

ALF region Stockholm

Panel 3 Self evaluation

To the reader:

This document includes the answers to the questions in panel 3 in accordance with the submission made to VR in their template (page 3-66).

In addition a short version of VR's instructions, definitions and overview of the scope and objectives of the 14 questions is included (page 1-2), and at pages 6, 25, 36 and 55 VR's additional guidance for the prerequisite.

Anyone interested in more information or the full VR instructions/guidance for Panel 3 can send questions to utvardering-alfusv@ki.se



Self-evaluation form for the Evaluation of Prerequisites for Clinical Research

ALF Panel 3

This evaluation concerns the following prerequisites for clinical research:

- easy access to necessary research infrastructures
- time for clinical research alongside clinical work
- career models for clinical research career development
- incentives for integrating clinical research competence in the healthcare organisation

Below is a short description of the concepts used to describe the organisational features of the prerequisites:

Scope	The range of the prerequisite that is to be evaluated.
Objectives	The aims and goals of the prerequisite in terms of quality and performance.
Strategy	The necessary plan of action designed to achieve the objectives of the prerequisites.
Structure	The physical structures (labs, instruments, etc.) and the methods or way in which the provision of the prerequisite and its organisational activities are divided, organised and coordinated.
Process	The necessary steps of actions, services and performances in order to achieve the objectives of the prerequisite. (day to day, or regular activities) This also includes monitoring and evaluation procedures to ensure that the structures and processes in place can deliver according to the strategy and ultimately to the set objective.
Result	The results from implementing the structures and processes for achieving the intended objective for the prerequisite for clinical research.

Each question is answered in the following way:

- A. What strategies and structures have the organisation established to achieve the stated objective?
- B. What recurring processes and activities at organisational level have been implemented to achieve the stated objective? These shall be based on the structures described under A.
- C. What results (evidence) has the organisation achieved in relation to the stated objective regarding strategies, structures and processes described under A and B?

The table below presents the structure of the self-evaluation regarding the prerequisites that are to be evaluated. They are described by defining their scope and objectives for successful implementation in the ALF regions:

Prerequisite	Scope	Objective
1. Access to research infrastructures	To what extent the ALF region ensures that clinical researchers have access to necessary research infrastructures (RI) to enable clinical research of the highest quality.	1.1 The ALF region has developed strategies for securing short- and long-term accessibility to relevant and necessary RI for clinical research.
		1.2 The ALF region has coordinated appropriate management and maintenance of RI, and provides support functions and quality assurance procedures, to enable proper use of RI for clinical research.
		1.3 The ALF region has implemented strategies for prioritising, coordinating and securing short- and long-term financing of RI including transparent and cost-effective user fees.
		1.4 The ALF region has ongoing collaborations with other Swedish universities and regions to secure access to larger and expensive RI (state-of-the-art) with appropriate expertise.
		1.5 The ALF region actively encourages and supports their clinical researchers to use large national RI, such as SciLifeLab, ESS, and MaxIV.
2. Time for research alongside clinical work	To what extent the ALF region ensures that clinical researchers have been allocated sufficient time to perform clinical research of the highest quality alongside their clinical work, and that allocated time can be used according to plan.	2.1 The healthcare organisation has the necessary resources and personnel to ensure that clinical research and clinical research education can be carried out alongside clinical work.
		2.2 The ALF region has enabled an academic career alongside clinical work in collaboration between the healthcare system and the medical faculty in order to ensure time for research, which includes combined posts and/or different types of joint positions for clinical research with clinical work.
3. Career development for clinical researchers	To what extent the ALF region has established career development models that enable clinical researchers in all healthcare professions to pursue a clinical research career.	3.1 The ALF region has well-established models for clinical researchers' career development in collaboration between the healthcare system and the medical faculty.
		3.2 The ALF region has a model for encouraging, enabling and supporting clinical researchers' mobility opportunities to pursue an international or national post doc or a sabbatical period.
		3.3 Gender balance is actively promoted at all levels, and gender perspectives are addressed to ensure gender equality for clinical researchers in the healthcare organisation and at the medical faculty at the university.
		3.4 The ALF region provides opportunities and ensures continuous research skills development throughout careers in the ALF region.
4. Incentives for clinical research in the ALF region	To what extent the ALF region has implemented incentive structures to integrate clinical research throughout the healthcare organisation.	4.1 The ALF region has developed and integrated incentives that promotes academic competence in clinical research at all levels in the healthcare organisation.
		4.2 The ALF region has developed specific incentives to encourage healthcare professionals to become PhD students and pursue a clinical research career, where academic merits are rewarded throughout the career.
		4.3 The ALF region actively promotes diversity among clinical researchers at all levels in the healthcare organisation, with incentives and specific support that enable and encourage clinical research careers for people who are at various phases of life during working life and come from different backgrounds.

REFLECTION ALF3 A

In relation to access to research infrastructures, please describe your reflections from the last ALF evaluation, and whether any modifications have been implemented as a result of recommendations given by the panel.

The evaluation report from 2018 states that the infrastructure for clinical research in the Stockholm ALF region is close to exemplary. However, the reviewers also conclude that there is a lack of access to and knowledge about the infrastructure among clinical researchers.

We have taken several steps to improve this. Immediately after the last evaluation, a process to develop [our websites](#) was initiated with a more distinct navigation, making it easier to access the information about infrastructure. To further create an organized support for researchers who need access to research infrastructure, we have started a [single point of contact](#), where they can get advice regarding available resources.

Furthermore, a core-facility management system that improves overview and simplifies booking of services has been implemented. A pilot study to expand the system to instruments and services not designated as core facilities has been conducted and evaluated with promising results. All our core facilities are available to all our researchers, including clinical researchers, with a fee for service system and a strict “first-come, first-served” policy.

Last year the users of our centrally funded core facilities were asked to complete surveys about their experience. Of 400 respondents, 90% answered that they were *satisfied* or *very satisfied* with the service core facilities provided, and 76% answered that it had been *easy* or *very easy* to find the relevant facility.

Access to healthcare data is pivotal in much of today’s clinical research and is a top priority in the region’s jointly developed strategies. The *Stockholm Centre for Health Data* has been established as a single point of contact for access to healthcare data in the Stockholm ALF region when data from several caregivers are needed.

To create organized support for clinical and translational research, the Stockholm ALF region has formed *CLINICUM*, a virtual regional organization that can help clinical researchers with data acquisition, study design and biostatistics/bioinformatics.

REFLECTION ALF3 B

In relation to time for research alongside clinical work, please describe your reflections from the last ALF evaluation, and whether any modifications have been implemented as a result of recommendations given by the panel.

Time allocated for research is essential for clinical researchers and is something that is monitored continuously. There are two aspects: the amount of money allocated for salaries, and the possibility to actually use the allocated time. According to our annual questionnaires most researchers have been able to use their time for research, also during the pandemic.

However, time for research has been an acute issue during the last two years and will continue to be so during the coming years because of the backlog the pandemic has caused in many of the region's hospitals. We will continue to monitor this issue closely to make sure that our researchers can use allocated time for research.

Since the previous evaluation the number of clinical research positions financed by common R&D funding has been increased. The number of research positions for interns has been increased by 25% (from 16 to 20 positions) and 5 positions to clinical researchers within other health professions than physicians have been announced. In addition to the jointly funded 55 positions announced annually, Region Stockholm is also partly financing several new research positions: 3 PhD positions for residents, 2 positions for senior clinical researchers and 3 positions as clinical postdocs in primary care. Furthermore, the RD&E Committee for Stockholm Health Care Services (SLSO) has decided to partly finance 3 postdoc positions and 2 higher clinical researcher positions starting in 2022. The purpose is to increase clinical research in primary care.

The yearly follow-up process of doctoral students' research time has been enhanced through a digital system for the individual study plan (ISP) implemented in 2020–2021 at KI. The digital ISP facilitates that both the doctoral students and the responsible departments can keep track of the progress and time plan of the doctoral projects.

Several of the other ALF regions set aside a proportionally higher share of the ALF funding for project grants. Stockholm has discussed the advantages and disadvantages of our system, where almost half (47%) of the common R&D funding is allocated based on existing positions and research activity. We still think 'activity-based allocation' of basic funding is important to give our research groups a certain stability. This basic funding usually covers the rent for the research group and in part salaries for more junior researchers.

REFLECTION ALF3 C

In relation to career development for clinical researchers, please describe your reflections from the last ALF evaluation, and whether any modifications have been implemented as a result of recommendations given by the panel

We completely agree with the panel that the number of places in our clinical research schools should be increased. We have therefore increased the number of participants in our first four clinical schools. A new clinical research school in *Clinical Therapy Research* has also been established, with 26 positions. In total the number of places in the clinical research schools has been increased by 53% since the last evaluation, from 94 during 2015–2016 to 144 during 2021–2022 (over two years).

The research environment in Stockholm is competitive. However, we do not see evidence that competition as such has a discouraging effect on the interest to pursue a career in clinical research; all available positions have many applicants. We are proud of the great interest in clinical research in Stockholm, e.g., evidenced by a 5% increase in the total number of clinical researchers since 2017 (individuals who have verified at least one article in bibliometrics), and an increase in the number of newly admitted clinical doctoral students from 137 in 2017 to 160 in 2021.

In the previous evaluation it was commented that a competitive research culture may have a negative impact on interdisciplinary collaboration. We believe that this may be challenged. Nevertheless, we work to stimulate such collaboration. Stockholm has a long-standing ambition to promote translational research. Our research schools encourage interdisciplinary collaboration and networking. An incubator for young researchers ([KIRI](#)) has been established which requires and supports a close collaboration between clinical and experimental researchers. [CIMED \(Center for innovative medicine\)](#) supports high-quality clinical and translational research at Campus Flemingsberg. Our new buildings, *BioClinicum* and *Biomedicum* and corresponding facilities at Campus Flemingsberg, *Ana Futura* and *Neo*, are designed to create a seamless transition from patient care to clinical research and to experimental research. The newly established [Precision Medicine Centre Karolinska \(PMCK\)](#) is a virtual center and a unique collaboration between Karolinska University Hospital and Karolinska Institutet. The mission of this center is to create the conditions for taking precision medicine all the way from research into the everyday life of healthcare. The university alliance [Stockholm trio](#), including Karolinska Institutet, KTH Royal Institute of Technology and Stockholm University, together form a complete academic environment with the areas medicine, technology, science, humanities, law and social sciences. The alliance provides conditions for in-depth collaboration and facilitates new university-wide research and education.

1. ACCESS TO RESEARCH INFRASTRUCTURES

Scope

To what extent the ALF region ensures that clinical researchers have access to necessary research infrastructures to enable clinical research of the highest quality.

Access to research infrastructure (RI) is a prerequisite for conducting high quality innovative clinical research. Typically, an RI also becomes a centre for creativity, which helps researchers develop their research and expertise. Examples of RI include biobanks, clinical competence centres and clinical trial units, core facilities, large-scale computational tools, research facilities, patient data and quality registers.

The availability and easy access to RI for clinical research require that policies, structures, and funding are in place. This is facilitated by collaboration between the region and university, as well as with other ALF regions and stakeholders. Furthermore, the needs for RI have to be mapped to reflect the needs of the clinical researchers, and it is also important to ensure monitoring and quality assurance of existing RI.

The questions below give you the opportunity to describe and explain how the ALF region works with these issues.

We are aware that most of these questions are interdependent, and might be easier to answer jointly. However, to make your responses easier to compare with those of other ALF regions, we ask you to please disentangle the overall strategy for providing RI for clinical research. It is important that you answer each question under A-C in as precise and delimited way as possible.

The five objectives for providing RI for clinical research are, in order: accessibility, management and maintenance, financing, collaboration, and use of national infrastructures.

Question 1.1.A.

How have you secured clinical researchers' access to necessary RI in your ALF region? (*Strategy*)

The collaborative organisation the Stockholm ALF region constitutes the framework for securing relevant and necessary RI for clinical research. Additionally, Karolinska Institutet (KI) has an [Infrastructure Council](#) with adjunct representation from Region Stockholm (Figure 1). The Infrastructure Council coordinates many resources and investments within the Stockholm ALF region as well as national and international initiatives. All bodies (Figure 1) monitor their respective investments.

The strategies to provide clinical researchers' access to necessary RI include:

- Systematic establishment of a broad repertoire of RI for clinical research
- Decisions on overall strategies for access to relevant and necessary RI
- Secured access to RI in the distributed healthcare landscape

Over the past decade the Stockholm ALF region has systematically established an RI portfolio based on:

New buildings equipped with **state-of-the-art RI** designed to comply with the future needs of translational and clinical research, **new animal facilities**, **clinical trial units** at the large hospitals/caregivers, **strategic investments in RIs**, **competitive calls** for funding of RI, and further initiatives. Specifically, to create an optimal clinical and translational research environment, four new research buildings were completed in 2018, *BioClinicum*, part of the new Karolinska University Hospital Solna, *Biomedicum* at KI Campus Solna, *Neo* and *ANA Futura* adjacent to Karolinska University Hospital Huddinge (Figure 2).

The Stockholm ALF region is presently guided by a [Research, Education and Development Strategy 2021–2024](#) for Region Stockholm. Furthermore, the Research, Development and Education Committee at the Karolinska University Hospital has recently published [similar strategy documents](#). In these documents, strategies for developing RIs are included as important facilitators of, and strategic investments for, clinical research. Following RIs increasing importance for research, a [Strategy for Karolinska Institutet's research infrastructure 2021–2024](#) has been developed. All RIs are open for clinical researchers. These strategies outline a number of processes, some of which are described in 'Processes' in 1.1.B below.

Furthermore, in accordance with the ambition to be at the international forefront, Karolinska Institutet and Karolinska University Hospital are the first institutions in Sweden to be accredited as a *Comprehensive Cancer Centre* by the Organisation of European Cancer Institutes. Karolinska University Hospital was also one of the founders of the *European University Hospital Alliance*. This group of nine different university hospitals from nine different European countries facilitate international collaboration within clinical research as well as forming common policy in research areas.

The Stockholm ALF region has taken several steps to adapt research, including RI, to the new distributed healthcare landscape. *Academic Specialist Centres* are important outpatient nodes that combine first class clinical service with clinical research such as studies on new treatment strategies and Academic Specialist Centres have been established 2016–2022 for large patient groups such as diabetes, rheumatoid arthritis, Parkinson's disease, obesitas and multiple sclerosis.

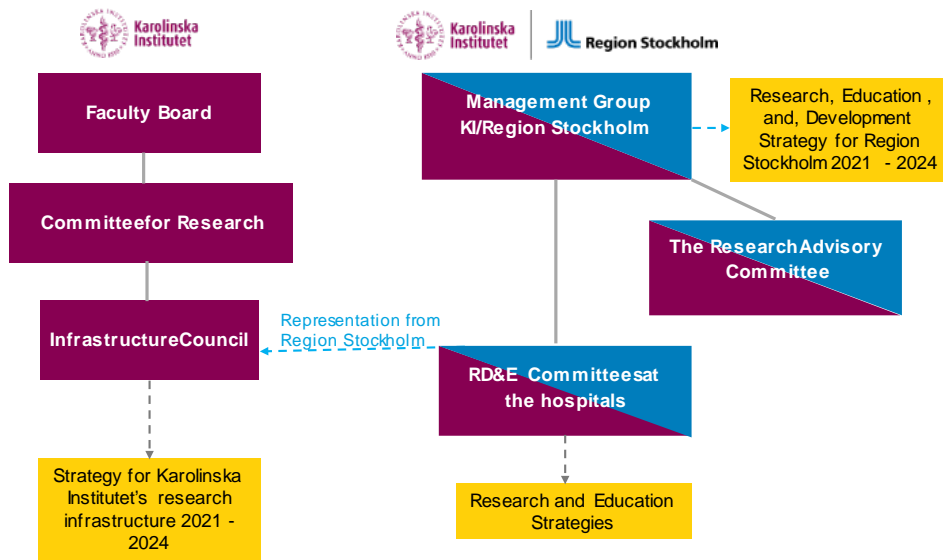


Figure 1. The Stockholm ALF region provides the relevant and necessary RI for Stockholm's clinical researchers. Karolinska Institutet (KI) in purple, Region Stockholm in blue and strategies in yellow.



Figure 2. Important laboratory buildings for translational research (the year the building was completed in bold).

Question 1.1.B.

How have you secured clinical researchers' access to necessary RI in your ALF region? (*Process*)

The processes for securing short- and long-term accessibility to relevant and necessary RI for clinical research include long-term strategic investments in RIs, a process for bottom-up funding of RIs and a structured process to suggest needs for new national infrastructures.

New research buildings. Figure 1 shows the most important buildings for translational and clinical research, including four new buildings, corresponding to a total of 120,000 m², completed in 2018.

Animal facilities. Two new animal facilities opened in 2018, the large *Comparative Medicine Biomedicum* and *Comparative Medicine Annex*, focusing on rodents and harbouring a zebrafish facility. The *Fagraeus lab*, harbouring primates, and some additional animals as well as BSL3 facilities for animals, was recently rebuilt and upgraded to allow advanced imaging examinations. In 2020 an addition to the animal facility in *Novum*, including operation theatres and stables for larger animals, was completed. These new facilities add significant value, particularly for clinical research.

Infrastructures for clinical studies. During 2019–2020 the clinical trial infrastructure in the Stockholm ALF Region was re-organised to build capacity centred around a hub at the Karolinska University Hospital, **Forum for Clinical Trials Units**, and the **Node Forum Stockholm-Gotland** (part of the national system 'Clinical Studies Sweden'), with a closely connected **Grants office** (Figure 3). The clinical trial facilities include significant infrastructures at the two emergency hospitals with the greatest numbers of emergency cases in Sweden, i.e. Stockholm South General Hospital and Danderyd Hospital. The regional hub receives 5M SEK annually from national grants (Swedish Research Council for clinical studies) and 4M SEK from Region Stockholm. In addition, **Clinical Trial Unit Academic Specialist Centre** (for clinical studies in primary care and organised within Stockholm Health Care Services close to the primary, psychiatric and geriatric healthcare, and research) is supported by Region Stockholm with 1M SEK annually.

Competitive calls. The Stockholm ALF region has developed a process based on 3-year cycles for competitive funding of RIs. In this process new needs are suggested. For 2022–2024, 388M SEK have been awarded for operational costs and instruments.

Every second year, the Swedish Research Council launches an inventory of RI needs in advance of calls for national RI. The Stockholm ALF region contacts all researchers in the region to survey the need for new infrastructures in a bottom-up process, followed by a **structured process resulting in the prioritised needs of the region for national RI**.

Other strategic initiatives. *Karolinska Cell Therapy Centre*, which has been operative for more than 25 years, has become a key resource for new strategies implemented in cancer treatment as well as an important partner for biotech companies. The centre supports researchers, clinicians, and industrial companies to develop quality assured Advanced Therapy Medicinal Products (ATMPs) and cell therapy products for unmet clinical needs.

