

Core DS Knowledge Model

Organization: DSW Global

Created by: Oliver Steizinger (oliver.steizinger@gmx.at)
Based on: Common ELIXIR Knowledge Model, 1.0.0

Project Phase: Before Submitting the DMP

Created at: 22.04.2019

I. Design of experiment

Before you decide to embark on any new study, it is nowadays good practice to consider all options to keep the data generation part of your study as limited as possible. It is not because we can generate massive amounts of data that we always need to do so. Creating data with public money is bringing with it the responsibility to treat those data well and (if potentially useful) make them available for re-use by others.

Report

Indications

Answered	36
Unanswered	1

Metrics

Metric	Score
Findability	0
Accessibility	0
Interoperability	0
Reusability	0
Good DMP Practice	0
Openness	0

1

Is there any pre-existing data?

Are there any data sets available in the world that are relevant to your planned research?

Data Stewardship for Open Science: <u>atq</u>

☑ External Links:

b. Yes

1.b.1

Will you be using any pre-existing data (including other people's data)?

Will you be referring to any earlier measured data, reference data, or data that should be mined from existing literature? Your own data as well as data from others?

■ Data Stewardship for Open Science: ezi

External Links:

b. Yes

1.b.1.b.1

What reference data will you use?

Much of todays data is used in comparison with reference data. A genome for instance is compared with a reference genome to identify genomic variants. If you use reference data, there are several other issues that you should consider. What are the reference data sets that you will use?

- Data Stewardship for Open Science: <u>quc</u>
- ☑ External Links:

Answers

Item 1.b.1.b.1.a https://data.europa.eu/euodp/en/data/dataset/Zaa87C9KaW0Oc7V1BeXRA

1.b.1.b.1.a.1

Do you know where and how is it available?

Do you know where the reference data is available, what the conditions for use are, and how to reference it?

- Data Stewardship for Open Science: <u>ckt</u>
- ☑ External Links:

b. Yes

1.b.1.b.1.a.2

Do you know in what format the reference data is available?

Do you know the data format of the reference data? Is this suitable for your work? Does it need to be converted?

- Data Stewardship for Open Science: <u>jxb</u>
- External Links:

b. I need to convert it before using

1.b.1.b.1.a.3

Is the reference data resource versioned?

Many reference data sets evolve over time. If the reference data set changes, this may affect your results. If different versions of a reference data set exist, you need to establish your "version policy".

- Data Stewardship for Open Science: <u>rgy</u>
- External Links:

b. Yes

1.b.1.b.1.a.3.b.1

Which version will you use?

If there are different versions available, you have to decide with all project partners together which version you will be using. Probably you will go for the latest release as of the date of the start of your research project. However, if you have other data from older projects that need to be merged, you may need to consider using the same release you used for a previous project.

2019-04-05

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1.b.1.b.1.a.3.b.2

Will you change version if it updates?

If the reference changes while you are working on your research project, you need to decide whether you will follow these changes. Most likely that will mean that you have to do some analyses again, so you will need to make sure enough resources are available to do so. You can decide to stay with the version that you started with; this can have the disadvantage that you will not benefit from added information or added consistency.

1.b.1.b.1.a.4

How will you make sure the same reference data will be available to reproduce your results?

Will the reference data in the version you use be available to others?

a. I will keep a copy and make it available with my results

Item 1.b.1.b.1.b https://data.europa.eu/euodp/en/data/dataset/Zaa87C9KaW0Oc7V1BeXRA

1.b.1.b.1.b.1

Do you know where and how is it available?

Do you know where the reference data is available, what the conditions for use are, and how to reference it?

- Data Stewardship for Open Science: <u>ckt</u>
- External Links:
- b. Yes

1.b.1.b.1.b.2

Do you know in what format the reference data is available?

Do you know the data format of the reference data? Is this suitable for your work? Does it need to be converted?

- Data Stewardship for Open Science: <u>jxb</u>
- External Links:

b. I need to convert it before using

1.b.1.b.1.b.3

Is the reference data resource versioned?

