Novo Nordisk Foundation

- our use of researchfish® as reporting platform for grant holders and data for research impact assessment

Henrik Barslund Fosse

Department of Impact

29 May, 2019

novo nordisk fonden

Our objectives

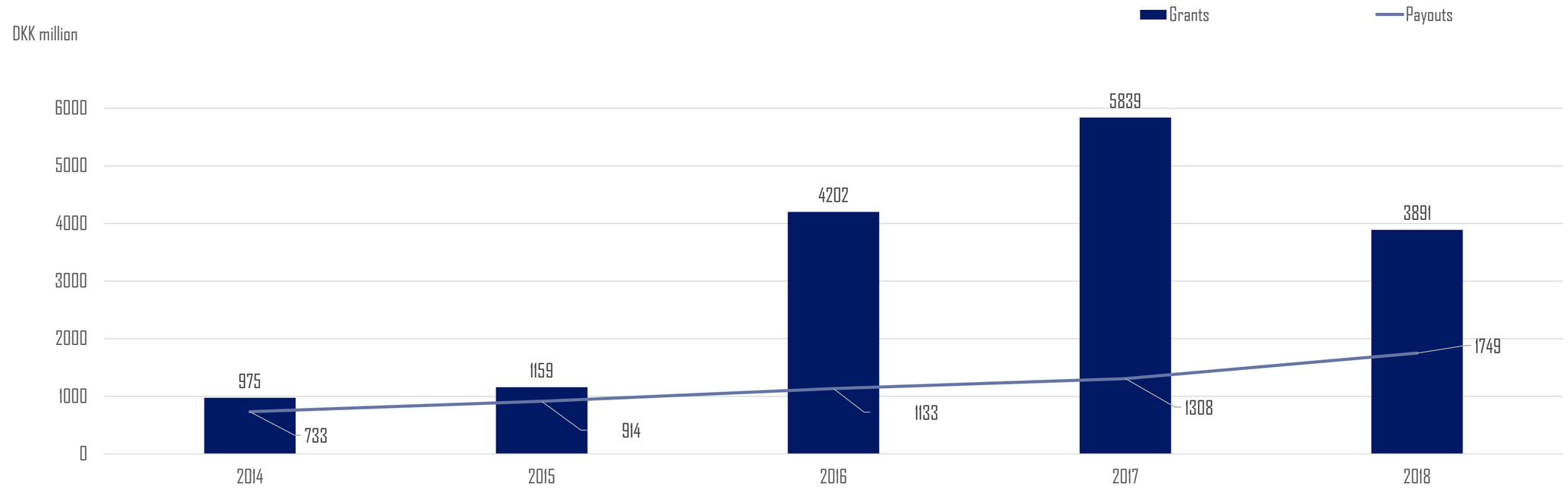
Corporate objective

- to provide a stable basis for the commercial and research activities of the Novo Group companies

Grant-giving objectives

- to support physiological, endocrinological, metabolic and other medical research,
- to support Danish research hospital activities within diabetes,
- to support other scientific, humanitarian and social purposes

Grants and payouts from the Novo Nordisk Foundation, 2014-2018



Awarded since 2000:
EUR 3 billion

5.5% payout share of Danish public research

7% payout share of Danish public research

novo nordisk fonden

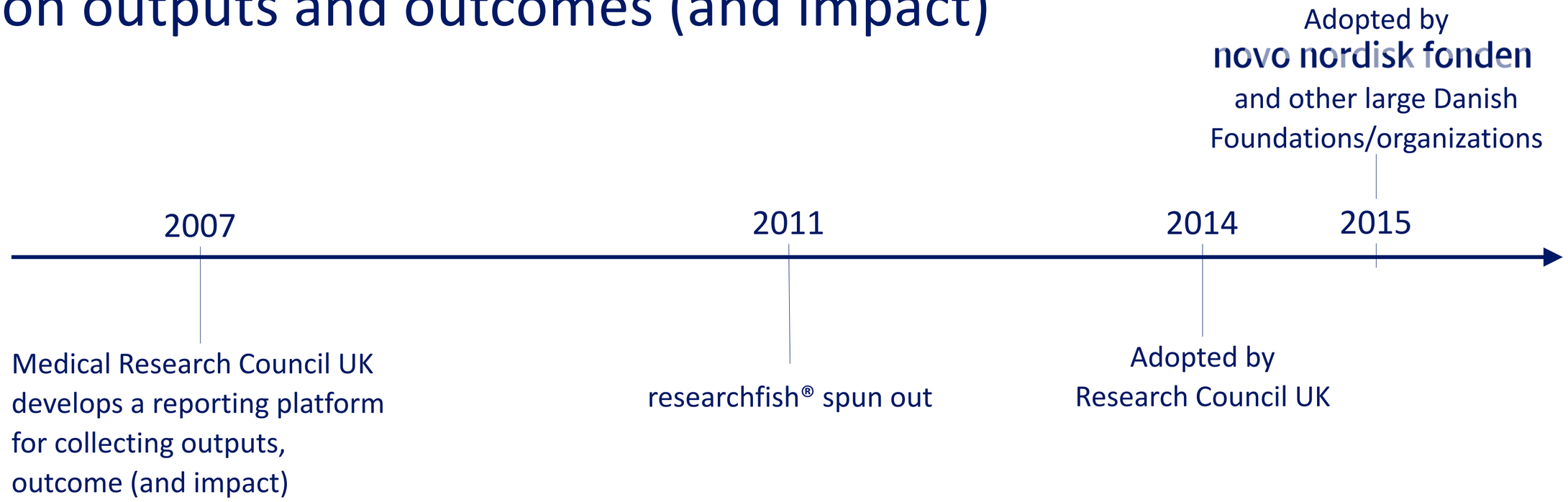
Our vision

To contribute significantly
to **research and development**
that improves the **lives**
of people and
the **sustainability** of society.