Example of a recent strategic initiative by the Stockholm ALF region is **CLINICUM**. This virtual RI with focus on clinical epidemiology and biostatistics, and with local nodes serving six emergency hospitals, is a significant addition to clinical research. The **Stockholm Center for Health Data** has been established as a single point of contact for access to healthcare data in Region Stockholm when data from several caregivers are needed. **MedTechLabs**, located in BioClinicum, is a collaboration between Region Stockholm, KI, and the Royal Institute of Technology. Additional strategic initiatives include **biobanking** and **imaging facilities**. Furthermore, the Research, Development and Education (RD&E) Committees at the hospitals invest approximately 125M SEK per year in RI and the Infrastructure Council invests about 23M SEK per year in **strategic RI investments** (Figure 4), including a recent strategic investment in BSL3 laboratories to facilitate clinical research of the corona virus.

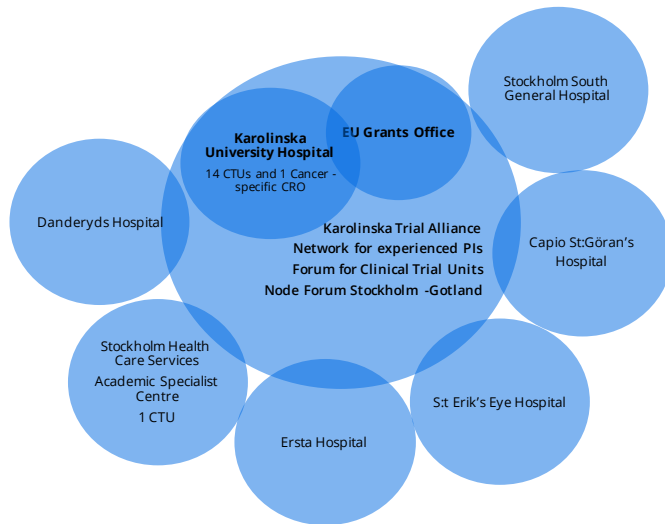


Figure 3. An umbrella organisation has been created for the clinical trial units. Clinical trial units (CTU), Contact Research Organisation (CRO).

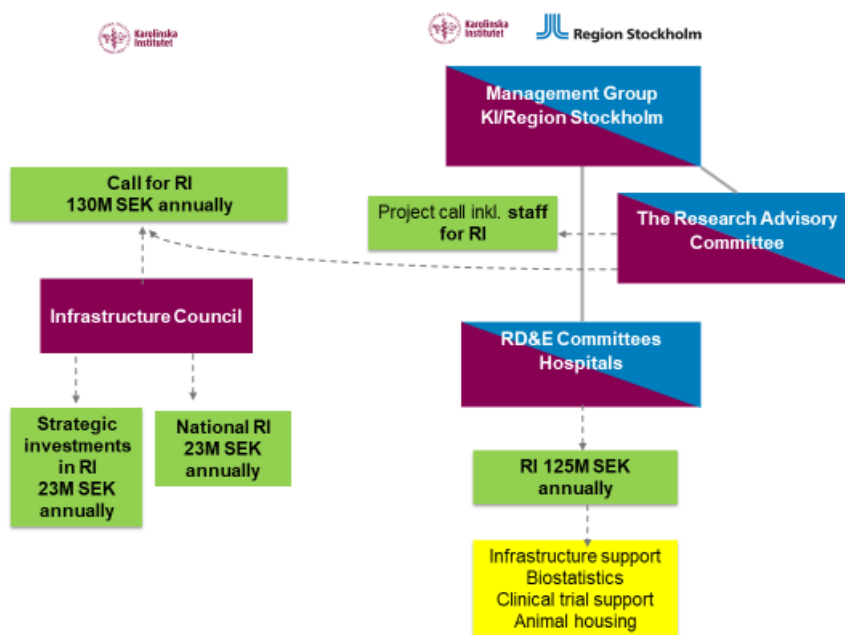


Figure 4. Funding allocated within the Stockholm ALF region to provide relevant RI for clinical researchers: 130M SEK per year for an open RI call, 23M SEK for strategic investments, 23M SEK for National RI together with the Swedish Research Council and the Stockholm hospitals also funds RI with 125M SEK annually. In addition, project calls that includes RI staff is launched every 2nd year. Karolinska Institutet (KI) in purple, Region Stockholm in blue, funding in green and examples of RI in yellow. In addition to what is shown in the figure, specific strategic investments in RI can be launched at all levels including the management group.

Question 1.1.C.

How have you secured clinical researchers' access to necessary RI in your ALF region? (*Evidence*)

[Global academic rankings](#) all place KI among the top ten universities in Europe, sometimes top ten in the world, in Clinical Medicine and related disciplines.

The results of the strategies and processes in securing RI for clinical research can be measured by:

- Clinical studies and implementations
- Attracted external funding for clinical studies
- Attracted collaborations
- Expansion of unique resources
- User surveys.

Infrastructures for clinical studies. The number of ongoing or planned **clinical studies** in the Stockholm ALF region was 1,614 in 2021. Of these about 20% are commercial trials with a scientist from the region responsible for the study. Further, scientists in the Stockholm ALF region **co-authored more than 800 publications on Covid-19** since April 2020. Many of these publications are large international collaborations, indicating that clinical scientists have strong international networks and benefit from efficient RIs to rapidly address important new clinical questions. Furthermore, results from this line of research have been implemented to reduce morbidity and mortality in Covid-19 patients.

Karolinska Cell Therapy Centre manufactures products and is, together with researchers, clinicians, and companies, an important resource for the **implementation** of novel therapies in healthcare, in particular severe disease states. At present Karolinska Cell Therapy Centre is involved in the development of 14 different products.

The recently established *Stockholm Centre for Health Data* has processed more than 100 applications of health data during the first two years of operation indicating that it will satisfy a growing need for access to health data for clinical research and innovation.

Relevant and necessary RI has enabled the wide implementation of massive parallel DNA sequencing in clinical practice for rare disorders at the Centre for Inherited Metabolic Diseases and the Departments of Clinical Genetics and Clinical Immunology.

Strategic investments in imaging by all levels in the Stockholm ALF Region make KI and Region Stockholm **attractive partners for the industry**, as exemplified by the long-standing collaboration with AstraZeneca. Further, [MedTechLabs](#) has been identified as **an attractive partner by GE HealthCare US** and the world's first silicon-based photon counting computed tomography system is now being tested in a clinical setting at KI and MedTechLabs.

As a result of **strategic decisions to build capacity in biobanking**, clinical research has access to two very large biobanks. *Stockholm's Medical Biobank* is responsible for all biobanking within the health care in Region Stockholm holding about 50 million clinical samples. Specifically, the pathology research centre delivers 95,000 samples to different clinical research studies yearly. KI biobank harbours about 7 million samples, including longitudinal research cohorts.

To follow up the results of its strategies, the Stockholm ALF region has conducted [two surveys](#) (more than 400 respondents) to users of core-facilities. **95% of the respondents answered that a given RI has been important for their research project.** 50% of the respondents use the RI monthly or more frequently. This indicates that the RI is necessary and relevant.

Question 1.2.A.

How are clinical researchers provided with well-managed, well-maintained RI as well as enough support for proper use of RI? (*Strategy*)

The RI available to clinical researchers includes buildings, local RI and individual equipment, regional RI and national RI. The strategies and structures for management, maintenance, and support include: **Research buildings.** *BioClinicum* and *Centre for Molecular Medicine* (CMM), two research buildings dedicated to clinical and translational research within Karolinska University Hospital in Solna, have research boards including members from different research areas. Strategic issues in BioClinicum and CMM are decided by the Karolinska University Hospital RD&E Committee and the CMM Foundation board, respectively, with members from the university and Region Stockholm. This governance structure balances clinical and university leadership in environments in which staff from different clinical and university departments work together in the laboratories. Biomedicum, Neo and ANA Futura have facility managers that support their operations.

Animal Facilities at KI have a board overseeing the operations that includes researcher representation and that reports to the vice president of KI. The animal facilities at Karolinska University Hospital are organised under the RD&E Committee with representatives from both KI and the hospital.

Infrastructures for clinical studies. More than 20 different clinical trial facilities located within hospital environments are supported by a hub at Karolinska University Hospital. The **Forum for Clinical Trials Units**, the **Node Forum Stockholm-Gotland**, and a **common Grants office** (Figure 3) provide start-up and planning support. Funding derives from the Swedish Research Council, the competitive core facility calls, the local RD&E Committees and from Region Stockholm. User fees are charged when a trial has received external funding.

Strategic initiatives. MedTechLabs is governed by a board headed by the Director of Research and Innovation at Region Stockholm and includes representatives from Region Stockholm, KI and KTH Royal Institute of Technology. Each programme area within MedTechLabs is headed by a clinical PI from the Stockholm ALF Region and a PI from the KTH Royal Institute of Technology.

The Stockholm ALF region has since 2010 **systematically built capacity at the regional level in a bottom-up process based on regular open calls for RI funding, complemented with strategic investments.** Structures that provide resources also monitor the RI, such as the KI Infrastructure Council, SciLifeLab, the Swedish Research Council and in some cases laboratory accreditation bodies. The systematic build-up of RI that handle larger volumes/numbers facilitates high quality and efficiency, in comparison to research groups individually establishing advanced methods or technologies and investing in similar instrumentation.

Competitive calls. The Stockholm ALF region has a 3-year cycle for competitive funding of RIs which are assessed by a group including clinical researchers. In the last call 2021, 37/67 applications received 3-year support, while seven previously supported facilities will be phased out with limited funding for two years. Eight new facilities were granted support. This process thus supports renewal of the RI portfolio.

The above RIs are generally hosted within organisations with responsibility for research. **This facilitates a close integration with research environments, ensuring availability of RI of high quality and relevance for clinical researchers and identification of current and future RI needs.** The responsibility for RIs follow the delegation order within the respective departments (or equivalent).

A high quality and relevant portfolio of RI for clinical research requires a strategy with clear, transparent, and predictable processes for initiating and maintaining resources for operating RI and having corresponding processes when resources are discontinued. The adopted report (*Steering and control of RI at KI*) addresses these aspects with a dialogue-based model for follow-up.

Question 1.2.B.

How are clinical researchers provided with well-managed, well-maintained RI as well as enough support for proper use of RI? (*Process*)

To secure a vibrant academic environment within the **research buildings** (Figure 2), research groups are assigned space according to research areas. This facilitates seminars, journal clubs, courses, and other scientific activities around specific themes for sharing of knowledge, RIs, equipment and other infrastructures. The location within or very close to Karolinska University Hospital gives clinical scientists easy access to the laboratories for translational and clinical research and ensures clinical involvement within academic environments.

The **animal facilities** are all equipped for translational research and are connected to the research buildings in Karolinska University Hospital. A pipe system enables rapid transport of short-lived radioligands from BioClinicum to animal facilities, enabling PET studies of non-human primates. The animal facilities in BioClinicum and Novum are equipped for research with larger animals of special interest for clinical research.

The Stockholm ALF region supports **clinical studies** through funding of a common support infrastructure (Grants Office and Karolinska Trial Alliance) located at Karolinska University Hospital. The support RI serves as an umbrella structure (Figure 3) with an outreach of support to all emergency hospitals as well as Stockholm Health Care Services (the latter hosts an Academic Specialist Centre and organizes psychiatric and geriatric care and non-hospital linked outpatient care in Region Stockholm). The clinical studies are facilitated by a designated coordinator and the RI provides, free of charge, hands-on support for clinical studies with advice and assistance with study planning, grant application, negotiation with companies and regulatory support, including ethical permits and biobanking. When a clinical trial receives funding, Karolinska Trial Alliance offers experienced staff, and the Grants Office provides the special competence needed for management of international grants and commercial funding.

Important resources for clinical research are **diagnostic laboratories** organized in Medical Diagnostics Karolinska that serve the entire Stockholm ALF region with accredited service. A joint [Precision Medicine Center Karolinska](#) was established by KI and the Karolinska University Hospital during 2021. This initiative is dependent on internationally competitive RI in genomics that has been built up in the region.

The mission of the **competitive calls** is to ensure that the most relevant and advanced methodology and technology infrastructure is provided to the researchers. An evaluation panel with broad representation including clinical researchers ranks applications and suggests which RIs to fund.

The model for **life cycle management and sustainability** follows the model for Steering and control of RI at KI with dialogues based on annual reports and is complemented with surveys to users and indicators such as number of users, number of assays, number of publications resulting from the use of the RI. Challenges for optimal operations are identified, discussed and action points are documented.

The **RI management system** (iLab) improves the overview and booking for customers as well as follow-up by the RI, department and KI management. iLab provides the framework to follow indicator RI usage over time for individual instruments.

Question 1.2.C.

How are clinical researchers provided with well-managed, well-maintained RI as well as enough support for proper use of RI? (*Evidence*)

Deliveries, coordination, and quality of RI are followed up by:

- Key indicators including users
- Evaluation according to predetermined schemes
- Survey results

Strong evidence that the infrastructure for clinical studies is successful is the **interest from other nodes in the national network of clinical studies** (Clinical studies Sweden). The infrastructure in Region Stockholm serves as a model for developing price lists, databases and quality assurance processes. Additional evidence comes from the number of clinical studies with scientists from Region Stockholm as PI (1,614 clinical studies during 2021). Furthermore, the infrastructure is an attractive partner for industry, as evidenced by the fact that 349 commercially sponsored active trials are currently led by PIs at the Karolinska University Hospital. The RI organises courses in Good Clinical Practice (670 participants 2021), provides a price list used for clinical trial applications and includes a database for clinical studies with information focused on regulatory information and funding, allowing the study leader to find the correct information gathered in one place.

The number of users of RI in the Stockholm ALF region has been followed up as part of the application process for funding in the recurrent competitive calls for RI funding, where the applicant has been asked to submit a list of projects and users of the RI. **The total number of users for 2019–2020 was over 1000.** The new iLab RI management system can follow the usage in real time, and it can be summarised in an annual report.

The two large biobanks, Stockholm Medical Biobank and KI Biobank, are by far the largest in Sweden. Evidence for their efficiency is that these biobanks delivered 63,000 blood samples (25% of all such samples in Sweden) and 95,000 tissue samples (56% of all such samples in Sweden) for research projects during 2021.

Needs for covid-19 clinical research drove a rapid decision for strategic investment to expand RI capacity at two BSL3 laboratories. **The upgraded BSL3 facilities provided service to seven different clinical research projects during the corona pandemic** that have enabled the investigation of SARS-CoV-2 in nasal aspirates, bronchoalveolar lavage, lung biopsies, bronchial biopsies, nasopharynx, nasal cavity, throat, saliva and cough. Coordination between the two BSL3 facilities are followed up in the yearly dialogues and could involve sharing of personnel and protocols and common training and educational activities. This illustrates the strategic ability and to match rapid developments and new research needs.

Two recent [surveys](#) (400 respondents) to users of RI were conducted. These show that **90% of the respondents are satisfied with the RI** and 80% responded that the system for access works well to a *high degree*. About 70% considered the waiting time to be *reasonable at a high or very high degree*. 76% of the respondents answered that it was easy to find the requested service to a *high or very high degree*. This is evidence that the Stockholm ALF region has a professional RI portfolio.

Question 1.3.A.

How have you ensured funding and cost-effective user fees for RI? (*Strategy*)

Many RIs that are essential for clinical research correspond to large investments and/or that values are built over time. Examples of such long-term investments are clinical research buildings and animal facilities located within or in the immediate vicinity of emergency hospitals (Figure 2), facilities for advanced imaging research, clinical trial units and facilities for biobanking.

Research buildings. Research groups are allocated into different research buildings based on their research area and demand for space, but also on the long-term ability of the research groups to cover rent for the allocated space. **The rental costs in the research buildings** are subsidised, but a significant fraction is charged to the research groups. The **research groups scientific activities are monitored** yearly and constitute input for their ALF funding based on performance during the last three years. Typically, a research group uses most of this ALF funding to cover rent costs. This system is transparent, flexible, ensures cost-effective use of research buildings and allows rapid re-allocations of research groups according to needs.

The animal facilities receive strategic funding of 250M SEK annually for rent and infrastructure. This funding is prioritised from the faculty board at KI and from the RD&E Committee at the Karolinska University Hospital. The researchers pay a user fee related to operational and personnel costs. Researchers have been included in discussions regarding the user fees. Furthermore, the Stockholm ALF region has decided on strategic investments in imaging facilities for animals and humans corresponding to 100M SEK totally for instruments and 30M SEK in annual operational costs.

Clinical studies are supported by strategic funding for planning, start-up negotiation with companies and regulatory support, while the running costs for projects must be covered by external funds. Linked to this is the support for biostatistics and clinical epidemiology receiving strategic start-up funding within the *CLINICUM* initiative.

The Stockholm ALF region provides strategic funding (80M SEK annually) for clinical research specifically at Campus Flemingsberg, the Center for innovative medicine ([CIMED](#)). CIMED supports clinical and translational research and funds RIs such as biostatistics and bioinformatics, and its resources are prioritised by a board with broad representation from the region and an external chair.

To facilitate renewal of the RI instrument park, **competitive calls for funding** are announced in 3-year cycles. The Stockholm ALF region combines resources to achieve a significant budget allowing funding of about 40 RIs. The evaluation is performed using in a transparent process by a panel of researchers decided by the faculty bodies. Funding for instrumentation is available to secure that RIs have the possibility to maintain state-of-the-art instrumentation. Strategies to reduce costs are sharing resources, instruments and knowledge.

Researchers from the Stockholm ALF region are active in both **suggesting and applying for funding of national RI from the Swedish Research Council**. Applications are prioritised by the KI President.

The strategy is that **RI should charge costs but not make a profit. User fees should generally constitute a significant part of the budget for a given RI**. For the academic users, the fees for the services are subsidised to varying degrees dependent on the specific RI. Benchmarking with similar facilities at other universities could constitute a parameter in setting the price list. The price should be transparent and is often equal for all academic users in Sweden. Industrial users should pay the total cost for the service. Looking into the future, price lists including the true cost as well as the customer fee will further increase transparency.

Question 1.3.B.

How have you ensured funding and cost-effective user fees for RI? (*Process*)

Research buildings. The Stockholm ALF region has made strategic investments in research buildings where research groups can rent space. Prioritising areas for individual research groups is based on their needs and ability to cover the rent based on ALF funding which is related to the groups scientific production. This transparent system has been used for more than 30 years and has proven to be cost effective and accepted by the researchers.

Animal facilities receive considerable strategic support, but user fees are used as transparent and effective instruments for cost effective prioritising the facilities resources.

The infrastructures for clinical studies receive long-term base funding for planning, start-up negotiations with companies and regulatory support while subsequent project costs must be covered by external funds. Similarly, the biostatistics support has a basic financing from the competitive calls while user fees are the main source for running costs.