Many reference data sets evolve over time. If the reference data set changes, this may affect your results. If different versions of a reference data set exist, you need to establish your "version policy".

- Data Stewardship for Open Science: <u>rgy</u>
- ☑ External Links:

b. Yes

1.b.1.b.1.b.3.b.1

Which version will you use?

If there are different versions available, you have to decide with all project partners together which version you will be using. Probably you will go for the latest release as of the date of the start of your research project. However, if you have other data from older projects that need to be merged, you may need to consider using the same release you used for a previous project.

2019-04-05

1.b.1.b.1.b.3.b.2

Will you change version if it updates?

If the reference changes while you are working on your research project, you need to decide whether you will follow these changes. Most likely that will mean that you have to do some analyses again, so

version that you started with; this can have the disadvantage that you will not benefit from added information or added consistency. b. New analyses will be done with the new version 1.b.1.b.1.b.4 How will you make sure the same reference data will be available to reproduce your results? Will the reference data in the version you use be available to others? a. I will keep a copy and make it available with my results Item 1.b.1.b.1.c https://data.europa.eu/euodp/en/data/dataset/Yu9NbJr3KNmCNuAcrrzWFQ 1.b.1.b.1.c.1 Do you know where and how is it available? Do you know where the reference data is available, what the conditions for use are, and how to reference ■ Data Stewardship for Open Science: <u>ckt</u> External Links: b. Yes 1.b.1.b.1.c.2 Do you know in what format the reference data is available? Do you know the data format of the reference data? Is this suitable for your work? Does it need to be converted? ■ Data Stewardship for Open Science: <u>ixb</u> r₹ External Links: b. I need to convert it before using 1.b.1.b.1.c.3 Is the reference data resource versioned? Many reference data sets evolve over time. If the reference data set changes, this may affect your results. If different versions of a reference data set exist, you need to establish your "version policy". ■ Data Stewardship for Open Science: rgy r₹ External Links: b. Yes 1.b.1.b.1.c.3.b.1 Which version will you use? If there are different versions available, you have to decide with all project partners together which version you will be using. Probably you will go for the latest release as of the date of the start of your research project. However, if you have other data from older projects that need to be merged, you may need to consider using the same release you used for a previous project. 2019-04-05

1.b.1.b.1.c.3.b.2

you will need to make sure enough resources are available to do so. You can decide to stay with the

Will you change version if it updates?

If the reference changes while you are working on your research project, you need to decide whether you will follow these changes. Most likely that will mean that you have to do some analyses again, so you will need to make sure enough resources are available to do so. You can decide to stay with the version that you started with; this can have the disadvantage that you will not benefit from added information or added consistency.

b. New analyses will be done with the new version

1.b.1.b.1.c.4

How will you make sure the same reference data will be available to reproduce your results?

Will the reference data in the version you use be available to others?

a. I will keep a copy and make it available with my results

Item 1.b.1.b.1.d https://data.europa.eu/euodp/en/data/dataset/uEVcriXpO2FOSnwlSkt4Q

1.b.1.b.1.d.1

Do you know where and how is it available?

Do you know where the reference data is available, what the conditions for use are, and how to reference it?

- Data Stewardship for Open Science: ckt
- External Links:

b. Yes

1.b.1.b.1.d.2

Do you know in what format the reference data is available?

Do you know the data format of the reference data? Is this suitable for your work? Does it need to be converted?

- Data Stewardship for Open Science: <u>jxb</u>
- External Links:

b. I need to convert it before using

1.b.1.b.1.d.3

Is the reference data resource versioned?

Many reference data sets evolve over time. If the reference data set changes, this may affect your results. If different versions of a reference data set exist, you need to establish your "version policy".

- Data Stewardship for Open Science: <u>rgy</u>
- External Links:

b. Yes

1.b.1.b.1.d.3.b.1

Which version will you use?

