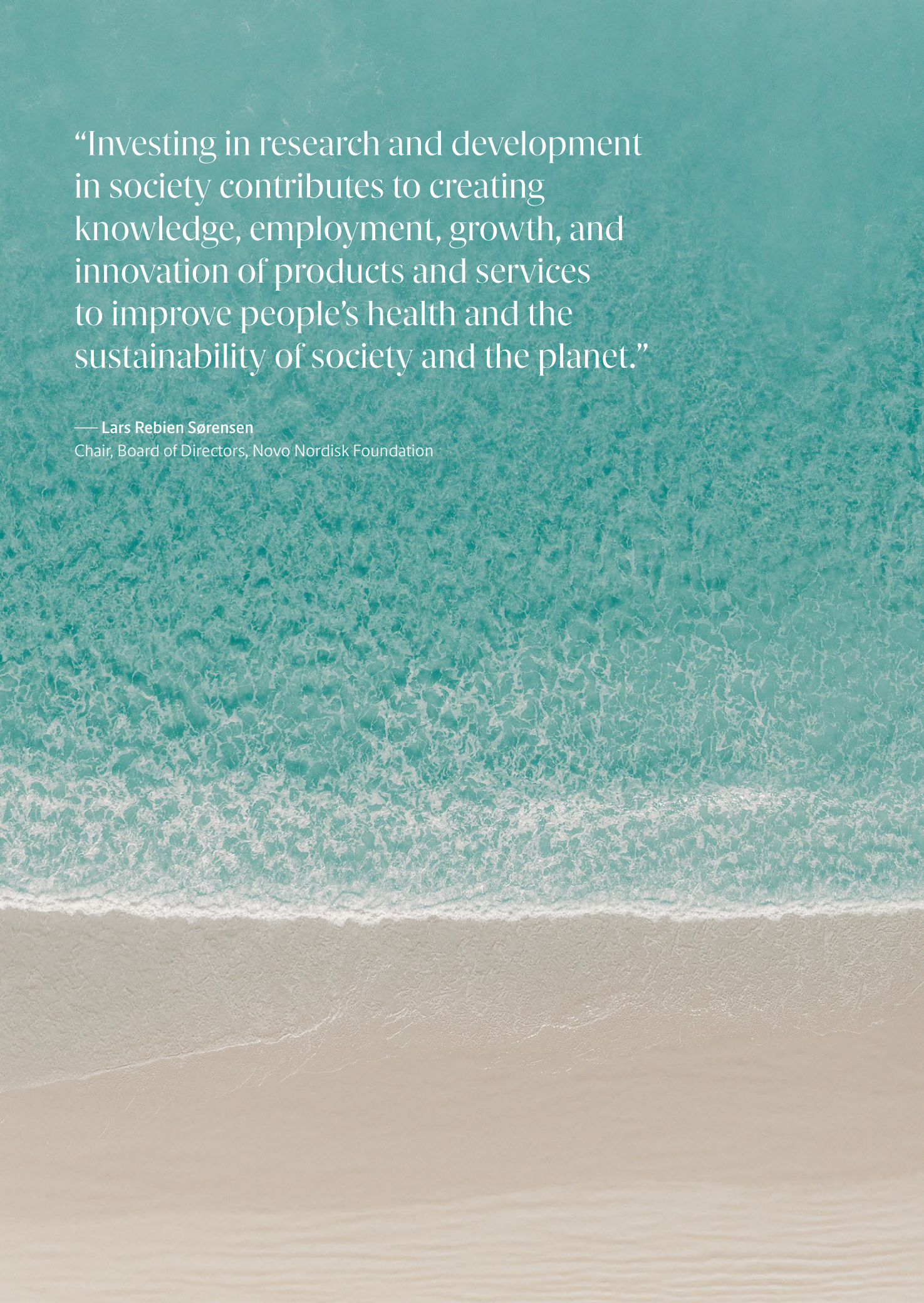
novo nordisk
foundation
Benefitting people and society

Annual Impact Report 2023

SOCIETAL IMPACT

of the Novo Nordisk Foundation



"Investing in research and development in society contributes to creating knowledge, employment, growth, and innovation of products and services to improve people's health and the sustainability of society and the planet."

— **Lars Rebien Sørensen**
Chair, Board of Directors, Novo Nordisk Foundation

Contents

Preface

The Novo Nordisk Foundation is an independent Danish enterprise foundation dedicated to philanthropic and corporate goals. Its vision centers on enhancing health, societal sustainability and planetary well-being. To realise this, it follows two multifaceted missions.

The Foundation's philanthropic mission is to:

- progress research and innovation in the prevention and treatment of cardiometabolic and infectious diseases,
- advance knowledge and solutions to support the green transition in society; and
- invest in scientific research, education and innovation to enable a world-class life science ecosystem.

The Foundation's corporate mission is to:

- be an engaged owner of Novo Nordisk A/S, Novozymes A/S and Novo Holdings A/S,
- generate attractive investment returns on the Foundation's assets; and
- make strategic investments with the main goal of supporting the Foundation's strategy.

The Foundation backs philanthropic endeavours in biomedical science, technical fields, sustainability, humanities, education and social causes. It emphasises fundamental and translational research. In addition to this, it boosts the economy by job creation and pioneering new technologies and research. Through investments in life sciences, it seeks to elevate health standards and advance society's green transition through biotechnological innovation.

By 2030, while having Denmark as its centre of gravity, the Foundation aims to expand its global collaborations and partnerships, addressing universal challenges and strengthening Denmark's life sciences and research sectors.

We champion a long-term view. Trust, risk-taking, and patience are essential for research, innovation and investments. We are convinced that top-tier interdisciplinary environments are catalysts for groundbreaking discoveries and sustainable solutions to societal issues.

Our strategy outlines our societal contributions, both philanthropic and commercial. We have devised an impact framework to assess and convey our achievements. This report showcases the Foundation's societal contributions, while our website's "NNF Dashboard" offers deeper insights and provides much more information about the Foundation's contribution to society and their impact.

We hope you will enjoy our Impact Report.

Mads Krogsgaard Thomsen,
CEO, Novo Nordisk Foundation

Summary of the Impact Report 2023

This report links our grant-giving and commercial activities in 2023 and before to scientific achievements and societal results beyond science. The output, outcome and impact of the Foundation are structured according to our nine principles for societal impact, which help to guide the Foundation's activities and investments.

Our results in this report are based on extensive research and build on analyses of several data sources. We track the activities from our input and assess output, outcome and impact through the systematic reporting of the grant recipients and the companies in our two reporting systems, Researchfish® and Foundgood, alongside surveys, research and other data sources. We share the results and our activities in the new NNF Dashboard (follow the QR link on the page opposite).

Chapter 1

The monetary contribution to society

Chapter 1 describes the monetary flows and the capital stock of the Novo Nordisk Foundation Group[1] and how we contribute to research investments and taxes in society. The key insights are:

- 14% of all public research and 23% of all private research in Denmark are financed by the Novo Group[2].
- An estimated 18% of corporate taxes (DKK 16.8 billion) and 1.5% of direct personal taxes (DKK 7.3 billion) in Denmark were paid by the companies in the Novo Group portfolio and its employees.
- The Foundation's and Novo Holdings' portfolio of companies had a net worth of DKK 1,114 billion (EUR 150 billion) and awarded grants (DKK 7.7 billion (EUR 1 billion)) and philanthropic impact investments (DKK 1.4 billion (EUR 0.2 billion)) for a total of DKK 9.1 billion (EUR 1.2 billion), placing it in the world top-three when it comes to philanthropic activities.

Chapter 2

The societal impact of philanthropic activities

Chapter 2 describes the societal impact of our grant-giving activities. Over nine sections, each devoted to a societal impact principle, we document our main imprints on society. The key results for the year 2023 are:

[1] Novo Nordisk Foundation Group consists of the Novo Nordisk Foundation, the Novo Group as well as Novo Holdings A/S' life science and capital investments. Novo Holdings A/S is an investment company fully owned by the Novo Nordisk Foundation.

[2] The Novo Group comprises Novo Nordisk A/S, Novozymes A/S and Novo Holdings A/S.

- 8,877 people in scientific and research hospital activities (55% men and 45% women) have been fully or partly financed by the Foundation's grants. Of the scientific personnel, 3,740 were PhD students and postdoctoral fellows.

- The Foundation's grants funded 8% of Danish journal articles. 80% were published by international teams, and 11% with co-authors from the industry. 23% were among the 10% most cited in the world.

- Grantees reported 45 invention disclosures for 2023. Moreover, 58 patent applications and 23 new spin-outs based on the Foundation's grants were reported for 2023.

- In 2023, more than 30,000 patients were treated at the Steno Diabetes Centers in Denmark.

Chapter 3
The societal impact of commercial activities

Chapter 3 documents the societal impact of our corporate activities. We have analysed the Novo Group and Novo Holdings' life science portfolio of companies. The key societal impacts for the year 2023 are:

- 153,000 people are employed in the Novo Group (Novo Holdings, Novo Nordisk A/S and Novozymes A/S) and the 145 other companies in the life science portfolio. This is the same as in 2022.

- Since 2019, more than 15,500 patent applications have been published and more than 4,100 patents have been granted worldwide. 14% of Danish patents are granted to the Novo Group and portfolio companies.

- In the period 2019–2023, more than 620,000 people have been successfully enrolled in 675 active clinical trials supported by the companies.

- There are 44 million users of medical products (5% increase compared to 2022), more than 40 million users of MedTech products (the same as in 2022) and 500 million health tests (the same as in 2022).

Chapter 4
Learnings from philanthropic practice

Chapter 4 reflects on our implementation of impact management in the Novo Nordisk Foundation by introducing how impact thinking is embedded in the development of new initiatives in our revised stage gate model (section 4.1). Learnings from the implementation phase of impact management:

- Logic models depicting the theory of change are the basis for planning and evaluation of Foundation-funded initiatives.

- Engaging stakeholders in co-creating impact frameworks enhances programme relevance and co-ownership to the frameworks, which is critical for impact management.

We further present a case of how we work to make the most of the reported data and how we can improve data collection for evaluation and learning by investigating the reporting of grantees from two open competition programmes. Learnings from this case:

- Grant progress is successfully tracked through standardised data collection in Researchfish®.

- More complete estimations of a project's development and success can be reached through complementing the data collection with less formal and tangible aspects.

We share the results and our activities in the new NNF Dashboard.

The NNF Dashboard provides much more information about the Foundation's contributions to society and their impact.

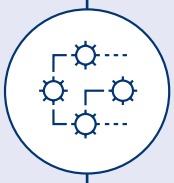
Read more

The Foundation aims to improve people's health and the sustainability of society and the planet

novo nordisk **foundation**

Output

Fostering the development of talent across different gender, life ages and scientific fields.



Supporting organisations, systems, and infrastructure to catalyse a knowledge-based societal development.

Stimulating collaboration across international borders, scientific disciplines, and sectors in society.

The societal impact principles for the Foundation

Outcome

Promoting excellent research and innovation.

Developing innovative products and solutions supporting a sustainable development.

Developing new technologies, therapies and patient-centred and research-based care and disease prevention.

Impact

Creating jobs, sustainable growth, efficient use of resources and productivity in society.

Supporting the development of world-class education at all levels and of a qualified and agile workforce.

Supporting people in difficult health, social, environmental, and humanitarian settings.

1

The monetary contribution to society

The Novo Nordisk Foundation's philanthropic and commercial activities contribute to society in many ways. It awards money and invests in companies, pays taxes, develops solutions and employs people. Through this, the Foundation impacts health, sustainability, and society by funding scientific research, experimental development, innovation, education, and environmental initiatives. The Foundation's philanthropy also extends to humanitarian and social efforts and public research hospitals, enhancing healthcare access and outcomes. This multifaceted approach both addresses immediate societal needs and invests in the future, ensuring a more sustainable world for generations to come.

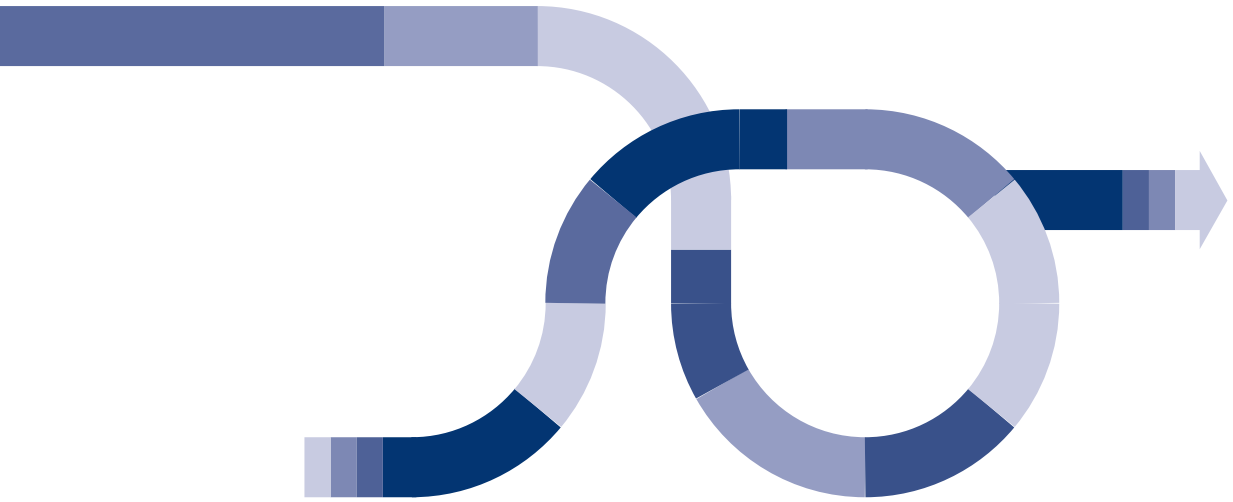
Through the Novo Group (Novo Holdings A/S, Novo Nordisk A/S and Novozymes A/S), investments in life science companies and capital investments, we contribute to private-sector research and innovation. These forms of engagement in society generate jobs, tax revenue in Denmark and abroad, and contribute to the creation of income for more than a hundred thousand people.

Underpinning all these benefits is the financial resilience and scale of the Foundation and its investments, which are covered in this chapter. We outline our legal and corporate structure, before describing the economic scale of our activities.

1.1 The business model

In 2023, the Novo Nordisk Foundation Group[1] held investments in 147 life science companies and more than 200 other companies through its fully owned subsidiary Novo Holdings A/S, a holding company and majority shareholder of Novo Nordisk A/S and Novozymes A/S. Novo Holdings manages the Foundation's commercial activities, which are primarily within the life sciences, in addition to receiving dividends from Novo Nordisk and Novozymes and returns on its own commercial and financial investments.

The Foundation receives income from Novo Holdings and awards grants to benefit society. In 2022 and 2023, the Foundation had a net worth of DKK 806 billion (EUR 108 billion) and DKK 1,114 billion (EUR 150 billion), respectively, making it one of the largest financial endowments of any foundation in the world. The income and the return on the investments in Novo Holdings was DKK 31.4 billion (EUR 4.2 billion) in 2023 compared to DKK 3.1 billion (EUR 0.4 billion) in 2022.

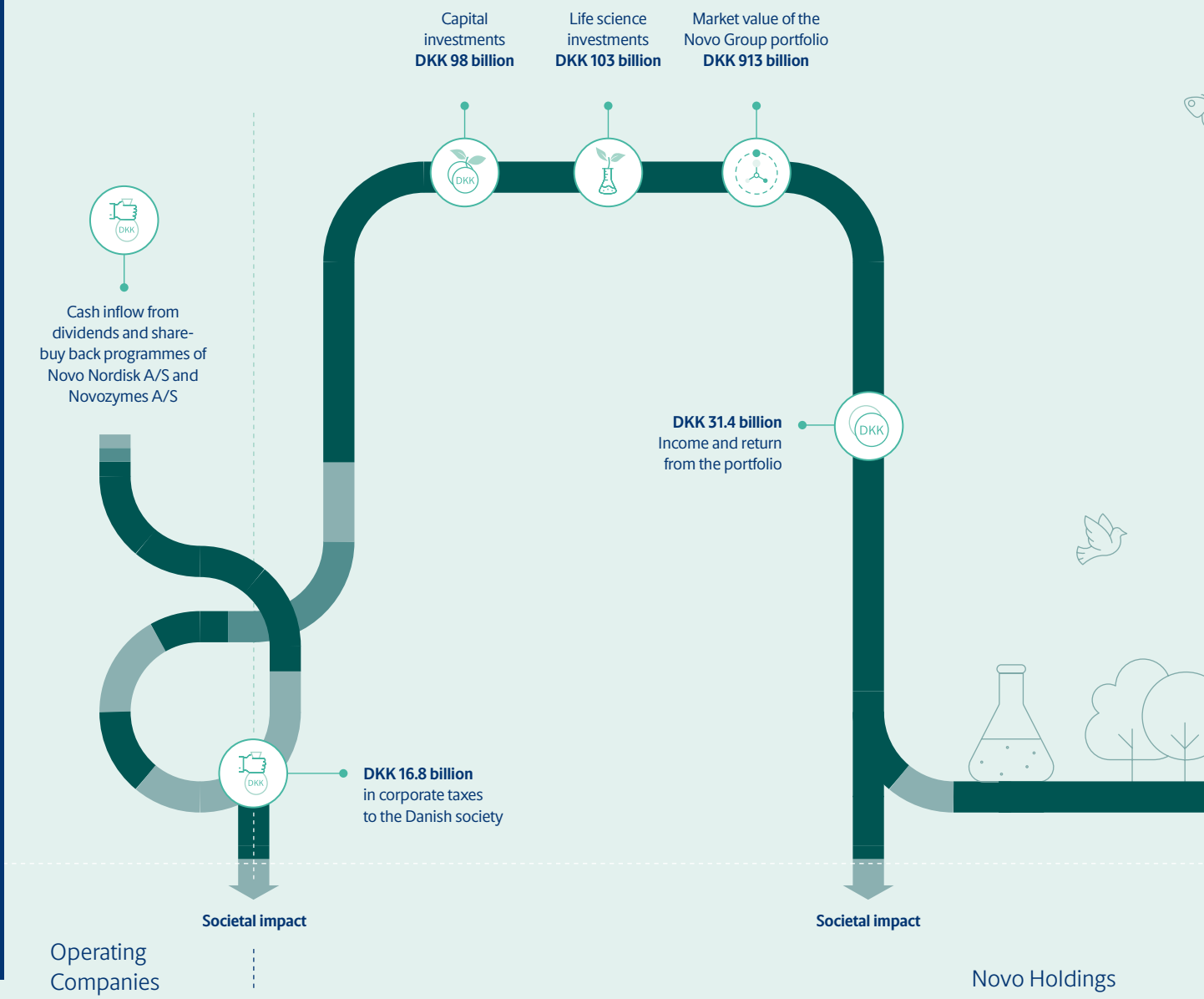


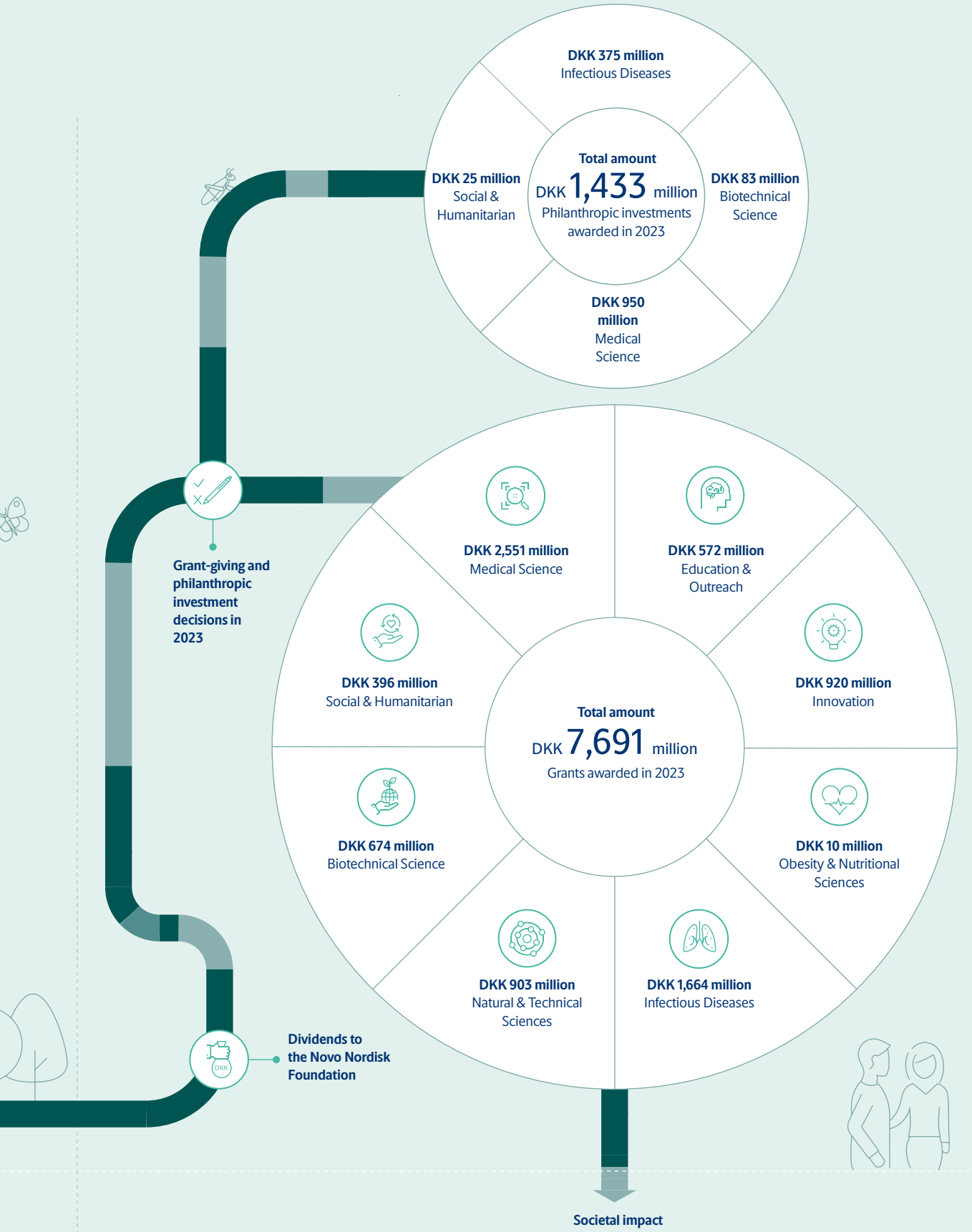
1 Novo Nordisk Foundation Group consists of the Novo Nordisk Foundation, the Novo Group as well as Novo Holdings A/S' life science and capital investments. The Novo Group comprises Novo Nordisk A/S, Novozymes A/S and Novo Holdings A/S. Novo Holdings A/S is an investment company fully owned by the Novo Nordisk Foundation.

The Novo Nordisk Foundation Business Model in 2023

The Novo Nordisk Foundation is a Danish foundation with corporate interests, also called an enterprise foundation. It operates independently of other interests than the corporate and philanthropic purposes described in its Articles of Association, commonly referred to as its statutory purposes.

