Research Lifecycle: as simple as it gets
Research Lifecycle: focus on the steps

- **Idea**
  - Experiments, Interviews, Observations, etc.

- **Methodology**
  - Numbers, Code, Text, Images, sound records, etc.

- **Data Collection**
  - Statistics, processes, analysis, documentation, etc.

- **Analysis**
  - Journal article, Dissertation, Book, Source Code, etc.

- **Publish**
  - Journal article, Dissertation, Book, Source Code, etc.
What is Open Science?

The movement to make scientific research, data and dissemination accessible to all levels of an inquiring society.

[FOSTER, Open Science Definition https://www.fosteropenscience.eu/taxonomy/term/7]

Scope:
- **Transparency** in experimental methodology, observation, and collection of data
- **Public** availability and reusability of scientific data
- **Public** accessibility and transparency of scientific communication
- Using web-based tools to facilitate scientific collaboration

[The OpenScience Project, What exactly is open science http://www.openscience.org/blog/?p=269]
Open Science taxonomy

- Open Science
  - Open Reproducible Research
    - Open Science Definition
    - Open Metrics and Impact
    - Open Reproducibility Guidelines
    - Reproducibility Testing
    - Open Peer Review
  - Open Science Evaluation
  - Open Science Policies
    - Open Science Guidelines
    - Organisational mandates
    - Subject policies
  - Open Science Tools
    - Open Science Projects
    - Open Workflow Tools
  - Open Access
    - Open Access Definition
    - Open Access Initiatives
    - Open Access Use and Reuse
    - Open Big Data
    - Open Data Definition
    - Open Data Journals
    - Open Data Standards
    - Open Data Use and Reuse
    - Open Government Data
    - Definition of Open Reproducible Research
    - Irreproducibility Studies
    - Open Lab/Notebooks
    - Open Science Workflows
    - Open Source in Open Science
    - Reproducibility Guidelines
  - Open Data
    - Open Access Routes
    - Gold Route
    - Green Route
  - Altmetrics
  - Bibliometrics
  - Semantometrics
  - Webometrics
  - Funders policies
  - Governmental policies
  - Institutional policies
  - Open Access policies
  - Open Data Policies

www.fosteropenscience.eu
Topics: adoption and gaps

- 37% - Open Access
- 34% - Open Access Routes
- 31% - Open Data
- 1% - Open Reproducible Research
- 2% - Open Science Definition
- 2% - Open Science Evaluation
- 2% - Open Science Projects
- 7% - Open Science Tools
- 16% - Open Science Policies
- 88% - Organisational mandates
- 13% - Subject policies
- 1% - Open Science Guidelines
- 22% - Open Services
- 69% - Open Repositories
- 22% - Open Peer Review
- 76% - Open Metrics and Impact
- 16% - Open Access Definition
- 23% - Open Access Initiatives
- 28% - Open Access Use and Reuse
- 8% - Open Big Data
- 8% - Open Data Definition
- 23% - Open Data Journals
- 18% - Open Data Standards
- 38% - Open Data Use and Reuse
- 5% - Open Government Data
- 13% - Definition of Open Reproducible Research
- 2% - Irreproducibility Studies
- 9% - Open Lab/Notebooks
- 42% - Open Science Workflows
- 35% - Open Source in Open Science
- 0% - Reproducibility Guidelines
- 0% - Reproducibility Testing
- 40% - Gold Route
- 60% - Green Route
- 42% - Altmetrics
- 42% - Bibliometrics
- 5% - Semantics
- 11% - Webometrics
- 60% - Funders policies
- 16% - Governmental policies
- 24% - Institutional policies
- 61% - Open Access policies
- 39% - Open Data Policies
Research Lifecycle: focus on the steps

- **Open Access**
- **Open Science**
- **Evaluation**
- **Open Metrics**
- **Open Peer Review**

- **Idea**
  - Journal article, Dissertation, Book, Source Code, etc.
  - Experiments, Interviews, Observations, etc.