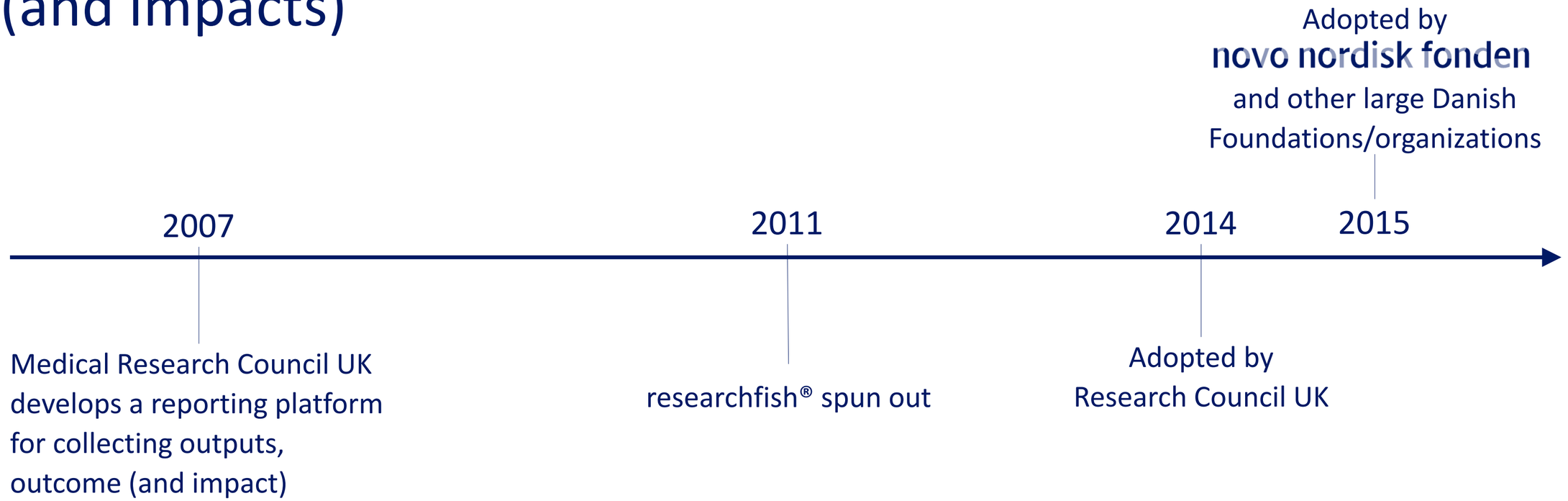
Content

- researchfish®
- Collecting the data
- Supplement data
- Examples of use

researchfish®
- Online system to collect information on outputs and outcomes (and impact)

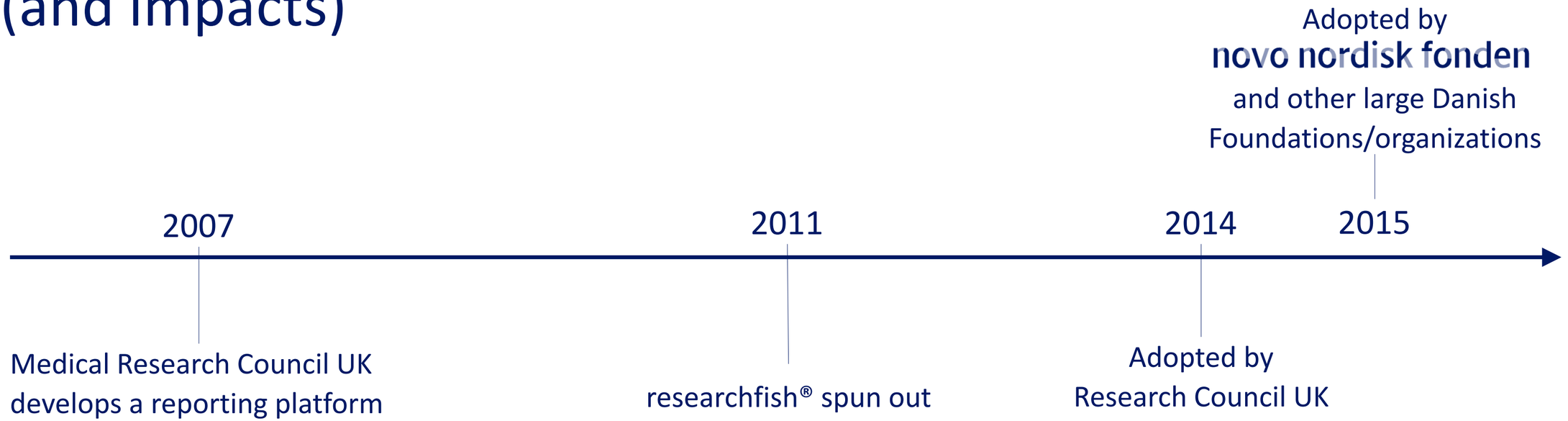


researchfish®
- Online system to collect information on outputs, outcomes (and impacts)



- ✓ Used across multiple research disciplines
- ✓ +100,000 awards annually
- ✓ +100,000 researchers
- ✓ +150 funding bodies

researchfish®
- Online system to collect information on outputs, outcomes (and impacts)



novo nordisk fonden

- ✓ Used across multiple research disciplines
- ✓ +1000 awards annually
- ✓ +3000 researchers
- ✓ 10 centers reporting

researchfish®
- multilayered reporting options

DO NOT UNDERESTIMATE THE CHANGE IN CULTURE that researchfish® or similar systems bring

researchfish® is core output and outcome data

It allows us to find out

what did happen based on our grant (outputs and outcomes)

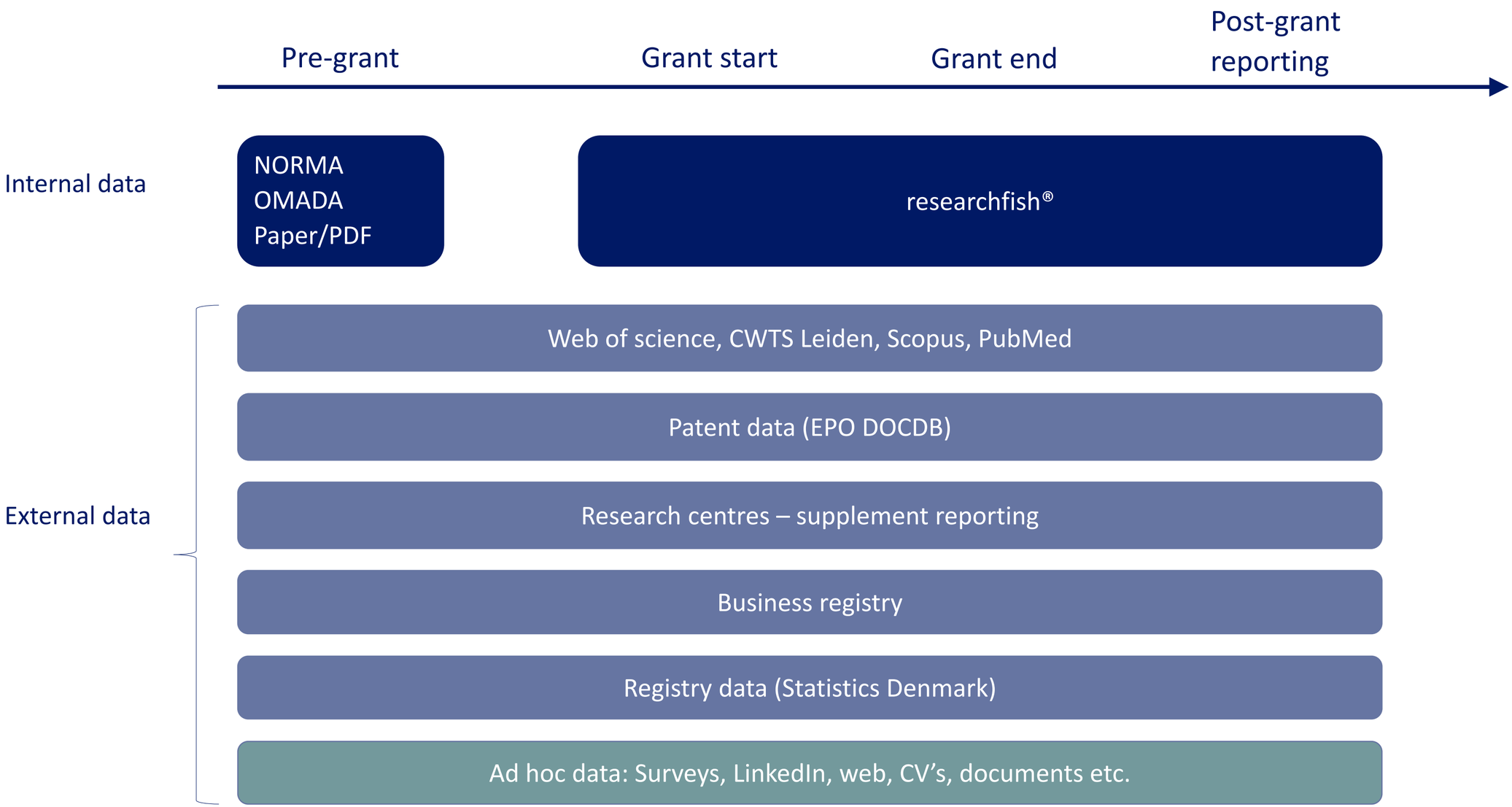
but not

what would happen without our grant (isolated or causal effect → impact)