Figure 1.1.1




DKK 375 million
Infectious Diseases
DKK 25 million
Social & Humanitarian
Total amount
DKK 1,433 million
Philanthropic investments awarded in 2023
DKK 83 million
Biotechnical Science
DKK 950 million
Medical Science
Grant-giving and philanthropic investment decisions in 2023
DKK 2,551 million
Medical Science
DKK 572 million
Education & Outreach
DKK 396 million
Social & Humanitarian
DKK 920 million
Innovation
Total amount
DKK 7,691 million
Grants awarded in 2023
DKK 674 million
Biotechnical Science
DKK 10 million
Obesity & Nutritional Sciences
DKK 903 million
Natural & Technical Sciences
DKK 1,664 million
Infectious Diseases
Dividends to the Novo Nordisk Foundation
Societal impact

Grant-giving for scientific and non-scientific purposes
The Foundation awards grants both for scientific purposes and non-scientific purposes. In 2023, the Foundation awarded 751 new grants (stand-alone grants and open competition grants) worth DKK 7.7 billion (EUR 1.033 billion), while it paid out DKK 5.8 billion (EUR 774 million) on all active grants (see Figure 1.2.1). On top of this, the Foundation also awarded DKK 1.433 billion (EUR 0.2 billion) to philanthropic investments.

In 2023, the direct payments to public sector research and development activities as well as to research equipment and buildings, mostly at universities and research hospitals, totaled DKK 4.7 billion (81% of total payouts). DKK 0.62 billion was paid out for non-scientific purposes.

The following were some of the Foundation's significant philanthropic grants and investments in 2023:

- The Novo Nordisk Foundation Initiative for Vaccines and Immunity (NIVI), a research and vaccine development initiative, received up to DKK 1.8 billion. The aim of NIVI is to create new or improved vaccines for some of the deadliest respiratory diseases.

- The Novo Nordisk Foundation Cellerator, a world-class facility for developing and upscaling cell therapies for testing in humans. Up to DKK 950 million was awarded.

- Together with the Bill & Melinda Gates Foundation, DKK 200 million was committed towards an initiative focused on utilising CO2 as a source of proteins for food production without the involvement of agricultural land use.

- As part of the commitment to fighting cardiometabolic diseases, the support to the Novo Nordisk Foundation Center for Basic Metabolic Research was extended with a grant of up to DKK 1 billion.

- Two of the Foundation's most ambitious grant programmes are the Challenge Programme, under which DKK 378.7 million was awarded, and the Research Leader Programme, where 37 researchers received DKK 361 million in funding. Both programmes are targeted at research within themes relating to human health, climate change mitigation and sustainability.

In the period 2021–2023, the Foundation awarded DKK 19.4 billion (EUR 2.561 billion) of which 44% were for basic research, 29% were for applied research, 10% for experimental development, 9% for education activities and 8% for other non-scientific activities.

1.2 Contribution to public and private research investments in Denmark

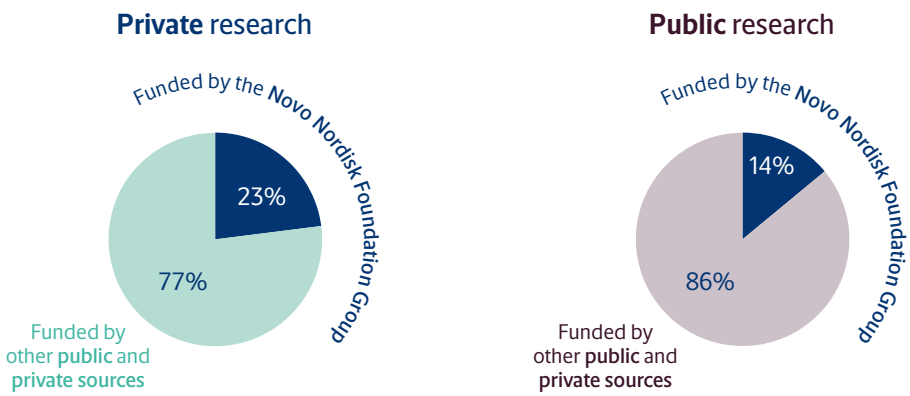
Public research and development
The Foundation contributed with an estimate of nearly 14% of public sector research funding in Denmark in 2023. Using the scientific purpose of funding, we estimate that Foundation payouts constitute 24% of public research spending in Denmark in 2023 within the medical and health sciences, 6% within the natural sciences, 10% within agriculture sciences, 4% within engineering/technical sciences, and 1% within the humanities (the Foundation funds art research and art history research).

Estimating the Foundation's share of total public sector research expenditure and by scientific field is challenging due to diverse activities in grants, diverse funding sources at institutions, varied accounting standards, timing of Foundation payouts and actual spending, and the

interdisciplinary grants and nature of research in many areas. Confidentiality, dynamic funding priorities, and international collaborations further complicate accurate allocation and reporting of expenditures across different scientific disciplines. Additionally, the use of research funds and disbursement of grants are being accounted for in various ways. These estimates are therefore subject to significant uncertainty.

Private research and development
The share of the Novo Nordisk Foundation Group companies' expenditure for R&D in the private sector in Denmark is estimated at 23% (see Figure 1.3.1).

Figure 1.3.1 Novo Nordisk Foundation Group's contribution to research and development investments



Note: Public research expenditure for 2023 is based on a projection of the 2022 level. Private research expenditure is for 2022
Sources: Novo Nordisk Foundation and Statistics Denmark

1.3 Tax payments to Danish society

Through its economic activities, the Novo Nordisk Foundation Group contributes to significant tax income. In Denmark alone, the total annual corporate tax payments amounted to DKK 8.7 billion in 2022 and DKK 16.8 billion in 2023, which corresponds to approximately 12% and 18% (preliminary estimates) of Danish corporate taxes in 2022 and 2023, respectively. Furthermore, in 2022 and 2023 the Novo Nordisk Foundation Group also contributed through the Danish direct income taxes paid by the employees from the Novo Group and the life science companies where Novo Holdings' ownership share ranges between 5% and 100%. The direct tax payments of employees amounted to DKK 7 billion in 2022 and nearly DKK 7.3 billion (preliminary estimate) in 2023. The share of total Danish direct income taxes is approximately 1.3-1.5%.

The total sum of the Group's corporate taxes and direct taxes of the Novo Group's and the life science companies' employees in Denmark was DKK 16 billion (EUR 2.2 billion) in 2022. For 2023, the total corporate and income tax (excluding indirect taxes) amount is preliminary estimated to DKK 24 billion (EUR 3.2 billion).

In addition, the companies and employees also pay indirect taxes in Denmark as well as direct and indirect taxes in other countries. On top of that, the grant-giving activities of the Foundation also generate income taxes via income for people fully or partly paid by Foundation grants and employees in spin-out companies based on Foundation grants (see section 2.6).

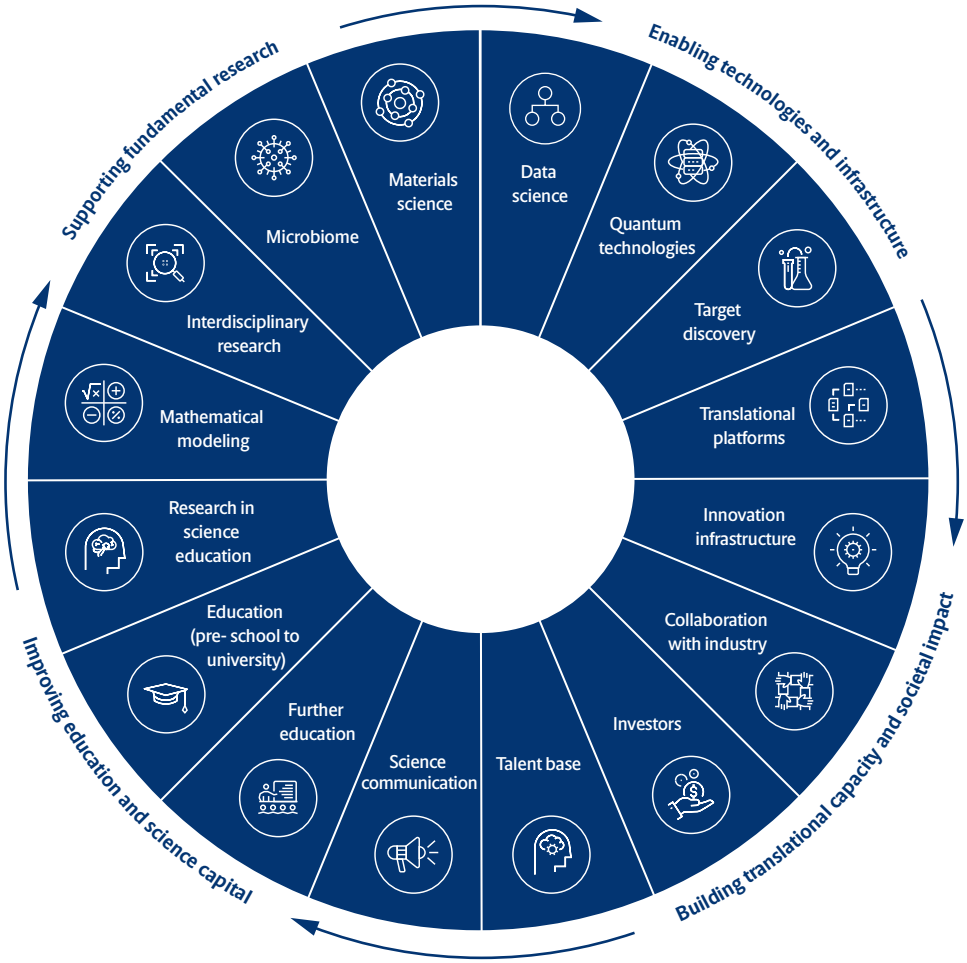
1.4 The life-science ecosystem

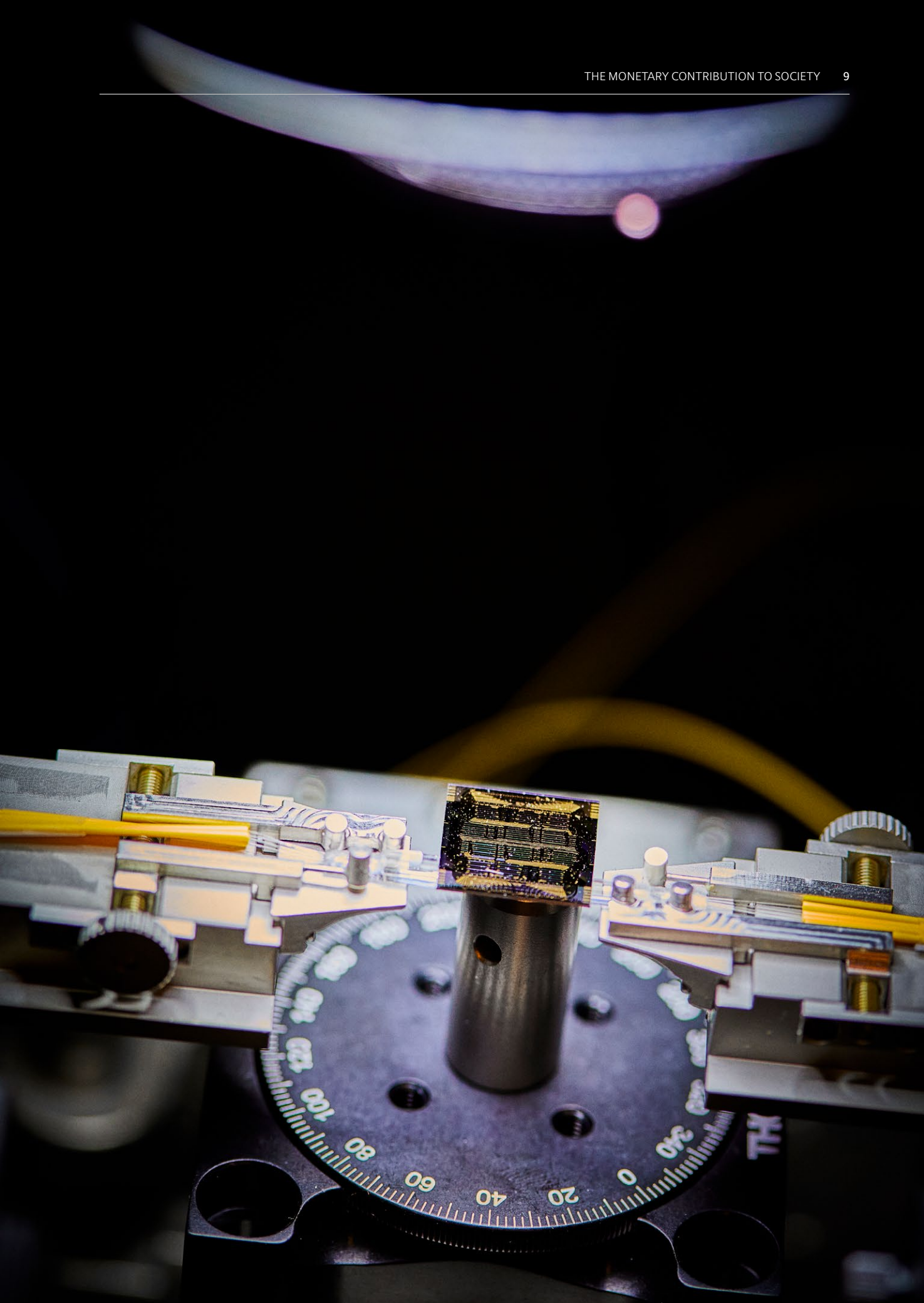
The Novo Nordisk Foundation has a long-standing tradition of supporting fundamental research and the development of new technologies to benefit society, focusing on life sciences and sustainability. The aim is to enhance support for an ecosystem that fosters excellence in these areas, addressing significant future challenges. This ecosystem encompasses a wide range of components, including fundamental and innovative research across various scientific disciplines, technological advancements, education at all levels, and the development of systems to bring research to market. The Foundation prioritises diversity and creativity within this ecosystem to tackle societal issues effectively. In the Foundation's 2030 strategy, it is stated that it plans to increase the support to both curiosity-driven and translational research in many new fields like AI, genomics, and robotics, among others. It also intends to promote high-quality education and establish Denmark as a leading innovation hub for transforming scientific discoveries into solutions that improve health and sustainability, requiring collaboration across multiple sectors. Figure 1.5.1 provides an overview of how the Foundation supports the life-science ecosystem.

Figure 1.5.1 Novo Nordisk Foundation's life-science ecosystem

Our focus areas within the Life Science Ecosystem

Education - Fundamental research - Innovation - Technology & infrastructure





2

The societal impact of philanthropic activities

This chapter surveys the societal impact of the Foundation's grant-giving activities. It does this by systematically working through the nine principles of the Foundation's societal impact model.

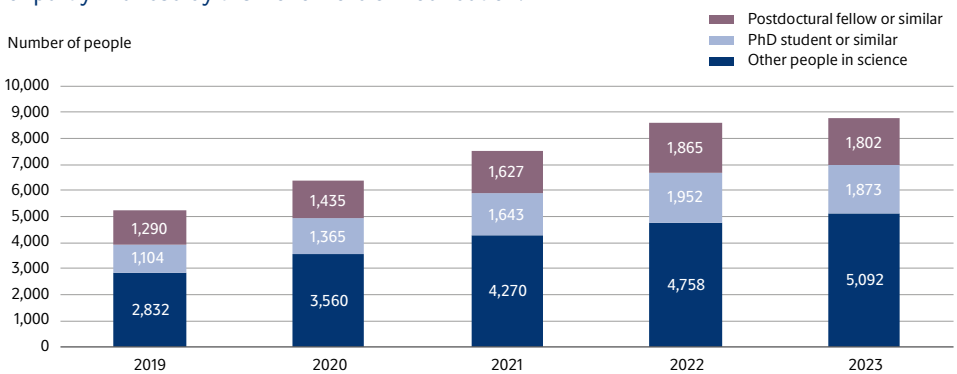
2.1 Fostering the development of talent

The first societal principle in the Foundation's impact model concerns developing a talented and diverse population of researchers, and helping institutions to attract talented researchers to Denmark. In 2023, the Foundation fully or partly funded 8,877 people in scientific activities or research-hospital settings (Figure 2.1.1). Nearly 20% of the people funded were postdoctoral fellows, 21% PhD students while 57% held other positions in science. This is an increase from previous years. The increase is in large part due to the introduction of a new reporting system that allows for better reporting on the people associated with a grant, as well as reporting on the staff at the Novo Nordisk Foundation Center for Stem Cell Medicine, ReNEW.

The Foundation's funding helps to attract talented researchers to Denmark. One third of the scientific staff at the Novo Nordisk Foundation research centres in 2023 are recruited from outside of Denmark. More than half of these are PhD students and postdoctoral fellows (65%). In addition, other Foundation funding instruments attract research talent to Denmark, such as the Young Investigator Programme, RECRUIT, Start Package Grants and the Copenhagen Bioscience PhD programme for international students.

Figure 2.1.1

Number of people in scientific and research hospital activities fully or partly financed by the Novo Nordisk Foundation.



Note: Other people in science include assistant, associate and full professors, as well as technical and administrative staff. The numbers of people for 2020, 2021 and 2022 are higher in this year's report compared to previous years' reports, because many grantees have resubmitted new data on team members during 2023 and in January 2024.

Sources: Novo Nordisk Foundation/Researchfish®/Foundgood/Impact-of-Science

PhD students and Postdoctoral fellows

Early career researchers are the future of the research ecosystem. The number of current PhD students and Postdoctoral fellows fully or partly funded by Foundation grants has grown to more than 3,600 in 2023, up from 2,400 in 2019 (Figure 2.1.1). The Foundation supports the research education of PhD students and Postdoctoral fellows through a variety of grant instruments, including fellowships, research centres, PhD academies and PhD programmes and team member funding through investigator grants and research projects and programmes.

Bachelor students and Master students

The Foundation also funds activities that – directly or indirectly – support the education of Bachelor and Master students. In 2023, projects supported by the Foundation– partly or fully – included 488 Bachelor and Master students as team members.

Case: A grant to increase awareness of the societal importance of chemistry to get more students to enroll in chemistry studies

In 2023, the Foundation granted DKK 5 million to the University of Copenhagen for a two-year project with the purpose of increasing the number of students enrolling in Bachelor studies of Chemistry at the Danish universities. The project will develop teaching materials for upper secondary education, engage chemistry teachers in workshops and use real-life examples of chemistry as a core component of the solution to the major societal challenge of making students aware of the importance of chemistry as a field of study. This grant was prompted by the awarding of the Nobel Prize in Chemistry to Morten Meldal, University of Copenhagen, in 2022. The project aims to increase the number of Bachelor students in Chemistry from 82 in 2022 to 180 in 2028 as well as increasing the number of students studying Chemistry (or Biotechnology) at higher levels in the upper secondary schools.

Gender distribution among researchers

In 2023, out of the more than 8,700 people in science who were fully or partly funded by the Foundation's grants, 54% were men and 46% were women (although a significant number of the gender of the funded people was not reported) – the same proportion as in 2022. By the well-documented leaky pipeline effect in academia, the proportion of women at the lower seniority levels exceeded 50%, falling gradually as seniority increased. The Foundation has a diversity policy that aims to support diversity among grant recipients and to ensure equal opportunities and treatment for all applicants. In addition, the Foundation is taking several actions to mitigate bias in evaluation procedures, for instance through partial randomisation (in the Foundation research project grants) and partially blinded assessment procedures (in the NERD programme).

2.2 Supporting organisations, systems and infrastructure

Since 2007, the Novo Nordisk Foundation has continually funded a wealth of larger initiatives designed to facilitate advancements in education, research, innovation and healthcare for the benefit of society.

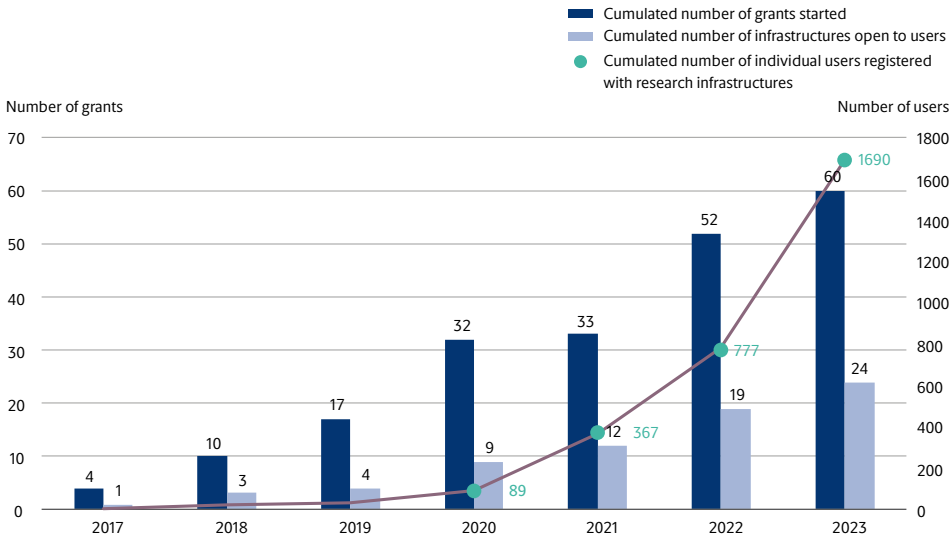
From 2007 to 2021, the Foundation awarded DKK 23.5 billion (EUR 3.3 billion) to organisations, systems and infrastructure initiatives. The Annual Impact Reports of 2020 and 2021 cover the activities of the many different types of organisations, systems and infrastructure initiatives supported in more detail.

In 2022 and 2023, the Foundation has awarded approximately DKK 7.5 billion (EUR 1 billion) to open research infrastructures, education platforms and academies, new research centres, innovation initiatives and a Steno Diabetes Center in the Faroe Islands. The largest new initiatives in 2022 and 2023 were the Novo Nordisk Foundation Center For Vaccines and Immunity (2023), the Novo Nordisk Foundation Quantum Computing Programme (2022), Centre for Childhood Health (2022), continuation of the Novo Nordisk Foundation Center for Basic Metabolic Research (2023), Environmental Impacts of Wetland Restoration in Western Zealand (2023), Danish Diabetes and Endocrine Academy (2022) and Open Discovery Innovation Network (2023). These initiatives alone amounted to DKK 5.1 billion (EUR 0.7 billion).

Research infrastructure grants

Research infrastructure grants differ from research grants and research centre grants as they are focused on giving researchers access to the specific infrastructure needed to achieve excellence in research and innovation. Applicants can apply for fully funded infrastructure projects, including procurement and installation of equipment, building or developing facilities, as well as hiring and training of technical specialist teams to best service the infrastructure and its users.

Figure 2.2.1 Development in the number of research infrastructure grants and availability for users



Source: Novo Nordisk Foundation and Foundgood

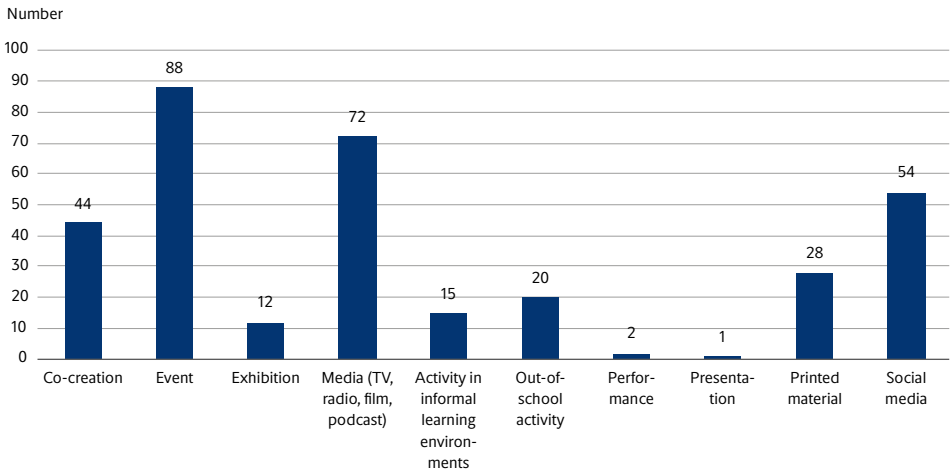
In the period 2016–2023, the Foundation awarded more than DKK 1.9 billion (EUR 255 million) to 60 research infrastructure projects. These are all sizeable projects, typically with a one to three-year implementation phase during a five-year project period. This is illustrated in Figure 2.2.1, which shows that the increased number of infrastructures services a large and growing community of researchers after the implementation phase.