If there are different versions available, you have to decide with all project partners together which version you will be using. Probably you will go for the latest release as of the date of the start of your research project. However, if you have other data from older projects that need to be merged, you may need to consider using the same release you used for a previous project.

✓

1.b.1.b.1.d.3.b.2

Will you change version if it updates?

If the reference changes while you are working on your research project, you need to decide whether you will follow these changes. Most likely that will mean that you have to do some analyses again, so you will need to make sure enough resources are available to do so. You can decide to stay with the version that you started with; this can have the disadvantage that you will not benefit from added information or added consistency.

b. New analyses will be done with the new version

1.b.1.b.1.d.4

How will you make sure the same reference data will be available to reproduce your results?

Will the reference data in the version you use be available to others?

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a. I will keep a copy and make it available with my results

1.b.1.b.2

What existing non-reference data sets will you use?

Even if you will be producing your own data, you often will also be relying on existing data sets (e.g. from earlier . You may need to integrate your new data with an existing data set or retrieve additional information from related data bases. Will you be doing such things?

- Data Stewardship for Open Science: wya
- ☑ External Links:

Answer

This question has not been answered yet!

X

1.b.2

Do you need to harmonize different sources of existing data?

If you are combining data from different sources, harmonization may be required. You may need to re-analyse some original data.

- Data Stewardship for Open Science: wht
- ☑ External Links:

a. No

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1.b.3

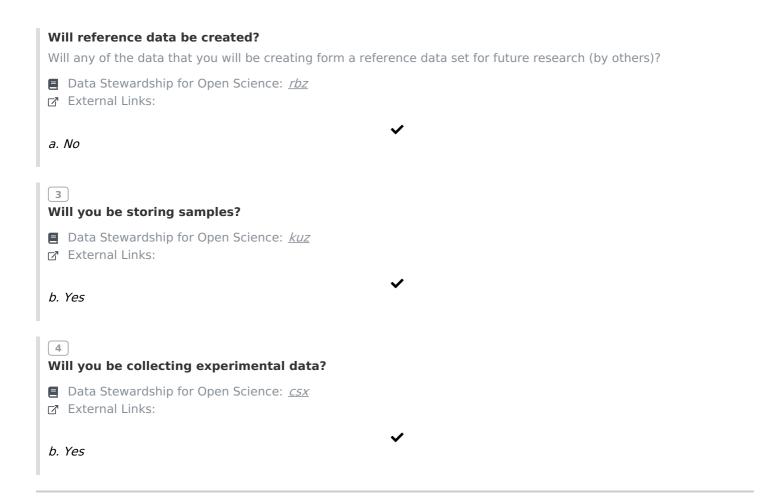
Will you be using data that needs to be (re-)made computer readable first?

Some old data may need to be recovered, e.g. from tables in scientific papers or may be punch cards.

- Data Stewardship for Open Science: <u>pth</u>
- ☑ External Links:

a. No

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II. Data design and planning

In the data design and planning phase, we will make sure that we know what data comes when, that we have enough storage space and compute power to deal with it, and that all the responsibilities have been taken care of.

Report

Indications

Answered	37
Unanswered	0

Metrics

Metric	Score
Findability	0.3333333333333333
Accessibility	0.5
Interoperability	1
Reusability	0.7142857142857143
Good DMP Practice	0.625
Openness	0



What data formats/types will you be using?

Have you identified types of data that you will use that are used by others too? Some types of data (e.g. genetic variants in the life sciences) are used by many different projects. For such data, often common standards exist that help to make these data reusable. Are you using such common data formats?