Competitive calls. The Stockholm ALF region has developed a process based on three-year cycles for competitive funding of RIs. The applications for funding of RI are assessed by a group including clinical researchers. In a transparent process applications are evaluated **on the following criteria:**

1. Deliveries/results of the activities: number of projects (users), customers scientific articles, courses given – this criterium is not relevant for new facilities, 2. Strategic importance for research within KI/Region Stockholm, 3. Resource efficiency: other financiers, how it is proposed to finance the activities with customer fees, 4. Clarity and transparency: access, customer fees 5. Future plans and 6. For applications involving expensive equipment/instruments, justify the importance of the equipment/instrument for the activities.

Based on experiences from the last evaluation process, the Infrastructure Council identified the need to further explore two areas:

- Review, including long-term funding, of the imaging RIs for animal and human studies that are fragmented into several RIs. Based on the review and a follow-up report approved by the Infrastructure Council, the process will now involve the newly formed *Centre for imaging research* (CIR). This is commissioned to coordinate several RIs such as cyclotrons, radiopharmacy, instruments for animal and human imaging, to further develop clear and transparent governance including organisation, steering documents, and goals. CIR will receive further strategic funding directed towards collaboration between platforms as well extended collaboration within KI and Region Stockholm.
- Review of the priorities of KI Biobank. Based on the review and a follow-up report approved by the Infrastructure Council, the continued process states that KI Biobank should focus its funding from the Stockholm ALF region on collection, storage, and withdrawal of samples. Other activities should aim towards a higher level of user fees. The future process will also see the establishment of a Biobank Council, including user representation, that will advise the KI Biobank management as regards to e.g. introduction of new technologies. Importantly, KI Biobank is expected to publish a price list with the true cost of a service and the user fee to increase transparency.

To support RIs in pricing services, administrative tools have been developed for pricing and payment models. RIs differ both in terms of organisation, services and conditions. The knowledge to produce adequate price calculations rests in the core business of the RI, which has the best knowledge and insight in terms of economic as well as scientific parts. One basis for being able to calculate prices is that there is one accounting structure that supports a pricing model, i.e. which provides the conditions for calculations. If accounting is performed according to a structured model, it is easier to price, follow up and report back fees.

Question 1.3.C.

How have you ensured funding and cost-effective user fees for RI? (*Evidence*)

In the competitive calls about 10–15% of the existing RI that have received funding in a previous 3-year period do not get renewed funding, and a similar number of new RI initiatives receive financial support. This illustrates an ability for prioritising financing between RIs.

Additionally:

- Researchers in the Stockholm ALF region have attracted 14.3M€ in funding for clinical projects from EU programs Horizon 2020 and EIT Health for the period 2016–2021. Researchers from Stockholm are coordinators for 28% of this funding.
- Researchers in the Stockholm ALF region have attracted 213M SEK in total as main applicant for national RI of particular interest for clinical research in the latest call from The Swedish Research Council.
- User fees that are accepted and can sustain the RIs infrastructure have been developed.

By systematically building high quality RI for clinical research, **the Stockholm ALF region has been very successful in receiving funding from the Swedish Research Council to serve as national RI in biomedical research and clinical research.** The funding from the Swedish Research Council acts synergistically with funding from the region to increase the critical mass, and resources are coordinated to provide good conditions for clinical research. In the last call from the Swedish Research Council the Stockholm ALF region received funding as main applicant for:

- 34M SEK for 2023–2028 as coordinator and host for the [Swedish Twin Registry](#) (STR) that manages a nationwide database enabling twin study designs for clinical research questions in any disease area where the STR holds, or can collect, data.
- 171M SEK for 2023–2028 as coordinator for the [National E-infrastructure for Aging Research](#) (NEAR), of which approximately 50M SEK goes to the RI in Stockholm and 121M SEK to other participating regions. NEAR coordinates databases for clinical research, from major population-based longitudinal studies on aging and health in Sweden.
- 8M SEK for an on-scalp MEG the RI [National Magnetic Encephalography](#) which will open novel opportunities for clinical research on for example epilepsy.

In addition, [Karolinska Cell Therapy Center](#) that acts as a national RI, has an annual budget close to 20M SEK and is financed by competitive RI funding, external grants, and user fees from clients in academia, healthcare and industry in Sweden and other European countries.

In [two recent surveys](#) (400 respondents) to users of RI, **62% answered that the price was reasonable to a large or very large degree.** Furthermore, the large number of users of RI, at the order of a thousand users for the period 2019–2020 as recorded from the 2021 competitive call for RI funding, suggests that the user fees are accepted by the users.

Question 1.4.A.

How do you collaborate with other Swedish universities and regions in enabling access to large and expensive RI for your clinical researchers? (*Strategy*)

The Stockholm ALF region acknowledges the need and possibilities inherent in coordinating investments in RI, as for example stated in [Strategy for Karolinska Institutet's research infrastructure 2021–2024](#). As RI grows more extensive, advanced, and expensive, organizations are finding themselves less and less able to finance RI. Streamlining, greater coordination and co-utilisation of advanced RI is therefore becoming increasingly necessary. Further, coordination also facilitates building of knowledge and experience. The strategy is to coordinate, develop, make available and use national RIs where possible and to make RIs developed within the region available to the broader research community in Sweden. The Stockholm ALF region welcomes the possibility to utilize RIs in other regions, when possible, rather than building up its own resources.

Particularly, the Stockholm ALF region is:

- Coordinating and participating in national RIs financed by the Swedish Research Council
- Hosting, together with other universities, SciLifeLab
- Supporting RIs in personalized medicine
- Allowing national access to RIs within the region

RIs within **National RIs** hosted by the Stockholm ALF region and of particular relevance for clinical research include the Swedish Twin Registry ([STR](#)), the National E-infrastructure for Aging Research ([NEAR](#)) and the [National Facility for Magnetoencephalography](#). The Stockholm ALF region also takes part in national RIs such as [National Bioinformatics Infrastructure Sweden](#), [National Genomics Infrastructure](#), [Swedish Infrastructure for Medical Population-Based Life-Course and Environmental Research \(SIMPLER\)](#), [CAMP](#) - Centre for Advanced Medical Products.

Within **SciLifeLab**, KI has a specific responsibility to secure methods and applications of high relevance and accessibility to clinical researchers.

[Genomic Medicine Sweden](#) (GMS) is a national **collaboration** for new genetic technologies in clinical research that are important for personal medicine, with a scientist from the Stockholm ALF region as lead PI. Closely linked to GMS is [Genomic Medicine Center Karolinska](#) (GMCK). GMS and GMCK provide laboratory as well as bioinformatic support for genetic research of clinical material. They have a strong emphasis on translational research and implementation of new genetic technologies in routine diagnostic support, and serve as a model for other regions with less experience in these technologies. The region has systematically built a portfolio of RIs through a combination of bottom-up regular competitive calls and strategic investments. **This portfolio of RIs is available to the broad Swedish clinical research community.**

Question 1.4.B.

How do you collaborate with other Swedish universities and regions in enabling access to large and expensive RI for your clinical researchers? (*Process*)

The Stockholm ALF region has developed processes for:

- Defining needs, applying for and managing RIs financed by the Swedish Research Council
- Contributing to the outreach of SciLifeLab activities
- Communicating and making available its RI to the broader Swedish research community

The Stockholm ALF region has developed a process for the inventory of RI needs that the Swedish Research Council offers every second year in advance of calls for national RI. The Stockholm ALF region reaches out to KI departments to collect needs in a bottom-up process followed by a structured review process, involving the Infrastructure Council and Committee for Research, resulting in the prioritised needs of the Region.

When calls for national RIs are announced, a discussion is initiated within the Stockholm ALF Region regarding participation in applications or coordinating applications. A structured process, involving the Infrastructure Council and KI Committee for Research, results in a decision for the Regions participation in, and co-funding of, RIs. Furthermore, the KI Infrastructure Office assists in application processes and when funding is awarded, is responsible for securing agreements, setting up the required steering structures and securing appropriate follow-up. **Importantly, both during the inventory and the application phases, researchers from the Stockholm ALF region are active in discussion with other regions to secure optimal RI for the Swedish research community.**

SciLifeLab has since its initiation had a structured process for reaching out to the broad research community. Through its representation in the Rector's Council of the four host universities, the National Board, and via the KI Scientific Director, KI contributes in SciLifeLab's ambition to reach out to the broad Swedish research community with specific focus on clinical research.

The Stockholm ALF region has many of its RIs presented at externally accessible web pages where RIs are grouped according to themes to facilitate navigation and identification of a desired service. The Stockholm ALF region has launched a project focusing on Digital Profiling of RIs whereby a specific focus is on facilitating the clinical researcher's navigation to find the right service. The Stockholm ALF region has implemented the core-facility management system iLab in all centrally funded RIs. **In iLab, clinical researchers from all ALF regions in Sweden can sign up and request services through this module.**

The Infrastructure Council 2022 initiated yearly dialogues with all funded RIs to follow-up the activities and to assure future performance in accordance with the needs of clinical research. **Usage of RIs outside the Stockholm ALF region can be followed up** in such dialogues.

Question 1.4.C.

How do you collaborate with other Swedish universities and regions in enabling access to large and expensive RI for your clinical researchers? (*Evidence*)

Maybe the strongest evidence for collaboration with other regions is the fact that **more than 300 ongoing clinical studies led from Stockholm are multicentre studies** together with other regions. Furthermore, clinical scientists in Stockholm are **responsible for 26 national ranked quality registers** and are key members of steering groups for many of the other Swedish quality registers. These quality registers are used not only to support clinical care but are also important infrastructures for clinical research.

In the last call from the Swedish Research Council, **the Stockholm ALF region received 115M SEK for national RI, for the period 2023–2028 out of 213M SEK, of which 98M SEK goes to other regions. The Stockholm ALF region is currently coordinating four national RIs**, the Swedish Twin Registry, National e-infrastructure for aging, National Magnetic Encephalography and Genomic Medicine Sweden (Vinnova funded) and **is participating in four more national RIs** (National Bioinformatics Infrastructure Sweden, National Genomics Infrastructure, Centre for Advanced Medical Products and Swedish Infrastructure for Medical Population-Based Life-Course and Environmental Research) all with clear relevance for clinical research.

The childhood tumour bank located in the Stockholm ALF region serves all paediatric cancer clinics in Sweden with sequencing data of all new childhood tumours, as well as constitutional sequence data of the patients and their parents.

The Stockholm ALF region participates in [Genomic Medicine Sweden](#) which has a total funding of 425M SEK (2018–2024) from Vinnova and the 14 partners (195M SEK from Vinnova and 230M SEK from the partners). This initiative is led by a PI in the Stockholm ALF region and involves all other ALF regions in Sweden. The Region is also part of [CAMP](#) - *Centre for Advanced Medical Products*, which consists of 40 partners under the leadership of Umeå University. The scientific manager and co-director of CAMP are from the Stockholm ALF region. CAMP is also a Vinnova-funded project focusing on the science and technology required to translate ATMPs from lab-to-clinic, including bioprocess development, GMP production and logistics. CAMP has received 48M SEK between 2018-2023. Researchers from KI and the Karolinska University hospital are the main recipients of 14M SEK funding from CAMP.

Investments and efforts over 60 years have made the [Swedish Twin Registry \(STR\)](#) the largest twin register in the world, with highly informative, researchable data for 87,000 twins born in Sweden since 1886. The use has been extensive and continues to increase. The formation of a consortium with members from several Swedish universities participating in the STR National Council improved the knowledge, access, and opportunities to influence priorities and developments for clinical research groups throughout Sweden, with disseminated use throughout the ALF Regions. During 2016–2021, STR supported 35 external projects including researchers from six other ALF Regions.

[NEAR](#)'s purpose is to empower aging research in Sweden by providing substantial added value to the field: a broad, multidisciplinary research perspective that cannot be achieved with the individual databases; increased sample size and variation, which enhance representativeness and generalizability; and a critical mass of data that opens new research avenues and supports innovation. The goal is to contribute to identifying sustainable intervention strategies for better health and care for older people. The consortium of 8 Swedish universities, is distributed over all ALF Regions, where the 15 local databases are located.

Question 1.5.A.

How do you encourage and support clinical researchers to use large national RI, such as SciLifeLab, ESS, and MaxIV? (*Strategy*)

[Karolinska Institutet's Strategy for Research Infrastructure 2021-2024](#) concludes that there is potential for increased usage of MAX IV capabilities for research within KI and for future use of ESS capabilities. **The strategy includes increasing the knowledge and experience of how MAX IV and ESS can be used in medical research**, exploring internal and external expertise. Activities include information and training.

As one of the four hosting universities for SciLifeLab, KI is, through its president and representatives on the national board, and in the management, working towards formulation strategies for SciLifeLab. In this task, **KI takes a specific responsibility for clinical research**.

Strategies and structures for securing, encouraging, enabling, and supporting clinical researchers use of SciLifeLab resources include:

- Incorporation of facilities into departments
- Recruitment of strong research groups to the environment
- Co-funded facilities.

The Stockholm ALF region hosts several facilities relevant for clinical research integrated in departments, thereby connecting them to clinical research environments. Some of the clinically-orientated facilities are connected to hospital departments, which further strengthens their connection to clinical research. In this model the **facilities become integral parts of the clinical research environment where research ideas and approaches are presented, discussed, and challenged**. These facilities will be incorporated into the RI management system, making it possible to follow the use of different core facilities by clinical researchers.

The Stockholm ALF region has actively recruited young fellows and more established researchers to the SciLifeLab environment who act as bridges to the clinical research environments, being located closely to both Karolinska University Hospital and KI. Over the past eight years KI has recruited six research fellows to the SciLifeLab environment. Three of KI's six recruitments in the Swedish Research Councils programme for top international scientists have their activities located at SciLifeLab in Solna. The other three recruitments have had interactions with SciLifeLab. These six scientists all have programs that are connected to clinical research.

Through the programme for funding of core facilities and through the programme for co-funding of national infrastructures, the Stockholm ALF region co-funds clinically orientated facilities within SciLifeLab: [Clinical Proteomics Mass Spectrometry core facility](#), [Clinical Genomics Stockholm/ Genomic Medicine Center Karolinska](#) and [Eucaryotic Single Cell Genomics](#). These facilities will be incorporated into the project *Digital Profiling of KI core-facilities* in which a specific focus is to facilitate exposure and information to clinical researchers.

Question 1.5.B.

How do you encourage and support clinical researchers to use large national RI, such as SciLifeLab, ESS, and MaxIV? (*Process*)

In 2020, the Infrastructure Council supported an online symposium to increase awareness of MAX IV beam lines and what they can deliver, including seminars in medicine, and supported start-up grants to initiate new research projects between KI scientists and MAX IV scientists using MAX IV beam lines.

During 2021, the Infrastructure Council commissioned a task and resources to increase the awareness of MAX IV and ESS opportunities for research in medical sciences. Within this task a [website](#) was established and seminars were arranged. A structured roadshow to departments had to be cancelled due to the pandemic, as were most specific seminars by MAX IV scientists for specific clinical research groups.

During 2022 the Infrastructure Council has commissioned **tasks and resources for outreach and inspiration activities related to the use of MAXIV and ESS resources**, such as lunch seminars highlighting the possibilities of neutron scattering in biomedical research, which will be led by biomedical researchers at KI who themselves use these technologies.

Processes and activities for securing, encouraging, enabling, and supporting clinical researchers use of SciLifeLab resources includes:

- Competitive calls
- Coordinated exposure of technologies
- Outreach activities

KI has initiated the recruitment of [postdocs with clinical translational focus in collaboration with SciLifeLab](#) with 7.5M SEK being available in the call.

The SciLifeLab [Precision medicine capability](#) is a new function collecting precision medicine technologies to support clinical research. The [Data Driven Life Science Personal Medicine Programme - Making an impact on the future of medicine](#) is of high relevance to clinical research. An expert group has been appointed for [Data Driven Precision Medicine and Diagnostics](#) at SciLifeLab, which emphasises the clinical application in Data Driven Medicine..

SciLifeLab organises several outreach activities including seminars as well as all-day symposia once/twice a year, and there is a special seminar series called “[Clinical talks](#)” with titles such as “[The road towards precision medicine in Sweden](#)” and “[Playing your way to a healthy life](#)”. Clinical researchers in the region are of course more than welcome to take part in these activities, and they do. Genomic Medicine Sweden gives monthly lunch webinars, facilitating the participation of clinical researchers.

Question 1.5.C.

How do you encourage and support clinical researchers to use large national RI, such as SciLifeLab, ESS, and MaxIV? (*Evidence*)

Research groups in the Stockholm ALF region use the MAX IV resource. Within this user group there are about 10 research projects who pursue clinical research, for example regarding treatment of Alzheimer's disease.

The importance of the close collaboration between the Stockholm ALF region and SciLifeLab (Figure 5) is illustrated by the recent publication of more than 3,200 whole genome sequence analyses of patients with rare diseases performed at *Clinical Genomics*. Whole genome sequencing (WGS) at SciLifeLab has become an integrated part of genetic research and genetic diagnostics in the Stockholm ALF region and Clinical Genomics currently performs more than 250 WGS analyses for Stockholm every month, accumulating to more than 10,000 samples in total. SciLifeLab and the Stockholm ALF region have also had other significant collaborations in other disease areas, including cancer and infectious diseases. Within cancer the collaboration has resulted in launch of several comprehensive gene panels (e.g. myeloid malignancies, lymphoid malignancies, and solid tumours) that have been used to date for analysis of thousands of patient samples in both retrospective and prospective studies, including patient stratifications for clinical studies. The parties also have several multi-omics pilots (combined whole-genome and whole-transcriptome sequencing) for implementing broad comprehensive diagnostics of acute leukemias, paediatric cancers and sarcomas. Within infectious diseases, the close collaboration has resulted in implementation of whole-genome sequencing for bacteria (e.g. >6,000 samples for surveillance of antibiotic resistance outbreaks), viruses (e.g. **sequencing of >25,000 SARS-CoV-2 samples during the pandemic**), and development of metagenomic sequencing for identification of unknown microbial species in clinical specimens.

This illustrate that **the region is driving developments in personalised medicine** it leads the nationwide initiative [Genomic Medicine Sweden](#) and has pioneered initiatives in which clinical research is implemented in clinical practice with dissemination to other regions.

Five grants (each corresponding to 1.5M SEK) were awarded in 2022 for recruitment of postdocs with clinical translational focus in collaboration with SciLifeLab.

A half-time position in the Stockholm ALF region and SciLifeLab as coordinator for Data Driven Life Science was recently appointed. Data Driven Life Science is of high relevance for clinical research. **The systematic use of SciLifeLab resources for clinical research and clinical practice has been the foundation for the establishment of precision medicine as a high priority activity in the Stockholm ALF region.** This is recently exemplified by the establishment of a [joint centre](#).