Users are defined as the individuals that the infrastructures service directly. However, more researchers than direct users benefit from their services. Behind each user is a team of researchers that depend on the results from access to the infrastructures, making the impact larger than the mere count of users. By 2023, 1,690 users were reported to have registered research projects with the infrastructures. In 2022, there were 777 users.

Outreach activities building science capital

The Foundation also supports activities that build science capital (e.g. science-related attitudes, knowledge, media consumption, out-of-school learning, family experiences and role models) in children, youths and the population at large. These activities facilitate science-related out-of-school activities and public debates on health, sustainability, science and technology. 131 grants have been awarded in the period 2019–2023 to organisations that build engagement and awareness through societal debates, journalism, exhibitions, science clubs etc. Figure 2.2.2 shows the distribution of outreach grants building science capital through different informal learning activities.

Figure 2.2.2 Number of outreach activities building science capital through communication and informal learning

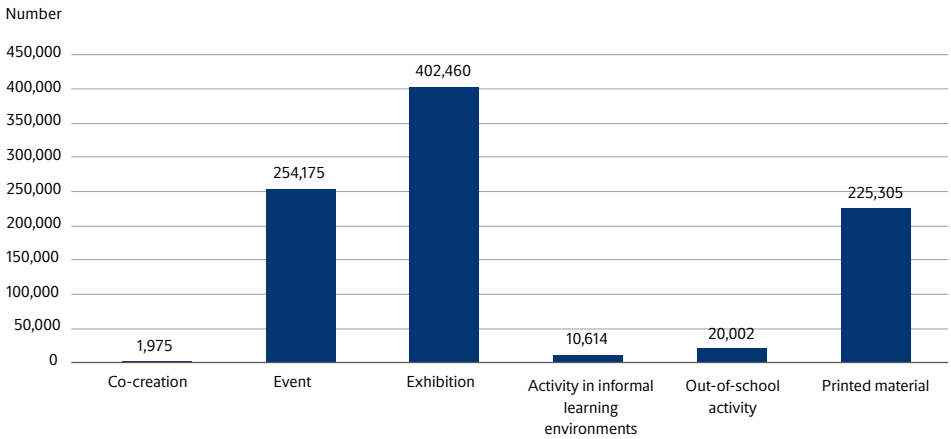


Source: The Novo Nordisk Foundation, Foundgood

The Foundation-supported outreach grants building science engagement and awareness reached nearly 13.7 million participants through many different activities. Most participants are reached through social media (10.1 million participants) and TV, radio, film and podcasts (3.6 million participants), both not shown in Figure 2.2.3. Figure 2.2.3 shows participants in other engagement activities based on the Foundation's outreach grants.

The Foundation also builds science capital in many of the non-outreach specific grants (e.g., research grants, education grants, innovation grants, etc.). The reach and effects of these activities are not covered in this analysis.

Figure 2.2.3 Number of participants in grants building science engagement and awareness



Note: Social media (4.6 million participants) and TV, radio, film and podcasts (1.4 million participants) reach are for clarity not shown in the figure.
Source: Novo Nordisk Foundation and Foundgood

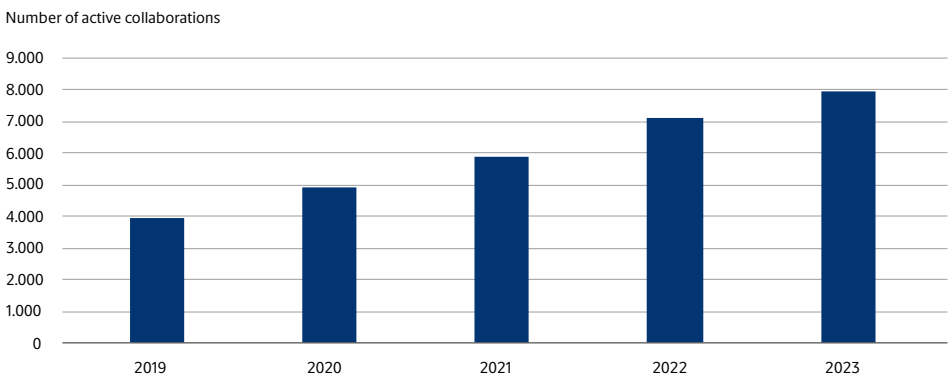
2.3 Stimulating collaboration

In our philanthropic activities, we wish to stimulate collaborations. Collaborations strengthen the life-science ecosystem, support the development of research talent, organisations and institutions and deliver excellent research and innovation. This section details the collaborative nature of the research supported by the Foundation. Collaborations can transcend geographical borders, involve both public and private researchers and build bridges between disciplines. The data show that researchers supported by the Foundation are involved in more international and industry collaborations than other researchers in Denmark. In addition to this, the analysis shows that the Foundation's dedicated interdisciplinary research grants are succeeding in promoting interdisciplinary co-authorship, especially compared to research grants in general supported by the Foundation.

Collaboration projects in Foundation-funded grants

Every year, researchers report active collaboration projects based on the Foundation's grant-giving activities. In 2019–2023, the grantees have reported a growing number of active collaboration projects, from 3,972 in 2019 to 7,967 in 2023 (see Figure 2.3.1). The NNF Dashboard provides details regarding the types of collaborations and collaboration partners.

Figure 2.3.1 Number of active project collaborations reported by grantees, 2019–2023



Sources: Novo Nordisk Foundation, Researchfish®, Foundgood

National and international co-authorship in academia
In the period 2019–2023, 80% of articles authored by Foundation-supported researchers are co-authored with international researchers. This is considerably higher than the 63% share of international co-authorship among all Danish articles published between 2018 and 2021 (the most recent data available - www.leidenranking.com). The proportion of international co-authorship has been steadily increasing from approximately 50% in 2007–2012 but has recently plateaued.

Table 2.3.1 Co-authorship in Foundation-funded journal articles, 2019–2023

Academic co-authorship	Number of journal articles	Share of journal articles
With international research institutions	14,603	80%
With other national research institutions	3,651	20%
Total	18,254	100%
Co-authorship with industry	1,991	11%

Note: The articles categorised as 'co-authored' in Dimensions include: 1) articles co-authored with researchers from two or more national research institutions only, and 2) articles co-authored with researchers from international, academic research institutions.
Sources: Novo Nordisk Foundation/Researchfish®/Impact-of-Science, Digital Science Dimensions.

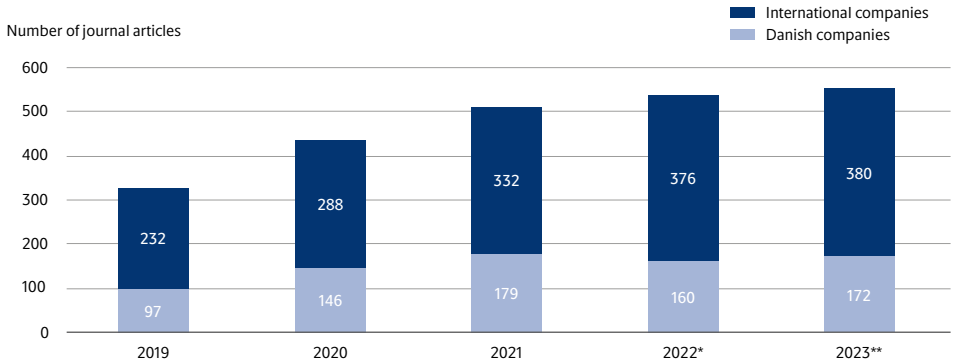
Research co-authorship with industry
Collaboration across national boundaries is often seen as a measure of success. Similarly, co-authorship between academic researchers and those based in industry is valuable, as it points towards collaborations that may move new knowledge into commercial application. Of the Foundation-supported journal articles published by grant recipients between 2019 and 2023, 11% (1,991 articles) were co-authored with industrial researchers. The share is slightly above the average for all Danish journal articles, 10%, published in 2018–2021 (www.leidenranking.com). Of the articles co-authored with industry, 63% concerned medical and health sciences, while one-third of the articles co-authored with industry researchers were within the chemical and biological sciences.

The number of journal articles co-published with industrial researchers has increased from 329 in 2019 to 420 in 2023. The number of different companies co-publishing with grant recipients has increased from around 250 in 2019 to nearly 300 unique companies in 2023. Figure 2.3.2 shows that the growth has largely come through co-publication with international companies. Around 68% of the collaborating companies are international, and the split remains largely the same between 2019 and 2023.

Figure 2.3.3 shows the distribution of Foundation-funded, company-authored journal articles across industry sectors. In 2023, the share of articles co-authored with researchers from the life science industry was 84%. Half of the life science industry-academia articles were co-authored with industry researchers from biotechnology companies. The involvement of life science industry researchers in academic publishing remained largely the same between 2019 and 2023.

Figure 2.3.2

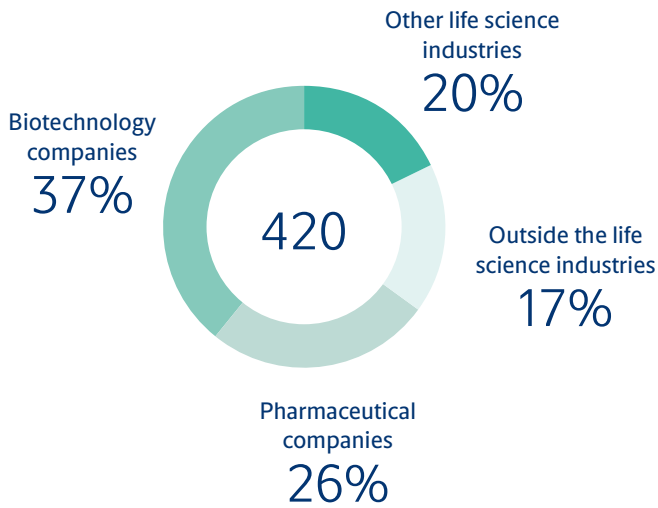
Number of journal articles co-authored with company-affiliated researchers distributed by origin of the company, 2019–2023



Note: *) Preliminary estimate. Distribution of Danish and international companies is likely to be different, due to publication lag.
**) Preliminary estimate. The actual figure is likely to be higher, since every year in January grant recipients also report publications previously omitted. The total of the columns are larger than the distinct number of journal articles, as an article can have both Danish and international industrial co-authors.
Sources: Novo Nordisk Foundation/Impact-of-Science.

Figure 2.3.3

Number of Foundation-funded journal articles co-authored with industry, 2023

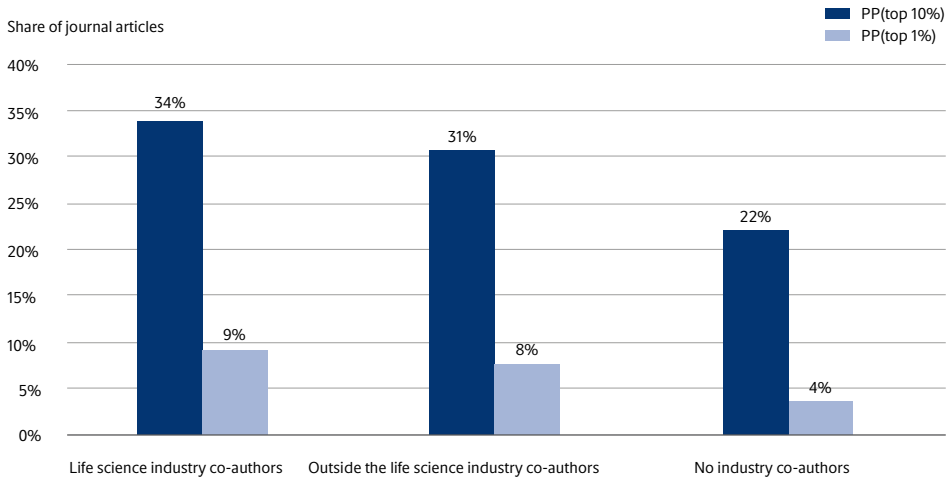


Note: Preliminary estimate. The actual figure is likely to be higher, since every year in January grant recipients also report publications previously omitted.
Sources: Novo Nordisk Foundation/Impact-of-Science.

Figure 2.3.4 shows the share of Fundation-funded journal articles published ni 2018–2021 among the 1% and 10% most cited worldwide. The figure shows both the citation impact of journal articles co-authored by researchers affiliated with a company within the life science industry and outside the industry. The citation impact is slightly higher for life science industry co-authors, PP(top 10%) equals 34% compared to the 31% for co-authors affiliated with companies outside the life science industry. Furthermore, the figure shows that journal articles co-authored with industry partners outperform citation rates of journal articles without industry co-authors by nine to 12 percentage points.

Figure 2.3.4

PP(top 1%) and PP(top 10%) for Foundation-funded journal articles co-authored with industry researchers, 2018–2021



Note: Preliminary estimate.
Sources: Novo Nordisk Foundation/Impact-of-Science.

Interdisciplinary co-authorship

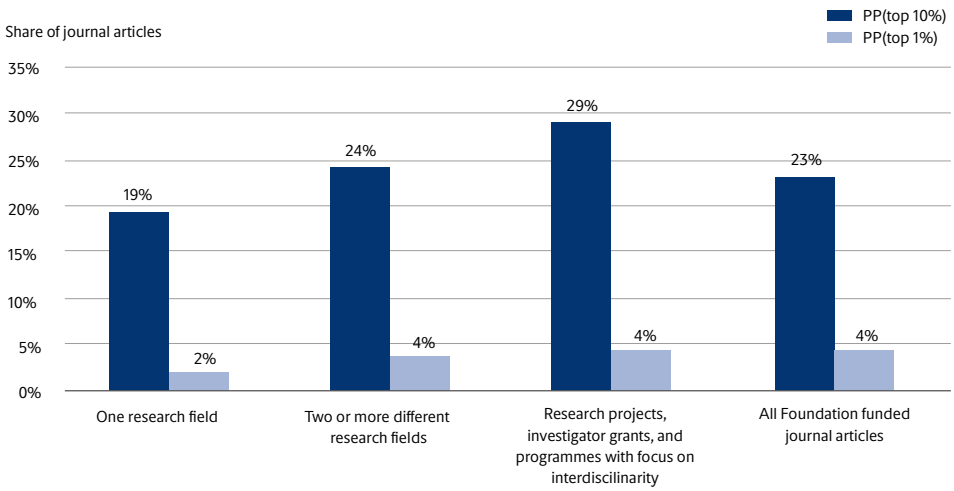
Like international co-authorship and co-authorship with industry, collaboration between disciplines is often valuable because it brings additional perspectives as well as synergies. By examining co-authors' background, journal articles can be classified as monodisciplinary or interdisciplinary. Interdisciplinary co-authorship can link relatively closely related disciplines or reach across a wider spectrum of science. The level of interdisciplinarity used here is based on the OECD field of science top-level categories (medical and health sciences; natural sciences; engineering and technology; agricultural sciences; social sciences; and humanities). These were aggregated from more finely-grained identified academic specialisations, such as endocrinology, microbiology, genetics, physiology, biotechnology, physics, chemistry or bioinformatics.

The analysis shows that the Foundation's dedicated interdisciplinary research grants are succeeding in promoting interdisciplinary co-authorship. Taking a random sample of 20% of the Foundation-funded journal articles for each year between 2018 and 2022, we find that 64% of the articles have been published by authors from 2–4 fields of science. In particular, the output from our dedicated interdisciplinary grant instruments shows that 74% of the journal articles have authors from 2–4 fields of science.

Citation impact of interdisciplinary co-authorship

Figure 2.3.5 shows a PP(top 1%) and PP(top 10%) of 4% and 23%, respectively, for all Foundation-funded articles published in the period 2018–2021. The figure shows both the citation impact by number of fields of science of co-authors, for journal articles reported from interdisciplinary grants and for all Foundation-funded articles. In comparison, PP(top 10%) for all Foundation-funded articles is twice the share for all Danish scientific journal articles.

Figure 2.3.5 PP(top 1%) and PP(top 10%) for Foundation-funded journal articles, 2018–2021



Note: Preliminary estimate.
Sources: Novo Nordisk Foundation/Impact-of-Science.

2.4 Promoting excellent research and innovation

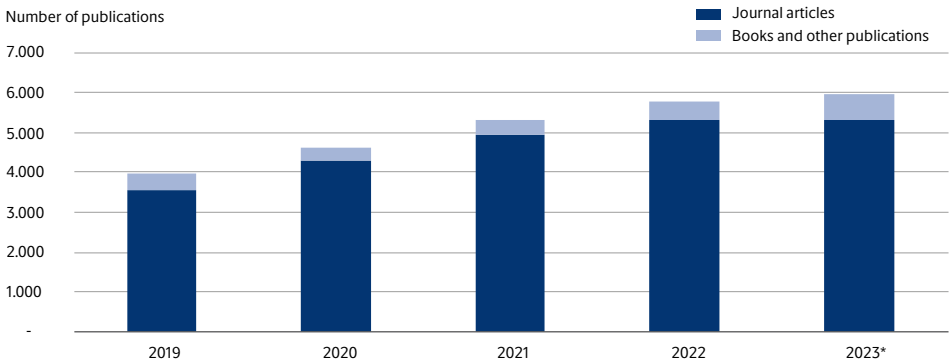
The fourth societal impact principle of the Foundation is to promote excellent research and innovation. The citation impact of the Foundation-funded research has been maintained as the breadth and scale of the research supported increases—one indication that research excellence is maintained in Foundation-funded research.

Foundation-funded research published in journal articles

The amount of research outputs produced by Foundation grant recipients has continued to grow. In 2023, grant recipients reported 5,971 publications supported by the Foundation's funding. 5,309 of these were journal articles, with the remaining 662 made up of a variety of other publications, including policy papers, technical reports, letters, books and book chapters (Figure 2.4.1). Because the recipients of Foundation grants typically obtain additional funding and multiple authors contribute to a publication, most research output is supported by more than one funder or more than one funding instrument of the Foundation. In total for the period 2019–2023, the grantees have reported 23,442 journal articles plus other publications.

Figure 2.4.1

Total number of publications by recipients of Foundation grants, 2019–2023

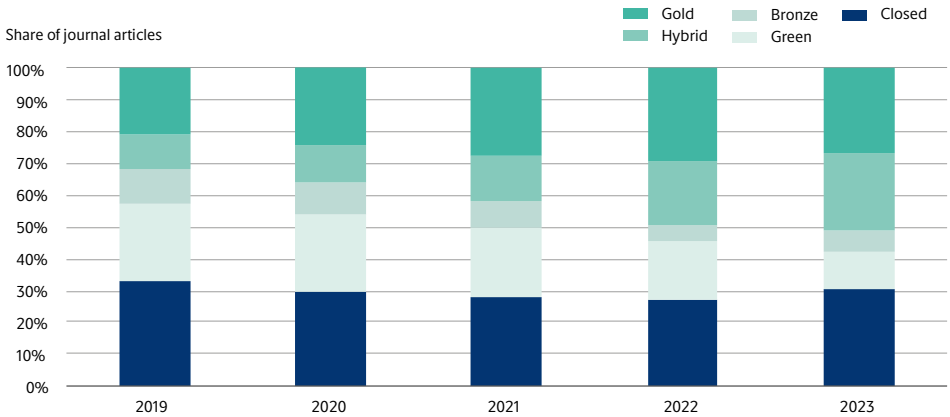


Note: *Preliminary estimate. The actual figure is likely to be higher, since every year grant recipients report publications previously omitted.
Sources: Novo Nordisk Foundation, Researchfish®, Foundgood, Impact-of-Science and Dimensions

In 2023, grant recipients contributed to 8% of the articles published in Denmark, up from 7% in 2020. In addition, the Foundation grants contributed to 1.1%, 1% and 0.7% of the journal articles published from Sweden, Finland, and Norway, respectively.

Figure 2.4.2

Share of Foundation-funded journal articles in open access



Note: Gold - Publication published in a full OA journal, Hybrid - Publication freely available under an open licence in a paid-access journal, Bronze - Document freely available on publisher page, but without an open licence and not in a full OA journal, Green - Free copy of the publication available in an OA repository, Closed - no freely available copy has been identified.
Sources: Novo Nordisk Foundation, Researchfish®, Foundgood, Impact-of-Science and Dimensions

Of the Foundation-funded journal articles, 20% are published in peer-review journals restricted by paywall access. However, Figure 2.4.2 shows that 80% of Foundation funded journal articles are accessible through managed open access. The fraction of journal articles that are shared in open access Gold or Hybrid journals has increased in recent years from 32% in 2019 to 51% in 2023. A Gold publication is published in a full open access (OA) journal and a Hybrid publication is freely available under an open licence in a paid access journal.

Overall citation impact of grant recipients' journal articles
Citation levels give an indication of the rate of dissemination and use of Foundation-funded research in an academic context. For journal articles published in 2018–2021, 4% were among the 1% most cited worldwide, and 23% were among the 10% most cited worldwide. In comparison, the fraction of all journal articles with Danish co-authors among the top 10% most cited articles in the world was 12% for the same period.

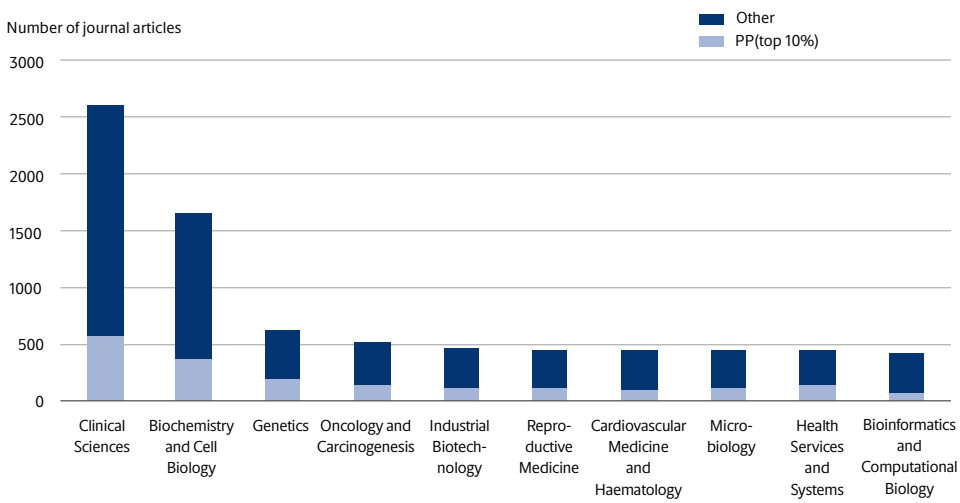
Grant recipients publish in a wide variety of fields of research. The most common is clinical sciences (25%), followed by biochemistry and cell biology (16%), and 4-6% of journal articles were published in the fields of genetics; oncology and carciogenesis; industrial biotechnology; and cardiovascular medicine and haematology, respectively.

While more than 95% of the publications within medical science and natural and technical sciences are journal articles, most of the publications from the Foundation's grantees within the humanities (e.g. research in art and art history) are books, book chapters, dissertations and other types of publications.

Overall, the Foundation grant recipients deliver high impact research within all supported fields of science (Figure 2.4.3). 22% of the 2,595 journal articles published within clinical science are among the top 10% most cited in their field. 22% of the 1,654 journal articles published within the area of biochemistry and cell biology are among the world's top 10% most cited in the field.

Figure 2.4.3

Number of journal articles among the top 10% most frequently cited in the world – PP(top 10%), 2018–2021, and volume of journal articles in the 10 most represented fields of research.