External Links:
Answers
Item 1.a DOI (https://doi.org/10.5281/zenodo.2648201)
Is this a standard data format used by others too?
b. Yes
1.a.2 Does this data format enable sharing and long term archiving?
Complicated (binary) file formats tend to change over time, and software may not stay compatible with older versions. Also, some formats hamper long term usability by making use of patents or being hampered by restrictive licensing
b. Yes
2
Will you be using new types of data?
Sometimes the type of data you collect can not be stored in a commonly used data format. In such cases you may need to make your own, keeping interoperability as high as possible.
■ Data Stewardship for Open Science: <u>ikk</u>☑ External Links:
a. No, all of my data will fit in common formats
3
How will you be storing metadata? For the re-usability of your data by yourself or others at a later stage, a lot of information about the data, how it was
collected and how it can be used should be stored with the data. Such data about the data is called metadata, and this set of questions are about this metadata
■ Data Stewardship for Open Science: <u>rhm</u> ☑ External Links:
External Links.
a. Explore
3.a.1
Do suitable 'Minimal Metadata About' (MIA) standards exist for your experiments?
a. No
Did you really check a service like fairsharing.org to verify this?
3.a.1.a.1
Do you have a good idea of what metadata is needed to make it possible for others to read and interpret your data in the future?
b. Yes

3.a.2 Do you know how and when you will be collecting the necessary metadata? Often it is easiest to make sure you collect the metadata as early as possible. b. Yes 3.a.3 Will you consider re-usability of your data beyond your original purpose? Adding more than the strict minimum metadata about your experiment will possibly allow more wide re-use of your data, with associated higher data citation rates. Please note that it is not easy for yourself to see all other ways in which others could be reusing your data. a. No, I will just document the bare minimum 3.a.4 Did you consider how to monitor data integrity? Working with large amounts of heterogenous data in a larger research group has implications for the data integrity. How do you make sure every step of the workflow is done with the right version of the data? How do you handle the situation when a mistake is uncovered? Will you be able to redo the strict minimum data handling? Data Stewardship for Open Science: <u>spa</u> □ External Links: a. Explore 3.a.4.a.1 Will you be keeping a master list with checksums of certified/correct/canonical/verified data? Data corruption or mistakes can happen with large amounts of files or large files. Keeping a master list with data checksums can be helpful to prevent expensive mistakes. It can also be helpful to keep the sample list under version control forcing that all changes are well documented. a. No Will you define a way to detect file or sample swaps, e.g. by measuring something independently? a. No

3.a.5

Do all datasets you work with have a license?

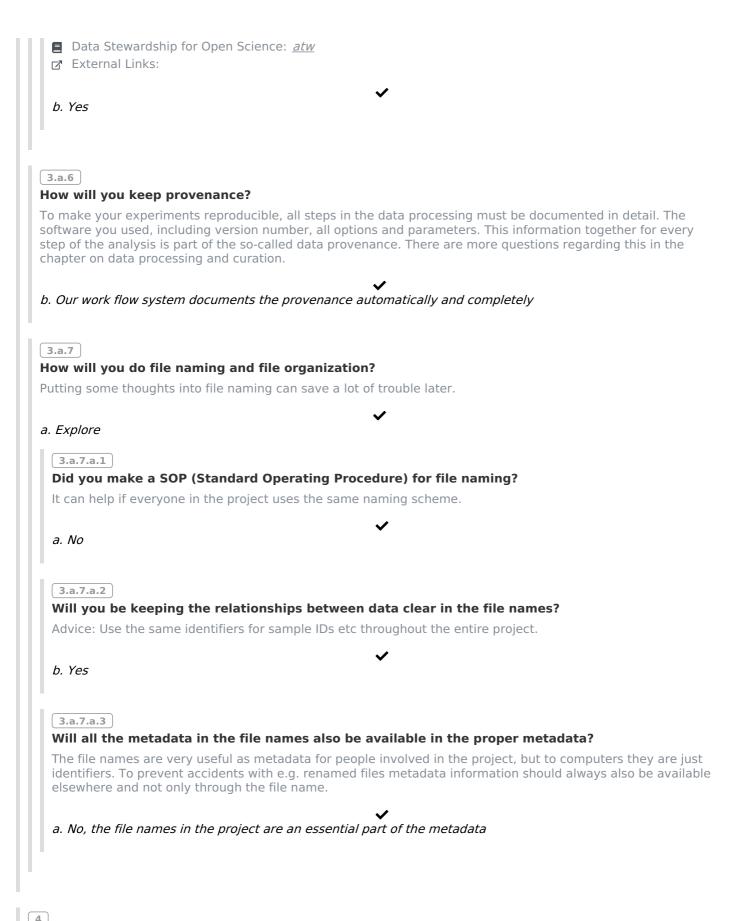
It is not always clear to everyone in the project (ad outside) what can and can not be done with a data set. It is helpful to associate each data set with a license as early as possible in the project. A data license should ideally be as free as possible: any restriction like 'only for non-commercial use' or 'attribution required' may reduce the reusability and thereby the number of citations. If possible, use a computer-readable and computer actionable license.