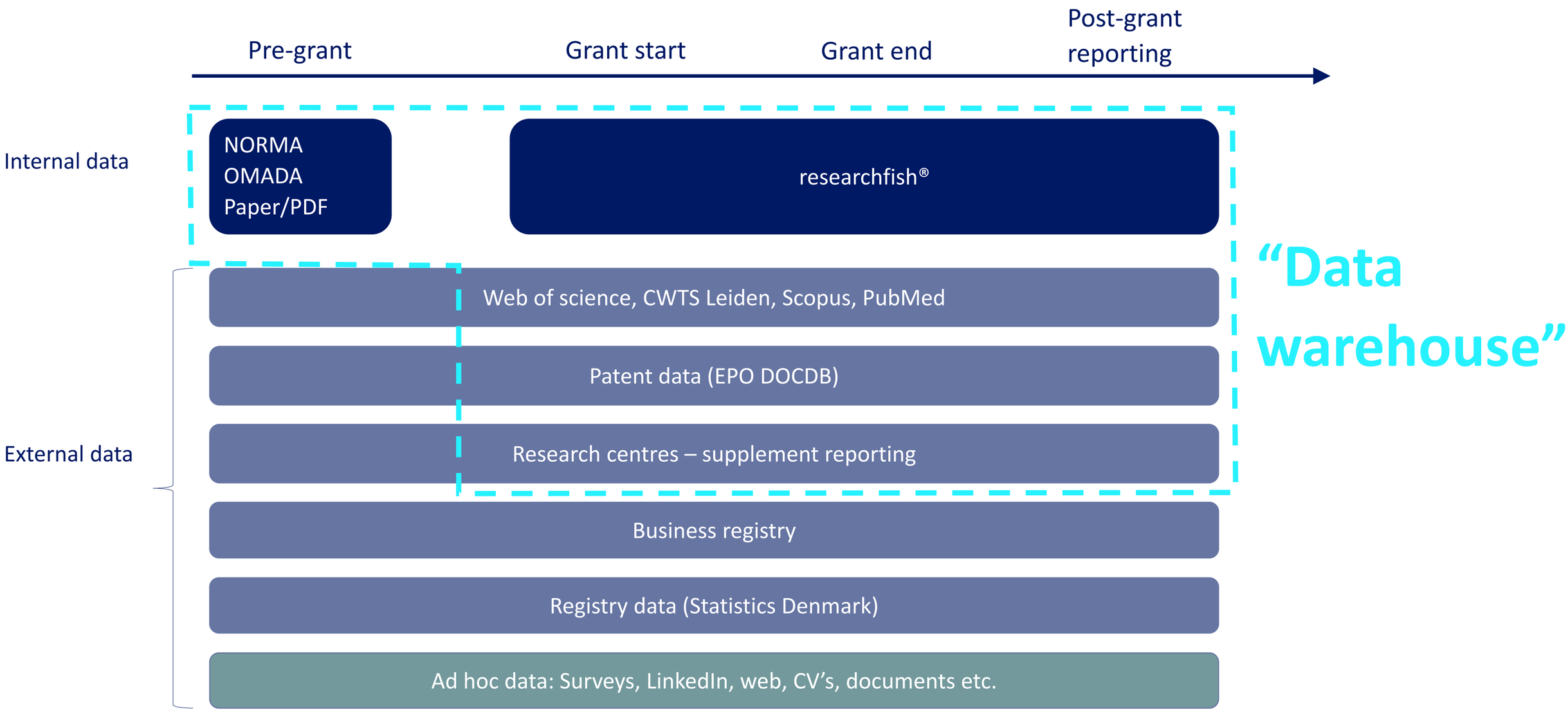
and

no benchmarks → supplement data needed

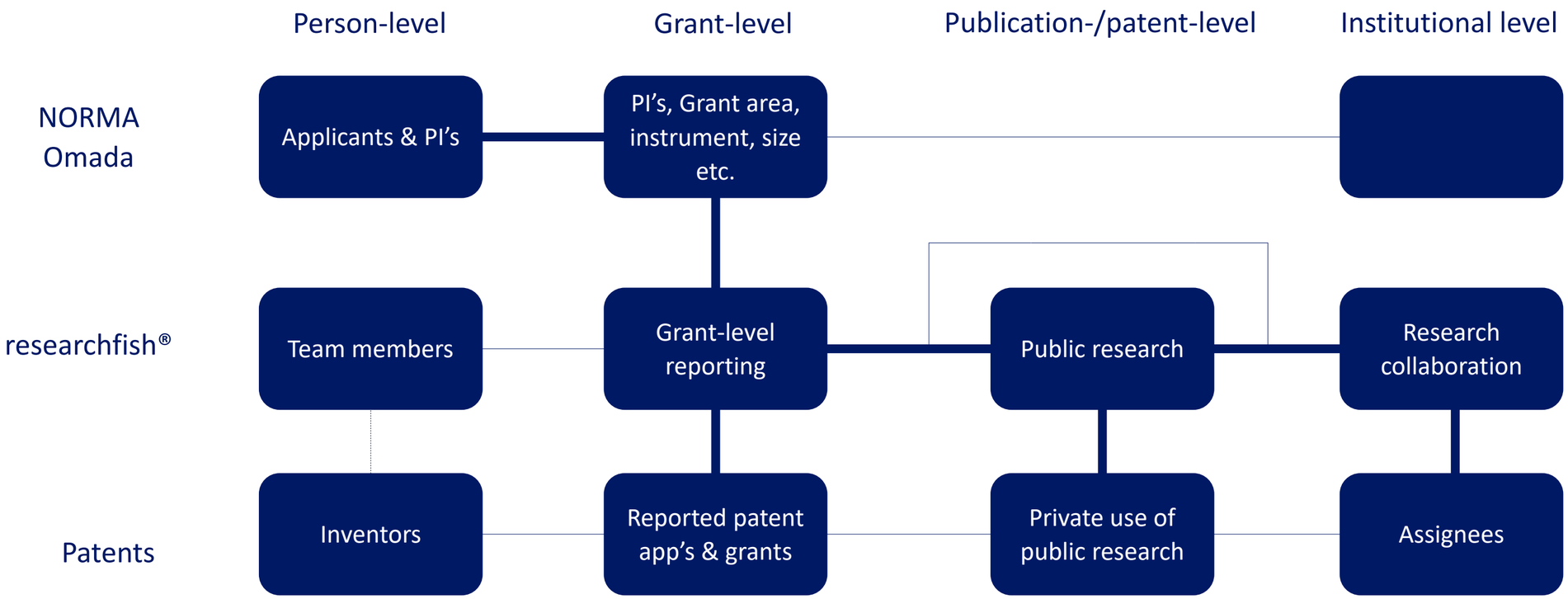
NNF collection of data



NNF collection of data



Linking data:
Tracking funded research towards patents



QUESTION CATEGORIES IN RESEARCHFISH

RF COMMON QUESTION CATEGORIES

- Publications
- Collaborations
- Further Funding
- Next Destination & Skills
- Engagement Activities
- Influence on Policy
- Research Tools & Methods
- Research Databases & Models
- Intellectual Property & Licensing
- Medical Products, Interventions and Clinical Trials
- Artistic & Creative Products
- Software & Technical Products
- Spin Outs
- Awards and Recognition
- Other Outputs & Knowledge
- Use of Facilities & Resources