Note: A journal article can be categorised in multiple fields of research.
Sources: Novo Nordisk Foundation, Researchfish®, Foundgood and Dimensions

As the Foundation has grown, so has the diversity in supported funding areas. The disease areas represented in the biomedical and clinical sciences journal articles have also dramatically shifted. Among clinical journal articles published in 2019–2023, 26.5% were with the metabolic and endocrine disease area, down from 31.5% in the period 2013–2017. Nineteen percent were within cardiovascular, 14% within cancer, and 9.5% were within infection disease areas. Clinical articles with infection consituted 6.5% in 2013–2017.

2.5 Developing innovative products and solutions

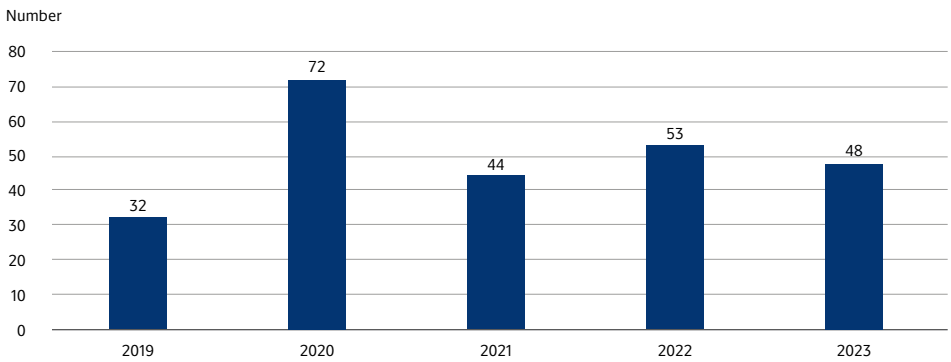
The Foundation supports innovation activities aiming for commercialisation of research discoveries within life science. Research also feeds into the technological and commercial innovation process.

Scientific discoveries and innovative solutions

One of the early steps on the road to commercialisation is when researchers file an 'invention disclosure' based on their new discovery at the research institution where they are based. Ownership and commercialisation rights for the invention are then negotiated and this allows for patent filing, which is often the next step in commercial exploitation. For 2023, grant recipients reported 48 invention disclosures, covering novel and improved processes and products (Figure 2.5.1). For the period 2019–2023, the public research institutions have taken ownership of the invention, corresponding to around two-thirds of the disclosures. Data on invention disclosures has been collected since 2020. There is an expected post reporting which means that the level of reported invention disclosures over the last couple of years will increase.

The submitted invention disclosures predominantly concentrate on innovations aimed at enhancing health outcomes, yet they encompass a wide spectrum of subject areas. The inventions mainly fall within the category of biomedical research, with Biotechnology, as well as Natural and Technical Sciences also being significant fields of interest. Notably, within the Biomedical sector, there are noteworthy inventions specifically targeting obesity treatments and advancements in imaging techniques for cancer detection and diagnosis. These inventions not only aim to address critical health issues, but also demonstrate an approach that combines medical knowledge with technological advancements to improve patient care and disease management.

Figure 2.5.1 Number of invention disclosures reported by grantees, 2019–2023



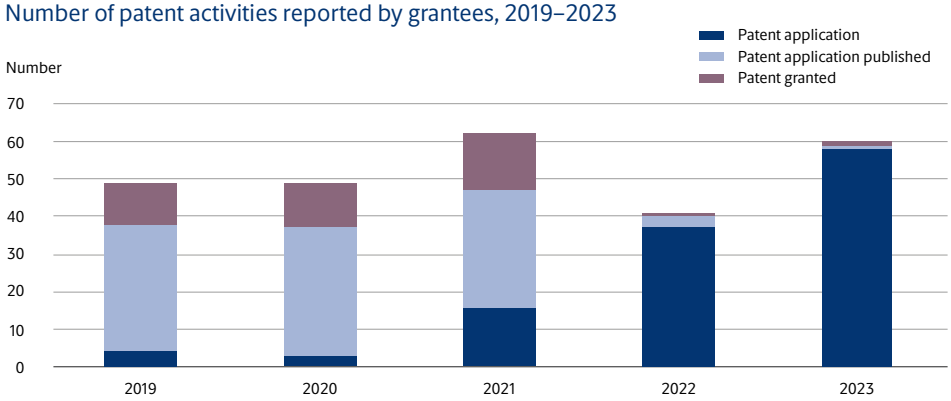
Sources: Novo Nordisk Foundation/ Researchfish®/ Foundgood

Patent innovation activities based on Foundation-funded research

The Foundation grant recipients have reported 238 patent activities (patent applications, published patent applications or granted patents) for the period 2019–2023, including 40 granted patents. In 2023 alone, there were 58 patent applications, which is by far the highest application number of a single year (Figure 2.5.2). The patent activity is distributed between the BioInnovation Institute, the Novo Nordisk Foundation research centres, the Novo Nordisk Foundation open competition programmes and the Foundation's stand-alone initiatives. There is an expected post reporting with a delay of up to three years.

Figure 2.5.2

Number of patent activities reported by grantees, 2019–2023



Sources: Novo Nordisk Foundation/ Researchfish®/ Foundgood

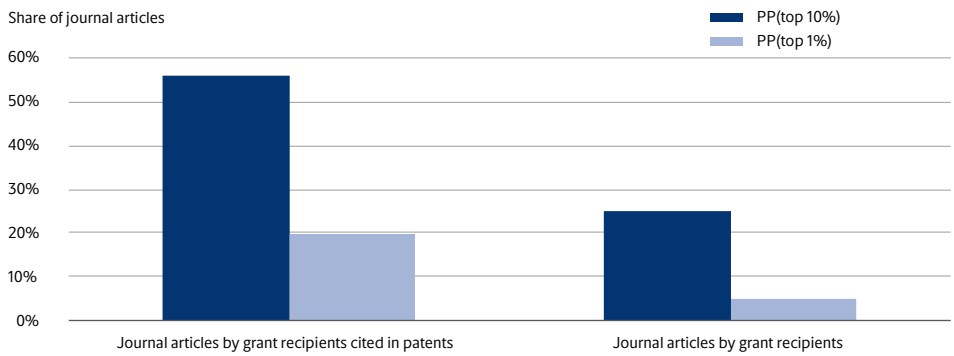
References to journal articles in patents

Journal articles by grant recipients are cited worldwide in patents and patent applications. The Foundation has access to the Dimensions Patent database, which includes data from the European Patent Office (EPO) patent database DOCDB and has worldwide coverage from more than 90 reporting countries, including the countries behind the five biggest offices (the IP5) in the United States (USPTO), the EU (EPO), Japan (JPO), South Korea (KIPO) and China (SIPO) as well as the UN organisation WIPO.

The non-patent-literature of more than 150,000,000 patents were searched and matched with the publications from the Foundation's publication database, which comprises publications funded or co-funded by Foundation grants. In 1996–2023, 1,758 distinct publications from the Foundation's database are cited in 4,985 distinct patents or patent applications. The patent offices group patents and patent applications for similar technologies into patent families. The total distinct number of patent families is 3,494.

Figure 2.5.3

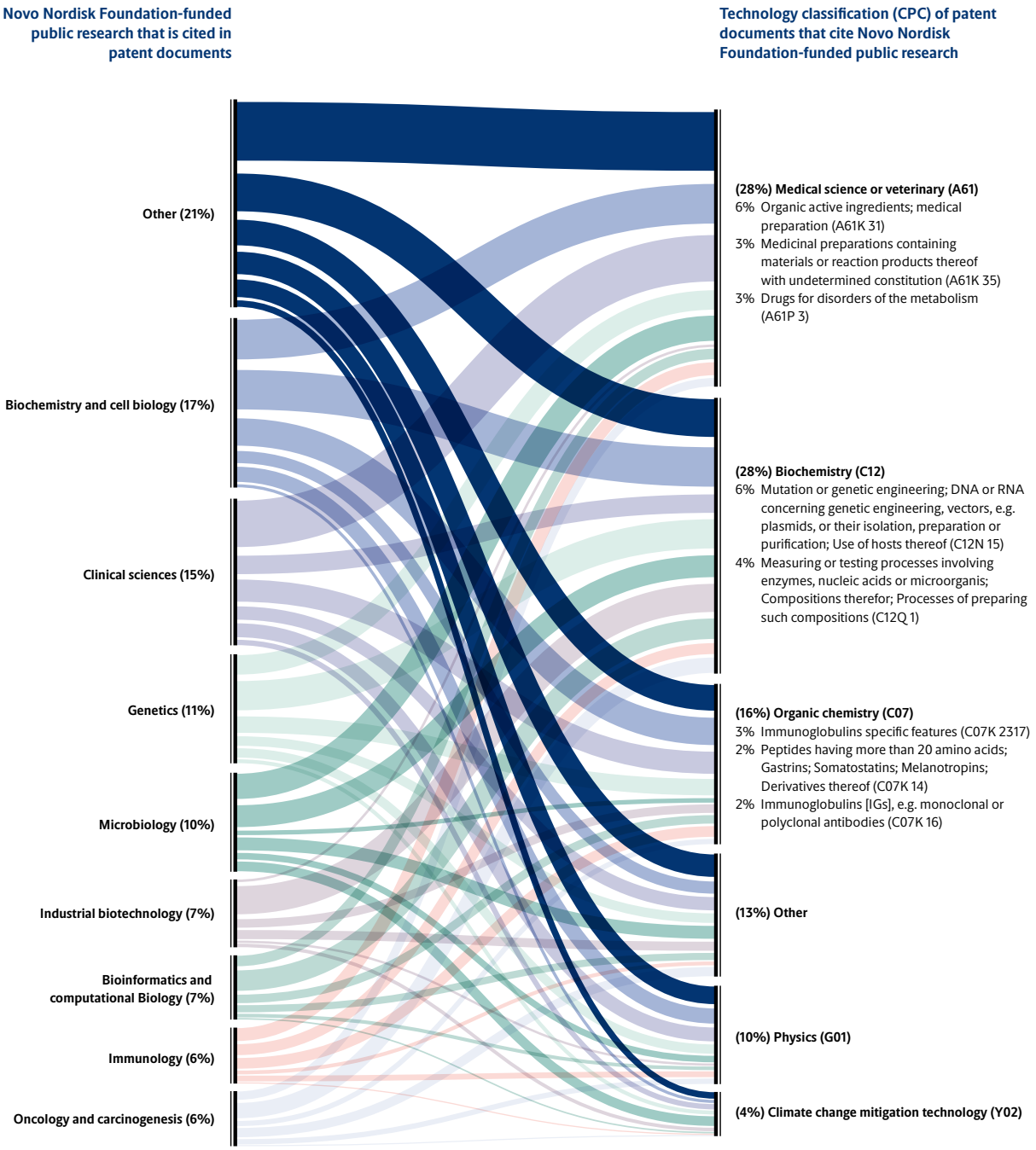
Share of journal articles by grant recipients cited in patents within the 1% and 10% most cited journal articles worldwide, 1996–2021



Sources: Novo Nordisk Foundation, Researchfish®, Foundgood, and Dimensions

A total of 56% of the journal articles by grant recipients cited in patents are among the 10% most frequently cited articles worldwide within their scientific field and year. This is more than double compared to all journal articles by grant recipients (Figure 2.5.3).

Figure 2.5.4 Link between the research field of Foundation-funded journal articles and the technologies of the patents that cite the journal articles, 1996-2023



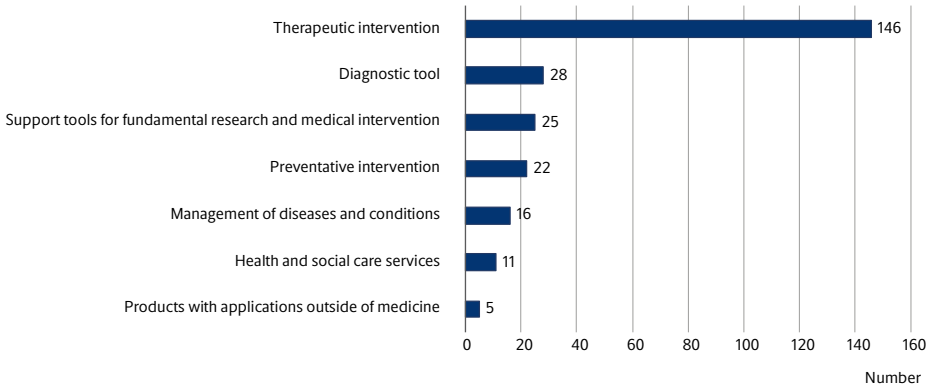
Sources: Novo Nordisk Foundation, Researchfish®, Foundgood, and Dimensions.

Figure 2.5.4 illustrates which field of research the cited journal articles contribute to and what type of patent technology area they map into. The results of this investigation are that 17% of the research fields identified for journal articles cited in patents and patent applications are within Biochemistry and cell biology, 15% within clinical sciences and 11% within genetics. The most common technologies of the patent documents that cite the grant recipients' research are within medical or veterinary science (28%), biochemistry (28%) and organic chemistry (16%).

Products and interventions based on grants within health

Through medical interventions and products, the Foundation's grants might have an impact on health and patient care. For the year 2023, the grant recipients have reported 64 new products and interventions. This corresponds to one in four of the 253 reported outcomes in the category in 2019–2023. Of the interventions and products reported, 58% are therapeutics that directly affect patients, 11% are diagnostics, 9% are preventative interventions (e.g. to increase physical activity in a childhood population), 6% are related to disease management, and 6% are divided between health services and social care services and products with applications outside of medicine.

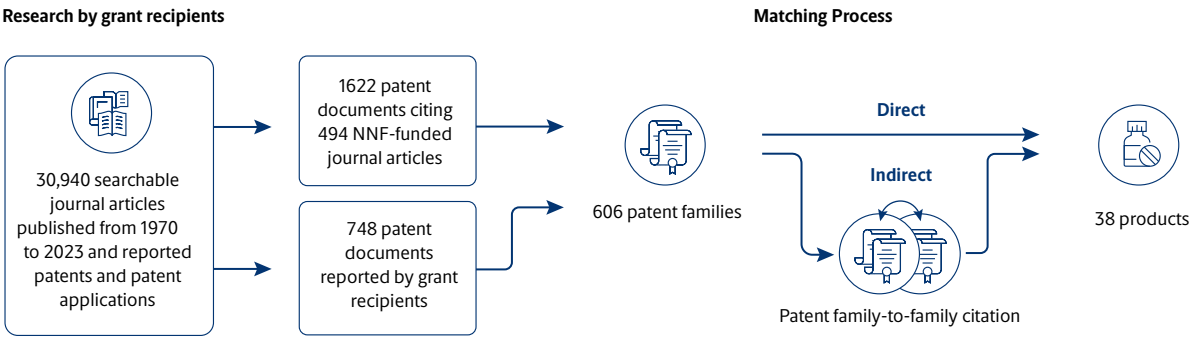
Figure 2.5.5 Products and interventions 2019–2023



Sources: Novo Nordisk Foundation/Researchfish®

Patent innovation activities based on Foundation-funded research
The flow of public research-based knowledge to the private sector (i.e. public research spillover) can follow several pathways. This section examines public research spillover through two primary sources of patent activities. One source is patent documents referencing Foundation-funded journal articles; the second is filed patents reported in Researchfish®. Figure 2.5.6 illustrates the pathways from Foundation-funded research to products. The patent data is either directly matched to a product within a patent family or indirectly matched within family-to-family citations and then to products.

Figure 2.5.6 Public research spillover from Foundation-funded research



Sources: Novo Nordisk Foundation/Researchfish®/Impact of Science; Dimensions; EPO DOCDB

We identify 38 products (for example, Wegovy®, STEGLUJAN™, AERO® Stent) that demonstrate a research-patent-product link to a Foundation-funded grant recipient by using a direct and indirect match of patent documents. The direct match identifies patent family members who also protect a patent, and the indirect match identifies patent-protected products through a patent family-to-family citation.

2.6 Creating jobs and growth

Investments in research, innovation, education and research hospitals also have impact and provide benefit to society through the creation of companies, jobs and economic growth. This section details the direct job-generating effect of Foundation-funded activities covering spin-out companies and employment through grants. The section takes its starting point in creation of spin-out companies, followed by their impact on job generation, and finally a case on assessing the impact and productivity of the companies in terms of their ability to attract additional funding.

Spin-outs and start-ups based on Foundation-supported research
New knowledge generated by Foundation-funded researchers can form the basis of innovation and new companies in the form of spin-outs and start-ups. The spin-out companies are generally established by researchers based in universities or hospitals. The Foundation has offered innovation grants since 2007, which involves funding of early academic research, mentoring, proof-of concept grants, pre-seed grants, advice in commercialisation of research discoveries, follow-on investments and support for exits. The support is provided by the Foundation's initiatives, including the Foundation-funded BioInnovation Institute (BII).

Figure 2.6.1

Spin-outs and start-ups based on grants from the Foundation

Figure 2.6.1a
Reported number of new spin-outs and start-ups based on Foundation grants

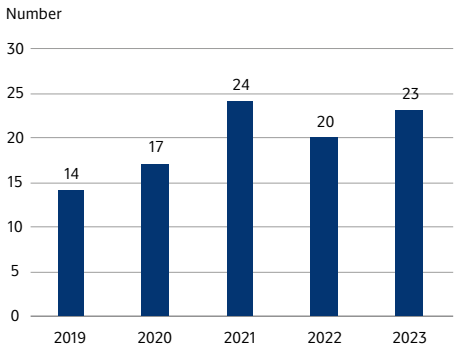
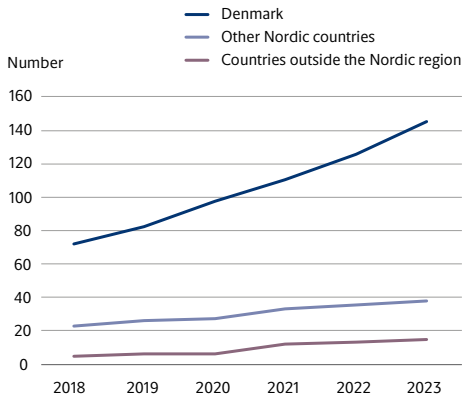


Figure 2.6.1b
Number of spin-outs and start-ups based on Foundation grants



Source: Novo Nordisk Foundation/Researchfish®/ Foundgood

For the year 2023, the establishment of 23 spin-outs and start-ups was reported (Figure 2.6.1a), which brings the total of established spin-outs and start-ups based on Foundation grants including BII to 200 (Figure 2.6.1b). 146 spin-outs and start-ups were established in Denmark, 39 were established in the other Nordic countries and 15 outside the Nordics (Figure 2.6.1b).

At BII another 46 start-up companies that have not been established based on Foundation or BII grants, have been supported. By 2023, these start-up companies employed 243 Full Time Employees (FTEs).

Spin-outs and start-ups attracting additional funding
The ability for Foundation-supported grantees to secure additional funding is a significant indicator of the market's appreciation of their research efforts.

For the BioInnovation Institute (BII), engaging with pioneering entrepreneurs in the life science sector, attracting further investment has been one of the crucial measures of success from the outset. Since BII was initiated in 2018, BII-backed spin-outs and start-ups have attracted DKK 3.4 billion in additional capital, with DKK 1.4 billion - raised in 2023 alone.

For the BII-assisted spin-outs and start-ups that have procured additional funding, the amount averages about fivefold the initial investment received from BII. This leverage demonstrates how a relatively small amount of capital, in combination with the network, infrastructure, knowledge and help lead to the attraction of further investment to these businesses and accelerate their growth. Take for instance a group of three entrepreneurs who launched the Teitur Trophics start-up in 2020. They secured a Series A investment totaling DKK 209 million in 2023. This considerable sum was raised on the back of a DKK 9.7 million convertible loan from BII, with the financing round being spearheaded by Sunstone Life Science Ventures and Sound Bioventures.

Job creation in initiatives, spin-outs and start-ups based on Foundation grants
By 2023, spin-outs and start-ups based on Foundation-funded research accounted for around 1,115 FTEs. 81% were in Denmark, 12% in the other Nordic countries and 7% in the rest of the world.

In line with the increase in the Foundation's payouts, the number of people fully or partly funded by the Foundation's grants has increased from around 5,200 in 2019 to around 9,500 in 2023 (including an estimated 400 employees in humanitarian projects abroad). In 2023, nearly 8,900 of these people were working within science and at the Foundation-funded research hospitals.

2.7 Developing new technologies, therapies and disease prevention

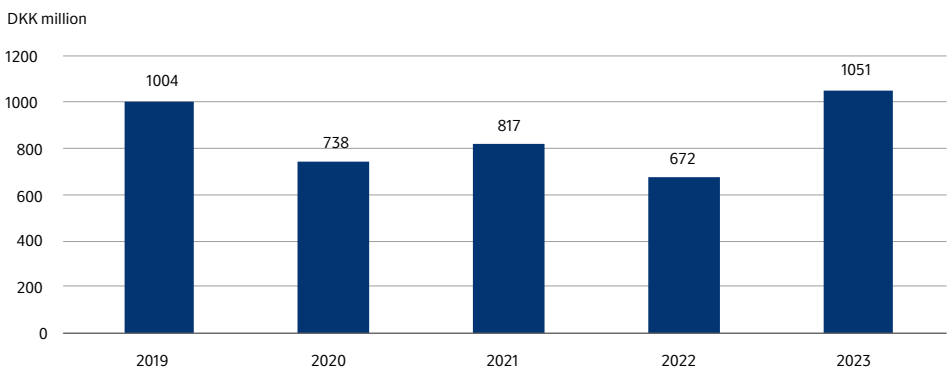
Measuring the impact of the Novo Nordisk Foundation's grant-giving activities in developing new technologies, therapies, patient-centred and research-based care, and disease prevention is essential for driving progress in healthcare. It enables the Foundation to strategically allocate funding and resources, foster innovation, improve patient care and, ultimately, contribute to an improved future health for all.

Clinical Research

The Novo Nordisk Foundation supports, among other fields of science, medical and health science. Within this field of science, the Foundation has supported especially clinical research, from DKK 1 billion, or 21% in 2019 to DKK 1.05 billion, or 14% in 2023.

The funding is for the most part distributed within the Novo Nordisk Foundation areas of Medical Science, Innovation and Infectious Diseases on grants awarded in both open competition (e.g. Research Leader Grants) and as stand-alone (e.g. clinical programmes such as BETA.HEALTH).

Figure 2.7.1 The Foundation's grant amount for clinical research, 2019–2023

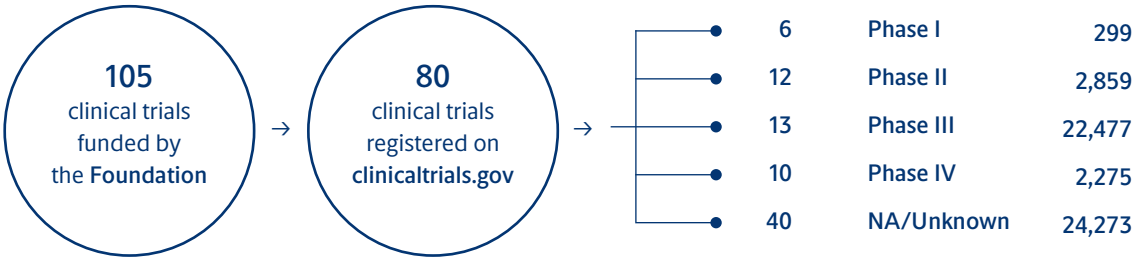


Source: Novo Nordisk Foundation

Clinical trials

The Foundation funds researchers who conduct investigator-initiated clinical trials. Grant recipients have reported a total of 105 clinical trials since 2014 (Figure 2.7.2), of which 80 are registered in the US registry clinicaltrials.gov. Of the 80 clinical trials, 64% were conducted fully or partly in Denmark. In total, more than 52,000 people have been enrolled in these trials. Of the 80 clinical trials, 8% reported on biological sex and ethnic groups of the people participating in the clinical trials.

