initiatives, particularly in the field of continuing education.

This collaboration can ensure that the evolving role of data stewards is fully integrated into Switzerland's vision for open research data.

87 <https://openresearchdata.swiss/the-strategy-council/>, last visited on 14 June 2025.

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Appendix I: Survey questions

Survey questions

ORD expertise as an independent career path

Background information

Institution: *

Choose one of the following answers

If you choose 'Other (please specify):' please also specify your choice in the accompanying text field.

Please choose **only one** of the following:

- Ecole polytechnique fédérale de Lausanne EPFL
- Eidgenössische Technische Hochschule Zürich ETH
- Universität Basel
- Universität Bern UniBE
- Université de Fribourg Unifr
- Université de Genève UNIGE
- Université de Lausanne UNIL
- Universität Luzern Unilu
- Université de Neuchâtel UniNE
- Universität St. Gallen HSG
- Università della Svizzera italiana USI
- Universität Zürich UZH
- Berner Fachhochschule BFH
- FHGR Fachhochschule Graubünden
- Fachhochschule Nordwestschweiz FHNW

- HES-SO
- Hochschule Luzern HSLU
- Kalaidos Fachhochschule
- Ostschweizer Fachhochschule OST
- SUPSI
- ZHdK Zürcher Hochschule der Künste
- ZHAW
- Haute école pédagogique des cantons de Berne, du Jura et de Neuchâtel HEP-BEJUNE
- Haute école pédagogique du canton de Vaud HEP Vaud
- Haute école pédagogique du Valais | Pädagogische Hochschule Wallis HEP-VS | PH-VS
- Haute école pédagogique Fribourg | Pädagogische Hochschule Freiburg HEP | PH FR
- Hochschulinstitut IVP NMS
- Interkantonale Hochschule für Heilpädagogik Zürich HfH
- Pädagogische Hochschule GraubündenPHGR
- Pädagogische Hochschule Bern PHBern
- Pädagogische Hochschule Luzern PH Luzern
- Pädagogische Hochschule Nordwestschweiz PH FHNW
- Pädagogische Hochschule St. Gallen PHSG
- Pädagogische Hochschule Schaffhausen PHSH
- Pädagogische Hochschule Schwyz PHSZ
- Pädagogische Hochschule Thurgau PHTG
- Pädagogische Hochschule Zürich PH Zürich
- Pädagogische Hochschule Zug PH Zug
- Schweizer Hochschule für Logopädie Rorschach SHLR
- SUPSI - Dipartimento formazione e apprendimento SUPSI-DFA

- Swiss Federal University for Vocational Education and Training SFUVET
- Other

This is a question help text.

Job title / current function *

Choose one of the following answers

If you choose 'Other (please specify):' please also specify your choice in the accompanying text field.

Please choose **only one** of the following:

- Data Steward
- Data Scientist
- Data Manager
- Data Curator
- Data Archivist
- Data Librarian
- Data Champion
- Data Stewardship Coordinator
- IT specialist/expert
- Database manager
- Infrastructure collaborator
- Infrastructure provider
- Scientific Collaborator
- Librarian
- Archivist
- Other

What field of study or area of education have you specialized in? *

Select all that apply

Please choose **all** that apply:

- Theology, religious sciences
- Law, economic sciences
- Medicine, health, sport
- Social sciences
- Languages and literature, communication, information
- Historical and civilization sciences
- Art, music, design
- Digital Humanities
- Mathematics, computer sciences
- Natural and environmental sciences
- Technical sciences
- Teaching, pedagogical profession
- Other:

What is your highest level of education? *

Select all that apply

Please choose **all** that apply:

- Secondary schooling (e.g. baccalaureate schools, upper-secondary specialised schools)
- Basic vocational education and training
- Bachelor's degree (University, Federal Institute of Technology, Universities of Teacher Education, Universities of Applied sciences)
- Master's degree (University, Federal Institute of Technology, Universities of Teacher Education, Universities of Applied sciences)
- PhD/doctorate (University, Federal Institute of Technology)

- Advanced Federal Diploma of Higher Education or Federal Diploma of Higher Education (Federal Examinations)
- Advanced Federal Diploma of Higher Education (Colleges of Higher Education)

Other:

Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)?

Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers. *

Choose one of the following answers

Please choose only one of the following:

- Yes
- No
- Partially
- No answer

What is your work percentage dedicated to ORD? *

Only answer this question if the following conditions are met:

Answer was 'Yes' or 'Partially' or 'No answer' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Choose one of the following answers

Please choose only one of the following:

- 0% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 100%
- No answer

What is your age?

Only answer this question if the following conditions are met:

Answer was 'Yes' or 'Partially' or 'No answer' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Choose one of the following answers

Please choose only one of the following:

- < 20 years
- 21-30 years
- 31-40 years
- 41-50 years
- 51-60 years
- > 60 years
- No answer

How long have you been working in ORD? *

Only answer this question if the following conditions are met:

Answer was 'Yes' or 'No answer' or 'Partially' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Choose one of the following answers

Please choose only one of the following:

- >1 year
- 1 - 3 years
- 4 - 6 years
- 7 - 9 years
- > 9 years
- No answer

What type of work contract do you have for your ORD-related job?

Only answer this question if the following conditions are met:

Answer was 'No answer' or 'Yes' or 'Partially' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Choose one of the following answers

Please choose only one of the following:

- Permanent work contract
- Fixed-term work contract
- No answer

What were your jobs you had before working in ORD, regardless of the domain/activities? Please limit the information to the three most recent main jobs.

Please specify: 1) job function 2) institution/organization and 3) period (from year X to year Y)

Only answer this question if the following conditions are met:

Answer was 'No answer' or 'Partially' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Please write your answer here:

Who trained you to acquire the knowledge, abilities and skills needed to perform ORD-related job activitites? Several answers are possible. *

Only answer this question if the following conditions are met:

Answer was 'No answer' or 'Partially' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Select all that apply

Please choose all that apply:

- Training by my current employer
- Training by my former employer
- Self-training
- No one
- Other:

What kind of training have you completed or are you currently undergoing to acquire the knowledge, abilities, and skills required for performing ORD-related job activities? Several answers are possible. *

Only answer this question if the following conditions are met:

Answer was 'No answer' or 'Partially' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Select all that apply

Please choose all that apply:

- Formal training (providing official qualification or certification)
- Informal training (not providing qualification or certification)
- None
- Other:

What kind of support does your institution provide to help you evolve in your ORD expertise or ORD-related job activities? *

Only answer this question if the following conditions are met:

Answer was 'No answer' or 'Partially' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Select all that apply

Please choose all that apply:

- Financial support for training

- Paid time for training
- Paid time for exchanging and connecting with other ORD experts
- No answer
- Other:

Do you believe the current support at your institution is sufficient to support you in your ORD-related job activities effectively? *

Only answer this question if the following conditions are met:

Answer was 'Partially' or 'No answer' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Choose one of the following answers

Please choose only one of the following:

- Yes
- No
- Partially
- No answer
- I don't know.

What areas of ORD need improvement? *

Only answer this question if the following conditions are met:

Answer was 'Partially' or 'No answer' or 'I don't know.' or 'No' at question ' [r392q0]' (Do you believe the current support at your institution is sufficient to support you in your ORD-related job activities effectively?)

Select all that apply

Please choose all that apply:

- Training
- Infrastructure
- Institutionalization of ORD-related job activities
- Dedicated workload
- No answer
- I don't know.
- Other:

What knowledge, skills and abilities are most important for performing ORD-related job activities? *

Only answer this question if the following conditions are met:

Answer was 'Partially' or 'No answer' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Comment only when you choose an answer.