QUESTION CATEGORIES IN RESEARCHFISH

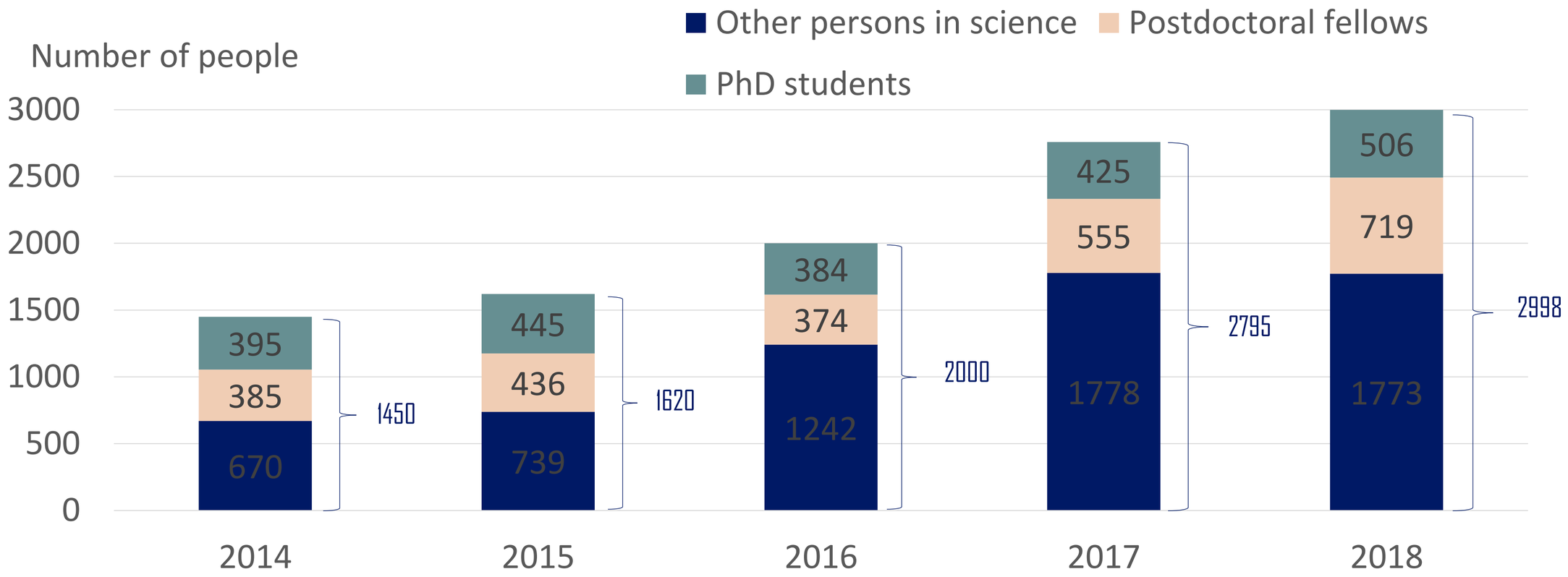
RF COMMON QUESTION CATEGORIES

Publications	Intellectual Property & Licensing
Collaborations	Medical Products, Interventions and Clinical Trials
Further Funding	Artistic & Creative Products
Next Destination & Skills	Software & Technical Products
Engagement Activities	Spin Outs
Influence on Policy	Awards and Recognition
Research Tools & Methods	Other Outputs & Knowledge
Research Databases & Models	Use of Facilities & Resources

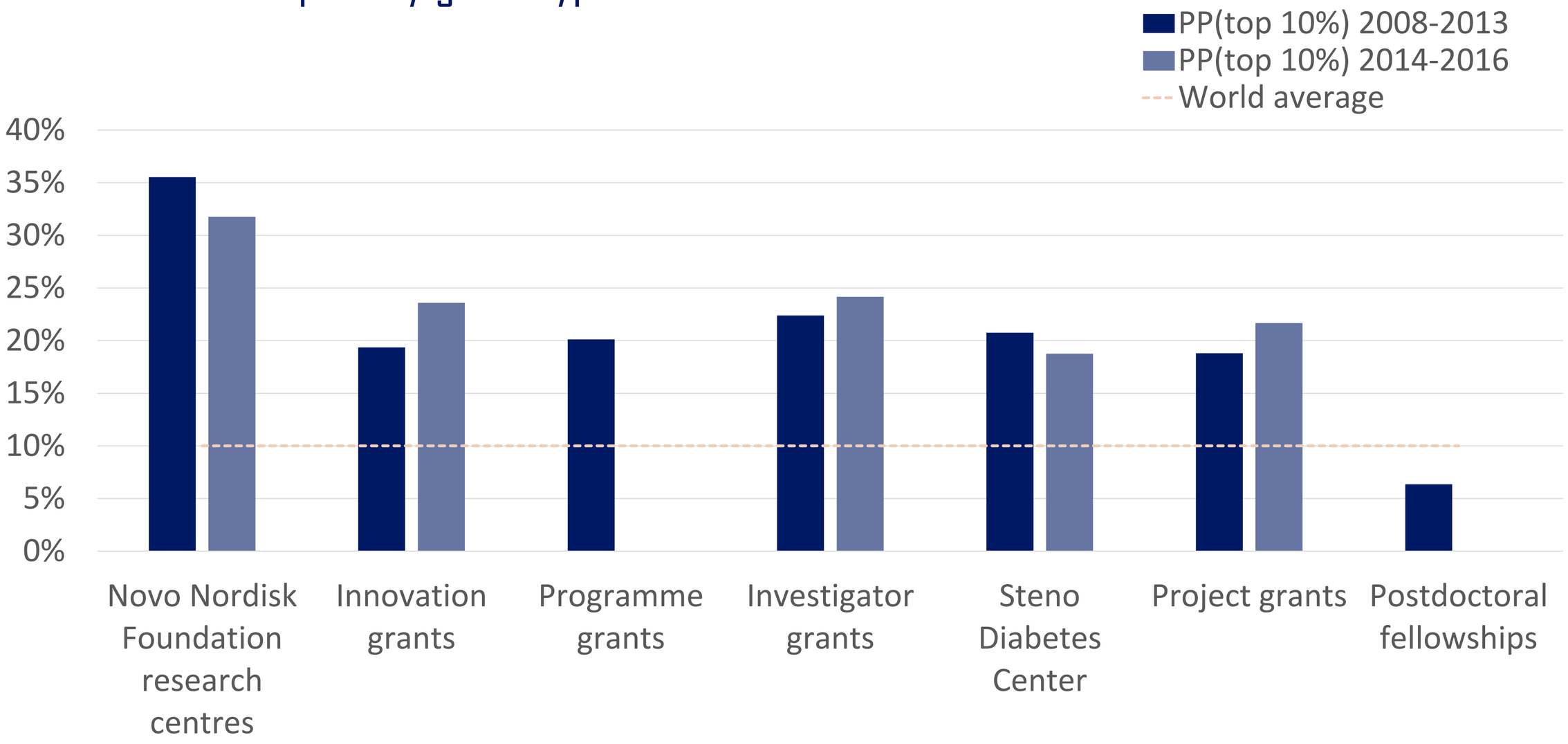
QUESTION CATEGORIES IN RESEARCHFISH

Publications	Intellectual Property & Licensing
Collaborations	Medical Products, Interventions and Clinical Trials
Further Funding	Artistic & Creative Products
Next Destination & Skills	Software & Technical Products
Engagement Activities	Spin Outs
Influence on Policy	Awards and Recognition
Research Tools & Methods	Other Outputs & Knowledge
Research Databases & Models	Use of Facilities & Resources
Grant team members	← Additional question added by us