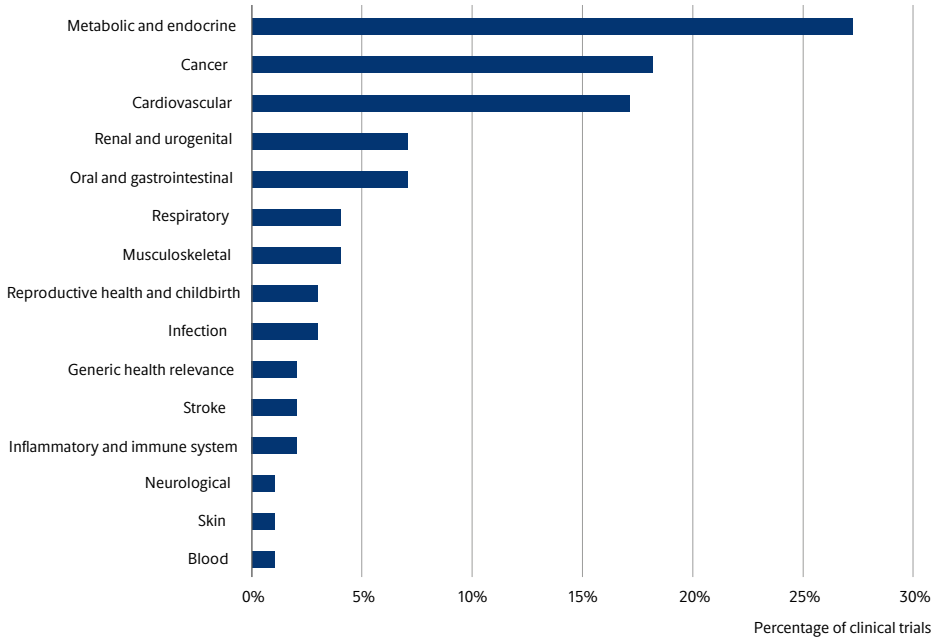
Figure 2.7.2 Clinical trials funded by the Foundation since 2014



Note: Not all clinical trials have to be registered, especially in the early phase I, and might be registered in a different clinical trial registry.
Sources: Novo Nordisk Foundation, Researchfish, Impact-of-Science and clinicaltrials.gov

The clinical trials reported by grant recipients are mostly within the metabolic and endocrine health category, which includes diabetes and obesity (Figure 2.7.3).

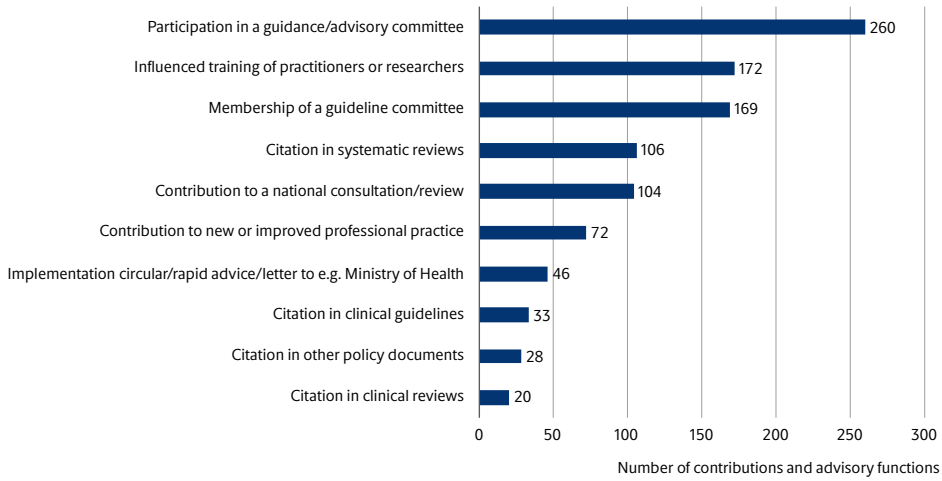
Figure 2.7.3 Health categories for clinical trials, 2014–2023



Sources: Novo Nordisk Foundation, Researchfish® and clinicaltrials.gov

Clinical Guidelines
Clinical guidelines are systematically prepared scientific recommendations drawing together evidence from clinical trials and other research that support healthcare professionals in decision-making. The extent to which clinical guidelines cite research conducted by the Foundation's grant recipients is indicative of the relevance and significance of the research for patients.

Figure 2.7.4 The 1,010 contributions to practice guidelines and advisory functions in 2019–2023



Source: Novo Nordisk Foundation/Researchfish®/Impact-of-Science

Researchers contribute to improved patient care by ,e.g., developing and revising the clinical guidelines, drawing on their own and others' research. Grant recipients reported a total of 1,010 such contributions in the period 2019–2023. In comparison, they reported 548 contributions in the period 2018–2022. Of the 1,010 contributions reported, 17% concern membership of a guideline committee, while 26% relate to participation in an advisory or guideline committee. Related activities are contributions to other policy documents and supporting training of practitioners or researchers. These various activities are broken down in Figure 2.7.4.

Clinical Guidelines within Non-Communicable Diseases
Many Foundation-funded journal articles are cited in guidelines on the treatment of patients within the four Non-Communicable Disease areas (NCDs): diabetes, respiratory diseases, cardiovascular diseases, and cancer. We analysed 1,103 clinical guidelines currently in use. The data includes guidelines published in 2023 and earlier in Denmark, the other Nordic countries, in the United Kingdom and the United States, and by international organisations such as the European Union and the World Health Organization (WHO). Clinical guidelines and recommendations for clinicians are continually updated with the latest achievements in research and new knowledge on patient care. Some are updated annually and others every 5–10 years.

Of these 1,103 guidelines, 162 cited Foundation-funded journal articles, corresponding to 15%. In comparison, last year's analysis showed that Foundation-funded journal articles were cited in 20% of 1,164 current guidelines. Overall, Foundation-funded research was represented to a higher degree in current international guidelines compared to guidelines from the Nordic countries. The exception being cancer guidelines, where the representation was equal in the Nordic and International guidelines.

Figure 2.7.5 Overview of Foundation-funded journal articles cited in guidelines

Clinical guidelines

within diabetes

Historically, the Foundation has focused on diabetes and its complications. The analysis of 126 current guidelines within the diabetes area showed that 51% included research published by the Foundation's grant recipients.

Clinical guidelines

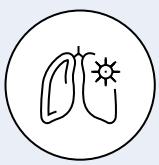
within cardiovascular diseases

Of the 351 current guidelines studied here, the Foundation's grant recipients contributed to 16%. The largest proportion of contributions from grant recipients were seen in the most recent international guidelines (40%).

Clinical guidelines

within cancer diseases, including screening

Of the 419 current guidelines analysed, Foundation-funded research contributed to 8%. In the most recent guidelines, contributions from grantees were seen in 12%.



Clinical guidelines

within respiratory diseases

Of the 207 current guidelins within non-communicable respiratory diseases, the Foundation's grant recipients contributed to 4%. Of the 93 guidelines published between 2019 and 2023, Foundation-funded research contributed to 9%.

Notes: Guidelines parsed for references using Chat-GPT-based text mining
Source: Novo Nordisk Foundation/Researchfish®/Impact-of-Science

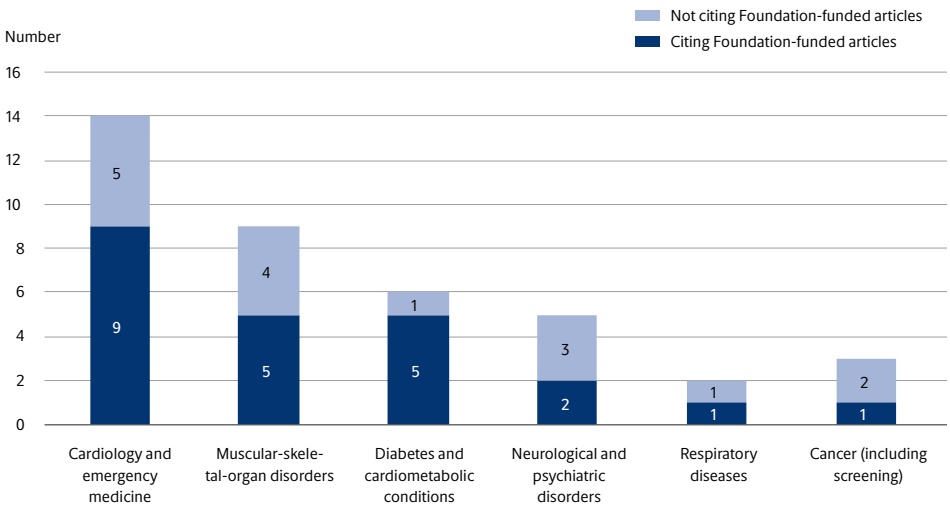
Documentation in patient quality databases

The Danish Clinical Quality Programme (National Clinical Registries) facilitates the development and reporting of quality indicators and standards for good clinical practice to improve the overall quality of medical practices and patient treatment in the Danish hospitals. Of the 83 Danish clinical databases, 39 databases have published documentation of the evidence in reports with references to scientific literature (as of December 2023).

Documentation reports provide a systematic overview of the scientific evidence behind the choice of indicator variables in the patient quality database and link the discoveries published in scientific journals to patient treatment and outcomes. Of the 39 documentation reports in

this year's analysis, 23 cite Foundation-funded journal articles. Last year's analysis found 17 documentation reports that cited Foundation-funded articles. The distribution within disease areas is shown in Figure 2.7.6.

Figure 2.7.6 Number of documentalist reports citing Foundation-funded articles



Source: Novo Nordisk Foundation/RKKP (Danish Regions)

Number of people treated and quality of treatment at the Steno Diabetes Centers
The Steno Diabetes Centers aim to advance all aspects of diabetes care in Denmark across a patient's lifetime through a public–private partnership model. The Foundation funds new up-to-date diabetes hospital buildings, diabetes research, education of nurses and doctors and state-of-the-art care for diabetes patients. The aim of this modernisation is to boost the development of diabetology and increase the life expectancy and quality of life for people with diabetes in the Danish Realm. The centres provide a wide range of healthcare services related to diabetes and the prevention of co-morbidities, including diagnosis, treatment, eye scanning and examination, podiatry and dietary guidance supplemented by tuition in food laboratories.

The number of patients treated by the Steno Diabetes Centers has continued to increase. The total number of people treated at the Steno Diabetes Centers was approximately 7,000 in 2017, and close to 30,000 by the end of 2023.

Steno Diabetes Center Copenhagen Case: Stenopool: Glucose monitoring metrics in individuals with Type 1 Diabetes (T1D)
Stenopool is a shared upload platform for pumps and sensors as it monitors T1D patient data 24/7, resulting in fewer diabetes consultations. The Stenopool system creates new possibilities for data-driven treatment. The platform includes transmitted blood sugar values and insulin dosages, allowing healthcare providers to contact patients when regulation challenges arise. For some, this means minimising the need for consultations. Stenopool gathers data from all insulin pumps, sensors, and blood sugar devices in the region. Stenopool has been in use at Steno Diabetes Center Copenhagen since 2021, encompassing data from nearly 7,000 patients at the centre. Currently, 60% of T1D patients upload their data to Stenopool during their consultations, and this number is increasing.

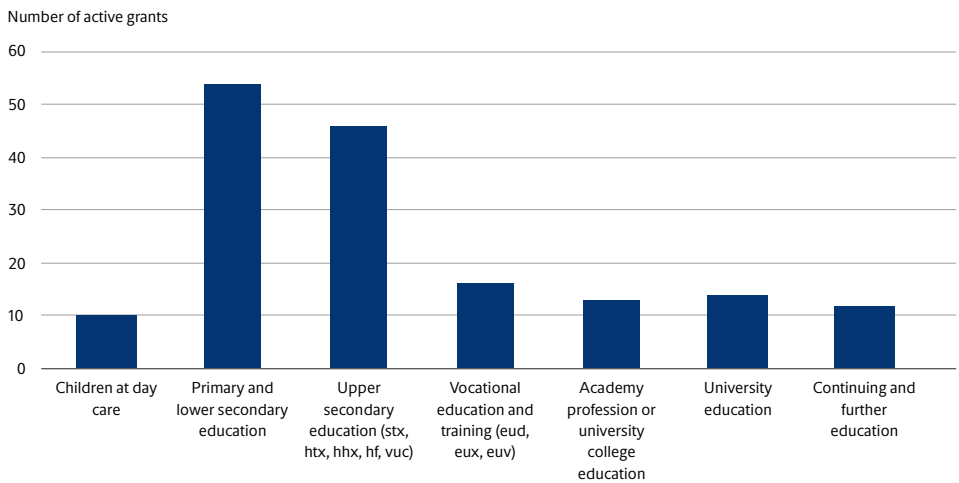
The latest development of Stenopool includes integration with the region's Health Platform data warehouse and direct connections to pumps and sensors from manufacturers' data platforms, with the first two integrations now in place. For patients, this means eliminating the time-consuming manual data transfer before consultations. In the long run, Stenopool is expected to expand nationally and internationally, contributing to new research in diabetes technology and the development of new algorithms for decision support during consultations[3].

2.8 Supporting the development of world-class education

The Novo Nordisk Foundation awards teaching and learning grants at all education levels, from day care to continuing and further education. The purpose is to cultivate interest, knowledge and competencies in health, sustainability, natural science and technology.

In 2023, the active teaching and learning grants, excluding the LIFE initiative, totalled 130 projects with an average grant size of DKK 4.54 million. Figure 2.8.1 shows that most of these grants are directed at primary and lower secondary education and at upper secondary education. The Foundation has supported these education levels with stand-alone grants as well as through open competition since 2018, while support for university and further education is an emerging area.

Figure 2.8.1 Number of active grants per education level (2023)

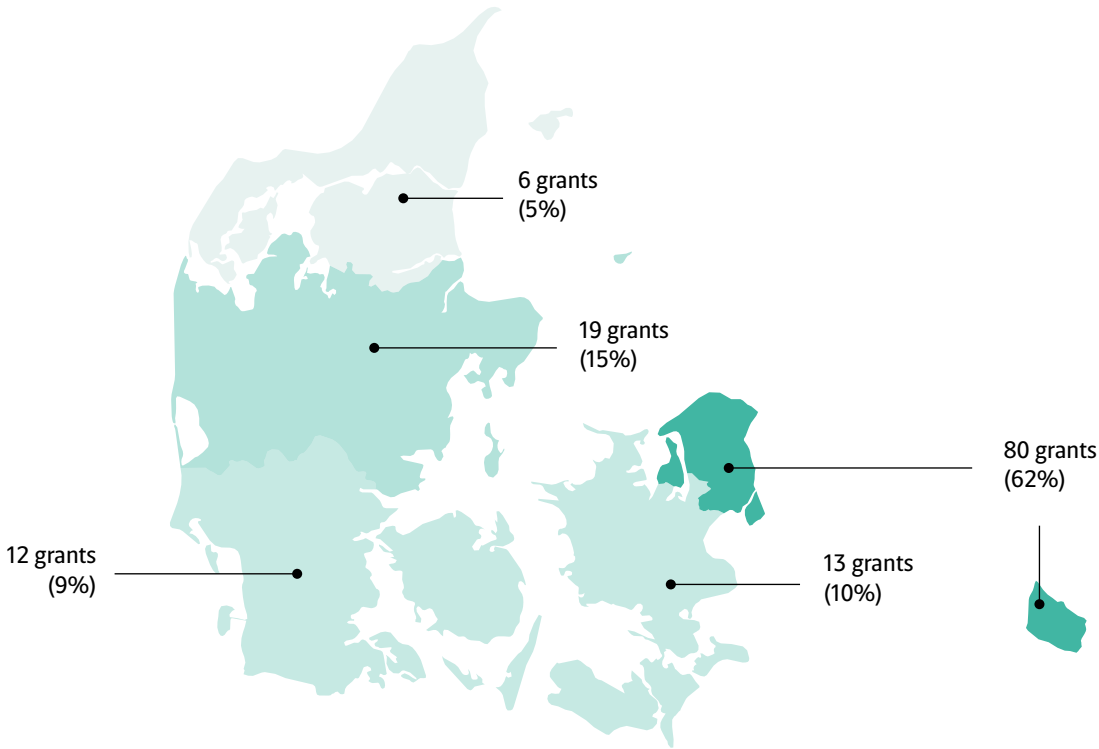


Note: The total across all groups do not reflect the total number of grants as a grant can adress multiple education levels
Sources: Novo Nordisk Foundation, Foundgood, Researchfish®

[3] Nørgaard et al.(2023) Glucose Monitoring Metrics in Individuals With Type 1 Diabetes Using Different Treatment Modalities: A Real-World Observational Study. Diabetes Care 2023 Nov 1;46(11):1958-1964.

Grantees located in the capital region of Denmark host the largest number of grant recipients, 62% of the active grants in 2023. The remaining four Danish regions share the remaining 38% with some variations between the regions, institutions in Central Denmark region holding 19 grants and North Denmark region has received 6 grants, cf. Figure 2.8.2.

Figure 2.8.2 Number of active education initiative grants (2023) per region in Denmark



Sources: Novo Nordisk Foundation, Foundgood, Researchfish®

The supported education initiatives have three main activities: 1) learning activities for pupils and students to engage in face-to-face interaction (e.g. at schools, universities, museums' school services); 2) development of teaching materials, methods or resources (e.g. learning games, websites or experimental equipment); and 3) continuing professional development for teachers. In 2023, the Foundation's support for learning activities and teaching resources reached 286,000 participating students within primary and lower secondary education, making this the largest target group for Foundation-funded educational programmes (Figure 2.8.3a).

Figure 2.8.3a and Figure 2.8.3b show that the developments of learning activities and teaching resources have reached a large group of people in primary and lower secondary education as well as the upper secondary education. Some grants imply that students who participated in learning activities also participated in the education resources development activities.

42% of all grants target both students and teachers and have dual focus on providing learning activities and teacher professional development. Figure 2.8.3b shows that initiatives addressing further education and competence building reached 6,082 science teachers in primary and lower secondary education in 2023.

Figure 2.8.3a

Number of children and students affected by Foundation-funded activities in 2023

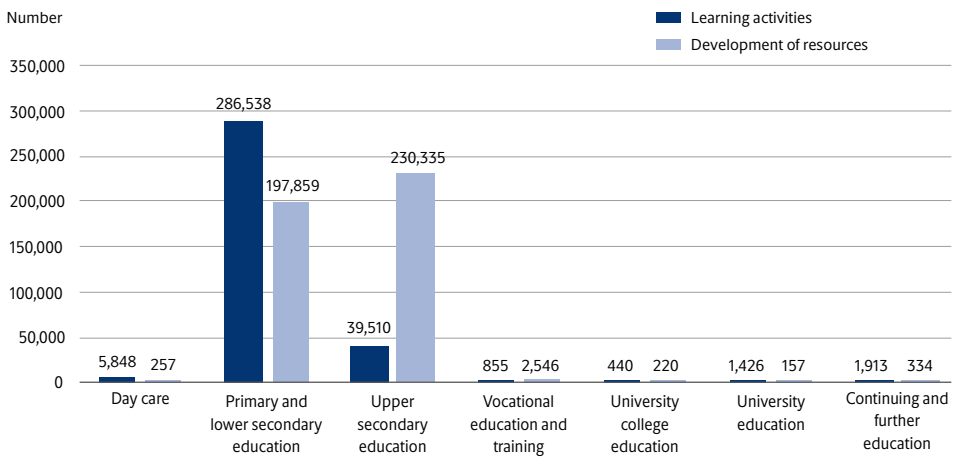
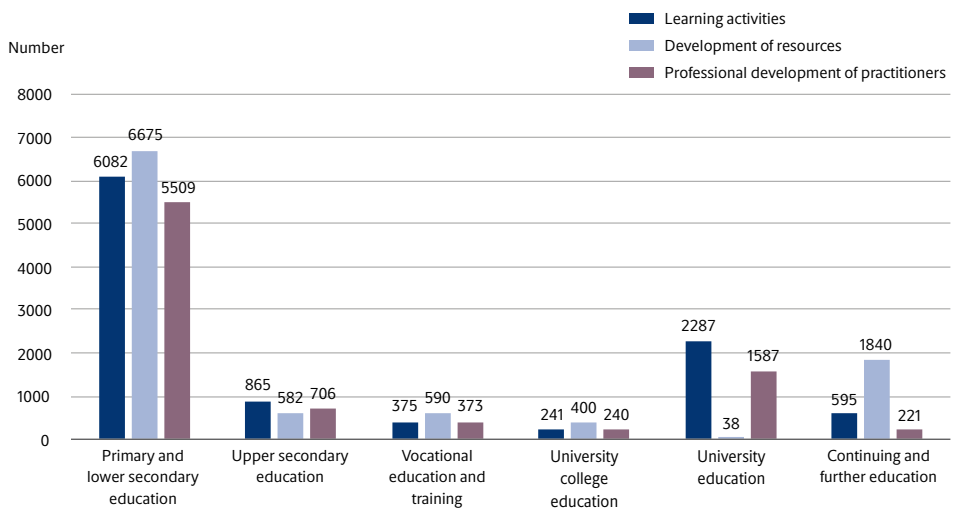


Figure 2.8.3b

Number of teachers involved in Foundation-funded activities in 2023



Note: The number of participants are not the same as the unique number of students and teachers, respectively, since some individual students as well as individual teachers might participate in more than one activity.

Sources: Novo Nordisk Foundation, Foundgood, Researchfish®

The largest single grant within education is the stand-alone grant covering the activities of the LIFE Foundation, which was DKK 392 million in 2022–2023. LIFE reached 211,485 students in 2023. The other grants targeting primary and lower secondary education are distributed across several different grant holders such as associations, organisations (culture, aid, education, research etc.), universities, schools, municipalities etc. (see Table 2.8.1). This shows the diversity in the Foundation-funded activities and types of institutions.

Table 2.8.1

Foundation-funded teaching and learnings activities targeting primary and lower secondary education (2023)

Grant holder organisation	Number of grants	Number of participants (students and teachers) reached
Aid organisation	2	2,502
Association & Federation	6	7,526
Company	2	396
Culture organisation	5	4,920
LIFE Foundation	1	211,485
Municipality	8	5,223
Other education organisation	5	6,487
Other research organisation	1	947
Primary and lower secondary school	2	5,620
University	7	42,517
Upper secondary school	3	162

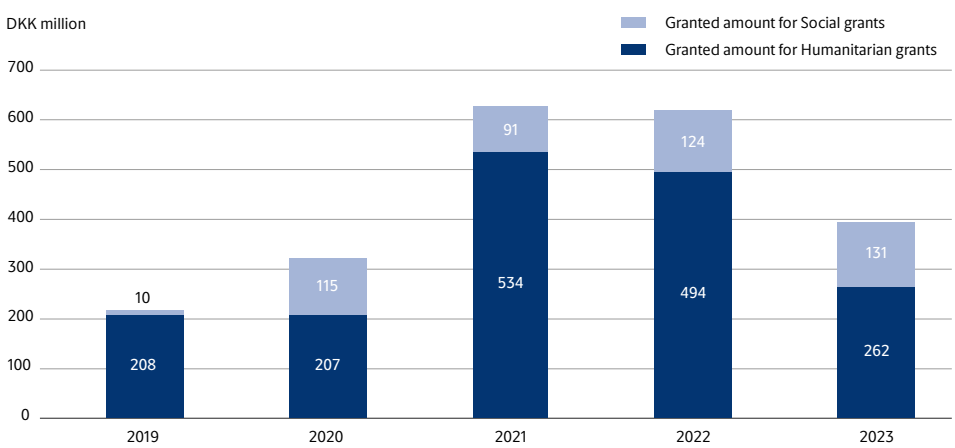
Sources: Novo Nordisk Foundation, Foundgood & Researchfish®

2.9 Supporting people in vulnerable positions in social and humanitarian settings

Foundation's support for social and humanitarian causes has increased in recent years. 416 grants have been awarded, amounting to a total of DKK 2.4 billion from 2019–2023.