Please choose all that apply and provide a comment:

- Research and research disciplines operations, and research life cycle
- Knowledge of one or several disciplines in detail
- Open Science and Open Research Data
- Research Data Management
- Findable, Accessible, Interoperable and Reusable (FAIR) data
- Collective Benefit, Authority to Control, Responsibility and Ethics aiming at safeguarding the rights and interests of indigenous peoples in the context of efforts to promote Open Data and Open Science (CARE)
- Data science & data processing

- IT & security
- Legal
- Data protection & Ethics
- Archiving & long term preservation
- Management skills, please specify
- Personal abilities, please specify
- Social abilities, please specify
- Other, please specify
- No answer

Do you think there are sufficient professional development opportunities at higher education institutions in Switzerland to support career advancement as an ORD expert? *

Only answer this question if the following conditions are met:

Answer was 'Partially' or 'No answer' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Choose one of the following answers

Please choose only one of the following:

- Yes
- No
- Partially
- No answer
- I don't know.

In your opinion, what's lacking to improve career advancement in ORD? *

Only answer this question if the following conditions are met:

Answer was 'No' or 'Partially' or 'No answer' or 'I don't know.' at question ' [r117q0]' (Do you think there are sufficient professional development opportunities at higher education institutions in Switzerland to support career advancement as an ORD expert?)

Select all that apply

Please choose all that apply:

- Financial support
- Relevant training
- Need of ORD experts at HEI
- Knowledge at HEI about ORD experts
- Acknowledgment of ORD experts at HEI
- Clear career path
- Fast career progression
- Higher salary
- Permanent employment contract
- No answer
- Other:

Would you recommend a career in ORD at higher education institutions in Switzerland to your friends and former colleagues?

Please explain in the text filed when you choose the answer "Partially" or "No" *

Only answer this question if the following conditions are met:

Answer was 'Partially' or 'No answer' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Choose one of the following answers

Please choose only one of the following:

- Yes
- No
- Partially
- No answer
- I don't know.

Make a comment on your choice here:

What are the main challenges you face in building a long-term, independent career as an ORD expert at higher education institutions in Switzerland?

Only answer this question if the following conditions are met:

Answer was 'Partially' or 'No answer' or 'Yes' at question ' [r81q0]' (Do you consider yourself an Open Research Data expert or do your job activities relate to Open Research Data (ORD)? Definition: ORD is data which is produced by a research that can be freely accessed, reused, remixed and redistributed, for academic research and teaching purposes and beyond. Ideally, open data have no restrictions on reuse or redistribution, and are appropriately licensed as such. As such, ORD expertise is the link between the researchers and the supporting units in the form of IT, libraries and infrastructure providers.)

Please write your answer here:

Appendix II: Interview questions

Interview questions

ORD expertise as an independent career path

Theme 1: Training & Certification (Past)

Our survey shows that 89% (n=49) of respondents had to self-train on ORD, most of the time without any form of formal training or certification.

- How did you acquire your RDM/ORD expertise, knowledge and skills **before** taking up your position?
    - What or who led you into your job in ORD (how did you enter in this career/position)?

Theme 2: Experience in the current job (Present)

Our survey shows that 60% of the respondents (n=33) feel that support for their ORD activities is partially sufficient or insufficient.

- Do you feel that an ORD career path should be supported more actively by higher education institutions and how?
    - Did you attend any RDM/ORD training courses **after** you were recruited?
    - Which ones?
    - Was it required by your employer?
    - Did your employer finance (or help to finance) your training?

Theme 3: Career Opportunities & Professional Development (Future)

44% of respondents feel they are not offered enough professional development opportunities in ORD. Adding the 27% who believe they are only partially offered enough, more than 70% are unsatisfied with current career opportunities.

- What types of professional development opportunities would you like to see in your ORD expert career? What structural changes would make ORD expertise a more attractive long-term career?

- Despite the lack of career opportunities, 38% (N=21) of respondents would fully recommend this career, while 50% (N=27) would partially recommend it.
    - Do you see it as a paradox? Would you recommend this career despite its challenges and why?

Appendix III: Inventory of training and education resources in Data Stewardship / Research Data Management

Appendix III: Inventory of training and education resources is available on the Website of swissuniversities.