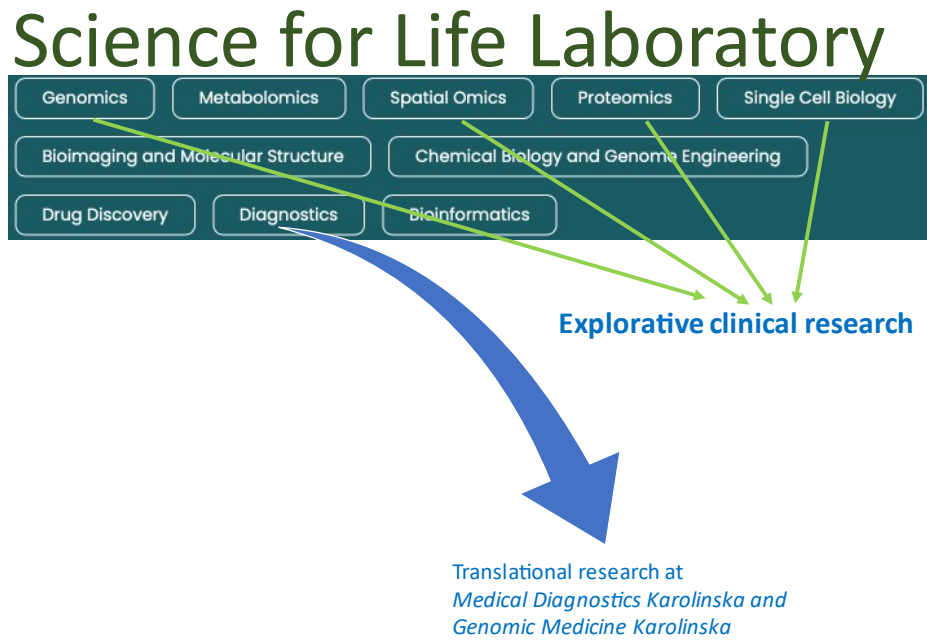


Figure 5 Science for Life Laboratory contributes to explorative clinical research via the RIs Genomics, Spatial Omics, Proteomics and Single Cell Biology.

The RI Diagnostics contributes to translational research via the units National Genomics Infrastructure, Clinical Genomics, Affinity Proteomics, Single Cell Proteomics and National Bioinformatics Infrastructures.

2 TIME FOR RESEARCH ALONGSIDE CLINICAL WORK

Scope

To what extent the ALF region ensures that clinical researchers have been allocated sufficient time to perform clinical research of the highest quality alongside their clinical work, and that allocated time can be used according to plan.

The second prerequisite concerns time for clinical research alongside clinical work. It is an organisational and operational challenge to make sure that scheduled clinical research time can be used according to plan. The ALF region can have developed specific joint positions or combined posts for clinical research, to enable a combination of clinical work, research, and academic duties, such as teaching and mentoring PhD students.

Scheduled time for research can be written into contracts, and the healthcare system needs to plan for time when clinical research projects take time from clinical work. The objectives and questions below concern these aspects of the prerequisite of securing time for research alongside clinical work.

We are aware that most of these questions are interdependent, and could be easier to answer jointly. However, to make your responses easier to compare with those of other ALF regions, we ask you to please disentangle the overall strategy for securing time for research. It is important that you answer each question under A-C in as precise and delimited way as possible.

The two objectives for providing time for research for clinical research are, in order: personnel planning for enabling clinical research in the healthcare setting, followed by specific joint positions enabling time for research for healthcare personnel.

Question 2.1.A.

How has the healthcare organisation enabled clinical research to be carried out alongside clinical work? (*Strategy*)

Since the evaluation in 2017 the healthcare system in the Stockholm ALF region has undergone substantial development. The new building for Karolinska University Hospital in Solna has been completed together with the adjacent clinical research building BioClinicum. The reorganization of care is part of a strategic plan initiated in 2012 to prepare for shorter inpatient periods, more digital care contacts and a shift towards outpatient and primary care as central parts of the care chain. Healthcare is now to a larger extent conducted outside of hospitals, and research and education need to follow patients flows.

To ensure resources and time for clinical research in a healthcare system with a variety of care providers, the Stockholm ALF region has implemented the following strategies and structures:

- University healthcare throughout the healthcare system
- Basic funding for clinical research is allocated to the operational level
- The importance of the healthcare leadership is highlighted in our strategies
- Clinical trials units and other research support structures close to the clinic

The university healthcare system in the Stockholm ALF region has expanded during 2019–2021 and now includes private healthcare providers. Region Stockholm's [Research, Education and Development \(RE&D\) strategy](#) and [Life Science strategy](#) focus on long-lasting and reliable conditions for clinical research, including access to patients and to health data across the entire healthcare system. The KI–Region Stockholm Management Group has appointed a special task force to secure research and education in all parts of the healthcare system, regardless of public/private operations.

The most important strategy for ensuring time and resources for clinical research is the “Stockholm model” of resource allocation whereby **almost half of the common R&D funding is distributed to the RD&E groups across the entire healthcare system to ensure basic funding of clinical research** (Figure 6). This model provides a relatively stable and secure base income for clinical research. The RD&E groups have an important function to ensure time and resources for clinical research and education at the clinics, in close consultation with the head of clinic (the latter is normally one of the two chairs of the RD&E group). Clinics also co-finance time for research in the form of time or other resources within their own budget. At the Karolinska University Hospital, a 15% overhead on external funding was introduced in 2021, of which 5% goes to the clinic to support local R&D (5% goes to central research support, and 5% goes to the economy department). In addition, a fraction of the care revenues for out-of-Stockholm patients is invested in the clinics' R&D.

Region Stockholm's RE&D strategy and Life science strategy describe the leadership in healthcare as being strategically important for time and resources for clinical research. The healthcare leadership is responsible for ensuring that the research time granted can be used and that **clinical research can be conducted in parallel with healthcare duties**. When appointing managerial positions, such as heads of healthcare clinics, research competence/PhD is a merit and in many cases a prerequisite. The R&D assignment of healthcare include among other things to ensure that university healthcare units (UHUs) have the competence and resources for research, education, knowledge formation, dissemination and implementation.

The Stockholm ALF region has **both regional and local research support structures enabling efficient clinical research** alongside clinical work. The structure with clinical trials units at the large hospitals and other major caregivers (Figure 3, 1.1) is crucial to ensure sufficient space, competence, and other resources to perform clinical studies closely integrated within healthcare. *CLINCUM* is a virtual, regional support structure for clinical researchers with seven hubs for support with access to health data and competence in epidemiology and biostatistics. Local clinical research support centres are available at the large emergency hospitals, e.g. Karolinska University Hospital, Danderyd Hospital and Stockholm South General hospital, as well as at other major caregivers.

Stockholm resource allocation model
of common regional R&D funding, including ALF-funding

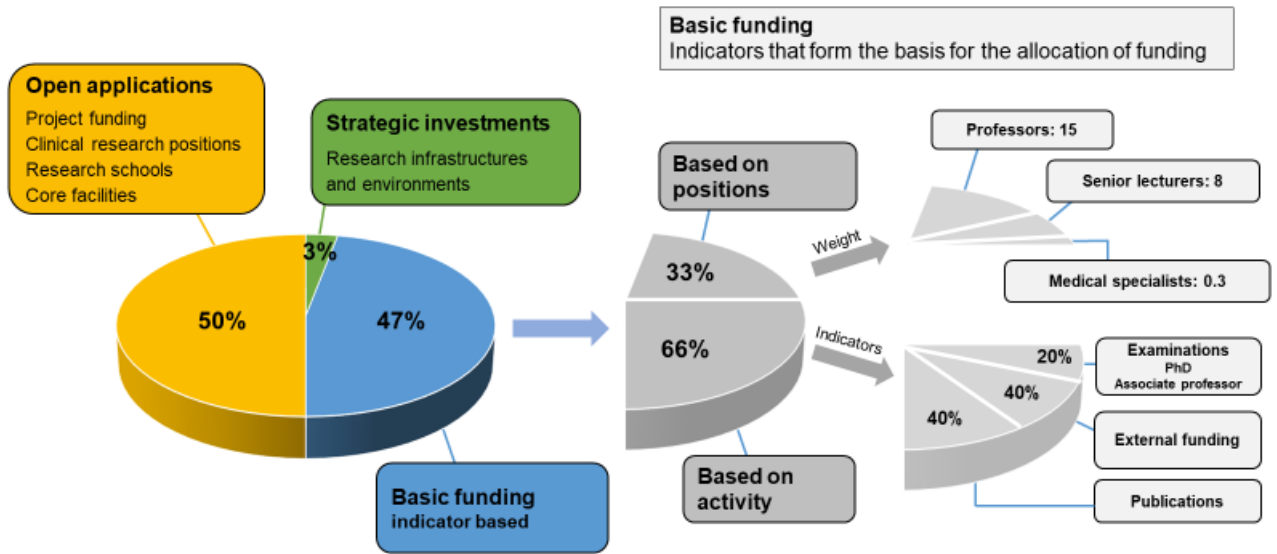


Figure 6. The Stockholm ALF region's resource allocation model, including basic funding based on indicators.

Question 2.1.B.

How has the healthcare organisation enabled clinical research to be carried out alongside clinical work? (*Process*)

Processes for ensuring and monitoring resources and time for clinical research include:

- Process, criteria and annual monitoring of university healthcare
- Allocation model of research funding to the operational level based on indicators
- Granting and scheduling of time for research
- Follow-up of basic funding to the RD&E groups including time for clinical research
- Monitoring of care contracts
- Regional coordination of clinical trial units

Process, criteria, and annual monitoring of university healthcare. In 2018 the Stockholm ALF region decided on regional criteria (in addition to the national criteria) that were required in order to be appointed as a university healthcare unit (UHU). Care providers with units that meet the criteria are included in the ALF collaborative organisation (Figure 7). Annual monitoring of the university healthcare is performed in accordance with the national and regional criteria. UHUs that have been appointed but do not meet all criteria at follow-up must prepare an action plan which is followed-up twice yearly. The organisation of and prerequisites for UHU status are continuously discussed and monitored.

The yearly allocation of basic R&D funding to each RD&E group is based on predefined indicators for positions and research activity that has been aggregated over the past three years: number of combined posts, specialists, publications and examinations and external funding (Figure 6). The generated R&D budget allocated to the RD&E groups is separate from the clinic's healthcare budget, and the RD&E groups prioritise how this budget should finance and enable time for research at the clinic. It is often used for long-term commitments, such as doctoral students, postdocs, research nurses and premises.

Granting and scheduling of time for research is an important process in ensuring time for research combined with a clinical position. A resource certificate signed by the head of clinic is required when applying for doctoral studies, project funding and research positions. This certifies that research time will be granted upon approved application. When clinical staff have been granted research time, they apply for time for research (e.g. 1–2 days per week, every other week or for several weeks) to the head of the clinic, who takes this into account in the scheduling of the clinical work. The individuals who have been granted research positions apply for a leave of absence from their full-time employment.

The basic funding to the RD&E groups and how it is used to finance time for research is followed-up yearly. The basic R&D funding to the RD&E groups is granted one year at a time and in cases where the budget is not consumed by the end of the year, funds must be returned. The share of the RD&E groups' budget that is used to finance time for research is analysed yearly. The ability of clinical researchers to actually take time for research is also followed up through questionnaires to R&E managers and in employee surveys at the university hospital.

Region Stockholm **monitors all care providers' care contracts** which include descriptions of required research capacities. Each caregiver's board elaborates and monitors these goals on the local level. In 2021 an action plan was initiated to more clearly define the clinical research assignment for care providers outside of the university healthcare in order to ensure their contribution. The work includes pre- and post-contract assessments of the caregivers' capacity and performance in clinical education and research and considers re-allocation of patient volumes when necessary.

The clinical trials units at the large hospitals/caregivers are coordinated regionally and collaborate to ensure and exchange expertise and resources for clinical studies (Figure 3, 1.1). The coordination of the clinical trials units has shown an increased need for more clinical trials units. In 2020 a clinical trials unit for outpatient studies was established within Stockholm Healthcare Services, and the work of expanding a clinical trials unit specialised in paediatrics has been started.

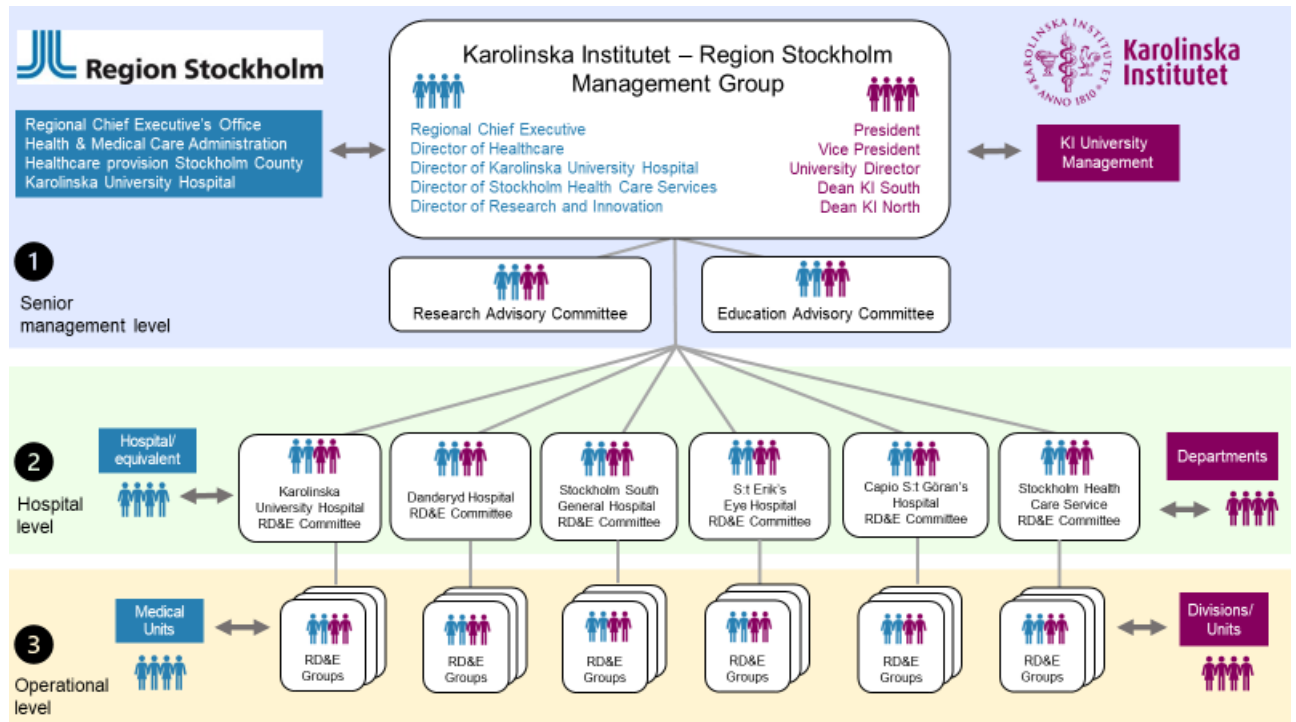


Figure 7. The Stockholm ALF collaborative organization

Question 2.1.C.

How has the healthcare organisation enabled clinical research to be carried out alongside clinical work? (*Evidence*)

Evidence that clinical research are carried out according to plan includes:

- Clinical research production
- The number of ongoing clinical studies
- Time for clinical research
- Outcome of the university healthcare monitoring
- Research collaborations within the region

The number of clinical publications in which a researcher from the Stockholm ALF region is the lead or corresponding author **has increased by 11%** over the past five years, from 3,190 in 2017 to 3,530 in 2021 (Figure 8).

The number and type of ongoing clinical studies are registered. These registers show that 1,614 clinical studies are underway in Stockholm 2021. Of these, about 20% are industry-sponsored clinical studies.

Time for clinical research. The financial reporting of the RD&E groups budgets shows that more than 90% of the R&D budgets has been used by the end of the year. Analyses also show that at the Karolinska University hospital approximately half of the RD&E groups budget is allocated to salaries to finance time for research (the other part covers e.g. rents and strategic initiatives). Follow-up of clinical researchers' ability to take time for research (through questionnaires to R&E managers and in employee surveys at the university hospital), revealed in 2021 that despite the ongoing pandemic, a large proportion of the clinical researchers who had funded research time had been able to utilise their research time. Only 6% of doctors, nurses and midwives who conduct research reported that they could not get their research time at all in 2021.

The monitoring of the university healthcare criteria has resulted in actions plans to ensure continued fulfilment of all criteria at 2 of 72 university healthcare units in 2022. The KI-Region Stockholm Management group decided on the university healthcare units for 2023–2024 in March 2022.

The strategic work to encourage and enable clinical research within the whole region's healthcare system involving many professional groups is evidenced through a large number of **clinical research collaborations** between KI, the Karolinska University Hospital, the other large hospitals, primary care and other parties. A few examples are:

- *My Midwife*: a new form of care is evaluated that enables midwives to work in a cohesive care chain through pregnancy, childbirth and aftercare. The project involves cross-border cooperation within the region in terms of agreements, finances, leadership, management, patient safety, competence development and scientific evaluation of medical outcomes.
- *Infections in migrants*: mapping and clinical follow-up and treatment of parasitic infections in migrants. Cooperation between the Karolinska University hospital, asylum clinics at health centres, maternal health care and the Public Health Agency of Sweden.
- *Preoperative training*: patients undergoing abdominal cancer surgery are offered preoperative training at home under the guidance of physiotherapists in primary care home rehab teams. Collaboration between Karolinska University Hospital, Stockholm South General Hospital, Ersta Hospital, and primary care.
- *Home care project*: Clinical researchers at Karolinska University Hospital, Stockholm South General Hospital and Danderyd Hospital collaborate with Advanced Home Care units (with multi-professional teams), for patients with endocarditis.

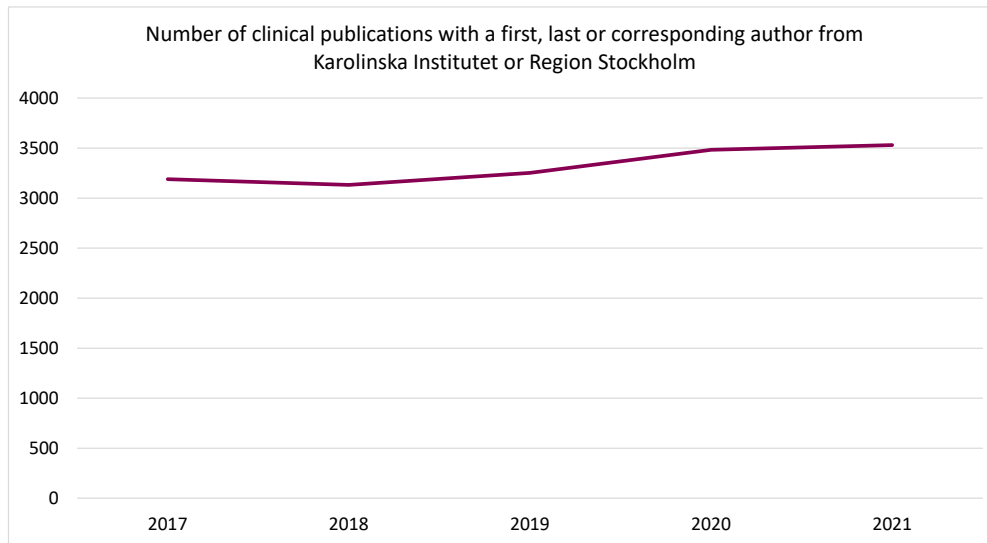


Figure 8. The number of clinical publications with a first, last or corresponding author from the Stockholm ALF region.