Figure 2.9.1

Grant amount for social and humanitarian causes (in DKK million)



Source: Novo Nordisk Foundation

Supporting people in vulnerable positions in Denmark through social grants
Through the Foundation's social grant activities, the Foundation supports causes to reduce inequity in health with a focus on people in a vulnerable position. 97 social grants were awarded, and in total DKK 471 million (EUR 63 million) was granted from 2019–2023.

A social grant focusing on children in a vulnerable position in underserved communities ("The GAME Project") has, over the past three years, worked on improving the following five elements: 1) Playmakers Education, 2) Involving and engaging parents, 3) Working closely with the local community and partners, 4) Focusing on girl participation and initiatives, and 5) Supporting coordinators. Two education camps have been organised for the Playmakers each year, with an average of over 200 individuals participating annually. In 2023, 49% of the participants were female. Efforts to involve more female volunteers, particularly with children, have yielded positive results. The proportion of females attending the weekly sessions started in 2019 with a 49% female participation share, then it decreased by 10% in 2021 and went up to 47% in 2023, with a total attendance reaching 11,126 (Figure 2.9.2).

Additionally, the focus has been on reaching children who are not involved in other sports or activities outside of school. In 2023, 54% of the kids in GAME's practices were not participating in any other activity, up from 45% in 2022. The goal of providing children and youths with alternative friend groups and communities has resulted in 91% of children feeling part of a larger community in GAME.

Figure 2.9.2 Effects of participation in GAME

2023
After children participated in GAME

91% Feel part of a larger community

75% Believe more in themselves

85% Have made new friends

71% Learn things that they feel they can use in other areas of their lives

77% Get to know people with another background

53% Are better at resolving conflicts

2023	2022	2021
182 (49% female) Playmakers	183 (46% female) Playmakers	199 (48% female) Playmakers
11,126 (47% female) participants	10,850 (39% female) participants	9,390 (37% female) participants

Source: GAME

As of the end of 2023, the programme held approximately 50 weekly practices throughout Denmark, depending on the indoor or outdoor season. Ten of these practices are the new initiative GAME Girl Zone, which focuses on including girls with no prior experience in sports and exclusively uses female role models.

Steno Diabetes Center Copenhagen is currently evaluating the GAME Community programme. The evaluation results will be presented in 2025 and relate to physical activity levels in GAME activities, the programme's ability to reach and retain children, and the functioning and mechanisms of the five GAME Community elements.

Supporting people in vulnerable situations in low- and middle-income countries
The Foundation's engagement in low- and middle-income countries (LMICs) aims to reduce inequities in health for people in vulnerable situations, such as people who have been displaced due to conflict or disaster. In the period 2019–2023, the Foundation has had a particular focus on reducing the burden of Non-Communicable Diseases (NCDs) and improving opportunities for youth through a wide range of partnerships with organizations such as the World Diabetes Foundation (WDF), the Red Cross, UNICEF, PlanBørnefonden, and the Danish Refugee Council. In this period, the Foundation awarded DKK 1.2 billion (EUR 159 million) for projects in Jordan, Lebanon, several countries in East Africa and additional geographies.

Since 2020, the Foundation has been responding to the impact of the Syrian conflict in Lebanon and Jordan. Of the 5.4 million displaced Syrians due to the crisis, Lebanon and Jordan are hosting more approximately 1,5 million. A major health challenge in the region is the high burden of NCDs including diabetes and hypertension. Economic crisis and rising levels of poverty have made access to health services and economic opportunities increasingly challenging for both refugees and host communities.

Results from the Danish Red Cross project 'Bridging the NCD gap' in Lebanon (2021–24)
In 2021, the Foundation launched the multi-partner project, 'Bridging the NCD gap'. It aims to support the integration of NCD services at the primary health care level to ensure that people affected by displacement and crisis have access to affordable prevention, treatment, and care for NCDs. The project is implemented by the World Diabetes Foundation and the Danish Red Cross, each applying their unique mandates to work with local partners. The project is a partnership between the World Diabetes Foundation and the Danish Red Cross, each applying their unique mandates to work with local partners. The Foundation's partnership with the Danish Red Cross supports the implementation of an integrated primary and community care model for NCDs through a network of 36 health facilities and 12,000 community care volunteers operated by the Lebanese Red Cross in underserved communities across the country. A promising component of the care model centers on patient education through a peer group approach facilitated by social workers.

A unique feature of the project is the interplay between capacity building, service delivery, and learning through research, which is made possible by the contributions of multiple partners. While the Foundation has supported improved access to NCD services for vulnerable communities, the learning component has been made possible through the initiative 'Partnering for Change' supported by Novo Nordisk A/S. It aims to develop evidence-based models of care for humanitarian settings by engaging international and local academic partners and research. Combined, this support has enabled the Red Cross to develop an evidence-based patient education model for persons with diabetes and hypertension, showing promising results that can be scaled up in the country.

Key outcomes of the Red Cross project 'Bridging the gap':

NCD services integrated into six 'model health facilities' including screening protocols, training of nurses and social workers, patient education, and medications management and procurement procedures, which have ensured a continuous supply of medicine even during national shortages.

Screening of 7,321 persons and **diagnosis and referral of 2,885 persons with NCDs.**

Health services delivered to approximately 44,000 unique patients, including approximately 10,000 patients with diabetes and hypertension.

A peer support group model for patient education and support was established, and 22 peer support groups with patients have benefitted from psychosocial support. **This approach has been applied as** a standard in all 36+ health clinics and mobile medical units managed by the Lebanese Red Cross.

Results from Resilient Youth, Socially & Economically (RYSE) project in Jordan (2020–2023)
In 2020, the RYSE project was launched by a consortium led by the Danish Refugee Council and with partners Mercy Corps, Generations for Peace, Jordan River Foundation, and INJAZ. The RYSE project received DKK 120 million in funding from the Novo Nordisk Foundation. The project aimed to empower displaced and conflict-affected Syrian youth, as well as vulnerable host-community youth, to take an active part in their community, better their opportunities for meaningful employment, and thus improve their future. Since then, more than 25,000 conflict-affected Syrian and host-community youth have been empowered, and more than 600 home-based businesses have been developed to benefit business owners and their families. Moreover, the RYSE project has developed capacity among government staff and institutions and established an investment facility to support businesses in employing youth, thereby ensuring the sustainability of the RYSE project. In addition, the Graduation Approach – a very successful approach in low-income settings – has been adapted to the middle-income context of Jordan, showing promising results and considerable interest among government, international agencies, and non-governmental organisations. Because of the success of and the interest in the Graduation Approach used in a middle-income context, the Danish Refugee Council has received a follow-up grant to make a detailed evaluation of the use of the Graduation Approach in the RYSE project and to disseminate the learnings such that the approach can be used in other middle-income countries hosting refugees.

Results from the World Diabetes Foundation (WDF) – Novo Nordisk Foundation partnership on NCDs.

WDF has been a strategic partner to the Foundation in reducing and managing the burden of NCDs in LMICs since 2018. The Foundation has awarded a total of DKK 289 million in multi-year grants to WDF to scale up NCD prevention and care in countries like Tanzania, Jordan, Lebanon, and Kenya and support the role out of the WHO Global Diabetes Compact. Grants have further been aimed at integrating NCD prevention and care in humanitarian response programmes in partnership with the United Nations Refugee Agency (UNHCR). The project-specific grants have been co-funded by WDF with a total of DKK 69 million. In addition, WDF has raised co-funding from other partners amounting to a total of DKK 202 million in cash or in-kind contributions.

In 2023, it was agreed to strengthen the strategic partnership between WDF and the Foundation by establishing a seven-year Partnership Framework Agreement covering 2024–2030 (DKK 260 million). The partnership will focus on strengthening the health system for improved NCD care and primary prevention efforts, creating health-promoting environments that increase the opportunities for healthy living and healthy pregnancies for vulnerable groups. Furthermore, with this partnership we aim to strengthen the integration of diabetes and NCD prevention and care in humanitarian response programmes and improve access to care for people living with Type 1 diabetes in LMICs. To accelerate the financing and implementation of scalable solutions for prevention and access to care for diabetes patients in LMICs, WDF engages in innovative financing solutions. The collective activities of these interventions will work towards accelerating NCD prevention and care for vulnerable populations, thereby ultimately contributing significantly towards bringing change for people at risk of or living with diabetes in LMICs by reducing morbidities and preventable deaths caused by diabetes and related NCDs.

Results since 2018 of the partnership between the Novo Nordisk Foundation and the World Diabetes Foundation

8,289 health care professionals trained.

163,233 patients receiving treatment at supported clinics.

141,740 people screened for diabetes.

117,057 children, parents and teachers trained in healthy living and prevention.

21,640 children with Type 1 Diabetes enrolled in care programmes.

16 strategic partnerships established, including WHO, UNHCR, and ministries of health to create policy change for improved NCD care.

3

The societal impact of commercial activities

The commercial purpose of the Novo Nordisk Foundation is to provide a stable basis for the commercial and research activities of the life science portfolio of companies, which the Foundation controls through Novo Holdings A/S or has a substantial investment in (stakeholder share). This includes Novo Nordisk A/S and Novozymes A/S. Notably, Novozymes A/S will change its name to Novonesis A/S during 2024.

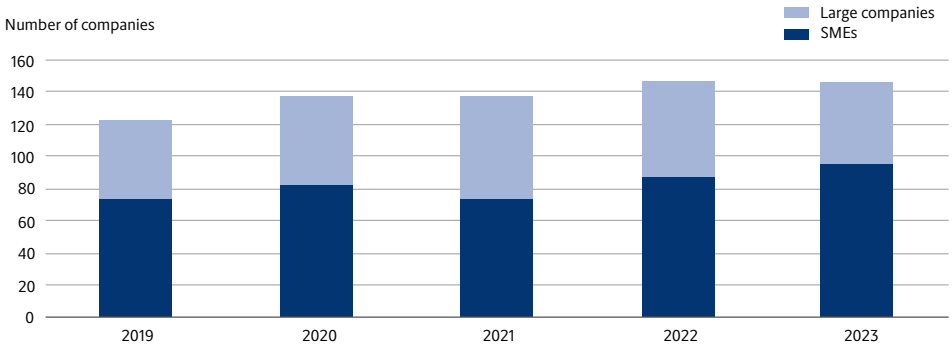
This chapter details some of the societal impacts of these commercial activities. The impacts vary greatly, both because of the different nature of the activities and because the data related to these are very different. The societal impact of the commercial activities is also different from the impact of the philanthropic activities, as the companies controlled and invested in are already established with pipelines of products, services and clinical trials, and in some cases are mature multinational companies with high turnover and many users of products and services.

This chapter focuses on the Novo Group and equity investments in life science companies where Novo Holdings' ownership share exceeds 5%. Unless stated otherwise, the analyses include Novo Nordisk A/S, Novozymes A/S and Novo Holdings A/S.

3.1 Fostering the development of talent

The size of Novo Holdings' company portfolio has grown since 2019, both in terms of the number of companies and of employment. Since 2019, the number of companies in the portfolio has increased by 19%, from 123 companies in 2019 to 146 in 2023 (Figure 3.1.1).

Figure 3.3.1 The number of life science portfolio companies, 2019–2023



Note: The portfolio is here defined as companies with equity investments in life science companies and includes Novo Nordisk A/S, Novozymes A/S and Novo Holdings A/S.
SME: Small- and medium sized companies.
Sources: Novo Nordisk Foundation and Novo Holdings A/S.

A large proportion of companies in the life sciences portfolio fall within the small- and medium-sized category (SME), including investments in start-up companies with future potential for growth. The size of the SME portfolio has grown from 73 in 2019 to 95 SMEs in 2023 (Figure 3.1.1).

The company portfolio consists of very research-intensive companies, which is reflected in the research talent employed in these. Our estimates for 2023 indicate that the life sciences companies employed more than 500 PhDs and 100 MDs, excluding - Novo Nordisk A/S and Novozymes A/S. Novo Nordisk A/S and Novozymes A/S have a high R&D ratio, with approximately 10% of their employees dedicated to research and development.

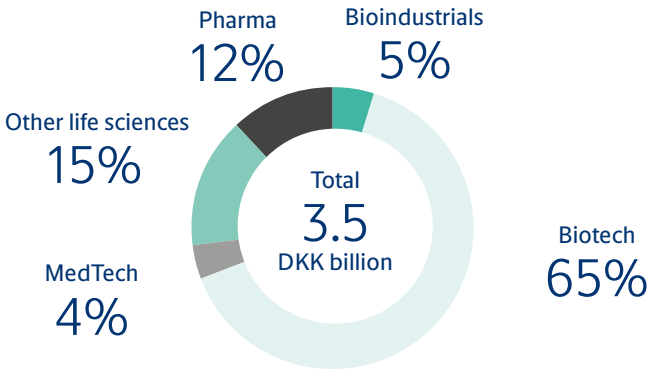
3.2 Supporting organisations, systems, and infrastructure

One of the Foundation's missions is to invest in scientific research, education and innovation to enable a world-class life science ecosystem. It has been a part of the heritage of the Novo Nordisk Foundation for almost a century to support fundamental research and the development of novel technologies that have the potential to benefit people and society. Building on this legacy, the Foundation aims to increase its commercial support for building an ecosystem that is needed for excelling within the life science and sustainability areas, and to help solve some of the major challenges facing us in the future.

Our ambition is to support the life science ecosystem as a dynamic entity. The Novo Holdings' corporate activities support the life science ecosystem across the entire corporate value chain, from seed investments to investments in large companies within the ecosystem.

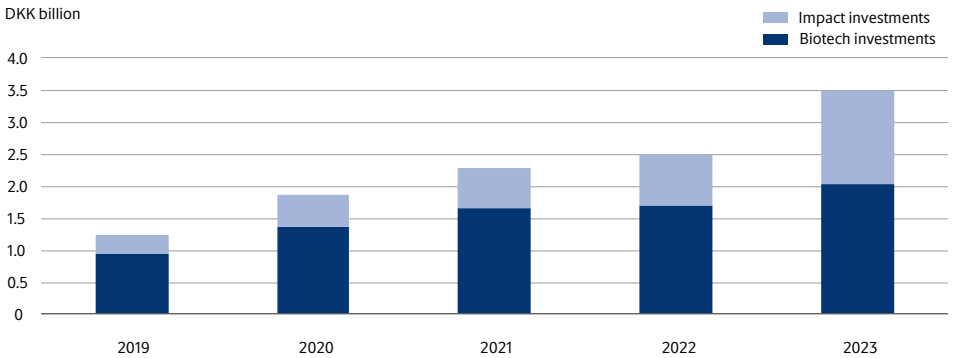
To promote the transition between spin-outs and commercial investments, Novo Holdings has established the investment team Novo Seeds, including the REPAIR Impact Fund. The allocation of funds to this part of the life science ecosystem is shown in Figure 3.2.2. The value of the Novo Seeds investment portfolio was more than 2.8 times higher in 2023 than in 2019.

Figure 3.2.1a The Novo Seeds investment portfolio by sub-sectors, end of 2023



Source: Novo Holdings A/S

Figure 3.2.1b The allocation of funds for start-up companies and impact investments in life science



Source: Novo Holdings A/S

3.3 Stimulating collaboration

Through its holdings company, Novo Holdings A/S, the Foundation owns and invests in research-intensive companies which generate research outputs, e.g., in the form of publishing of scientific journal articles. This section analyses the university-industry co-authorship patterns of these articles.

The companies in the portfolio published more than 3,600 journal articles from 2019 to 2023. 76% were published with co-authors from academia. The share of international co-authorships is high, with the proportion of international co-authorships being stable and 70% throughout the period 2019–2023.

Researchers at the University of Copenhagen have published 427 journal articles with the portfolio companies since 2019. The second highest number of articles by portfolio companies co-authored with academia is with the Technical University of Denmark (219 articles). The portfolio companies publish with all top 25 highest ranked universities (measured by share of journal articles among the top 10% most cited in the field) in the world within biomedicine and health sciences. Table 3.3.1 shows the five universities with the highest number of articles co-authored with portfolio companies.

Table 3.3.1 The five universities with the highest number of articles published with portfolio companies in the period 2019–2023

Institution	Number of journal articles co-authored	Leiden Ranking
University of Copenhagen	427	213
Technical University of Denmark	219	113
Medizinische Universität Graz	175	506
Universität Heidelberg	119	271
Harvard Medical School	109	6

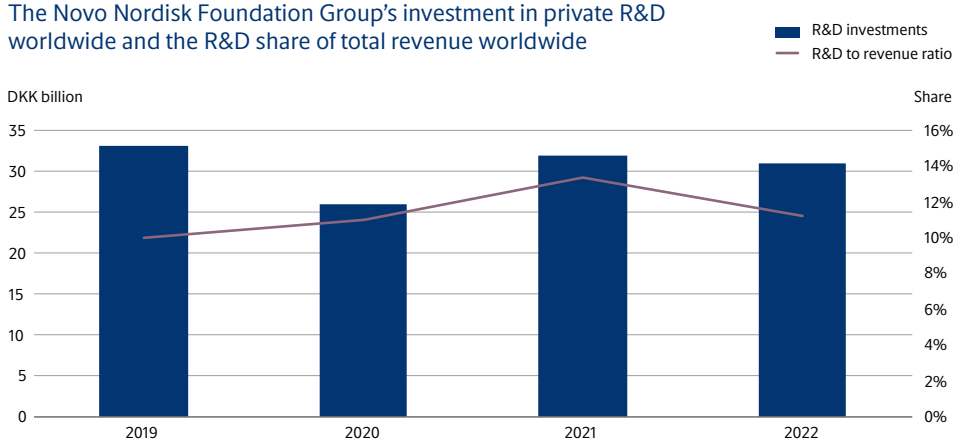
Sources: Novo Nordisk Foundation/Impact of Science, Scopus and Leiden Ranking 2023

3.4 Promoting excellent research and innovation

Research and development ratio (R&D ratio)

Many of the portfolio companies are research-active and spend a high share of their revenue in private research and development investments. Figure 3.4.1 shows the development in the R&D ratio of the companies in the portfolio. The ratio is stable and growing. Data for 2023 are not yet available.

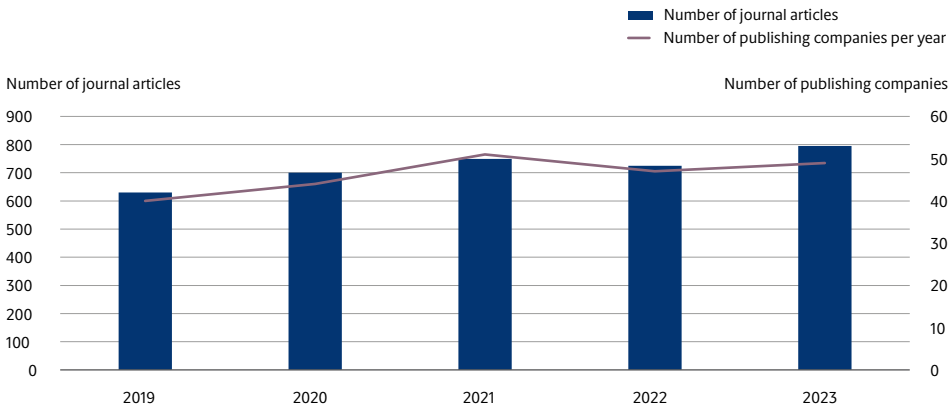
Figure 3.4.1 The Novo Nordisk Foundation Group's investment in private R&D worldwide and the R&D share of total revenue worldwide



Source: Novo Nordisk Foundation/Statistics Denmark

Scientific journal articles
The R&D investments result in a high output of new knowledge and ideas. The portfolio companies published 3,656 articles in peer-reviewed scientific journals in the period 2019–2023. In 2023, 795 journal articles were published by 49 different companies (Figure 3.4.2). More than a third of the portfolio companies published a journal article in 2023.

Figure 3.4.2 Research active companies and journal articles, 2019–2023



Sources: Novo Nordisk Foundation, Novo Holdings A/S and Scopus

Citation impact of journal articles
Journal articles published by the portfolio companies have an impact well above the world average. For the latest available year, 2021, the impact was higher than the world average, with 4.7% of the journal articles being ranked among the top 1% most cited, and 21% among the top 10% most cited in the world. These levels are similar to the levels for articles published by Foundation-funded researchers, suggesting the applied nature of the research does not decrease its citation impact.

Science fields of journal articles
Most articles (384 journal articles) were published by portfolio companies within endocrinology, diabetes and metabolism in the period 2019–2023, with 17% of articles among the world's 10% most cited within this field. The second highest output is within internal medicine, with 252 journal articles of which 16% are among the world's 10% most cited. The third most frequent field of science being covered in 185 journal articles by portfolio companies is biochemistry with 15% among the world's 10% most cited. The 114 journal articles published by the companies within cell biology have the highest share of articles (34%) among the world's 10% most cited articles within these fields.

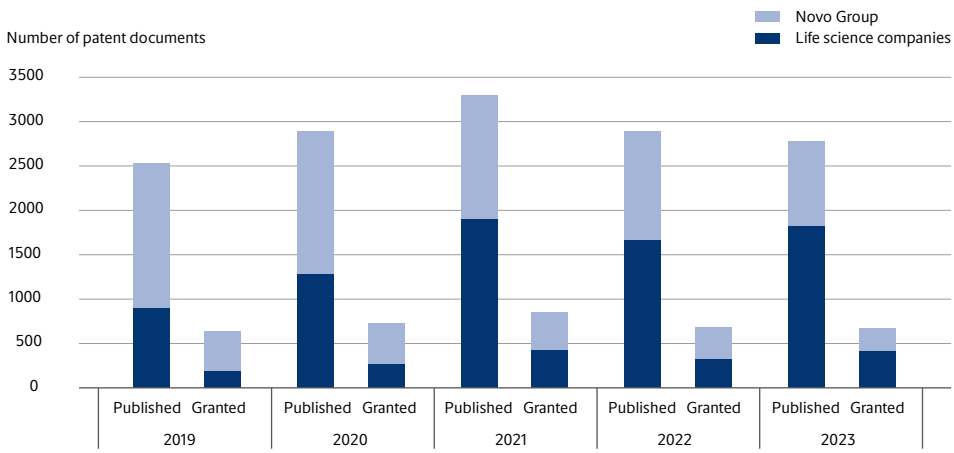
3.5 Developing innovative products and solutions

This section examines how the life science portfolio companies are contributing to the development of new solutions as revealed by their product and patent activity.

The portfolio companies have contributed to numerous patent applications. Since 2019, more than 15,500 patent applications have been published by the portfolio of companies, and more than 4,100 patents have been granted (Figure 3.5.1). Multiple patent documents can be published for each technological innovation, as they can be patented in multiple jurisdictions. For the period 2019–2023, 3,800 technological innovations are represented in the published patent applications of the portfolio companies, and 1,751 technological innovations are represented in the granted patents.

The number of published patent applications and granted patents in a particular year reflects the number of patents filed some years previously, as patents are not published until 18 months after filing and are granted around three and a half years later. It should also be noted that many patent applications are dropped before a patent decision is reached. In 2019–2023, portfolio companies accounted for 14% of all granted patents and 11% of all published patents in Denmark.[4]

Figure 3.5.1 Number of patent applications and granted patents filed in the Novo Group and the life science portfolio companies across technologies, 2019–2023



Sources: Novo Nordisk Foundation, Novo Holdings, Dimensions

4 The analysis has been updated to only include patents from Danish companies, where at least one assignee is listed with Denmark as their country of affiliation.