Number of people supported fully or partly by the Novo Nordisk Foundation



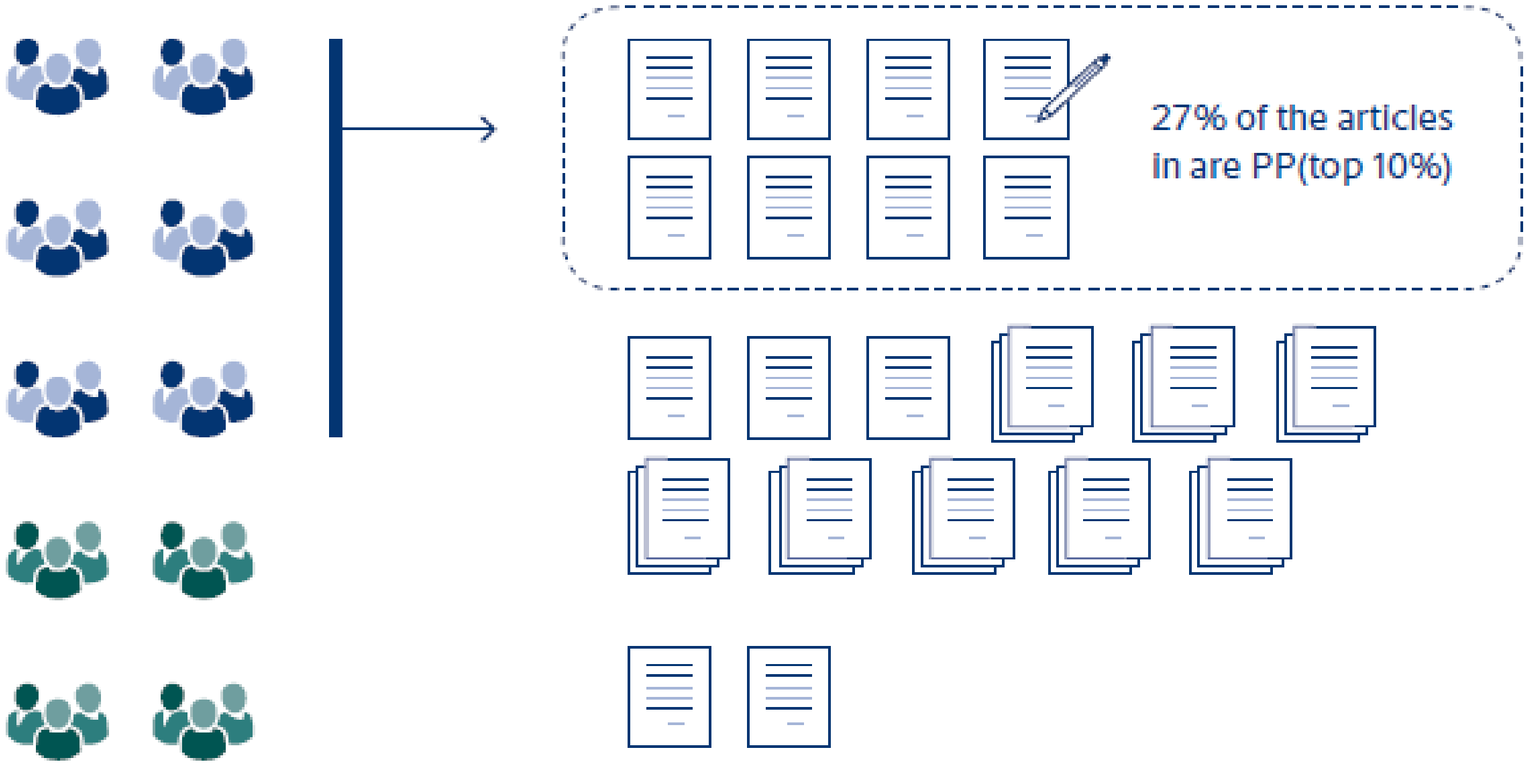
Citation impact by grant type



Who delivers high-impact research? A small elite group?