Question 2.2.A.

How does the ALF region secure research time for clinical researchers wanting to pursue a clinical research career in combination with clinical work? (*Strategy*)

These strategies and structures of the Stockholm ALF region ensure time for research to enable an academic career in combination with clinical work:

- Combined posts and adjunct positions throughout the healthcare system
- Common funding of research time in the form of basic funding, research positions and project funding

Combined posts and adjunct positions throughout the healthcare system. In the Stockholm ALF region 182 clinical researchers have a combined post as a professor or senior lecturer, and 103 are adjunct senior lecturers or professors. The Stockholm ALF region has a regional criterium to have at least one combined post at each university healthcare unit. The combined posts are thus central to the management of the university healthcare, i.e. clinical research and education, throughout the healthcare system, at all 72 university healthcare units in the Stockholm ALF region.

Region Stockholm contributes with specific funding to a common R&D budget including the ALF funding. The common R&D budget is **jointly handled and prioritized** by the Stockholm ALF collaborative organisation, which is a specific strength of the regional ALF agreement.

The **common R&D funding of the Stockholm ALF region is allocated to basic funding, research positions and project funding** to finance time for research (Figure 6, 2.1).

- **The basic funding** distributed to the RD&E groups finances time for research, as described in 2.1
- Specific funding is allocated for **clinical research positions** at different levels from doctoral students to senior researchers (Figure 9). The research positions require a combination of research and clinical work and finance of research time of 30–50% for four years (except for research internships which finance 1 year of research).
- Approximately 240M SEK annually is allocated for **clinical project funding** in all areas, including pedagogical research, that is open for application by all care providers and staff categories. At least 51% of the funding must be used for staff costs in healthcare. Specific annual project funding is announced for research projects in the network healthcare, i.e., research collaborations between emergency hospitals and primary care. To additionally strengthen the opportunities for clinical research in the network healthcare, it was decided in 2021 to invest in specific strategic funding for research collaborations within the network healthcare.

Question 2.2.B.

How does the ALF region secure research time for clinical researchers wanting to pursue a clinical research career in combination with clinical work? (*Process*)

Established processes to enable time for research combined with clinical positions include:

- Monitoring and recruitment processes for combined posts and adjunct positions
- Annual follow-up process of doctoral students' time plans
- Announcements and monitoring of clinical project funding and clinical research positions
- Monitoring of R&D activity on different levels

Monitoring and recruitment processes for combined posts and adjunct positions. The number of combined posts and adjunct positions is monitored annually. During 2018–2020, a decline in the number of combined posts was noted, primarily due to retirements which were not replaced. This led to an increased awareness that replacement of combined posts must be planned well in advance. The recruitment process for combined posts is conducted in collaboration between KI and Region Stockholm. The need for a combined post is identified by the KI department and certified to the KI Recruitment Committee by the departmental and clinical heads. Both the academic and clinical qualifications for the position must be met. The most common distribution for combined posts is 70% employment at KI and 30% employment within healthcare. When the need for a position is primarily based on the need of the healthcare organisation, an adjunct position can be created. The process and the academic qualifications are the same as for a combined post. Healthcare is usually the main employer and financier of adjunct positions.

KI annually announces funding (50%) to 60–70 doctoral student projects, clinical as well as non-clinical, in addition to research positions aimed at medical intern and resident doctoral students. All **doctoral students follow a yearly follow-up process focusing on the progress of their research project** based on the individual study plan (ISP). In 2020–2021 a new digital system for the individual study plans was implemented. The digital ISP enables efficient monitoring of time plans by both the doctoral students and the departments.

Announcement and monitoring of clinical research positions. Six calls for clinical research positions are announced annually (Figure 9). Two of the programmes are aimed at medical interns and residents, and after PhD completion there are positions for postdocs, clinical researchers, and senior clinical researchers. Specific positions are announced for clinics within 'health professions' (i.e. allied health professions and nurses (audiologist, biomedical analyst, counsellor, dietitian, dental hygienist, midwife, occupational therapist, physiotherapist, radiology nurse, nurse, and speech therapist). The expert groups evaluating the applications for the two most senior research programmes include experts from other regions. The research positions are for 4 years, and after 2 years a progress report is required before the remaining funding can be granted.

Announcement and monitoring of clinical project funding. Several calls for clinical project funding are announced annually (ALF Medicine, ALF Network healthcare). The assessment criteria are scientific quality and patient benefit. To strengthen the opportunities for clinical research collaborations between several care providers including primary care, specific project funding has been introduced (ALF Network healthcare). External expert groups evaluate the applications. Project funding is monitored regarding progress, used time and costs, and through a final report upon completion. The requirement of at least 51% of the project funding being used to finance the care staff's time for research is addressed in a financial report.

Monitoring of R&D funding and time for research is conducted at several levels. Regional overall R&D activity is reported in an annual R&D financial statement. Important R&D indicators reflecting clinical research production are reported to the political regional leadership. At each hospital/equivalent, R&D activity is followed up through the RD&E committees' annual activity reports and through special reports of research activity. At the operational level, the RD&E groups report their clinical research production and make R&D financial statements.

Clinical research positions
funded through common regional R&D funding*

Well established independent researcher**	Senior clinical researcher research 30%, 2+2 years, 7 positions	
To some degree independent researcher**	Clinical researcher research 50%, 2+2 years, 8 positions	
Postdoc	Clinical postdoc research 50%, 2+2 years, 10 positions	"Health professions"**** 2+2 years, 5 positions 2nd year
Doctoral student	Research internship 1 year 20 positions	Research residency research 50%, 2+2 years, 6 positions

* Research internship positions are funded by KI

** Not adjunct senior lecturer, senior lecturer, adjunct professor or professor

*** Allied health professions and nurses: audiologist, biomedical analyst, counsellor, dietitian, dental hygienist, midwife, nurse, occupational therapist, physiotherapist, radiology nurse and speech therapist.

Figure 9. Financing programmes for clinical research positions

Question 2.2.C.

How does the ALF region secure research time for clinical researchers wanting to pursue a clinical research career in combination with clinical work? (*Evidence*)

Evidence for time for clinical research in combination with clinical work includes:

- Number of clinical researchers, doctoral students, docents
- Number of combined posts and adjunct positions
- Time for research is enabled by ALF funded research positions and projects
- External funding of clinical research

The Stockholm ALF region has more than **3,300 clinical researchers and the total number has increased by 5%** since the previous ALF evaluation (the number of researchers is based on the individuals who have verified at least one article in bibliometrics in 2021). The number of newly admitted clinical doctoral students, the number of clinical dissertations and the number of clinical docents has also increased over the past five years. This is evidence of a high interest for clinical research and that it clearly is possible to pursue clinical research in the Stockholm ALF region.

Karolinska Institutet is Sweden's largest medical faculty and has extensive research, both preclinical/translational and clinical, within public health and epidemiology, providing an excellent research environment for clinically active staff who are interested in clinical research.

The number of combined posts and adjunct positions has increased during 2021–2022. In 2022, the Stockholm ALF region had 182 combined posts, of which 128 were professors and 54 senior lecturers; in total 14 additional combined posts compared to 2020. In 2021 the number of adjunct positions was 103, of which 59 were professors and 44 senior lecturers, an increase by 3 positions compared to 2020. The Stockholm ALF region provides possibilities to conduct clinical research in other forms than academic employment, as evidenced by the high interest for clinical research and high number of clinical researchers. The most common model for a clinical research career in combination with a clinical position is full-time employment with a care provider, usually at a university healthcare unit.

Time for clinical research is enabled by ALF funded research positions and projects. In total approximately **185 clinical researchers currently have jointly funded clinical research positions** in the six programmes. In 2018 the number of research positions for interns was increased from 16 to 20, and 5 positions as clinical researcher for 'health professions' were announced. In 2022 new positions for postdocs and senior researchers in primary care have been announced to strengthen research in primary care. Follow-up of the clinical research positions shows that no one has been denied 4 years' funding and financial reporting shows 99% accrued costs in accordance with budgeted personnel costs for the research positions. This shows that time for research positions in combination with clinical positions has been conducted according to plan. Karolinska University Hospital's latest survey of its 42 university healthcare units reports that approximately 90% had been granted time for research in accordance with the plan, even during the pandemic year 2021.

Follow-up of the requirement that at least 51% of the project funding must be used for personnel costs, indicates that on average 70% of the funding is used to finance healthcare staff time for research. This clearly shows that research time has been granted and financed as planned. The financial report also shows that more than 98% of the funds granted have been used within the project period, which further indicates that time for the project has been granted.

External funding of clinical research. The strategy for allocation of funding for clinical research through basic funding, project funding and clinical research positions, provides very good conditions for clinical researchers' ability to attract external funding. Over the past four years (2017–2020), clinical research in the Stockholm ALF region has been granted an average of 2.5 billion SEK per year in external funds. Researchers in the Stockholm ALF region have attracted an average of 45% of the funding from the Swedish Research Council call for *Clinical Therapy Research* during the last five years and 45–46% of the funding from the call within *Medicine and Health* during 2019–2021.

3 CAREER DEVELOPMENT

Scope

To what extent the ALF region has established career development models to enable clinical researchers in all healthcare professions to pursue a clinical research career.

The third prerequisite for clinical research concerns career development for clinical researchers within all health professions. The career development plan should cover all parts of becoming a researcher, from PhD education to the level of professorship. This also includes specific incentives for progressing in the career development model, such as salary incentives and specific academic clinical positions, or other benefits for pursuing a research career. The incentives for pursuing a clinical research career should also be reflected in the recruitment strategy for the ALF region, where the ALF region should describe how academic merit is part of the recruitment assessment.

The ALF region should also describe how it promotes gender balance at all levels, and how gender perspectives are addressed to ensure gender equality.

It is important that both parties in the ALF region, the healthcare system and the medical faculty, have established good collaborative measures for clinical researchers moving between the organisations in order to pursue a clinical research career, between clinical duties, research projects, and teaching.

The coverage of healthcare facilities and departments outside the university hospitals that include clinical research within your ALF region should also be described.

Career development also includes clinical research training and education throughout careers. One way to incentivise, and to further academic clinical research careers, is to provide mobility opportunities and exchange programs for clinical researchers. This is also important for strengthening research quality in general in Sweden.

Finally, in order to ensure that clinical researchers can pursue their academic endeavours, a supportive management and leadership culture at all levels in the healthcare system is vital.

Below are the questions for describing the career development plan in the ALF region.

We are aware that most of these questions are interdependent, and could be easier to answer jointly. However, to make your responses easier to compare with those of other ALF regions, we ask you to disentangle the overall strategy for career models for clinical research. It is important that you answer each question under A-C in as precise and delimited way as possible.

The four objectives for providing career development models for clinical research are, in order: models for clinical research career development, mobility opportunities for clinical researchers, gender equality, and finally, continuous training opportunities for clinical researchers.

Question 3.1.A.**How can clinical researchers develop their clinical research career in your ALF region? (*Strategy*)**

Strategies and structures aimed at ensuring a career model for clinical researchers include:

- The regional ALF agreement covers all education which leads to a licenced care profession
- Investment in clinical research schools providing a clinical doctoral education of high quality
- Financing programmes for clinical research positions
- Different forms of employment for clinical researchers in combination with clinical work

In the regional ALF agreement, the Stockholm ALF region has made a joint declaration of intent to ensure the regeneration of internationally competitive clinical researchers. **The Stockholm regional ALF agreement covers all education programmes that leads to a licence.** Clinical education for students within university healthcare provides a particularly important environment to stimulate and interest them for a clinical research career.

The strategic investment in clinical research schools helps clinicians to combine doctoral education with clinical work and offers a doctoral education of high quality. A new fifth clinical research school, in *Clinical Therapy Research*, has started in 2022.

Financing programmes for clinical research positions. To support and enable the regeneration of internationally competitive researchers, a model with six programmes for research positions has been implemented (Figure 9, 2.2). The programmes are intended to provide time and funding for research during various career stages in order to be able to qualify for an adjunct position or a combined post. Two of the programmes are aimed at doctors during medical internship and residency programmes, and three are open for all healthcare professions, for postdocs, clinical researchers and senior clinical researchers. A sixth programme is aimed at clinical researchers in health professions (allied health professions and nurses). All research positions (except for research internship) fund 30–50% of time for research for 2+2 years. All calls are open to all employees within the Stockholm healthcare system.

The Stockholm ALF region offers a range of possibilities that enable a clinical research career, often combined with education. The most common form of employment for clinical researchers is a full-time employment in healthcare whereby an individual is part of a research group at KI and has/or has begun to develop their own research group. The R&D funding distributed to the RD&E groups enables funding of research time for doctoral students and other research resources. KI announces funding for doctoral students. The combined posts are distributed throughout the healthcare system and are central for the management and development of clinical research. The healthcare organisation finances many adjunct positions at the professor, senior lecturer and lecturer levels. Academic career paths for clinical researchers are also supported through the KI academic career structure, where several of the research profiles (*'research profile'*, *'adjunct profile'*, *'education profile'*) are applicable for clinical researchers.

Question 3.1.B.

How can clinical researchers develop their clinical research career in your ALF region? (*Process*)

Processes for career models for clinical researchers include:

- A regional action plan 'From Student to Docent'
- Calls for clinical research schools
- Calls for clinical research positions
- Recruitment processes for combined posts and adjunct positions

To support the career development of clinical researchers the Stockholm ALF region has developed and implemented a **regional action plan *From Student to Docent***. The action plan includes incentives to start a research career, financing options for doctoral students and postdoctoral research and the development of ongoing research skills. During clinical education students in first and second cycle education meet clinical researchers tasked with stimulating and capturing the student's interests in the ongoing clinical research right at the start of the students' education. An evaluation in 2019 noted a reduction in the number of applicants and the granting of clinical docents. A docent programme was therefore established for clinically active researchers. As of 2022, the programme is open to all clinical researchers in the Stockholm ALF region as part of the action plan.

The Stockholm ALF region has five clinical research schools with different profiles; Family Medicine and Primary Care, Epidemiology, Psychiatry, Molecular Medicine and Clinical Therapy Research, the latter started in 2022. In addition, there is a research school in Health Science that clinical doctoral students can also apply to. Most of the research schools are announced every second year and comprise 16 weeks of courses (full-time studies) over two years. Advantages of these schools are that the doctoral student receives a complete course package planned well ahead instead of applying for each course separately, and that they are part of a research network. Salary during the course is financed by common R&D funds. KI also **collaborates with universities in other regions within national research schools** that are relevant to clinical researchers. The National Research School in Clinical and Translational Cancer Research is organised by KI together with Uppsala University. The National Research School in Family Medicine and Primary Care is coordinated by Umeå university with KI as one of the co-financiers.

Calls for clinical research positions are announced yearly (55 positions yearly). Expert groups evaluate the applications, with at least one member having a professional healthcare background. The expert groups for the clinical researcher programmes and the senior clinical researcher programme include experts from other regions to minimise conflicts of interest. The Research Advisory Committee evaluates the process and results annually, offering an opportunity to modify the programmes according to needs. In 2021 the clinical research position programmes were evaluated in a survey of those participating in the 2006–2019 programmes. The purpose was to investigate the effect of the programmes on the future academic career of those who obtained the posts, as well as for clinical and translational research.

The recruitment process for combined posts as senior lecturer and professor is performed in collaboration between KI and healthcare. The need for the combined post is initiated by the department at KI and certified to the KI Recruitment Committee by the departmental and clinical heads. Healthcare can initiate the establishment of **adjunct positions**, where healthcare is usually the main employer and financier. The academic qualifications are the same for adjunct positions as for the combined posts.

Question 3.1.C.

How can clinical researchers develop their clinical research career in your ALF region? (*Evidence*)

Evidence that the models for clinical researchers' career development are implemented is shown by:

- Evaluation of clinical research schools
- Evaluation of clinical research positions
- Number of clinical docents
- High number of applicants for research positions, research schools and docent programme

Evaluation of clinical research schools. The number of participants in the clinical research schools has increased by 53% since the previous ALF evaluation. During 2021–2022 (over two years) the research schools have included 144 participants compared to 94 participants during 2015–2016. This increase is due to both an increase in the number of places in the original research schools, as well as the start of a new fifth school in *Clinical Therapy Research* in 2022. Approximately 140–160 new clinical doctoral students are admitted each year, and the proportion of clinical doctoral students attending a research school has increased to 45%. Evaluations conclude that among the clinical doctoral students those who have attended research schools are the most satisfied. Over 60% of doctoral students who have attended the clinical research schools state that the research school 'makes all the difference'.

Evaluation of clinical research positions. The six financing programmes include in total approximately 185 ongoing clinical research positions. In 2018, the number of research internship positions were increased by 25% (from 16 to 20 positions). In 2022, additional research residency positions within primary care have been established. An [evaluation of the clinical research positions was conducted in 2021](#), including all participants in the programmes between 2006 and 2019. A total of 86% of the respondents (in total 244 responded, 60% response rate) rated the importance of the programme for their own research career as being *high* or *very high*. The participants stated for example that the programmes improved opportunities for external grants and facilitated admission as docent. A total of 79% considered that the programme has a *high* or *very high* significance for clinical research in general. In total, 89% of all respondents also consider it very important that the programmes continue. 64% of the former recipients of funding for research positions reported that their research has been implemented into clinical practice, and contributed to new or changed guidelines for prevention, diagnosis or treatment. In 2021 40% were docents and 11% were professors. A total of 14% have later become employed with a combined post. A total of 63% had secured external research funding during the last five years.

Number of clinical docents. There has been great interest in the new regional docent programme, with a total of 73 applicants for 35 places. Due to the high number of applicants, a total of 44 people were offered a place. In 2021 the number of docent applications increased by 40% and the proportion of approved docent applications also increased in all subject areas. In 2021 47 new clinical docents were approved compared to on average 27 per year during the four preceding years.