3.6 Developing new technologies, therapies and disease prevention

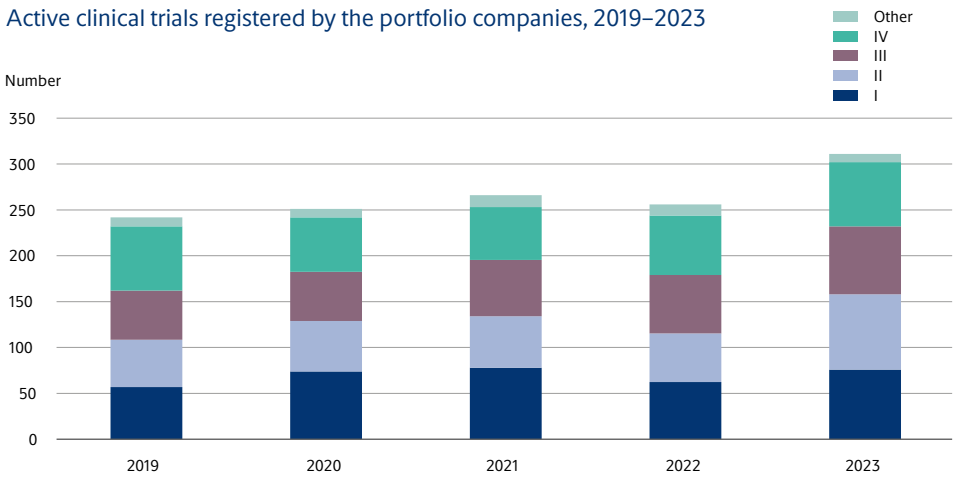
A large proportion of the patents and products, both launched and in the pipeline of portfolio companies, are new medicines and healthcare products. These are examined further in this section.

Clinical trials in companies

Before new medicines and therapeutics can be launched, they undergo vigorous testing in clinical trials. Between 2019 and 2023, 675 clinical trials were registered by portfolio companies in global clinical trial registries (Figure 3.6.1). Compared to the period 2018–2022, this is 36 clinical trials more registered by the portfolio companies.

The clinical trials of companies tend to be associated with more advanced trial stages (phases III and IV) compared to clinical trials of public researchers. 96% are in official clinical trial phases I-IV, with 54% being in early clinical trial phases I and II, and 42% in late clinical trial phases III and IV.

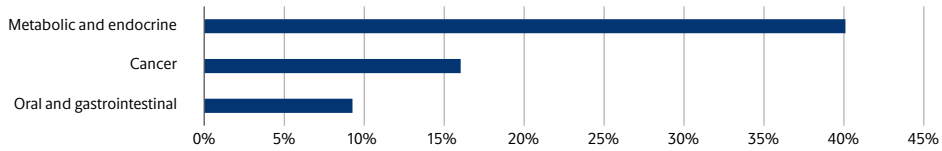
Figure 3.6.1 Active clinical trials registered by the portfolio companies, 2019–2023



Sources: Novo Nordisk Foundation, Novo Holdings and PharmaIntelligence

Further analyses show which health areas the clinical trials fall within. Most trials are in metabolic and endocrine conditions, which include diabetes (Figure 3.6.2).

Figure 3.6.2 Top three health categories of clinical trials registered by the portfolio companies, 2019–2023



Sources: Novo Nordisk Foundation, Novo Holdings, PharmaIntelligence, Dimensions

Over the past five years, more than 620,000 people have been successfully enrolled in clinical trials supported by the portfolio companies.

Globally, ensuring diversity among the participants in clinical trials has been, and continues to be, an issue both in terms of biological sex and ethnic groups. If trial participants do not accurately reflect the patient population the drug aims to treat, it may not be safe to extrapolate the results of the trial to predict the benefits or adverse effects when treating the population. It was possible to find biological sex data in 13% of the clinical trials supported by portfolio companies on clinicaltrials.gov and for 54% of all people enrolled in the clinical trials. Among the clinical trials that do report on biological sex, there was an equal distribution with 49% female and 51% male participants, excluding clinical trials dealing with sex-specific illnesses such as prostate cancer.

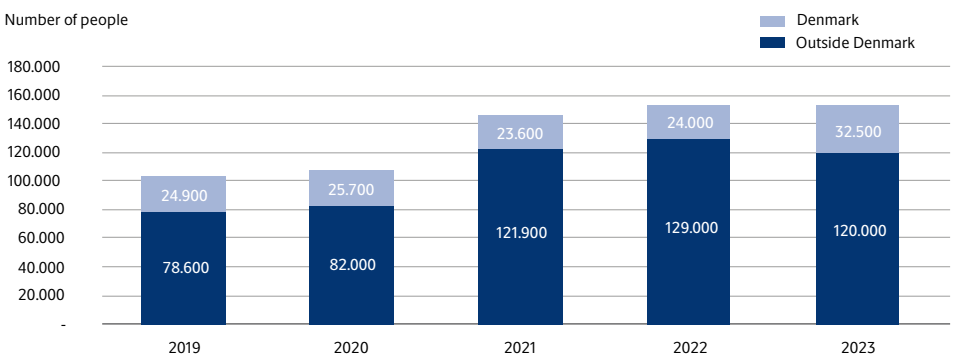
Development of treatments for rare diseases has historically been under-prioritised, as the limited number of patients reduces the economic incentive. 'Orphan drug' status is one approach to addressing this, by providing incentives to companies to develop such drugs. The status is awarded to drugs aimed at rare diseases that are life-threatening or chronically debilitating, but where there is not currently any effective treatment. Thus, the orphan drug status can be used as an indicator of drugs with immense potential impact for patients living with these rare diseases.

Among the drugs in the commercially supported clinical trials, 25% of the trials have at least one orphan drug designation, with a total of 73 individual orphan drugs. These designations include therapies for amyotrophic lateral sclerosis (ALS) and glioblastoma (an aggressive form of brain cancer). A parallel designation system is the FDA fast track designation, which aims to speed up clinical trial processes for drugs addressing an 'unmet clinical need'. 20 of the drugs also have a fast-track designation indicating they have big potential to improve patients' lives.

3.7 Creating jobs and growth

In 2023, the Novo Group and the life science companies employed about 153,000 people, which is approximately 50,000 more than in 2019 (Figure 3.7.1). Of these, almost 21% are employed in Denmark.

Figure 3.7.1 Number of people employed in Danish-based and foreign-based companies, 2019–2023



Sources: Novo Nordisk Foundation, Impact-of-Science, Novo Holdings and Statistics Denmark

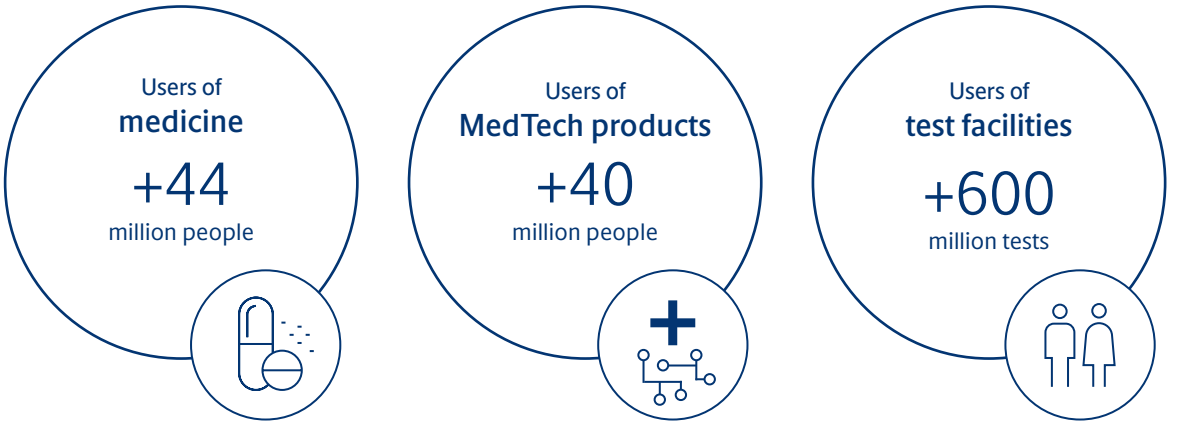
3.8 Supporting people in difficult settings

The products and services of the companies in the Novo Nordisk Foundation Group help millions of people every year with pharmaceutical products, medical devices and technologies, and health services, including clinical health tests.

People reached with pharmaceutical products (medicine)

The Foundation is built on the success of Novo Nordisk A/S alongside other pharmaceutical companies. Today, through Novo Holdings, many investments have been made in companies that develop and supply vital medicines for people all over the world. In 2023 alone, it is estimated that the portfolio of companies provided medicines to more than 44 million patients (Figure 3.8.1).

Figure 3.8.1 People reached, 2023



Sources: Novo Nordisk Foundation, Novo Holdings A/S, Novo Nordisk A/S, Sonion and Synlab.

People reached with technology products (MedTech)

The portfolio companies deliver products and solutions to millions of people within health- and patient care. One example is Novo Holdings' 100% ownership of Sonion (since July 2014), designing and manufacturing components and solutions for hearing instruments servicing more than 40 million people worldwide each year.

People reached with test facilities and services

The life science portfolio also comprises health tests and diagnostics facilities. Laboratory medicine makes a significant contribution to medical care. Around two thirds of medical diagnoses worldwide are based on or confirmed by medical laboratory tests. In February 2017, Novo Holdings invested in SYNLAB, which provides modern laboratory analyses that help to confirm diagnoses, derive the right decision from them and monitor the success of therapy. SYNLAB conducted more than 600 million tests in 2023.

4

Learnings from philanthropic practice

Impact management and data collection – what it means and why it is important for optimising societal impact of research

Building a learning environment requires a common language for the culture to flourish. In the Foundation we talk about impact management—our signature approach, gradually implemented in 2021–2023, to working with impact, both within the Foundation and with prospective applicants and stakeholders. It starts with the shaping of new initiatives, guiding applicants on their proposals and how they support the vision and mission of the Foundation.

In this chapter, we focus on two aspects of impact management. First, in Section 4.1, we introduce how we work with impact management as a concept by focusing on the impact frameworks that are co-created with every new, large initiative in the Foundation together with applicants and other stakeholders. Second, in Section 4.2, we present a case analysis of two open competition programmes for interdisciplinary projects and research leader grants, by diving into the reporting data collected from grant recipients' reporting in Researchfish® and comparing that data with survey responses from those recipients about their prioritisation of the results, or success, of their projects.

Learnings from the implementation phase of impact management:

- Impact management is an ongoing learning process and a constant change management exercise as we continuously onboard new people to the organisation.
- Impact frameworks help clarify the purpose and goals of the initiative and are fundamental tools for planning and evaluating Foundation-funded initiatives.
- Engaging stakeholders in co-creating impact frameworks enhances program relevance and co-ownership of the frameworks, which is critical for impact management.

Learnings from investigating the reporting of grantees from two Open Competition programmes:

- Grant progress is successfully tracked through standardised data collection in Researchfish®.
- More complete estimations of a project's development and success can be reached through complementing the standardised data collection with less formal and less tangible aspects.

Recommendations for the direction of our future efforts:

- Reinforcing stakeholder feedback mechanisms to maintain a dynamic theory of change responsive to societal shifts.
- Enhancing reporting to capture activities and outputs and the trajectory toward outcomes and impact, requiring new or refined metrics and processes.
- Investing in capacity-building for researchers and project teams to deepen their understanding and application of impact management and theory of change methodologies with the aim to bolster impact-driven research, innovation and education initiatives.
- Enhancing the granularity of our monitoring and evaluation tools to capture the multifaceted impacts of our funding activities, allowing for precise impact measurement and responsive programme adaptation.
- Promoting transparency and sharing best practices within and beyond the Foundation, fostering a culture of learning and continuous improvement in the pursuit of societal impact.
- Exploring innovative ways to visualize and communicate impact, making the impact management and impact frameworks with theory of change narratives more accessible and engaging to a broader audience.

By pursuing these strategies, the Foundation aims to strengthen its role as an influential agent of societal impact and encourage a broader adoption of impact management principles within the knowledge society funding ecosystem.

4.1 Impact management as a basis for effective multi-level evaluation and learning

In this chapter, we introduce how, using impact frameworks, the Novo Nordisk Foundation has geared itself towards incorporating impact management in a project-centric organisation, to foster an impact culture within the organisation and externally with its stakeholders. The approach uses a few simple tools and processes developed, distributed and facilitated by a team with diverse backgrounds and experiences, ensuring a common and accessible language for the people in the Foundation as well as its stakeholders.

The approach ensures that the Foundation can work convincingly in close collaboration and through co-creation with external stakeholders in a way that reduces evaluation anxiety among grant holders and opens a dialogue about strengths and weaknesses, ambitions, risks, and possibilities, to create societal impact in accordance with the Foundation's nine principles for societal impact. This increases the likelihood of moving closer to the Foundation's vision of improving human health and the sustainability of society and the planet.

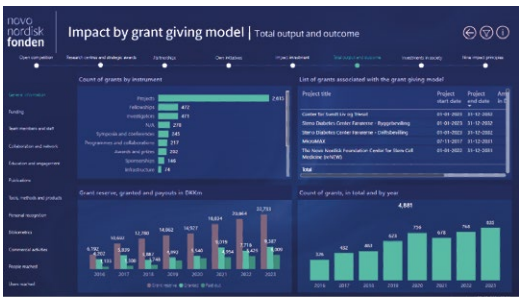
4.1.1 Introduction to impact management

With its 2030 strategy, the Foundation has intensified its ambitions and efforts to address major societal challenges within health and environmental sustainability. Internally, this raises the need for a unified approach to impact thinking and monitoring of progress. Externally, it emphasises the need for engagement with local, national, and international stakeholders and to be transparent around data and results to build trust.

To meet these requirements and build an impact culture, the Foundation has introduced **Impact Management** as an overarching management concept. This offers standardised tools and approaches to identifying successes and potential impact from prospective initiatives. It stresses the importance of evaluation for learning and delivers transparency and insight into Foundation data via the dashboard platform enabling Foundation's Board of Directors as well as its employees, grant recipients and their institutions, by facilitating informed decision-making and strategic planning.

Because solving societal challenges involves multiple stakeholders and takes time, the funded initiatives cannot solve these challenges on their own. The Foundation's strategic approach to tackling societal challenges makes it possible to identify how each individually funded project supports societal impact—even beyond the expectations of the outcomes of the individual project.

Figure 4.1.1 Impact management works to serve learning and decision needs at all levels



FACILITATES communication to society → Societal stakeholders

ASSISTS informed decisions → Board of Directors, Executive management

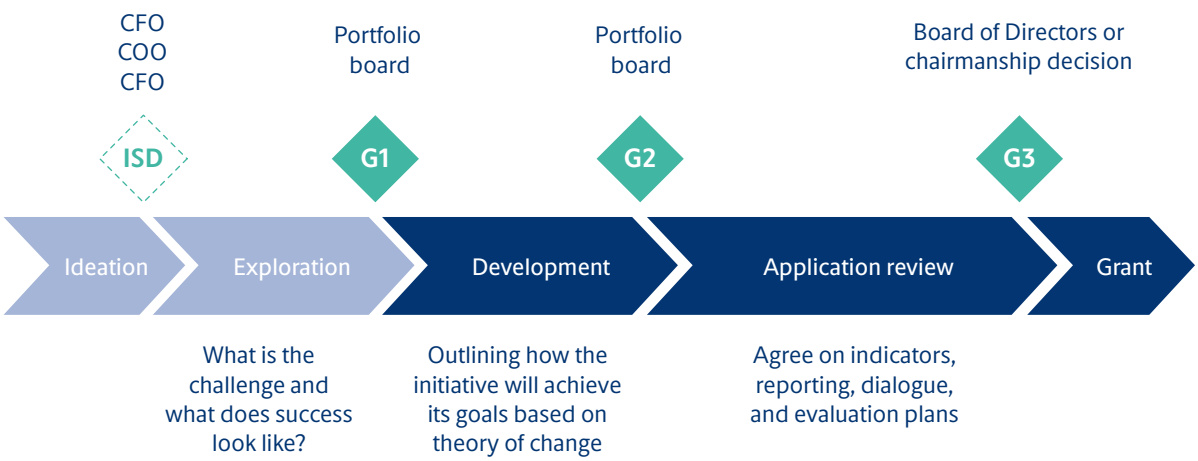
ENABLES strategic analysis and evaluation → Strategy performance

INVOLVES systematically learning → How we fund

4.1.2 Impact management starts with the stage-gate model

Within the Foundation, the Impact area's two departments, Evaluation & Analysis and Data, ensure that the impact management culture is rooted in the Foundation, but the unfolding of impact management takes place in the cross-organisational project groups, at first internally in the Foundation and later with applicants and other stakeholders. New initiatives in the Foundation pass through the Foundation stage-gate model (see Figure 4.1.2), which is governed by Foundation's Portfolio & Project Management. An essential part of the project work concerns intervention design and impact thinking. The approach is the same whether developing new open competition programmes, stand-alone grants (e.g. infrastructure or a research centre), partnership grants (e.g. the public Steno Diabetes Centres), or philanthropic investments (e.g. Impact Repair Fund).

Figure 4.1.2 Impact thinking in the Foundation's stage-gate model



The stage-gate model was revised in 2023 and deployed in 2024, further strengthening the Foundation's commitment to impact management. In this model, there are three gates (G1-G3). An initiative approaches board-funding approval at gate 3 (G3, Figure 4.1.2) by fulfilling certain gate requirements. In addition to providing more detail and finally a full application, these requirements include budget justification, legal considerations, risk mitigation strategy and an impact framework.

Ideation originates in the Foundation's programme areas. Ideas are pitched and screened by the executive management team in Initial Screen Dialogue sessions (ISD, Figure 4.1.2). If an idea passes, a cross-organisational, internal project team is formed, including an impact partner from the Impact area.

To pass G1, the Foundation's internal project team must draft a one-pager called "Expected Change". The one-pager outlines the challenge, the vision (desired state or long-term objective), the mission (how to get there), success at the end of the funding project period, and the deliverables it takes to get there. Finally, any assumptions made about why the approach will work are noted.

After G1, a budget range is allocated for the initiative, a sign of commitment from the Foundation, and an applicant is onboarded. To pass G2, the applicant, in collaboration with

the Foundation internal project team, must complete the logic model (explained below). The logic model guides the dialogue with the Foundation and the application writing.

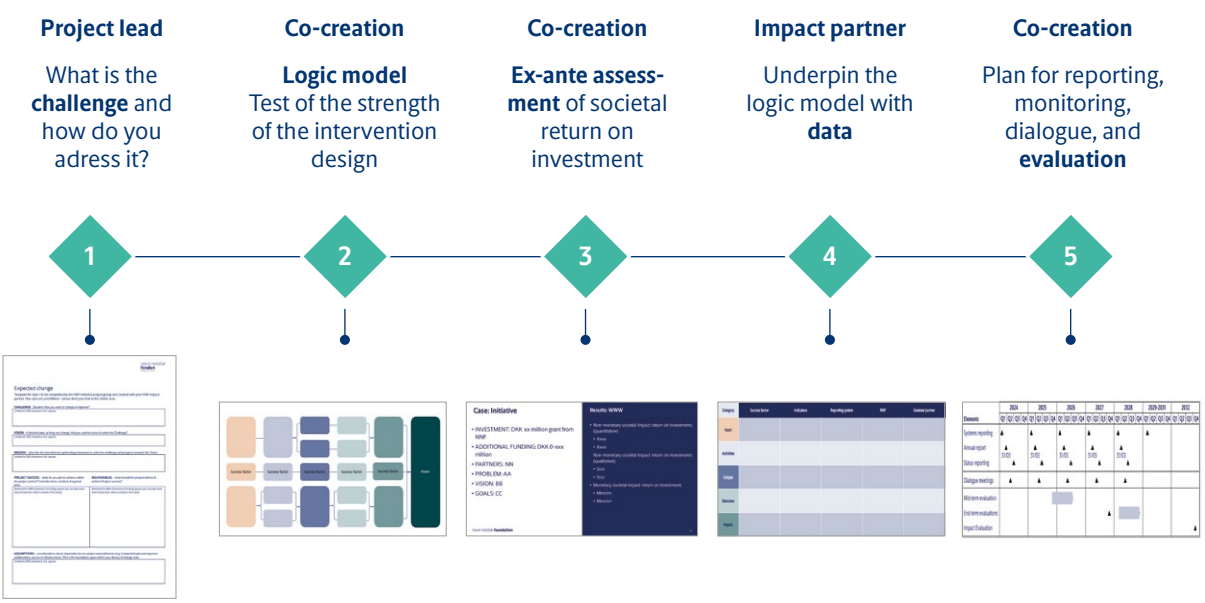
If the application review is successful, the remaining two elements of the impact framework are completed: the data model with indicators linked to the logic model, and the timeline of when and how the prospective grantee shall report and when evaluations are planned. The logic model and the data model are presented below.

4.1.3 Impact framework: Improving intervention design and ensuring learning and evaluation

Impact management encompasses all processes and deliverables essential for gathering data, monitoring progress, facilitating evidence-informed management, and evaluating milestone achievement and success across all stages and beyond the grant life cycle. The facilitating component of impact management is impact frameworks. Impact frameworks are created in collaboration between the Foundation project group, the applicant, and possibly other stakeholders. Other stakeholders can be co-funding organisations, but they can also be representatives of groups or societies that are the beneficiaries of the outcome or wider societal impact of the intervention.

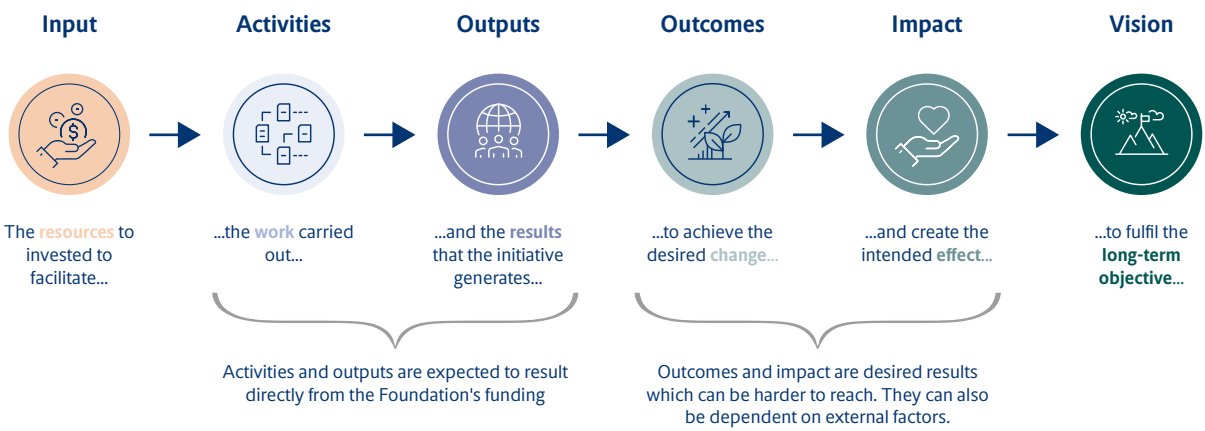
The impact framework has five elements:

1. a clearly motivated challenge to solve, a clear vision and strategic objectives for the initiative.
2. a logic model that maps the theory of change for the intervention logic.
3. an early assessment of the potential impact of the initiative.
4. a data model that links indicators to the logic model and maps how the data is reported and presented.
5. a timeline—a plan for reporting, monitoring, dialogue, and evaluation during the duration of the grant



Before indulging in the creation of an impact framework, the applicant also completes the same one-pager "Expected change" that the internal project team drafted to clear G1 in the stage gate model. We utilise this one-pager in different ways to learn about the applicant and the initiative's state of development. If the one-pager is not clear enough or robust, the initiative is not ready to be translated into a logic model. More work on the vision, the mission, and the success of the project must be done.