Grant teams…

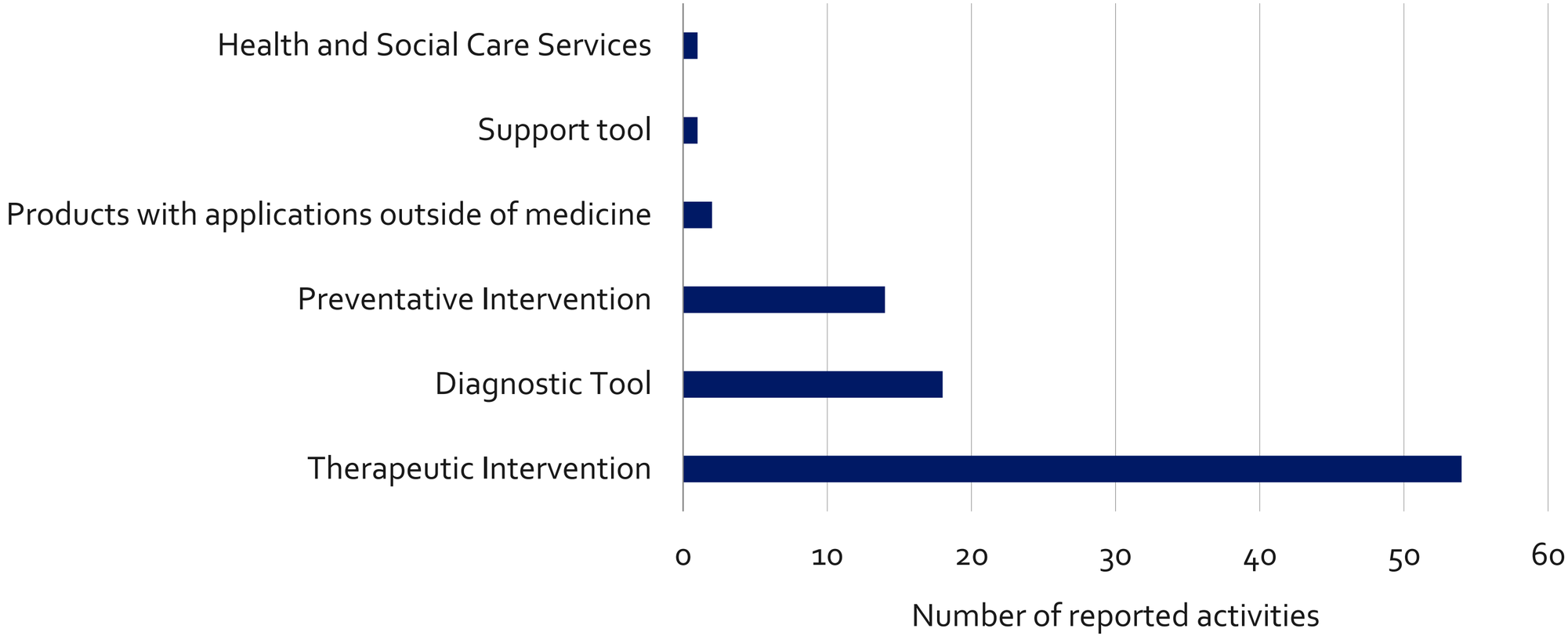
…and their publications



QUESTION CATEGORIES IN RESEARCHFISH

Publications	Intellectual Property & Licensing
Collaborations	Medical Products, Interventions and Clinical Trials
Further Funding	Artistic & Creative Products
Next Destination & Skills	Software & Technical Products
Engagement Activities	Spin Outs
Influence on Policy	Awards and Recognition
Research Tools & Methods	Other Outputs & Knowledge
Research Databases & Models	Use of Facilities & Resources
Grant team members	

Number of medical products, interventions and clinical trials reported by grant holders



Example 1

3D printed, patient-fitted, resorbable bone implants

Associate Professor Morten Østergaard Andersen and his team have developed a new method and biomaterial for creating 3D-printed implants for replacement of resected or destroyed bones. The method involves designing a 3D model of the bone-implant from a computed tomography (CT) or magnetic resonance imaging (MR) scan of the patient. Based on the 3D model, the specific bone for the patient can be 3D-printed. The bone is printed in a structure that allows room for blood vessels, nerves and bone marrow that are essential for the bone to function. The biomaterial is resorbable in the body, and the 3D bone will degrade slowly and be replaced by natural living bone.

This invention is expected to reduce the rate of complications and pain related to bone implants and reduce healthcare expenditure. The Exploratory Pre-seed Grant from the Foundation has funded a clinical trial on pigs. If the results are positive, the next step is to provide the first implants for human patients. The team has created the start-up company Particle 3D to

Example 2

Burning sensations, numbness, sensation of needles and problems with correctly sensing temperatures and touching. The symptoms of neuropathic pain are many. The pain can arise by damage to the nervous system caused by a disease or an accident. Current medication can only ease the experienced pain in a subset of patients, and medication has considerable side-effects.

Associate Professor Kenneth Madsen and his team have discovered mechanisms of key importance for neuronal signalling. They identified the PICK1 protein as a promising target for the development of a new therapeutic drug and developed a peptide inhibitor of PICK1: TAT-PEG4-di-DATC5 (TPD5). This invention can be a new mechanism to relieve pain without serious side-effects for patients with neuropathic pain.

The drug has proved highly efficacious in animal-trials, and the pain-relieving effect is surprisingly long-lasting. The Exploratory Pre-seed Grant has been awarded to the team to continue the development of this invention, which hopefully can lead to better and more effective treatment for people with neuropathic pain.

Example 3

Preventing damage from diabetes

Blood vessels have a protective layer on the inside of the membrane called the glycocalyx. High blood glucose, which is common among patients with diabetes, can affect the glycocalyx and lead to damage of the small blood vessels. Changes in the composition or loss of the glycocalyx can be an early indicator of damage to the heart and kidney. The monitoring of the glycocalyx is therefore an important preventive measure for people with diabetes.

Invasive methods were the only way to measure glycocalyx integrity until recently. With the newly developed camera and software (GlycoCheck™), the thickness of the glycocalyx layer can be measured non-invasively from the small blood vessels underneath the patients' tongue.

A team led by Peter Rossing at Steno Diabetes Center Copenhagen is now assessing the camera in a trial on healthy volunteers to investigate the reproducibility and the influence of daily living conditions such as smoking and eating.

Invasive methods were the only way to measure glycocalyx integrity until recently. With the newly developed camera and software (GlycoCheck™), the thickness of the glycocalyx layer can be measured non-invasively from the small blood vessels underneath the patients' tongue.

Treating people with head and neck cancer involves head or neck surgery, radiotherapy and chemotherapy. Because of the site of the cancer, the treatments can affect physical and mental health and well-being as well as social functioning after treatment. An instrument is needed to support healthcare professionals in assessing people's needs to help them reduce their burden of symptoms and regain their ability to live a normal life.

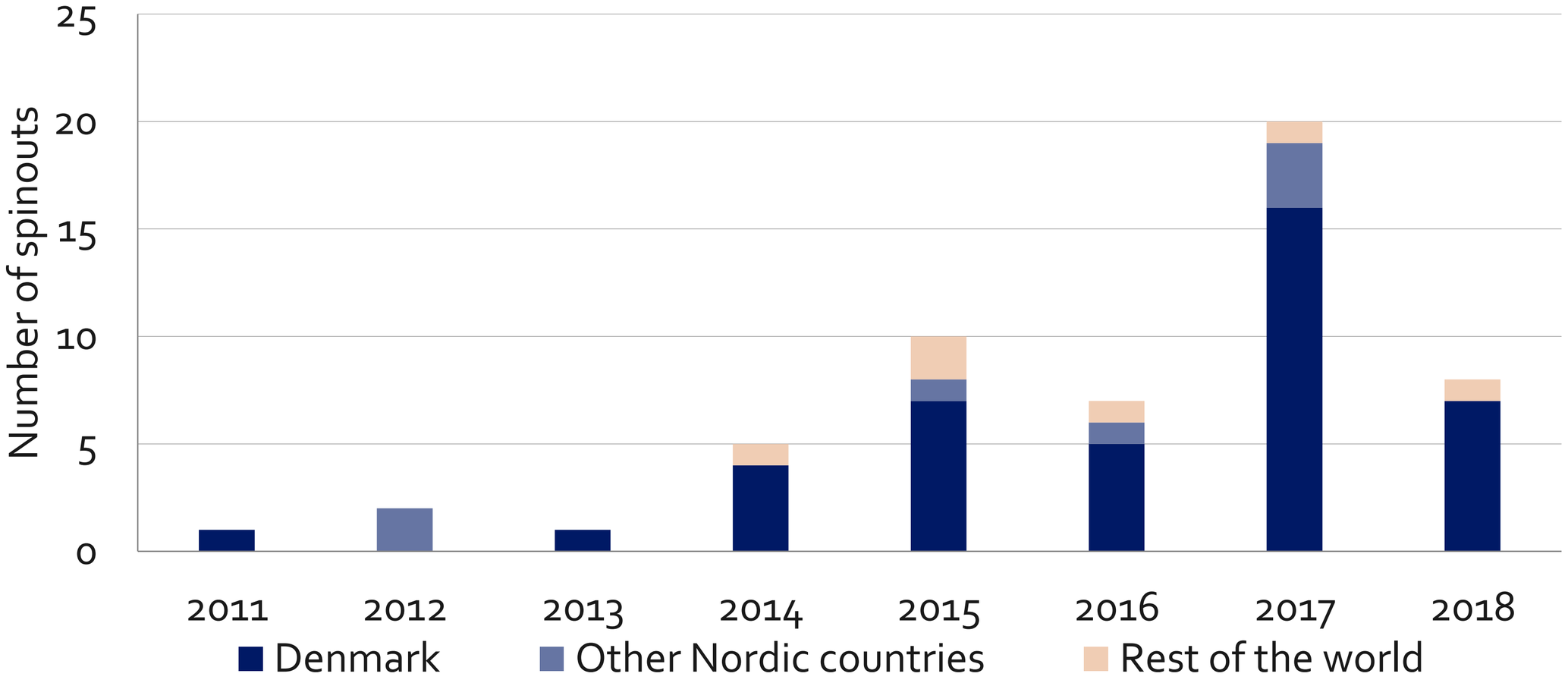
Mary Jarden and her team at Dept. of Otorhinolaryngology, Head and Neck Surgery and Audiology at Rigshospitalet in Copenhagen have linguistically validated the Patient Concerns Inventory instrument developed for people with head and neck cancer in Liverpool, United Kingdom and are developing an information technology solution that is applicable to clinical practice. Further, the team is assessing the usefulness of the tool in a randomized controlled trial.