b. Yes

3.a.5.b.1

Will you store the licenses with the data at all time?

It is very likely that data will be moved and copied. At some point people may lose track of the origins. It can be helpful to have the licenses (of coarse as open as possible) stored in close association with the data.



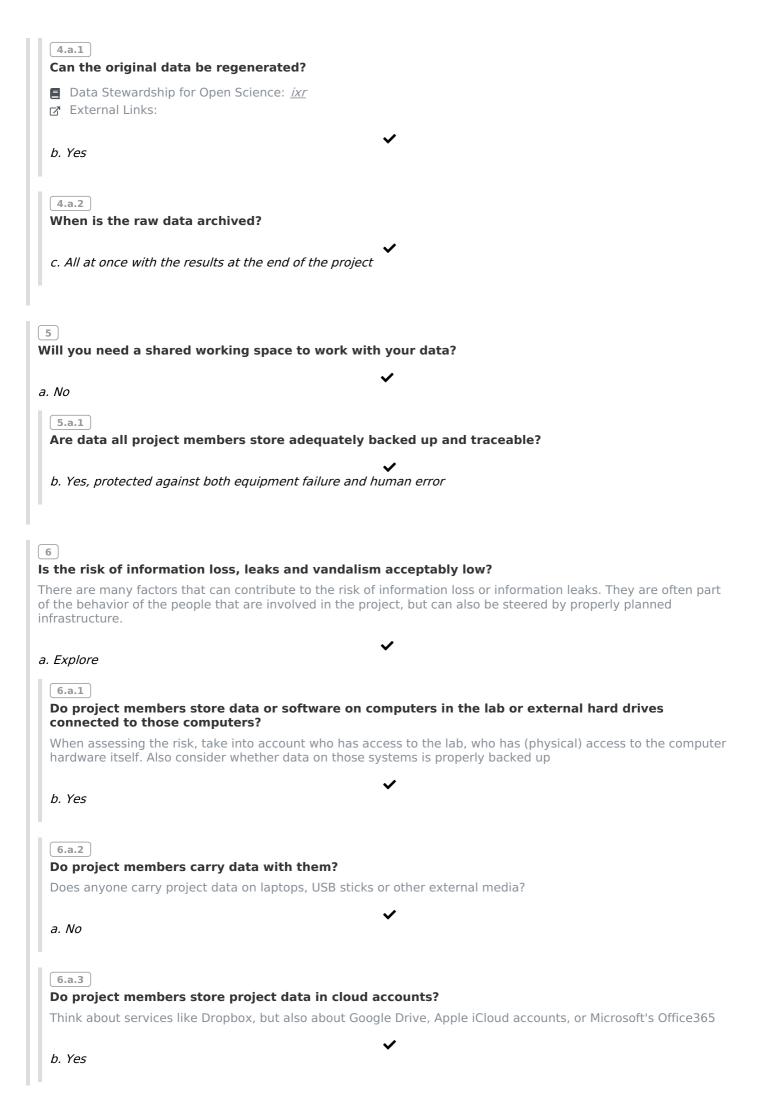
During the project, will you be archiving data (using so-called 'cold storage') for long term preservation?

Much of the raw data you have will need to be archived for your own later use somewhere. This is often done off-line on tape, not on the disks of the compute facility. Please note that this does not refer to the data publication.