The high number of applicants in calls for clinical research for project funds, research positions and research schools **demonstrates the large interest for clinical research in Stockholm**, and is evidence that the Stockholm ALF region provides a very attractive clinical research environment. The grant rate for some calls has decreased in the past year, including the largest project funding call *ALF Medicine* (Figure 10). The grant rate in the calls for the clinical research positions has been just over 20% for four of the six programmes during the period 2018–2022. The first call for clinical research positions for allied health professions and nurses had a grant rate of 59%. The grant rate for research internships was around 36% in 2010–2021 and has risen in recent years after an increase in the number of positions in 2018. The interest in the clinical research schools is high, and the number of applicants per place is particularly high for the research schools in Epidemiology and the new school in *Clinical Therapy Research* (the latter had 61 applicants to 30 places in the first call in 2022).

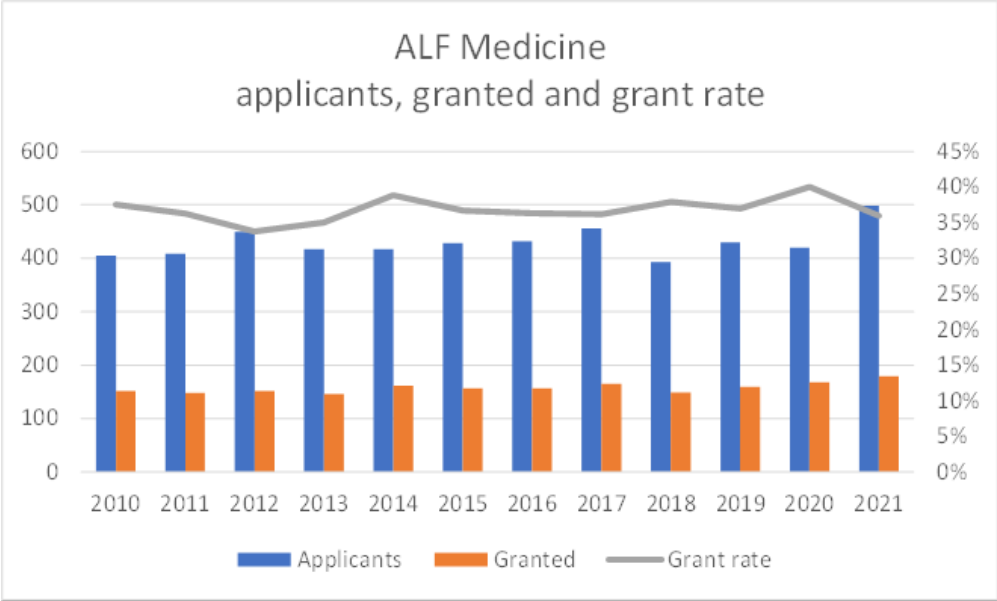


Figure 10. The project call ALF Medicine 2010-2021, number of applicants and grant rate.

Reader friendly

Question 3.2.A.

How do you encourage, enable and support clinical researchers to use mobility opportunities to develop their research career? (*Strategy*)

The strategies and structures to encourage and support clinical researchers' opportunities to conduct national or international exchange include:

- Strategic international and national collaborations
- Support structures for applying for funding and participation in exchange programmes
- Internationalisation at home
- Exchange in first and second cycle education

An important part of clinical researchers' competence development is the opportunity to participate in **international collaboration as part of their research careers**. Exchanges offer individuals new perspectives based on cultural aspects or skills that enrich both the individual and the individual's specialist knowledge. Another way to broaden the perspective is to collaborate with researchers outside of the region. **Clinical researchers in the Stockholm ALF region have an extensive collaboration nationally, as well as internationally.**

[Karolinska Institutet's strategy 2030](#), which Region Stockholm supports and collaborates on, points out internationalisation as being strategically important to ensure high quality in all parts of the university's operations. The KI vision and strategy calls for *a global perspective and health for all*. The education at KI includes an international perspective. There is a range of strategic collaborations that offer possibilities for exchange for both clinical and preclinical researchers. There are also travel grants available, some specifically for clinical researchers. International experience and mobility are components in [KI's qualifications portfolio system](#).

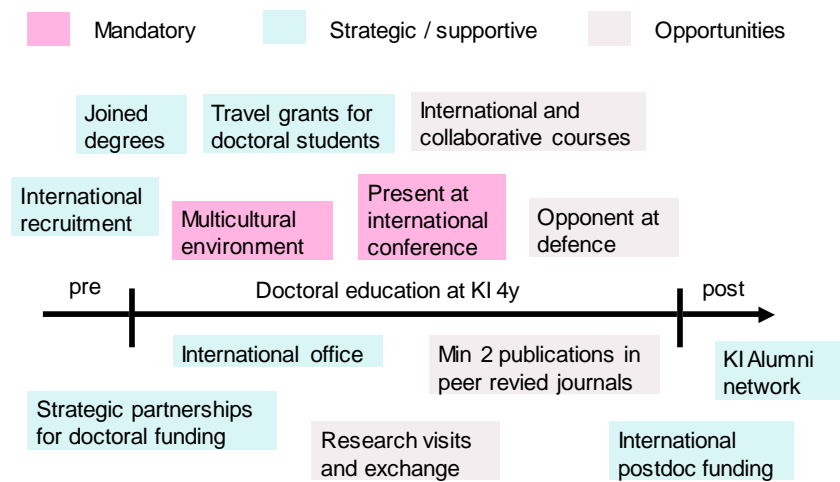
Through established collaborations with companies, Stockholm offers clinical researchers the opportunity to make **national exchanges** with other organisations, for example research companies.

Several support structures assist and encourage researchers to participate in strategic collaborations. They provide information about available opportunities and support in the application process. [A research support office at KI](#) provides information about funding opportunities and application support for both clinical and preclinical researchers. The research support office offers general internship programs, workshops and support, mainly for doctoral students and postdocs. International experiences are gained in various ways during the doctoral education (Figure 11). [Karolinska University Hospital has established a regional Grants Office](#) that specifically supports employees within the healthcare system in seeking international funding – both projects and positions. KI and Karolinska University Hospital work closely together and jointly support the interests and ambitions of clinical researchers to participate in various types of existing exchange programmes and strategic collaborations.

Internationalisation at home is an alternative way for our clinical researchers to broaden their perspectives. The Stockholm ALF region has a strong ambition to create an international campus in which our students and researchers are continuously exposed to new ideas. Considering the ongoing climate change and our national goal to reduce by half the carbon dioxide release by 2030, this way of international exposure will become even more important over time.

Exchange within first and second cycle education is an important part of our mobility strategy. KI's ambition is that half of our students should experience an exchange during their studies.

International experience during PhD studies



Sources: [Rules and general syllabus for doctoral education](#), [KI Annual report 2020](#)

Figure 11. International experiences are gained in various ways during the doctoral education.

Question 3.2.B.

How do you encourage, enable and support clinical researchers to use mobility opportunities to develop their research career? (*Process*)

The processes to enable mobility include:

- Collaborations and funding opportunities for exchange and travel for clinical researchers
- Strategic communication and support to researchers
- Sabbaticals for staff and exchanges for doctoral students
- Internationalisation at home
- Support in application processes for national and international exchanges

A wide range of **collaborations and funding opportunities for exchange and travel for researchers** are available, see Table 1.

KI offers strategic, specialised, and targeted communication, support and expertise regarding the various mobility opportunities available for all researchers. Information about programmes and collaborations is given regularly in both newsletters and information meetings. To reach the target group the programmes are particularly aimed at, social media is also used as a means of communication. In cases for which programmes are specifically aimed at clinically active researchers, research support office and grants office functions host joint information meetings.

Managers and research group leaders have an important role in encouraging their research group's members to be aware of the wide range of opportunities offered. Specific information is regularly provided to both head of departments and departmental research group leaders about application opportunities, and also regarding practical support in different application procedures.

Sabbaticals for staff, as well as exchanges for doctoral students at other research centres nationally and internationally are encouraged. These are financed by RD&E groups' funding and by external grants.

Internationalisation at home is achieved in various ways, for example through a large proportion of international doctoral students and guest students. KI welcomes external doctoral students, free of charge, to our research courses, to give our doctoral students an opportunity to interact and network with students from outside of KI.

Grants office and research support office functions provide workshop-based **application support for clinical researchers** as well as personal counselling. **National exchanges between universities and businesses** is also supported. Karolinska University Hospital has established a **national network with four university hospitals** in Sweden for the exchange of expertise and experience in order to support researchers participate in the EU research & innovation framework programme.

International coordinators at KI **support exchange students and teachers** during the whole process of application, selection, admission, reception and throughout their stay. International students, teachers and researchers can apply for housing at *KI Housing*, which has approximately 550 apartments and student rooms available for rent to these groups. External exchange programs enable scholarships for outgoing students and teachers, and in some cases also for incoming students and teachers.

Table 1. Collaborations and funding opportunities for exchange and travel for researchers

Collaborations and funding with focus on clinical researchers	Opportunities for both clinical and preclinical researchers
<ul style="list-style-type: none"> • MD Anderson Cancer Center, USA: Visiting scientist position for young clinicians. • European University Hospital Alliance: Nine university hospitals* collaborating with the aim to play an active role in shaping the future of European health care. • Sao Paulo University, Brazil: Travel awards for clinical researchers. • The Network Medicine Institute and Global Alliance: Global network of 31 leading universities. • Hirsch travel grants for physicians 	<ul style="list-style-type: none"> • University of Tokyo – Stockholm Trio (Stockholm University, KTH, KI). Travel awards. • Mayo Clinic, USA: A long-term collaboration, providing travel awards. • Rockefeller University, USA: Postdoc exchange, short-term exchange. • University College London-Stockholm Trio City Partnership Programme, providing travel awards • EuroLife: A network of nine European universities in life sciences and medicine • EU-exchange program, Marie Skłodowska Curie Actions • KI travel grants

* EUHA members: Allgemeines Krankenhaus der Stadt Wien, Austria. Assistance Publique Hôpitaux de Paris, France. Charité Universitätsmedizin Berlin, Germany. Erasmus MC Rotterdam, the Netherlands. Karolinska University Hospital, Sweden. Kings Health Partners, UK. Ospedale San Raffaele, Milan Italy. UZ Leuven, Belgium. Vall d'Hebron Barcelona Hospital Campus, Spain

Question 3.2.C.

How do you encourage, enable and support clinical researchers to use mobility opportunities to develop their research career? (*Evidence*)

Evidence for how strategies, structures and processes enable and support clinical researcher's mobility opportunities includes:

- Clinical publications published in national and international collaboration
- National exchanges and collaborations
- International strategic collaborations, travel grants and exchanges
- Student exchanges

A very high share, approximately 90%, of all clinical publications are published in collaboration with at least one organisation outside of the Stockholm ALF region, and approximately 70% of all clinical publications are published in international collaboration (Figure 12). This shows that our clinical researchers have extensive research collaborations, both nationally and internationally.

National exchanges and collaborations. Between 2017 and 2021, the Stockholm ALF region has supported and enabled 223 national exchanges (general internships) within 70 different companies or organisations within Sweden – from public authorities to private companies or non-profit organisations (Figure 13).

International collaborations.

- Between 2018 and 2021, approximately 1,000 **travel grants**, totalling approximately 17M SEK were granted to researchers from KI's funds and foundations.
- **The Hirsch travel grant:** The applicant must be a registered doctoral student or associate researcher/guest researcher at KI and a doctor who has been employed as an Assistant Physician for at least two years at a KI department. During the last 5 years 145 grants have been awarded.
- **Marie Skłodowska Curie Actions (Horizon Europe).** Between 2014 and 2020, researchers in the Stockholm ALF region were granted and participated in 40 MSCA, of which one was as coordinator and 36 as MSCA Individual Fellowships. Researchers from the Stockholm ALF region have also participated in three exchange projects within the MSCA-RISE programme.
- **[The European University Hospital Alliance](#).** The alliance between 9 of the most important European university hospitals from nine countries (Table 1) was founded by Karolinska University Hospital and one other hospital in 2017, initially to benchmark healthcare performances. EUHA has developed to a full-grown alliance which covers all areas of university hospital action, from healthcare quality, education, clinical research, and to innovation and implementation. A few examples of collaboration projects within the alliance:
 - GRAIN, an incubator in which EUHA members sit together with two European networks for clinical and translational research, respectively (ECRIN and EATRIS). GRAIN also supports the creation of European consortiums for EU project calls and develops a common strategy for clinical research and development.
 - Healthcare Transformation Academy which aims to increase knowledge about Personalized Medicine and ATMP (Advanced Therapy Medicinal Products)
 - Clinical trial working group

Student exchange. During the three academic years preceding the pandemic, over 200 students per academic year came to KI as exchange students to complete a clinical course (rotation). Just under half of these were medical students. During the same period, 140 students annually spent time at one of KI's partner universities to complete a clinical study period. About half of these were medical students.

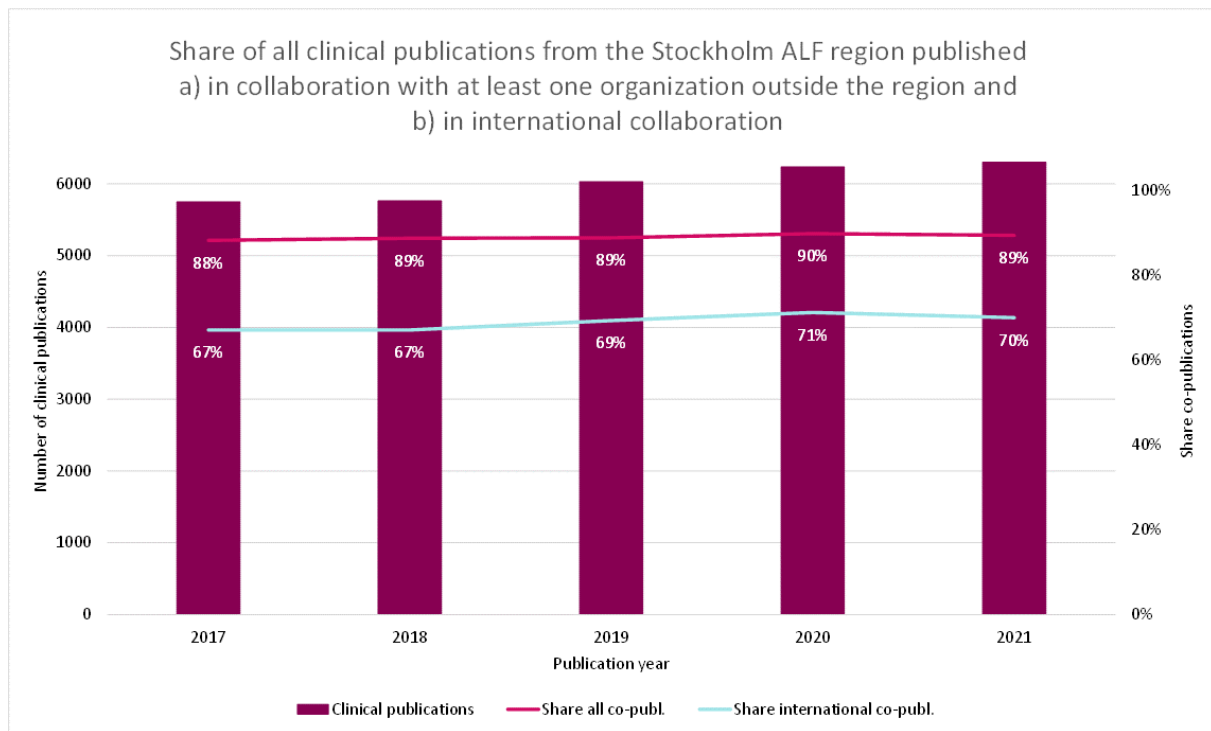
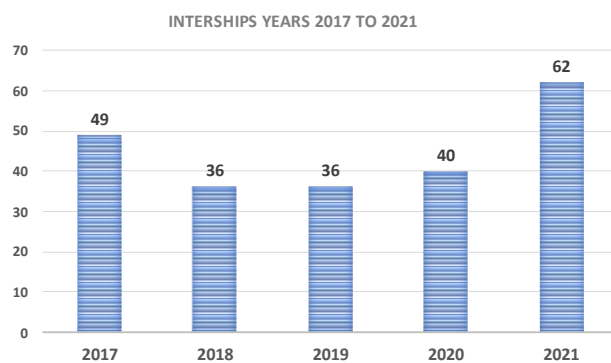


Figure 12. The share of the total number of clinical publications published in collaboration with at least one organization outside the Stockholm ALF region and in international collaboration.



Total 223 internships during 2017-2021 with 70 different external organisations, ranging from large life science companies with >80.000 employees, to small start-ups, banks, patient organisations, Swedish governmental agencies, and other non-profit organisations.

Figure 13. National exchanges and collaborations. General internships 2017 to 2021 for doctoral students and postdocs.

Question 3.3.A.

How do you ensure gender equality for clinical researchers wishing to pursue a clinical research career? (*Strategy*)

The strategies and structures for addressing gender perspectives in the healthcare organisation and at KI and for promoting gender balance among clinical researchers are:

- Gender equality strategies and policies for all employees in healthcare and academia
- Gender equality for clinical researchers is considered regarding career opportunities, recruitment, allocation of research funds, work environment, and leaderships
- Investment in strengthening younger women's opportunities to obtain academic qualifications

Both Region Stockholm and KI have strategies and policies for gender equality for their employees and conduct continual gender equality work with special commitments and activities ([Stockholm Gender Equality Policy](#), [KI Gender mainstreaming for 2021-2022](#) and [KI Strategy 2030](#)). The strategies emphasise that all activities, including research, should have a clear gender perspective and that gender equality work must be integrated into the regular operations and into all decisions. Gender perspectives must be considered in all aspects of clinical research, including career development, recruitment and retention, assessment and allocation of funds and resources and leadership.

Region Stockholm's gender equality policy states that all activities within research, education and development work should be given a clear gender perspective. When **allocating research and development funds**, the gender equality aspect must be decisive when applications are judged to have an equal scientific value. **Personnel-focused strategies** include that the under-represented group is supported to undergo training or other skills development and to apply for certain positions. **Managers must work for the integration of a gender perspective**, and when recruiting for managerial positions, experience and knowledge of gender equality work must be an advantage.

A gender-equal KI implies equal division of power and influence through equal representation in senior and academic positions and economic equality through gender-equal resource allocation and equal pay for equal work. **Equal career opportunities and employment conditions, a good work environment** and a leadership that promotes equal opportunities are part of the KI strategy. KI has a specific recruitment target of 60% women in the recruitment of new professors during the years 2021-2023.

KI has an ongoing long-term **investment to strengthen younger women's opportunities to obtain academic qualifications**. The initiative is part of the aim to achieve recruitment goals for a more even gender distribution among newly recruited professors. The initiative includes a [network and coaching programme for younger women \(WISE\)](#) and a [mentorship program for both men and women \(FIELD\)](#) contributing to gender equality and equal opportunities.