Denmark has 1,300 new cases of head and neck cancer each year, and only 68% of these people are alive 5 years after diagnosis. The project has already heightened the awareness of the complexity of the short and long-term struggles in rehabilitating people with head and neck cancer. The Foundation is supporting the project through a nursing research grant.

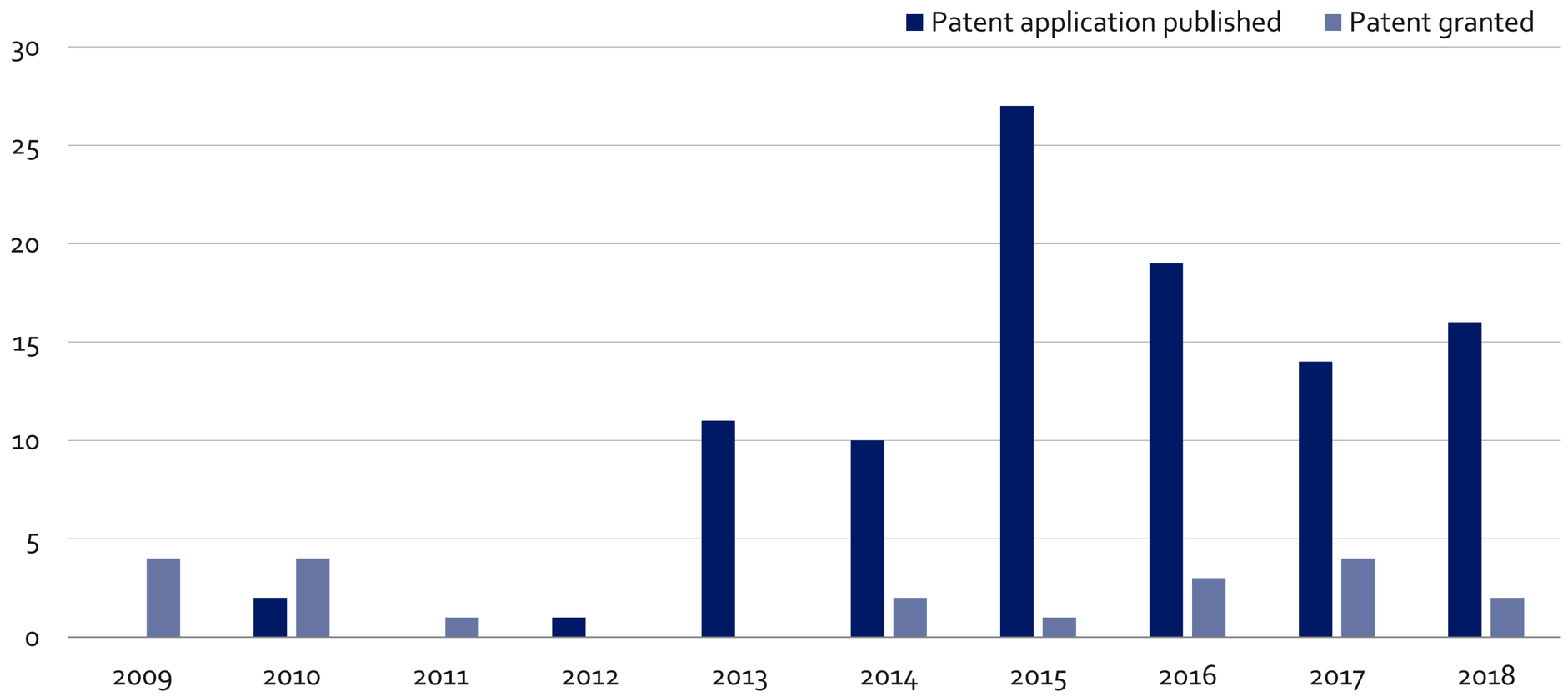
QUESTION CATEGORIES IN RESEARCHFISH

Publications	Intellectual Property & Licensing
Collaborations	Medical Products, Interventions and Clinical Trials
Further Funding	Artistic & Creative Products
Next Destination & Skills	Software & Technical Products
Engagement Activities	Spin Outs
Influence on Policy	Awards and Recognition
Research Tools & Methods	Other Outputs & Knowledge
Research Databases & Models	Use of Facilities & Resources
Grant team members	

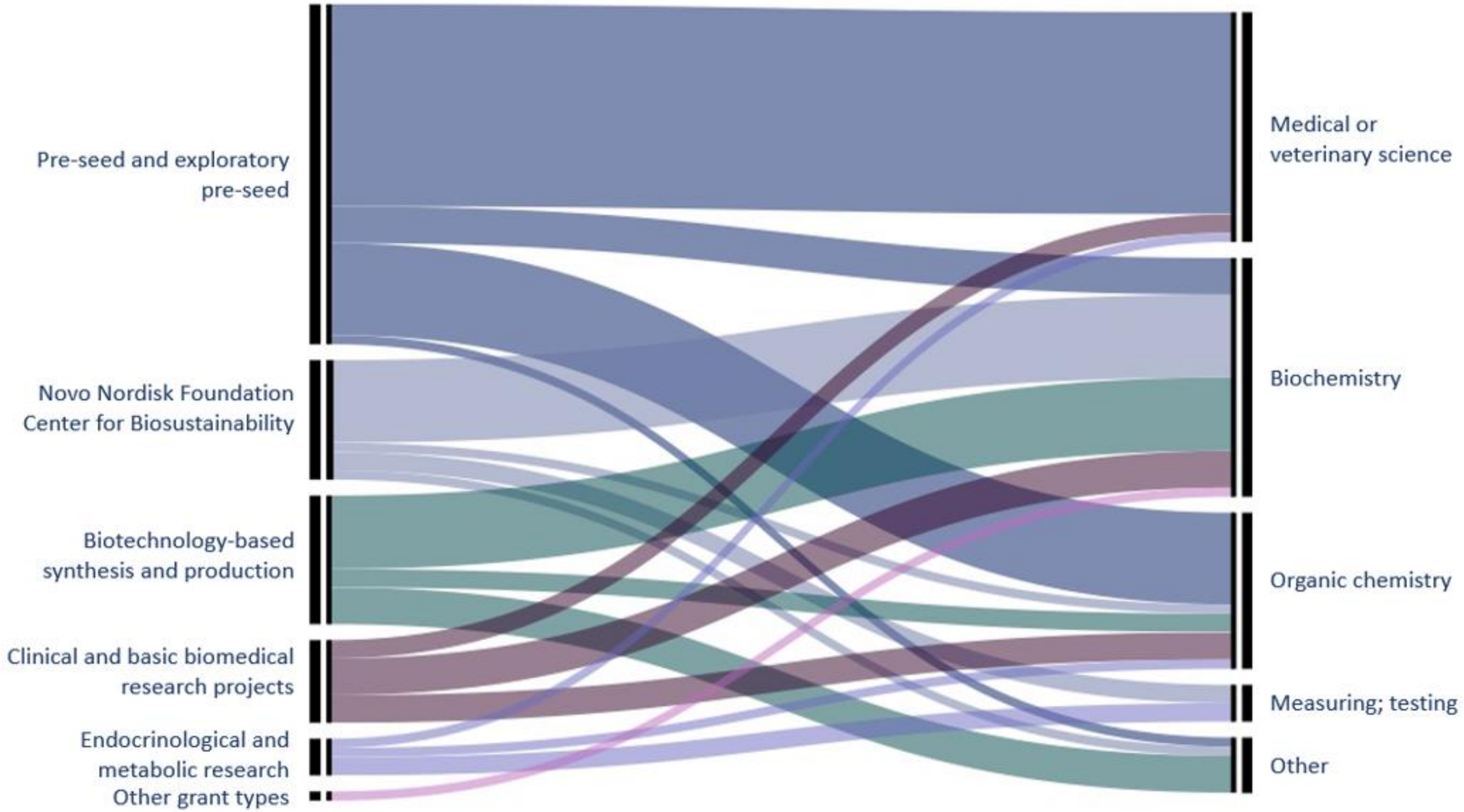
Number spinouts based on Foundation-funded research