Data Stewardship for Open Science: <u>kjp</u>

☑ External Links:

a. No



	6.a.4
	Do project members send project data or reports per e-mail or other messaging services?
	b. Yes
	6.a.5 Do all data centers where project data is stored carry sufficient certifications?
	Journal Control of Freguet and is stored carry summercine continuations.
	b. Yes
	6.a.6
	Are all project web services addressed via secure http (https://)?
	b. Yes
	6.a.7 Have project members been instructed about the risks (generic and specific to the project)?
	Project members may need to know about passwords (not sharing accounts, using different passwords for each service, and two factor authentication), about security for data they carry (encryption, backups), data stored in their own labs and in personal cloud accounts, and about the use of open WiFi and https
	b. Yes
i	6.a.8 Did you consider the possible impact to the project or organization if information is lost?
	a. No
	a. NO
	6.a.9 Did you consider the possible impact to the project or organization if information leaks?
	✓ ·
	a. No
	6.a.10 Did you consider the possible impact to the project or organization if information is vandalized?
	a. No
	7
	Do you need to do compute capacity planning?
	f you require substantial amounts of compute power, amounts that are not trivially absorbed in what you usually have abailable, some planning is necessary. Do you think you need to do compute capacity planning?
á	a. No

III. Data Capture/Measurement

Report

Indications

Answered	3
Unanswered	1

Metrics

Metric	Score
Findability	0
Accessibility	0
Interoperability	1
Reusability	0
Good DMP Practice	0
Openness	0

Please specify what data sets you will acquire using measurement equipment

Answer

This question has not been answered yet!

Do you have any non-equipment data capture?

Does the data you collect contain non-equipment captured data such as questionnaires, case report forms, electronic patient records?

Data Stewardship for Open Science: ybw
External Links:

×

Is there a data integration tool that can handle and combine all the data types you are dealing with in your project?

b. Yes

What software will you be using to collect all data?

c. Software not listed here

IV. Data processing and curation

Report

3.b.1

Indications

Answered	14
Unanswered	0

Metrics

Metric	Score
Findability	0
Accessibility	0
Interoperability	0
Reusability	0.42105263157894735
Good DMP Practice	0
Openness	0

1

Workflow development

It is likely that you will be developing or modifying the workflow for data processing. There are a lot of aspects of this workflow that can play a role in your data management, such as the use of an existing work flow engine, the use of existing software vs development of new components, and whether every run needs human intervention or whether all data processing can be run in bulk once the work flow has been defined.

a. This has been arranged

2

How will you make sure to know what exactly has been run?

a. Explore

2.a.1

Will you keep results together with all processing scripts or workflows including documentation of the versions of the tools that have been run?

b. Yes

2.a.2

Will you make use of the metadata fields in your output data files to register how the data was obtained?

File formats like VCF (for genetics) and TIFF (for images) have possibilities to document metadata in the file header. It is a good idea to use work flow tools that use these fields to document what was done to obtain the data.

a. No

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2.a.3

Will you use a central repository for all tools and their versions as used in your project?

Especially if analysis and processing of data in the project is done on multiple different computers by different people, it is a good idea to have your own repository of tools and their blessed versions.

- Data Stewardship for Open Science: <u>pzq</u>
- r External Links:

	✓
	b. Yes
ı	
	2.a.4
	Will you use a central repository for reference data used in your project?
	Especially if analysis and processing of data in the project is done on multiple different computers by different
	people, it is a good idea to have your own repository of reference data versions.
	Data Chausandahin fan Onan Saisanas, nan
	■ Data Stewardship for Open Science: <u>pzq</u>
	Z External Links:
	√
	b. Yes
ľ	
	2.a.5
	Will you make use of standard workflow engines and automatic work flows for all data analysis in
	the project?
	• •
	It is much easier to guarantee consistency and reproducibility if all data processing is done using automated work flows, especially if the workflow engine automatically keeps adequate provenance data.
	work nows, especially if the worknow engine automatically keeps adequate provenance data.
	✓
	a. No
	2.a.6
	Are all software tools in the work flow professionally maintained, with version control?
	Will you be able to find and reproduce exactly which version was used for any analysis? Not only for the major
	tools in the workflows, but also for all 'glue' code and small tools you created especially for the project?
	↓
	b. Yes
	3
ŀ	low will you validate the integrity of the results?
7	a. Explore
٠	
	3.a.1
	Will you run a subset of your jobs several times across the different compute infrastructures you are
	using?
	There are surprisingly many complications that can cause (slight) inconsistencies between results when
	workflows are run on different compute infrastructures. A good way to make sure this does not bite you is to run
	a subset of all jobs on all different infrastructure to check the consistency.
	✓ ·
	a. No
	3.a.2
	Will you be instrumenting the tools into pipelines and workflows using automated tools?
	Surrounding all tools in your data processing and analysis workflows with the 'boilerplate' code necessary on the
	computer system you are using is tedious and error prone. Especially if you are using the same tools in multiple
	different work flows and/or on multiple different computer architectures. Automated instrumentation, e.g. by
	using a workflow management system, can prevent many mistakes.
	✓
	a. No
	3.a.3
	Will you use independently developed duplicate tools or workflows for critical steps to reduce or

eliminate human errors?

Validation of results without a golden standard is very hard. One way of doing it is to develop two solutions for a problem (two independent workflows or two independently developed tools) to check whether the results are identical or comparable.

a. No

3.a.4

Will you run part of the data set repeatedly to catch unexpected changes in results?

Running a small subset of the data repeatedly can be useful to catch unexpected problems that would otherwise be very hard to detect.

- Data Stewardship for Open Science: <u>egv</u>
- ☑ External Links:

a. No

4

Do you have a contingency plan?

What will you do if the compute facility is down?

b. We have an alternative

V. Data integration

Report

Indications

Answered	13
Unanswered	1

Metrics

Metric	Score
Findability	0
Accessibility	0
Interoperability	1
Reusability	0
Good DMP Practice	0
Openness	0

1

How will you be doing the integration of different data sources?

a. Explore

1.a.1

List the data formats you will be using for data integration

	Answer some questions for each	
	Answer	
	This question has not been answered yet!	×
	1.a.2 Will you be using a workflow for data integration	n, e.g. with tools for database access or conversion?
	Data Stewardship for Open Science: <u>aqb</u> External Links:	i, eig. With tools for dutubuse decess of conversion.
	a. No	✓
	1.a.3 Will you use a 'linked data' approach?	
	a. No	✓
	2	
	Will you be using common or exchangeable units? b. Yes	✓
i	3	
	Will you be using common ontologies? b. Yes	✓
	Choose the ontologies before you start	
	Will there be potential issues with statistical norm	nalization?
	a. No	✓
	5 Will you be integrating different data sources to g	et more samples or more data points?
	a. No	✓
	6 Will you be integrating different data sources in o point?	rder to get more information for each sample or data
	b. Yes	✓
	Did you already select the variables on which yo	u will join the data sets?
		✓

If the coupling parameters are lenient, you will find more connections than when they are strict. But you may find that they are less accurate. This is a balance.

b. We can balance the two

7

Do you have all tools to couple the necessary data types?