Question 3.3.B.

How do you ensure gender equality for clinical researchers wishing to pursue a clinical research career? (*Process*)

Processes for addressing and promoting gender balance among clinical researchers are:

- Monitoring of calls for clinical research regarding gender distribution
- Gender distribution in the ALF collaborative organization
- Measures to prevent skewed gender distribution
- Gender distribution is reported in career-related outcome measures

For all calls aimed at clinical researchers, gender distribution is taken into account when assessing and monitoring the calls. Specially appointed expert groups, where an even gender distribution is also a consideration in the composition of the groups, assess the applications. When applications are judged to have an equal scientific value, the gender equality aspect is the deciding factor. Results of all calls are analysed on the basis of gender distribution. In the event of a skewed distribution between men and women, the results are analysed in-depth to identify possible causes and measures.

In the bodies of **the ALF collaborative organization an even gender distribution** is taken into account when representatives from KI and Region Stockholm are chosen.

A specific measure taken to strengthen competence and awareness of gender perspectives, is that all expert groups members engaged in evaluation of grant applications, since 2021, are required to undergo an on-line training course focusing on *partiality (bias) in assessment*. In (KI's) courses for clinical researchers (research supervisors and research group managers/principal investigators), on-line courses that covers the discrimination act, equal conditions and bias in assessment are included. Another measure is that courses in grant application writing are offered to clinical researchers, where the majority of the participants are women.

Gender distribution for career-related outcome measures is reported and monitored in different ways through:

- Statistics of the gender distribution for clinical, academic, and managing positions at different levels
- Statistics of gender distribution in the recruitment of academic positions, for example professors
- Salary levels are continually evaluated and monitored from a gender equality perspective and if unreasonable salary disparities between women and men are discovered, they must be rectified.
- Statistics from employee surveys relating to gender equality, equal opportunities and values
- Questions in the Exit Polls for doctoral students and for first and second cycle students
- The incident reporting system for employees and students

Question 3.3.C.

How do you ensure gender equality for clinical researchers wishing to pursue a clinical research career? (*Evidence*)

Evidence showing that gender balance and gender perspectives are promoted, and inequalities are targeted are:

- Gender distribution among doctoral students, clinical researchers, docents, and PI's
- Gender distribution among clinical researchers with combined post or adjunct position
- Gender distribution among heads of clinics
- Approval rates for women and men in calls for clinical research schools, positions, and projects
- Follow-up of the course *Bias in Assessment* for expert groups that assess ALF calls

Of the approximately 3,300 clinical researchers in the Stockholm ALF region, the gender distribution is even, with 51% being women. Among clinical doctoral students, the distribution is approximately 60/40 (in 2021, 58% were women). Among new clinical docents in the subject area of clinical medicine during the period 2013–2021, 46% were women. Among new docents in health sciences during the same period, more women than men have been appointed (74% women). The gender distribution among all research principal investigators is 62% men and 38% women.

Among clinical researchers with a combined post, 32% of the professors and 51% of the senior lecturers are women (2020). Among clinical researchers with an adjunct post, 44% of the professors and 47% of the senior lecturers are women (2020).

The **gender distribution among heads of clinics** at medical units within the healthcare system is even. In February 2022, 50% of the heads of clinics at Karolinska University Hospital were women.

In calls for clinical researchers (clinical research schools, clinical research positions, and project funding) the approval rate is fairly even between women and men (within 60/40 distribution).

- There are somewhat more women than men that apply to the research schools (64 vs 36%: all clinical research schools 2010–2021). Women are granted a place at the research schools to a slightly higher degree than are men.
- In calls for clinical research positions, the approval rate by gender varies between the different positions and from year to year. Over the period 2007 to 2022 the approval rate was somewhat lower for women than for men in calls for positions for research residency, clinical postdoc, and clinical researcher. For the positions research internship and senior clinical researcher, women have over time had a slightly higher approval rate than have men.
- In the largest call for project funding (ALF Medicine), the approval rate has been even for most of the years over the period 2010–2022 (Figure 14). The proportion of approved funds has also been relatively evenly distributed between men and women (Figure 15). The trend the last two years that women have received somewhat lower amounts of funding than men is being closely monitored.

As mentioned above, in 2021, all expert groups that assess ALF calls were strongly encouraged to complete the course *Bias in assessment*. **Follow-up of participation of the course is performed during 2022** and the course is continuously offered to and completed by new participants in the expert groups.

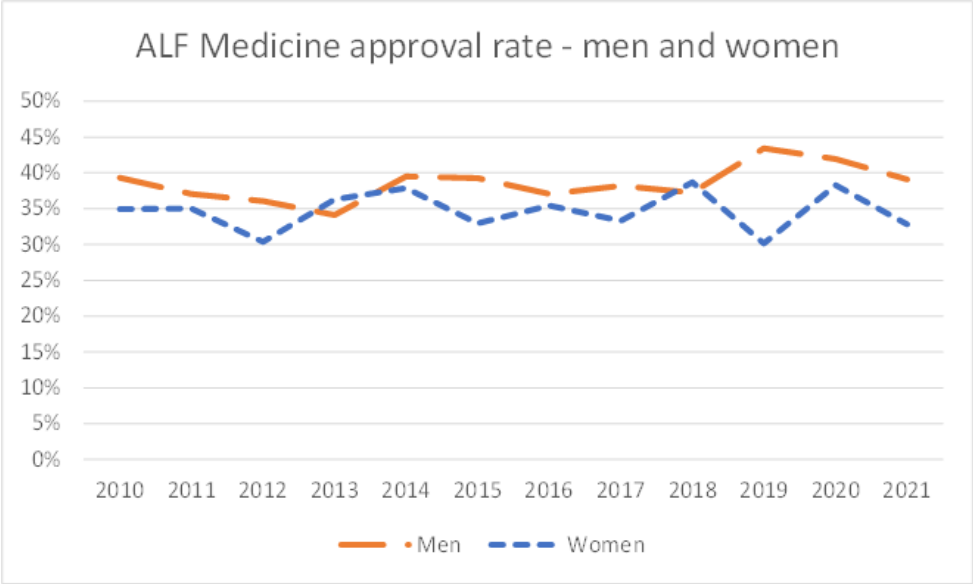


Figure 14. ALF medicine approval rate, men and women

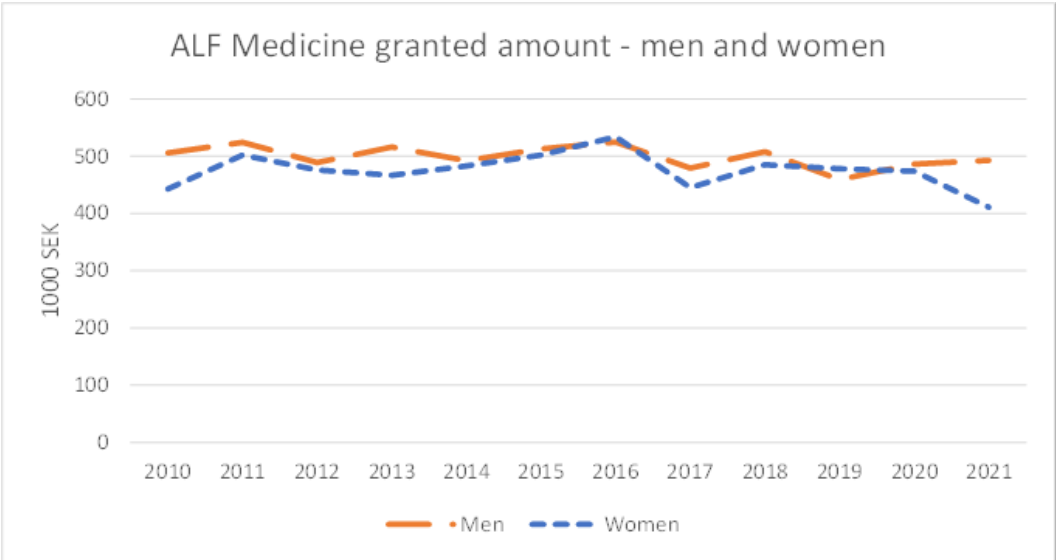


Figure 15. ALF Medicine granted amount, men and women

Question 3.4.A.

How do you provide opportunities for continuous research skills development for your clinical researchers? (*Strategy*)

Stockholm is one of Europe's leading Life sciences ecosystems creating an excellent basis for clinical research with high scientific quality. The region's current share of ALF funding is 27%, while its share of clinical publications is 46%. Clinical research projects in the Stockholm ALF region were awarded 45% of the funding from the Swedish Research Council within Medicine and Health in 2021. These outstanding results have been made possible by a deeply rooted culture of academic and clinical excellence; shared ways of thinking, feeling, and behaving that are not easily described but are still critical in creating world-leading clinical research. While Stockholm's culture emphasises individual commitment and driving force, adequate strategies, processes and systems constitute important support for creating results for the benefit of patients and residents.

The strategies and structures for promoting and supporting research skills development for clinical researchers throughout their careers are:

- Strategies emphasise the importance of continuous competence development
- Regional action plan *From Student to Docent*
- Regional and local research support functions
- Interdisciplinary collaborations

The Stockholm ALF region overall strategies ([Region Stockholm RD&E Strategy](#), [KI Strategy 2030](#)) emphasise the importance of continual competence development to increase healthcare's capacity to participate in research, to attract and maintain a high level of competence in clinical research and to support individuals to develop their skills and achieve their goals.

The Stockholm ALF region action plan *From Student to Docent* includes competence development for clinical researchers in different ways; through basic resources/research infrastructures available for both doctoral and postdoctoral researchers, courses for the development of clinical researchers' pedagogical competence to achieve supervisor and docent competence, clinical research schools and regional docent programmes.

The Stockholm ALF region has both regional and local **research support structures** that support clinical researchers' competence development in study design, biostatistics and bioinformatics, research seminars and network activities. A set of clinical trials units at the large hospitals and other major caregivers disseminate knowledge across all phases of a clinical study. Research core facilities support skills development in research methods. Competence development regarding research grant applications and ethics applications is offered by grants offices support functions. There are also special travel grants aimed at clinical researchers to stimulate competence development through participation in research congresses.

A range of structures for **interdisciplinary collaborations**, networks and research centres promote competence development among clinical researchers. Karolinska Institutet is Sweden's largest medical university in which all research and education are aimed at licenced occupations in healthcare and the development of improved health for the individual. A total of 449 research groups interact at KI's 13 (out of 21) clinical departments. Many of these research groups consist of both preclinical and clinical researchers. The mixed environment of the research groups means that many researchers collaborate to develop an understanding of the entire chain of development from laboratories to clinics in the development of new diagnostics, treatments, and methods for improved health. The organisation at the university hospital, based on thematic medical areas and functional areas, also strengthens interaction between disciplines, professions, and the patients. The *Precision Medicine Centre Karolinska*, jointly established in 2021 by KI and Karolinska University Hospital, promotes collaborations and transfer of skills between different areas of expertise in several clinical specialities, infrastructure, and data. SciLifeLab and MedTechLabs are two other examples of multidisciplinary collaborations.

Question 3.4.B.

How do you provide opportunities for continuous research skills development for your clinical researchers? (*Process*)

Important processes for promoting research skills development are:

- Clinical leadership reassures academic skills development
- A wide selection of courses for clinical researchers
- Follow-up of individual research skills development
- Follow-up of university healthcare access to relevant courses
- Regional programme for docents

The clinical leadership is responsible for ensuring that employees continually develop their scientific and professional competences and are given the resources and time required for the complex task of combining clinical research with the health and medical care assignment. Research competence among clinical managers promotes that employees' development in terms of research is taken into account.

The Stockholm ALF region provides numerous courses for clinical researchers at different levels. KI has a wide selection of courses for both doctoral students and postdoctoral researchers. A clinical trials training course (*Clinical Studies - From Idea to Archiving*) and a course in ethics in clinical studies are examples of courses open to all clinical researchers. Karolinska Trial Alliance, with a regional mandate to support clinical studies, offers training in *Good Clinical Practice* (GCP). One particular course is aimed at research nurses. Courses for PhD supervisors are also provided. QRC Stockholm, a regional centre for national quality registries, offers courses in clinical research utilising quality registry data. For future docents, there has been a docent programme since 2019 that includes education days and networking. **To improve implementation and innovation capabilities** among clinical researchers specific courses are offered. In addition other continuing professional development courses are offered.

The competence development of clinical researchers is followed up through employee appraisals. The [competence ladders for most professional groups](#) within clinical operations are a tool for monitoring and setting goals for the competence development of clinical researchers. The competence ladders contain formal competence requirements and competence goals for both clinical and academic competences. Specific tools and models (KOLL, ProCompetence) are used for competence planning and assessment of employees' competence. Clinical doctoral students' individual study plans are monitored in an annual process.

In annual regional monitoring of university healthcare units, the **access to relevant** research infrastructure and support, including relevant **courses** (e.g. CGP courses) is monitored.

The action plan *From Student to Docent* has, among other things, contributed to the establishment of a **regional docent programme** which is offered to clinical researchers to promote and support them in their application for docent.

Question 3.4.C.

How do you provide opportunities for continuous research skills development for your clinical researchers? (*Evidence*)

Evidence showing that the Stockholm ALF region provides opportunities and ensures continual research skills development throughout the researchers' careers are:

- New clinical doctoral students and docents
- Participation in docent programme
- Participation in GCP training
- High quality of clinical research production
- Attracting external funding
- University healthcare units' access to courses

The **number of clinical doctoral students** has increased over time. **The number of new clinical docents** has increased over the last five years, which is evidence of a high competence level among clinical researchers and that there are opportunities to continue research after dissertation.

There has been **great interest in the regional docent programme**, demonstrating high ambitions among clinical researchers for their research career development. In 2022 there were a total of 73 applicants for 35 places. Due to the high number of applicants, a total of 44 people were offered a place.

In 2020, free GCP certification courses were introduced. Since then, **participation in GCP courses has increased by around 50% per year**. This has resulted in a large increase in the number of GCP certified healthcare staff.

The high quality of the clinical research production is a measure of the competence of the clinical research. This is illustrated in Table 2 showing clinical publications from the Stockholm ALF region by patient groups with at least 10 publications published in 2017-2021 that are among the world's 5% most cited within the same year and subject area.

Researchers in the Stockholm ALF region are **successful attracting external funding for clinical projects** which is additional evidence of the high quality of our clinical research and of a high competence level among our clinical researchers. During the latest five years Stockholm has attracted an average of 45% of funding from the Swedish Research Council call for Clinical Therapy Research (as compared with the 27% Stockholm receive through the ALF system).

The Stockholm ALF region's evaluation of university healthcare unit shows **that almost every unit provides relevant and sufficient support, including courses and training**, and research premises that enable clinical research.

Table 2 Clinical publications from the Stockholm ALF region by patient groups (adults) with at least 10 publications published in 2017-2021 among the world's 5% most cited within the same year and subject area.

Patient group (adults)	P(total)	P(top5%)	Avg. Cf
Cognitive impairment	535	50	1.76
Respiratory tract infections, severe	298	36	8.21
Pregnancy	550	32	1.18
Anxiety and depression	337	29	1.49
Neuroinflammatory diseases, CNS	195	24	1.93
Diabetes type 2	218	22	2.65
Heart failure	214	20	1.48
Breast cancer	299	18	1.2
Coronary disease	256	17	1.31
Disorders of the nose and paranasal sinuses	90	16	2.59
Inflammatory bowel disease	131	13	1.46
Chronic kidney failure	162	13	1.44
Allergy	224	12	1.28
Prostatic neoplasms	166	12	1.2
Disease or conditions with symptoms from the nervous system	94	11	1.79
Stroke	295	11	1.15
Otorhinolaryngologic Neoplasms	224	11	1.39
Foetal abnormalities	107	10	1.45
Pregnancy related illness	104	10	1.34
Complications of pregnancy	121	10	1.4
Intestinal diseases, rare	131	10	1.89

P(total)=Number of publications from the Stockholm ALF region 2017-2021 on the patient group

P (top5%) = The number of publications that belong to the 5% most cited in their field

Avg Cf = Mean of the field-standardized citation rate

4. INCENTIVES FOR CLINICAL RESEARCH IN THE ALF REGION

Scope

To what extent the ALF region has implemented incentive structures to integrate clinical research throughout the healthcare organisation.

The organisational conditions and challenges for conducting high-quality care in combination with clinical research place specific demands on coordination, incentive structures and management in Swedish healthcare. Both at the organisational level and at the individual level, there should be incentives to conduct clinical research.

The management of the health care organisation requires both clinical and academic competence and experience. In order to integrate research into everyday clinical practice it is thus required that the management has personal experience of clinical research including an understanding of the prerequisites that are essential for research. Therefore, it is important that academic qualifications are considered when appointing managerial positions in the health care organisation. It is also important to have healthcare professionals with research competence throughout the organisation in order to be able to implement new research results in the clinical practice.

Doing research in addition to your regular position in the healthcare organisation requires that time is set aside for this and that there are incentives that reward those who choose to become PhD-students, and continue to do research after their dissertation in addition to their clinical work. This could include incentives such as salary increase for academic performance and academic career development. Incentives for research are also about levelling out structural barriers and enabling clinical research careers that concerns the various phases of life during working life and promote different backgrounds and diversity.

Question 4.1.A.

What incentives has the ALF region developed to ensure that academic competence in clinical research are present at all levels in the healthcare organisation? (*Strategy*)

The Stockholm ALF region works strategically to integrate academic competence and development opportunities into all parts of healthcare. The ALF collaborative organisation sets a mutually formalised requirement for academic competence, which is complemented with specific incentives, such as requirements for academic competence in recruitments of positions in healthcare. Strategies and structures for incentives that promote academic competence at all levels of healthcare include:

- The Stockholm ALF collaborative organisation
- Specific regional criteria for university healthcare
- Requirements for academic competence in care contracts
- Academic requirements for positions in healthcare
- Research and Education (R&E) managers in healthcare
- Academic competence in the knowledge transfer system

The Stockholm ALF collaborative organisation ensures academic competence at all levels in the university healthcare. A clearly defined collaborative organisation with a mission and mandate to ensure academic competence in all parts of university healthcare from management to clinic level has been formalised through the regional ALF agreement. At the senior management level there is a joint management group with two advisory committees for clinical research and education respectively. At the hospital/department level there are six RD&E committees, and at the clinic/operational level there are RD&E groups under each RD&E committee (Figure 7, 2.1).

The Stockholm ALF region has decided on specific regional criteria, in addition to the national criteria **for university healthcare**. Two of the regional criteria for university healthcare units aim to **ensure academic competence** are: 1) KI participates in the organisation and management of the activities at the university healthcare unit, and 2) the university healthcare unit has staff with combined posts.

The **care contracts with care givers include requirements** with regard to what is expected in terms of knowledge transfer, research and education. **Academic competence in health care leadership** is necessary to perform in line with those requirements and is thus an important incentive.