- **Methodology**
  - Statistics, processes, analysis, documentation etc.
  - Numbers, Code, Text, Images, sound records, etc.

- **Data Collection**
  - Open Access Tools: Notebooks Workflow

- **Analysis**
  - Open Reproducible Research: Guidelines, testing, studies

- **Publish**
  - Open Data: Big Data, Standards, Data Journals

FOSTER
How can we get closer to Open Science?

Mikael K. Elbæk
@melbaek

I've talked to 76 researchers in engineering and the majority thinks that their data is useless to others. We need incentives

#opengov

4:27pm - 20 Jan 2016 - Twitter for iPhone

1 RETWEET 2 LIKES
General benefits

- Increases **research efficiency**
- Promotes scholarly rigour and enhances **research quality**
- Enhances **visibility** and engagement
- Enables the creation of **new research questions**
- Enhances **collaboration** and community building

[Source: Open To All? Case studies of openness in Research](http://www.rin.ac.uk/system/files/attachments/NESTA-RIN_Open_Science_V01_0.pdf)
Benefits for early career researchers

• Become pioneers
• Have gained valuable experience
• Distinguish from the crowd
• Plan successful research proposals
• Receive higher citations
• Know how to comply with funders’ policies
• Comply with funders’ policies
• Demonstrate research and societal impact

[Note: see also benefits of open access for early career researchers http://oro.open.ac.uk/44720/]
Benefits for research consumers

Aggregating the world’s open access research papers

We offer seamless access to millions of open access research papers, enrich the collected data for text-mining and provide unique services to the research community.

Source: https://core.ac.uk/
Benefits for Text and Data Miners

Open content enables the collection of a large corpus and promotes the use of TDM.

- Unlocks hidden information and develops new knowledge
- Explores new horizons
- Improves research and evidence base
- Improves research process quality

 Millions of research papers ready to text-mine  

CORE  

core.ac.uk
Research and Social Impact

Research Excellence Framework (REF)

Excellence – Impact – Implementation

- Quality Research Outputs: 65%
- Impact: 20%
- Research Environment: 15%

[Source: http://www.ref.ac.uk/panels/assessmentcriteriaandleveldefinitions/]
Research Reproducibility

• greater visibility and impact for authors & projects
• makes research networked & interconnected
• networked research generates serendipity by default
• speeds up innovation & discovery, takes ideas to the market & solutions to societal challenges
Open Science is now a requirement

Research results:
“each beneficiary must ensure open access to all peer-reviewed scientific publications” (page 4)

Research data:
“A new feature of Horizon 2020 is the Open Research Data Pilot (ORD Pilot), designed to improve and maximise access to and reuse of research data generated by projects… The Pilot on Open Research Data will be monitored throughout Horizon 2020 with a view to further developing Commission policy on open research.” (page 7)

Report URL:
Is it a wrap rage?

Image from Wikipedia https://en.wikipedia.org/wiki/Wrap_rage
**Toolkit courses**

**What is Open Science?**
This introductory module will help you to understand what open science is and why it is something you should care about.

**Best Practice**
This module introduces policies and other environmental factors that influence good practice in open research.

**Open Peer Review (OPR)**
This module will introduce you to OPR and let you know how you can get started with it.

**Data Protection and Ethics**
This module helps you to get to grips with responsible data sharing.

**Licensing**
This module helps you to find the best license for your open research outputs.

**Open Data**
In this module, you'll focus on which data you can share and how you can go about doing this most effectively.

**OSS and Workflows**
This module introduces Open Source Software (OSS) and workflows as an emerging but critical component of Open Science.

**Open Innovation**
This module will show you how Responsible Research and Innovation is accelerated through Open Science.

**Open Access Publishing**
This module will help you become skilled in Open Access publication in the wider context of Open Science.

**Preprints**
This module introduces the practice of sharing preprints and helps you to see how it can support your research.
What will your mini training be about?
Pick a topic.

- Re-use and innovation
- Introduction to open science and best practices
- Research evaluation & open metrics
- Open peer review
- Open source software & workflows
Thank you!