b. Yes

VI. Data interpretation

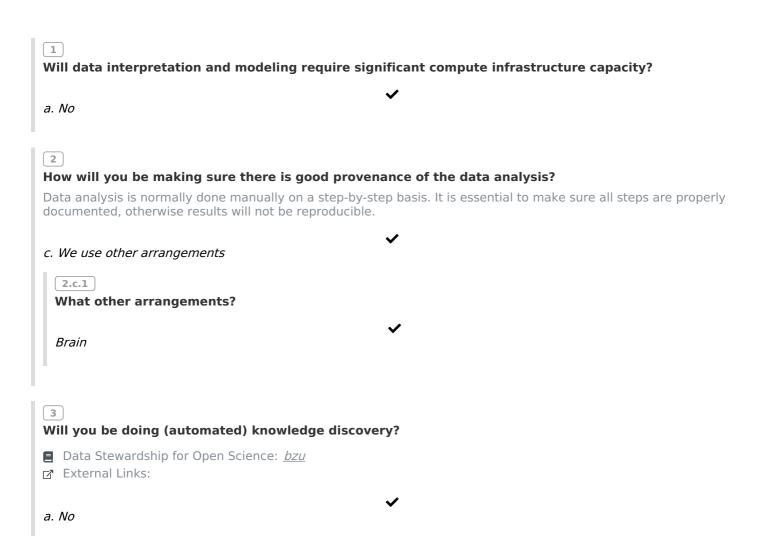
Report

Indications

Answered	4
Unanswered	0

Metrics

Metric	Score
Findability	0
Accessibility	0
Interoperability	0
Reusability	0
Good DMP Practice	0
Openness	0



VII. Information and insight

Report

Indications

Answered	13
Unanswered	3

Metrics

Metric	Score
Findability	0.75
Accessibility	0
Interoperability	0
Reusability	0
Good DMP Practice	0
Openness	1

1

Will you be working with the philosophy 'as open as possible' for your data?

- Data Stewardship for Open Science: <u>ivm</u>
- ☑ External Links:

Answer
This question has not been answered yet!
2 Can all of your data become completely open immediately?
Answer
This question has not been answered yet!
3 Specify a list of data sets you will be publishing
Specify a short name for each data set, sufficient for yourself to know what data it is about. It is useful to think about a data set as some collection of data that will be ending up in the same place.
Answers
Item 3.a https://doi.org/10.5281/zenodo.2648674
3.a.1 What kind of repository will this data be stored in?
Domain repositories often have the best functionality to make the data findable and reusable. Many of them are listed in https://fairsharing,org/
a. A domain-specific repository
3.a.1.a.1 What repository?
GitHub
3.a.1.a.2 Will you contact the repository beforehand?
Contacting the repository early may be useful to establish conditions, formats, and metadata requirements for submission. It may also be necessary to establish whether the repository can accommodate your data
a. No, this submission is routine both for us and the repository
3.a.2 Will you be adding a reference to the published data to at least one data catalogue?
Data is sometimes difficult to locate, especially if it is not in a domain-specific repository. Data catalogues may increase findability.
a. No

4

Will you be making sure that blocks of data deposited in different repositories can be recognized as belonging to the same study?

	5
	Did you work out the financial aspects of making the data available?
	a. Explore
	6
	Will your publications be open access?
	■ Data Stewardship for Open Science: <u>mjf</u> This is a stewardship for Open Science: This is a stewardship fo
	C External Links.
	b. Yes, this is budgeted in the project
	7
	Are there any recurring fees to keep data or documents available?
	Are you using any commercially licensed products to keep data, software or documents available, for which a regular fee must be paid?
	✓
	a. No
ĺ	
	8 Will you be archiving your data after the project in 'cold storage'?
	Will you be storing (in cold storage) copies of your own data for a longer period after the project has ended? Possible
	as a continuation of archival as part of data storage strategy during the project? Data archival is distinct from data publishing, an archive is usually limited in who can access the data.
	■ Data Stewardship for Open Science: <u>fxe</u> T* External Links:
	G External Links:
	a. No
	9
	Will you also publish data if the results of your study are negative/inconclusive or unpublishable?
	Even if you do not obtain the results you had foreseen from your own study, the data can still be valuable for reuse in another context. Also, publishing the data can avoid that someone else collects a similar data set with a similar
	negative result.
	b. Yes
	10
	Specify a list of software packages you will be publishing
	Specify a short name for each software package.
	Answer
	This question has not been appropriately
	This question has not been answered yet!
ĺ	

Will there be planning of valorization or translational returns?

b. Yes, all data sets will have links to the related data

Data Managament Plan generated by Data Stewardship Wizard https://ds-wizard.org