Patent activities reported by grant holders



Grants… …delivering inventions… …in these areas…



Next steps

- Now we have volume and grants progressing in research

  → get to know the data better (dynamics, text mining, prediction)

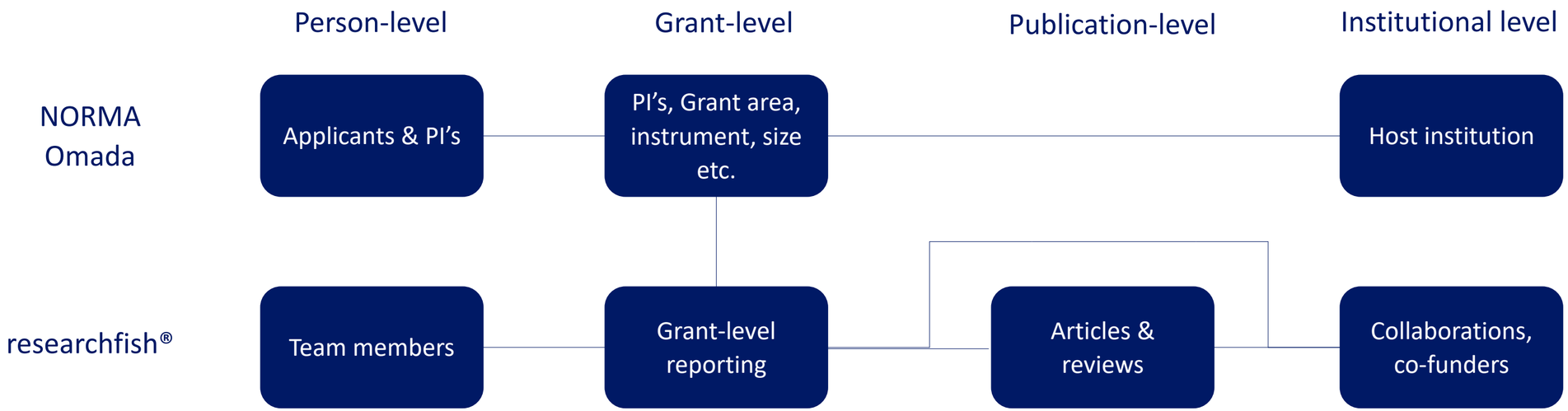
- 100% of grant holders
  - Educational activities seem to be underreported
  - Learn why acknowledge of grants in publications do not respond 1:1 with the reporting of grant-relevant publications in researchfish®

Thank you!

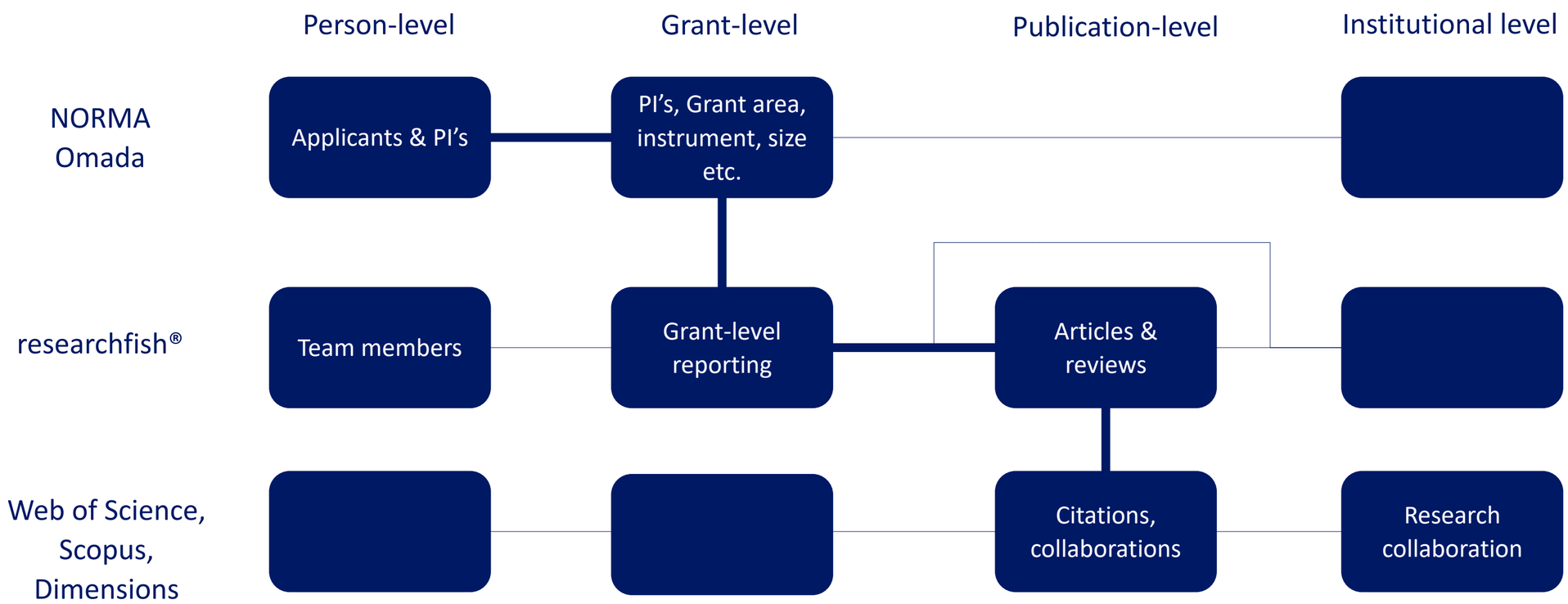
http://impact.novonordiskfonden.dk

researchfish®
- multilayered reporting options

Linking data:
Bibliometric analyses



Linking data:
Bibliometric analyses



Linking data:
Tracking funded research towards patents