Figure 4.1.4 The elements of the logic model in the Novo Nordisk Foundation



For some applicants, formulating success and how it is delivered is a new way of thinking. Using the applicant's own words from the one-pager to kick off the logic model creation has the advantage that the impact partner can introduce the applicant to the Foundation way of distinguishing between activities, outputs, outcomes and impact (Figute 4.1.4). In the process, the applicant also learns how the Foundation distinguishes between activities and outputs (expected to occur) and outcomes and impact (desired result that a prospective grant recipient will not be in full control of). This usually leads to an open discussion of what success looks like, and the level of ambition. Importantly, it builds trust between the Foundation and the prospective applicant as they learn that the Foundation acknowledges uncertainties and risks of ambitious projects.

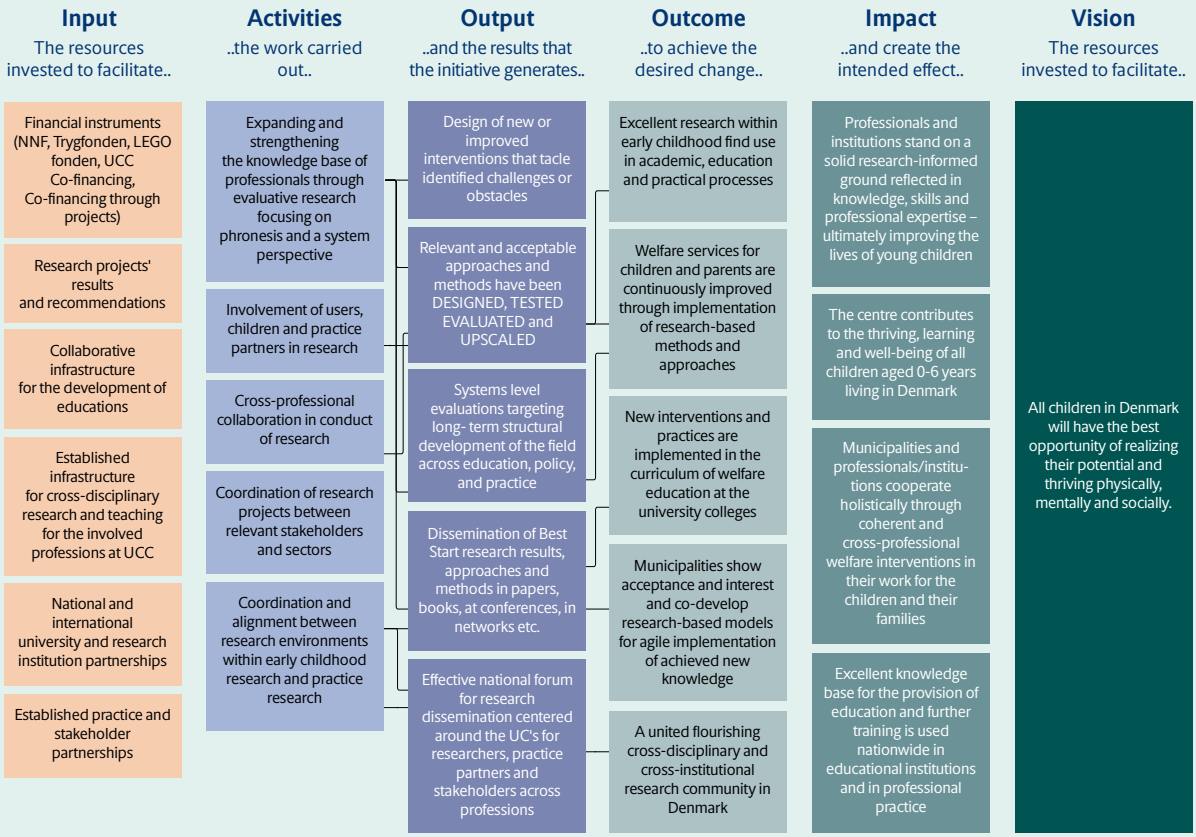
An impact framework for Centre for the Best Start in Life – a case of multiple stakeholder alignment

The logic model is more than a frame for a future evaluation, it is a tool for conversation and alignment among multiple stakeholders. The Centre for the Best Start in Life is an initiative hosted by Københavns Professionshøjskole - University College Copenhagen (UCC). The initiative is co-funded by three private foundations—TrygFonden, LEGO Foundation and the Novo Nordisk Foundation—and UCC itself.

All three funding foundations have societal goals in their vision. The Novo Nordisk Foundation is rooted in change through research-based knowledge, the LEGO Foundation is focused on children "learning through play", and TrygFonden is focused on a safe society in general but specifically concerning children who grow up thriving physically, mentally and socially to unleash their full potential in life. In this initiative, they all come together from different angles to support a centre with the mission of improving professional interventions in daycare with the vision to provide the best opportunities for children in Denmark to realise their potential and thrive physically, mentally and socially.

The logic model approach helped create a common language across the group of funders and the grant-applying team to align on the expectations of how their activities could lead to societal impact. The model highlights that focusing only on improving interventions for children would mask important work to facilitate change including the inclusion of relevant stakeholder groups, and the creation of a national environment for researchers and professionals to ease translation and increase feedback.

Figure 4.1.5 One of three thematic logic models for the Centre for the Best Start in Life: Research



Assessing the potential scale and impact of an initiative
The first phase of introducing impact management in the Foundation has focused on the logic model, the data model backing it and a timeline for interaction, i.e. working systematically with a theory of change to strengthen the impact argumentation and stress-test interventions. Our approach to formulating a logic model does not quantify the potential impact. We consider this a strength as it guides the applicant to think visionarily when designing the initiative.

In the second phase of impact management, we will expand our engagement in prospective initiatives to assess their potential. This provides decision-makers with a better feel of what the initiative would look like and what outputs, outcomes and impact it might have if accepted. The assessment will be twofold:

- **Input-output analysis**
  A data-informed assessment of well-known outputs and outcomes based on our experience with similar initiatives, utilising our highly structured longitudinal data collection. The assessment can highlight the expected timing and size or volume of the initiative based on experiences from many similar, previous initiatives in a research initiative regarding:

  - Team recruitment
  - Type and scale of produced research outputs (e.g. databases and publications)
  - Students taught, researchers trained or educated
  - People reached
  - Impact on research, practice policy or legislation
  - Innovation outcomes

The groundwork paving the way for scaling these types of return-on-investment analyses was presented in Chapter 4 of our Societal Impact Report 2021.

- **Societal impact**
  An analytical assessment of societal impact addresses at what scale the initiative can support the Foundation's strategic goals for societal impact. Societal impact analysis can be performed in many ways – from simple, practical assessments to full scale cost-benefit. In an environmentally- or climate-oriented research programme, this could include quantification of:
  - Impact on CO2 reduction
  - Decrease in the use of fertilisers, and costs saved
  - Increase in biodiversity
  - Health benefits and the socioeconomic value

Concluding remarks
In this presentation, we have articulated the integration of the impact management with a theory of change within the Novo Nordisk Foundation's (NNF) strategic framework for philanthropic initiatives. Initiated in 2021, the adoption of impact management has enhanced the Foundation's capacity to design and evaluate complex research, innovation and education interventions as well as social and humanitarian initiatives, emphasizing societal impact.

The impact management with its theory of change approach has proven instrumental in facilitating stakeholder communication, with overarching narratives for broad outreach and detailed sub-theories for specialized engagement.

The Foundation's use of impact management, complemented both by a theory of change with logic models and by data models and evaluation plans, represents a comprehensive and strategic methodology for generating tangible societal benefits from our grants and philanthropic investments. The iterative refinement of these frameworks, informed by feedback from applicants and Foundation project leads, ensures alignment with our mission promoting societal progress.

The expansion of impact frameworks to include long-term open competition programmes reflects our commitment to research and innovation excellence with clear societal impact pathways. The participatory nature of these frameworks encourages multi-stakeholder engagement and cross-disciplinary collaboration.

The use of the theory of change thinking and the development of tools for impact frameworks illustrate the Foundation's progressive approach to research, education and innovation funding, prioritising societal impact alongside scientific merit. By rigorously planning, documenting, and monitoring impacts, we enhance the effectiveness of our funding and set an example for sustainable societal contributions.

4.2 Learnings from investigating the reporting of grantees from the Interdisciplinary Synergy Programmes and the Research Leader Programme

Since 2015, it has been a priority for the Novo Nordisk Foundation to enhance our comprehension of the impact of the research we support. Evaluation data largely relies on grantees' self-reporting via the online data collection platforms, Researchfish® and FoundGood[5], where grantees report on activities and results for a full grant period and up to 5 years afterward. Researchfish® encompasses 16 standardised question categories. A research funder can add additional question categories and the Foundation has on earlier occasions added funder-specific question categories for specific grant instruments. The categorical approach to reporting decouples reporting of results from the project narrative. The strength of that is that reporting categories are clearly defined, and funders receive structured data that can be aggregated and compared across their portfolio of grants. The lack of a causal link in the reporting of outputs and outcomes in Researchfish®, however, poses a principal challenge in understanding what drives success.

> Researchfish® serves as an online data collecting system for research projects, annually handling more than 130,000 reports from more than 120,000 researchers for 150 funders and research organisations.

To reach a more comprehensive understanding of what grant recipients consider to be the most important outputs and outcomes of their projects and how this matches the reporting categories and questions in Researchfish®, we performed an exploratory analysis to answer:

[5] Foundgood - Working together to understand impact

1) How do the most important outputs and outcomes according to grantees' survey responses compare with the data they have reported in Researchfish®?

2) How can the inclusion of responses outside Researchfish® question categories complement the data collection?

Methodological approach and data for the analysis
Surveys were conducted in relation to programme evaluations of the two open competition programmes over the summer 2023: First, the Interdisciplinary Synergy Programmes[6] with grants ranging from DKK 5-15 million (EUR 0.7–2.0 million), emphasising collaborative efforts across different fields, organisations, and countries, and second, the Research Leader Programme[7], with grants ranging from DKK 7-10 million (EUR 1-1.3 million), that inherently concentrates on the Principal Investigator (PI) who, operating from Denmark, encourages collaboration that transcends scientific disciplines and international frontiers.

In the surveys, grantees listed up to five of the most important outputs or outcomes of their projects, along with explanations in a free-text format and a matching up of the free text against the Researchfish® question categories[8]. Each of the free-text responses are assigned by us to a corresponding Researchfish® question category. If the free-text responses do not correspond to any of the question categories, it is designated to an "Other" category. Survey free-text responses assigned to a Researchfish® question category by us is referred to as *Foundation categorisation*, whereas respondents' own categorisation of their free-text responses is referred to as *Grantee categorisation*. By comparing survey feedback with information submitted in Researchfish®, we can enhance our insight into grantee reporting.

The surveys are disseminated to 78 Interdisciplinary Synergy grantees and 185 Research Leader Programme grantees. The response rate is 68%, resulting in totals of 53 and 125 respondents from the two programmes respectively.

Hypotheses
The anticipation is that grantees report a broader spectrum of outputs or outcomes through Researchfish® than they do via the free-text descriptions in the surveys, because grantees are prompted to report on all relevant outputs and outcomes in Researchfish®, thereby documenting an extensive array of research outputs and outcomes, encompassing the most critical elements of their research.

We foresee that grantees might mention certain outputs or outcomes in the free-text description in the surveys that fall outside the scope of the standardised Researchfish® question categories. These responses, while not fitting into the established categories, are viewed by grantees as significant steps or achievements that have contributed to the progress and potential success of their research projects.

This information may provide valuable insights into research projects that standardised metrics may not fully capture.

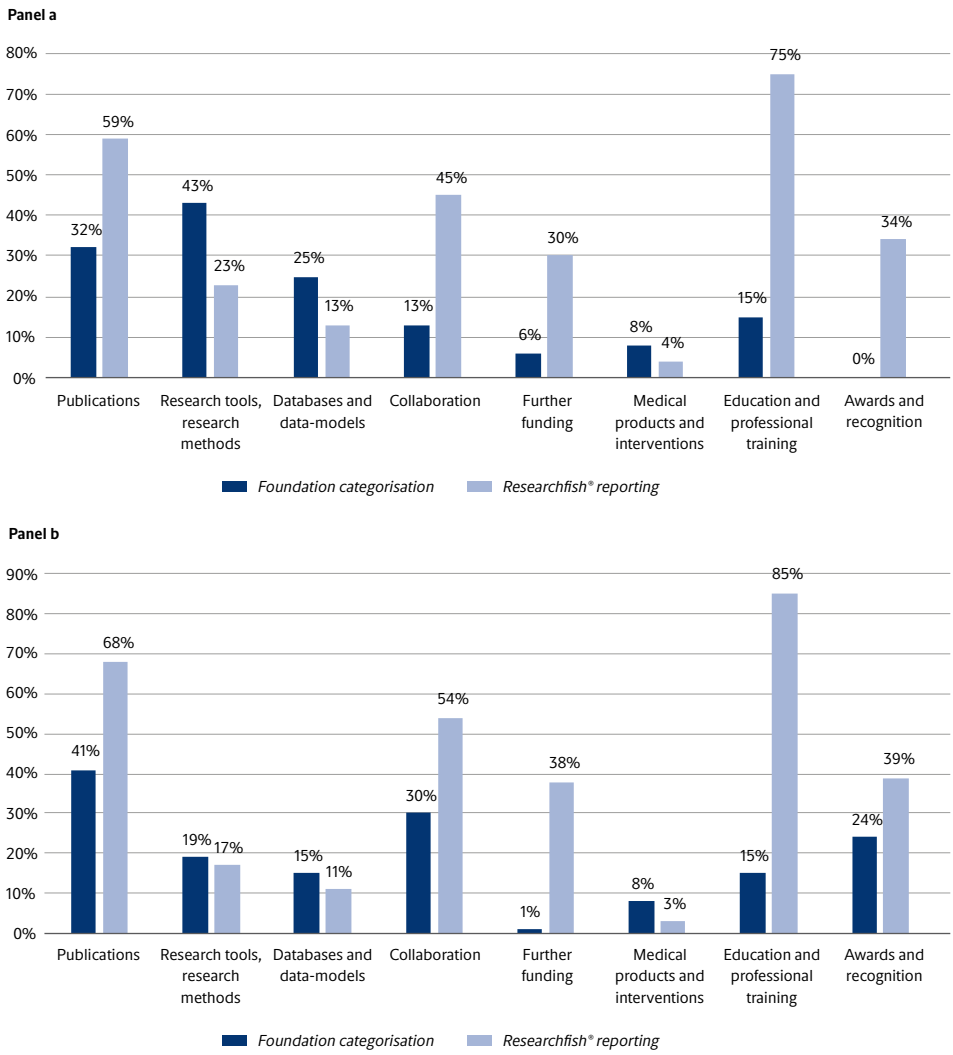
[6] The Interdisciplinary Synergy Programme and the Exploratory Interdisciplinary Synergy Programme
[7] Research Leader Programme
[8] Researchfish® question categories cover both Researchfish® standard question categories as well as funder-specific question categories in Researchfish® added by the Foundation.

A comparison of Researchfish® and survey reporting

The share of respondents reporting on specific categories in the survey and in Researchfish® is presented in Figure 4.2.1.

Figure 4.2.1

Comparison of share of respondents from Interdisciplinary Synergy Programmes (Panel a) and Research Leader Programme (Panel b) reporting of output and outcomes in surveys and in Researchfish®



Note 1: Survey responses have been classified in accordance with the Researchfish® question categories through the process of *Foundation categorisation.*

Note 2: The figures display a selection of eight out of 18 Researchfish® question categories used in the survey. The eight categories are the ones most referenced.

Source: Novo Nordisk Foundation/ Researchfish®

The data indicates a higher percentage of grantees reporting on Researchfish® question categories compared to their survey responses categorised by *Foundation categorisation*. For the Interdisciplinary Synergy Programmes, 32% of the survey respondents highlight “Publications”, while 59% have reported on “Publications” through their Researchfish® submissions. For the Research Leader Programme, the pattern is the same.

For the Interdisciplinary Synergy Programmes, survey respondents more frequently highlight the categories of "research tools and methods," "databases and data-models”, and "medical products and interventions", which could indicate the importance these categories hold for the respondents, or it may suggest that these categories are underreported in Researchfish® submissions. This discrepancy may have been influenced by the time gap between the Researchfish® reporting period in January 2023 and the collection of survey responses over the summer 2023.

Upon reviewing the Researchfish® reporting from January 2024, we see the same distribution pattern across most of the reporting categories, albeit with an increased rate of reporting for all categories. An exception is that the Interdisciplinary Synergy Programmes grantees have doubled the reporting on "Databases and Data-models” to 25% and "Medical products and interventions" to 8% and thereby diminishing the gap between the share of grantees reporting on these categories in the survey and in Researchfish®. The increase could potentially be explained by the six-month gap between the January 2023 Researchfish® reporting and the survey, which may have resulted in certain outputs and outcomes reported in the survey not being reported in Researchfish® before January 2024. However, it is also possible that the survey itself raised awareness about the importance of reporting, leading to a more comprehensive capture of data in the 2024 data collection.

Grantees from Interdisciplinary Synergy programmes and the Research Leader Programme were both asked to identify which Researchfish® question categories best matched their survey free-text descriptions, here referred to as *Grantee categorisation*. Several grantees included additional Researchfish® question categories in *Grantee categorisation* that went beyond our initial categorisation of their free text responses in *Foundation categorisation*. Except for a few cases of misalignment, the additional categories in the *Grantee categorisation* contribute to an expanded interpretation of their research deliverables aligning more closely with the share of grantees who report on these categories in Researchfish®. This observation suggests that several grantees perceive their most important research outputs and outcomes as part of a wider spectrum of interconnected activities. For instance, "Publications" can be associated with other outputs such as collaborations, funding, and so on. As detailed in Section 4.1, Impact Frameworks build on the relational understanding of success factors and indicators enhancing the ability to assess and amplify the impact of the funded research.

Survey responses not encompassed by the Researchfish® question categories
One of the key strengths of Researchfish® is that it allows grantees to report on a variety of outputs and outcomes. However, for less formal and less tangible outputs or outcomes, Researchfish® sometimes fall short. The survey respondents pointed out certain research outputs or outcomes that extend beyond the predefined Researchfish® question categories. For example, a publication is a formal research output that relates to a Researchfish® category and indicates the success of delivering a significant result, whereas the importance of research freedom to explore, possibly fail and learn from it is a less formal output that does not fit the standardised question categories. Similarly, while a research collaboration denotes a formal partnership which relates to a Researchfish® question category, access to a new network is less formal and not monitored by Researchfish®.

Specific outputs and outcomes that do not align with the pre-existing Researchfish® categories, we assigned to an alternative "Other" category. Within the Research Leader programme, 58% of respondents mention outputs or outcomes that fall into the "Other" category, in contrast to 21% from the Interdisciplinary Synergy Programmes. Here we show the top four response areas in the “Other” category. There are several other areas, but none of them include an answer from more than 6% of participants, and so have not been included in this analysis.

Table 4.2.2 Grouping of survey responses outside the Researchfish® question categories

Output/outcome	Content	Synergy (N=53)	Research leader (N=125)
Research freedom	Freedom to pursue new research projects and directions, time to reach a deeper understanding understanding of the research field, and freedom from the pressure of securing funding	4 (8%)	25 (20%)
Leadership development	Acquiring leadership and mentoring skills	0 (0%)	12 (10%)
Interdisciplinarity and cross-communication	Possibility to engage with researchers from other fields of research	6 (11%)	6 (5%)
Networks	Access to excellence networks with opportunities for collaboration.	1 (2%)	11 (9%)

Source: Novo Nordisk Foundation

Following the hypotheses, responses in the "Other" category from the survey encompass a wide array of outputs and outcomes. These include primarily intangible and more informal categories.

On a programme level, respondents from the Interdisciplinary Synergy programmes emphasise "interdisciplinarity" as important outputs or outcomes, a trend less pronounced among Research Leader Programme grantees, see table 4.2.2. In contrast, "Networks" and "Leadership development" are outputs or outcomes that feature more prominently in the feedback from the Research Leader Programme. Even though the numbers are small and therefore subject to some uncertainty, the distinctions align with the inherent goals of each instrument type. On a general level, the responses in the “Other” category, even if representing a relatively small fraction for the surveyed programmes, contribute to enhancing our comprehension of the advancement of research endeavours:

“Research freedom” is related to pursuing new research projects and directions with the fails and learnings that come with it, reaching a deeper understanding of the research field, and experiencing freedom from the pressure of securing funding. This category highlights the importance of intellectual autonomy and the capacity for deep engagement with research topics. If monitored, we may gather a better understanding of whether the Foundation funding gives grant recipients the sense of (financial) stability and security thereby enabling high risk research and exploration of innovative ideas, allowing for an expansion of their research field.

“Interdisciplinarity and cross-communication” is related to the ability to effectively communicate across different disciplines which is central for addressing complex scientific questions. Monitoring this category helps to better understand how the integration of knowledge from diverse fields and collaboration with experts outside their immediate area, enrich their research and contribute to the advancement of science. The Foundation does not directly collect reporting on interdisciplinarity, but use administrative data on applicants, co-

applicants and team members as well as Researchfish® reporting on publications to analyse the researcher's collaboration- and publication-patterns to map e.g. interdisciplinarity (see chapter 2.3).

"Leadership development" is related to acquiring leadership and mentoring skills that are critical for managing research teams and shaping the next generation of researchers. The Foundation monitors mentoring, teaching and the set-up of research teams, but not the development of the skills to do so. By monitoring progress in this area, we can possibly determine if grant recipients and their research teams are gaining the skills necessary to lead effectively, mentor others, and manage complex research projects, which in turn can enhance the overall productivity and impact of their work.

"Networks" is related to opportunities for collaboration. Networking with top-tier researchers and engaging in collaborative projects can significantly amplify the research impact. Monitoring access to excellence networks helps to understand the dynamics of networks connecting grant recipients and their research teams with leading experts, sharing knowledge, and leading to more formal collaborations and partnerships, which are monitored through Researchfish® and may result in new insights and breakthroughs.

Despite the relatively small sample size and the reflection of specific programme objectives in the "Other" category, the insights emphasised by the survey respondents complement and enhance our understanding of what grantees also consider to be important outputs and outcomes of their projects emphasising research freedom, interdisciplinarity, leadership development, and access to excellence networks as critical outputs and outcomes that contribute to the advancement of their research endeavours.

Conclusion

Our analysis indicates that while Researchfish® effectively tracks grant progress through standardised data for formal and tangible results, it may overlook less formal and less tangible aspects such as motivational impacts, informal networks, and personal development. While some of the aspects that grantees reported in the surveys' "Other" category are covered by data collected or enriched through other channels than Researchfish®, the survey feedback indicates that a more complete picture of a project's development and success can be reached through complementing the standardised data collection. Additional insights from survey feedback in relation to future programme evaluations of open competition programmes across various grant instruments and research disciplines will continue to shape the conversation going forward.

Authors
Novo Nordisk Foundation
Impact Area

Anders Agerbæk Kjøller Nielsen
Daryl Paul
Emil Søndergaard Hansen
Gert V. Balling
Henrik Barslund Fosse
Jens Christian Sandbak Petersen
Joan Bentzen
Katrine Iversen
Kristian Raudal
Rasmus Vendelbo Lund Jensen
Rikke Nørding Christensen
Sandra Schluttenhofer
Thomas Alslev Christensen

Layout: Rasmus Christensen

Novo Nordisk Foundation
Tuborg Havnevej 19
DK–2900 Hellerup
Denmark

T +45 35276600
E nnfond@novo.dk
W novonordiskfoundation.com

novo nordisk
foundation
Benefitting people and society

ISBN xxxx

Benefitting people and society

Novo Nordisk Foundation
Tuborg Havnevej 19
DK–2900 Hellerup
Denmark

T +45 3527 6600
E nnfond@novo.dk
W novonordiskfoundation.com