Requirements for academic competence in recruitments of managerial and clinical positions in health care are key incentives. When recruiting a resident or a specialist physician, individuals who either already have a PhD or who intend to start their doctoral education are preferred. For the position as senior consultant within the university healthcare, dissertation is required or a strong merit, and docent competence is an advantage. Docent competence is also an advantage for applicants for the position as head of clinic.

Managers at all levels in the university healthcare oversee the important three-part-assignment – care, research, and education. In addition to the formal collaborative organisation, a **specific role with managerial responsibility for research and education, R&E managers, have been introduced**.

Their role is to support and facilitate the head of clinics' responsibility for research and education. The R&E manager role (or corresponding role with similar responsibility) exists at all emergency hospitals and within Stockholm Healthcare Services. The academic qualifications of R&E managers are at least senior lecturers, but professors hold most of the positions.

The **regional system for knowledge transfer in healthcare includes academic competence**. The regional level of the knowledge transfer system provides a system for implementation of evidence-based care and clinical research across caregivers. The system is organised into regional program groups (RPO) based on disease areas. All RPO have secured academic competence through a KI representative, holding a combined post (professor or senior lecturer), to safeguard a close bond between the knowledge transfer system and clinical research and education. KI in turn gathers all its representatives in RPO to allow cross-program benchmarking of clinical research and education.

Question 4.1.B.

What incentives has the ALF region developed to ensure that academic competence in clinical research are present at all levels in the healthcare organisation? (*Process*)

The processes for implementing incentives for academic competence in healthcare include:

- Monitoring of the university healthcare units including combined and adjunct posts
- Evaluation of academic merits in recruitment processes
- Implementation and evaluation of the R&E manager role
- The three-part assignment of the university healthcare is clarified to all healthcare staff
- Competence ladders for healthcare professions
- Monitoring and planning of individuals competence development

The university healthcare is monitored annually at several levels. The monitoring process and dialogue with university healthcare units **safeguard continued and strengthened academic competence** within healthcare. The collaborative organisation has implemented practice based KPIs specific to research and education, contributing to the governance and management of research and education in healthcare. The **number of combined posts and adjunct positions** at the university healthcare units is monitored, to identify the need for replacement or new positions in the next years. **Evaluation of academic merits in recruitment processes.** Academic merits are always addressed and factored in the recruitment of head of clinics and other senior clinical positions. The joint recruitment processes between KI and Region Stockholm including expert groups constitute quality assurance in the recruitment of senior consultants and head of clinics. Qualitative monitoring of the process for recruiting senior consultants has been carried out in the form of interviews with members of expert groups.

Implementation and evaluation of the R&E manager role. At the large hospitals the R&E manager role has been implemented, in addition to the role as director for research, education and innovation for the hospital, into each hospital's organisation to support the head of clinics. At Karolinska University Hospital, there is an R&E manager for each of the eight themes and functions (corresponding division) as well as a part-time R&E responsible for each medical unit (corresponding clinic). At the Stockholm South General Hospital, there is a R&E manager/responsible for each clinical operational unit. Within Stockholm Healthcare Services the assignment of the managers of the university healthcare units includes the R&E responsibility corresponding to that of the R&E managers. The R&E manager role have been evaluated and developed in the last few years.

The three-part assignment of the university healthcare - care, research and education - is highlighted and clarified to employees at all university healthcare units. Active work is carried out to increase the awareness and importance of the integration of research and education into the activities. Clinical research and education at each medical unit is recognized and how this contributes to developing and improving the healthcare for patients.

Competence ladders for healthcare professions. To ensure academic competence within all professions in clinical care, the Stockholm ALF region has introduced [competence ladders](#) for a number of the licenced occupations (occupational therapist, audiologist, biomedical analyst, dietician, physiotherapist, counsellor, speech-language pathologist, optician, psychologist, radiology nurse, nurse, specialist nurse, midwife, research nurse). The competence ladders constitute a clear incentive to continually develop within one's profession and participate in healthcare development and clinical research for the benefit of the patients and the region's inhabitants. The competence ladders include the step "*Responsibility for strengthening the interaction between clinical activities, research, and education in the professional field. Responsibility for development and research work*".

Monitoring and planning of individuals' competence development takes place within the regular employee appraisal and annual salary review. Development plans are prepared for employees in dialogue with the manager based on the competence ladders and other development goals. At the salary review, monitoring and salary setting are made based on the goals achieved.

Question 4.1.C.

What incentives has the ALF region developed to ensure that academic competence in clinical research are present at all levels in the healthcare organisation? (*Evidence*)

Evidence that the incentives promote academic competence in all parts of healthcare includes:

- The number of persons employed in healthcare with a PhD
- Increased number of university healthcare units and combined posts
- Results of evaluation of academic merits in recruitment processes

The **number of persons employed by Region Stockholm in a healthcare profession with a PhD** is 2,180 – 1,635 in a licenced healthcare profession, and 545 in a non-licenced profession (2020). In addition there are over 800 clinical doctoral students in the Stockholm ALF region.

Increased number of university healthcare units and combined posts. The Stockholm ALF region's collaborative organisation, that has been gradually implemented since 2016, has clarified responsibilities and mandates for research and education within all parts of the healthcare system. The number of university healthcare units has increased to 72. Five new university healthcare units were established in 2021, four of which are located within privately operated hospitals. Apart from the Karolinska University Hospital, seven other hospitals/care organizations in the region contribute to the regional research activity (Stockholm Health Care Services, Danderyd Hospital, Stockholm South General Hospital, Capio S:t Göran Hospital, Södertälje Hospital, Norrtälje Hospital, Ersta-Sköndal and Stockholm Sjukhem).

Action plans for the establishment of new academic positions have been drawn up in collaboration between KI and Region Stockholm, resulting in 14 new combined posts during 2021 and 2022.

The evaluation of academic merits in recruitment processes shows that the academic criteria carry a great weight in recruitment processes. It is not uncommon for individuals to be denied a position as senior consultant when academic qualifications are not fulfilled.

Question 4.2.A.

What specific incentives has the ALF region developed to encourage clinical research careers among healthcare professionals? (*Strategy*)

Formal incentives represent only a part of what encourages healthcare professionals to pursue a career in clinical research. The curiosity and personal driving force in finding solutions to clinical challenges are the key, as is the Stockholm ALF region's culture of academic and clinical excellence which allows for great freedom in pursuing one's ambitions. One important success factor in creating a favourable environment for clinical research careers is creating a culture in which research is an integrated and natural part of clinical careers, from medical school and onwards. Students are actively encouraged and supported in pursuing research careers, which has also proven to be an efficient way of identifying potentially excellent talents. The Stockholm ALF region is making significant efforts to continually develop incentives and support for professionals.

The strategies and structures to encourage healthcare professionals to pursue a clinical researcher career include:

- Stimulate interest in clinical research during first and second cycle education
- Recruit staff with an interest in clinical research to university healthcare
- Economical and other incentives
- Incentive structures after dissertation

Stimulate interest in research in first and second cycle education. To ensure a continued high interest in starting a clinical research career it is crucial to stimulate interest for clinical research at an early stage during first and second cycle education. [KI's Strategy 2030](#) and the [RE&D Strategy for Region Stockholm](#) both stress the importance of research and education being closely interconnected.

Recruitment of staff with an interest in research. Both interest and formal academic competence are highly valued when recruiting staff for positions in healthcare. Applicants with an interest in clinical research are actively welcomed to the healthcare system and encouraged to fully participate and be involved in developing the research environments that are fundamental for clinical research. A doctoral education is a strong merit for individuals who intend to apply for a senior consultant position within the university healthcare, and thereby an incentive to achieve a PhD.

Economical and other incentive structures. A salary increase for healthcare professionals after dissertation as well as for docents has been introduced. The salary increase is on average SEK 2,000 after dissertation and SEK 4,000 for docent. These economic incentives are symbolically important for the individual. There are also support structures to healthcare professionals interested in starting a clinical research career, such as the clinical research schools and clinical research positions targeting doctoral students.

The Stockholm ALF region supports and **encourages a continued career as a clinical researcher post-PhD with several incentives.** The strategic ambition is to offer broad opportunities for clinically active care staff to pursue a research career after PhD completion. The basic funding to the RD&E groups is an important incentive enabling financial support to all clinical researchers, and is especially important for early career researchers. There are also additional specific incentives targeting junior clinical researchers early after dissertation. The funding programs for clinical research positions targeting researchers from postdoc to senior clinical researcher are also significant for pursuing a clinical research career within all health professions. The regional docent program aims to stimulate to and prepare clinical researchers for docent application.

Question 4.2.B.

What specific incentives has the ALF region developed to encourage clinical research careers among healthcare professionals? (*Process*)

Processes to deliver incentives encouraging clinical research careers include:

- Research-based-education and education-based-research
- Introductory courses and summer research school for students
- Incentives targeting different health professions and junior clinical researchers
- Awareness of the three-part assignment of university healthcare among all employees

In the action plan linked to [KI Strategy 2030](#) one action is to stimulate research interest among students by offering research introductory and research stimulating activities and to improve the conditions for third-cycle qualifications. KI has developed a [definition of research-based education](#) used in first and second cycle education, which states that: 1) students are involved in ongoing research; 2) teachers are active researchers and have a scientific approach using relevant pedagogical methods; 3) the content of the education programmes is based on scientific methods and evidence-based research; and 4) teaching is based on research in teaching and learning. Students are trained in scientific research methods through theoretical courses, the degree project and through appraisal of scientific papers whereby students are trained to critically assess and interpret research articles and clinical research finding.

The concept of **education-based research** is also established, meaning that researchers who are involved in teaching and that teachers who are involved in research are of equal importance. Many researchers supervise and teach at third cycle education, but work is ongoing to increase the involvement in first and second cycle courses and study programmes by making teaching, educational development and mentoring more visible.

KI offers two consecutive **research introductory courses for medical students** ([FoLäk1](#) and [FoLäk2](#)) with 35 places yearly. These courses introduce the students to current cutting-edge research and research departments at KI and include scientific theory, scientific history, basic molecular biology techniques, popular and scientific communication, manuscript writing, as well as summer projects at KI labs. In addition, [KI Summer School in Medical Research](#) is offered to first cycle students. Students enrolled in the summer school are entitled to a research scholarship.

Several incentives target other healthcare professions than medical doctors and junior researchers to a continued research career. One of the clinical research position targets clinical researchers within allied health professions and nurses, with the specific aim of encouraging a continued research career among professionals other than physicians. To encourage junior clinical researchers, in addition to the regionally financed clinical postdoc positions, the RD&E groups prioritize financing of junior research positions. Junior researchers are also encouraged to become main supervisors for doctoral students, with the support from a more senior researcher as co-supervisor. The [KI research incubator](#) is a new innovative virtual research forum in which young researchers can collaborate and develop joint interdisciplinary research projects.

Question 4.2.C.

What specific incentives has the ALF region developed to encourage clinical research careers among healthcare professionals? (*Evidence*)

Evidence that the strategy for stimulating healthcare professionals' interest in a clinical research career is successful includes:

- The number of scientific publications of medical students' degree projects
- The number of participants in summer research school
- The number of clinical doctoral students
- The number of clinical docents
- Approval rate in calls for clinical research projects and positions

Scientific publications of medical students' degree project

The medical education includes an independent degree project. During the last 5 years an average of 70% of these projects have resulted in a scientific publication. This shows that students have participated and completed their first scientific work early on in their education. It also indicates that the strategy to stimulate early interest in clinical research is successful.

Participants in summer research school

The summer research school has run since 2012 and in total approximately 400 students have participated. The interest for the summer research school is high among the students; every year about 90 students from 10 different first- and second-cycle programmes have applied for the 40 places. The highest interest is seen among the students in the medicine, dentist and biomedicine programmes. Since 2010 71 of the participants, from five different education programmes, have continued to doctoral studies.

Clinical doctoral students

The number of clinical doctoral students has increased somewhat since 2017 (Figure 16). In 2021 there were 809 clinical doctoral students (admitted during the last 4 years), i.e. doctoral students who have a clinical position within healthcare. In total, there are about 2,000 doctoral students enrolled at Karolinska Institutet. Thus approximately 40% of the doctoral students are clinical.

Number of clinical docents

The number of docent applications has increased by about 40% during 2021, and the proportion of approved docent applications has also increased in all subject areas, to 88%, compared with 69% during the period of 2013-2017. In 2021, 47 new clinical docents were appointed compared to an average 27 per year during the four previous years.

The **approval rate is between 20 and 40% for most calls of clinical project funds and positions**, which shows that the interest in starting and participating in clinical research in the Stockholm ALF region is high and stable.

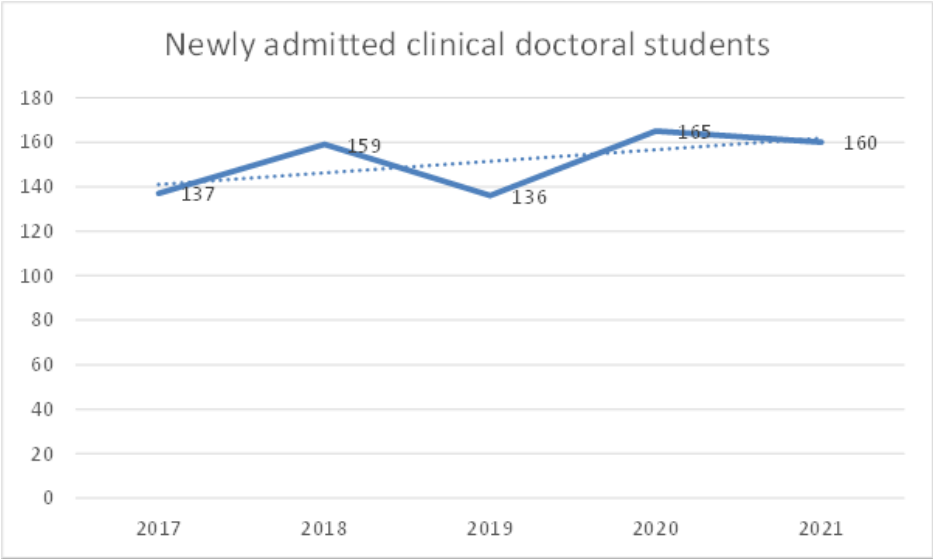


Figure 16. Newly admitted clinical doctoral students 2017-2021

Reader friend

Question 4.3.A.

How does the ALF region create incentives and actively promote and support diversity among clinical researchers in the organisations? (*Strategy*)

The strategy and organisation for developing incentives and support for diversity in clinical research includes:

- Regional strategies to ensure diversity
- General supportive work to promote diversity
- Incentives for clinical researchers in different phases of life and within all health professions

To meet societal challenges, it is important that clinical research and education address aspects of diversity and, KI and Region Stockholm have agreed that it is an integral part of the collaboration. In [Region Stockholm's Sustainability Strategy 2022–2027](#) and [KI's Strategy 2030](#) the **importance of diversity among leaders and employees is highlighted.**

General supportive work to promote diversity

For KI, the responsibility to work for diversity is two-folded: both as an employer and as an education provider, including both researchers and students. As one of Stockholm's largest employers', Region Stockholm also has a great responsibility to support diversity among its employees. Consequently, the university and healthcare have a common responsibility to promote and support diversity of its staff and students within clinical research.

The work and definition of diversity in clinical research are based on the seven grounds of discrimination and victimisation in the Swedish discrimination legislation. In accordance with [KI Strategy 2030](#), the university's activities must be characterised by a good physical, organisational and social study and work environment free from discrimination, abuse, and harassment. [Broader recruitment, equal conditions, and gender equality are well established within KI](#), including support structures such as an equal opportunities group. Region Stockholm's Sustainability Strategy 2022–2027 states that all operations are required to work systematically and long-term against all forms of discrimination as well as actively oppose all forms of discrimination.

Incentives for clinical research careers in different phases of life and within all professions

The Stockholm ALF region promotes and encourages an early start of a clinical research career through several incentives. The joint funded clinical research positions target clinical researchers at different levels, from doctoral students to senior researchers. The career of clinical researchers who are at the stage of establishing a family is encouraged by prolonging the financed clinical research positions after parental leave. Calls for clinical project funding and research positions that are open to all licenced health professions promote research careers among all clinical professions.

Question 4.3.B.

How does the ALF region create incentives and actively promote and support diversity among clinical researchers in the organisations? (*Process*)

Processes for promoting a clinical research career for individuals with different backgrounds include:

- Action plan for widening access and participation
- Competence-based recruitment in the healthcare system
- Courses and education in equal opportunities

To achieve diversity among clinical researchers, recruitment to higher education must involve a diversity of individuals with different backgrounds and experience. KI has developed an [Action plan for widening access and participation 2021-2023](#) to reach underrepresented groups in the recruitment to the educational programmes. The goal is that everyone who comes into contact with KI can see studies at KI as a possibility and that all students are given the prerequisites to complete their studies. A number of activities are carried out to promote broader recruitment and participation and the action plan is refined and evaluated continuously, during and after each recruitment year.

KI's recruitment is largely based on students telling others about their life as a student at KI via digital and face-to-face meetings. Participation in activities arranged by external organisations also aims to broaden the recruitment. The project *Shadow a doctoral student* is an initiative to broaden the recruitment of doctoral students by information to first and second cycle students about research opportunities. The assignment for the general study counsellors includes support to students who are interested in starting a doctoral programme.

For all advertised positions in healthcare, the ambitions, and goals for an equal and fair workplace and for a diversity of applicants are emphasised. As part of working actively to oppose all forms of discrimination in healthcare, a **programme for 'competence-based recruitment'** has been implemented. The programme is specifically aimed at managers, and it is a part of the region's leadership training for all managers. In this programme it is emphasised how preconceived notions implicitly affect individuals and how this can be counteracted. Participants are encouraged to take a self-assessment test to examine which preconceived notions they carry, to draw attention to these and consequently be able to avoid them at the workplace.

KI works with similar [courses and education for both students and staff](#). *Equal Opportunities* is an on-line course aimed at students, researchers and employees at KI, and covers the rights and opportunities of legislation, discrimination, harassment and victimisation. For supervisors of doctoral students, there is a compulsory course in *Bias in Assessment*. In 2008, together with three other universities in Sweden, KI took the initiative to form a [national network supporting broader recruitment: "Include"](#). The network initiates network meetings and conferences aiming at broader recruitment and wider participation.

Question 4.3.C.

How does the ALF region create incentives and actively promote and support diversity among clinical researchers in the organisations? (*Evidence*)

Evidence of strategies and processes for diversity are:

- Evaluation of recruitment of students to the university
- Allocation of ALF funding in different age groups

An evaluation of recruitment of students to universities performed by the Swedish Higher Education Authority (UKÄ) in 2018 presents statistics for the student population in KI's first and second cycle education programmes and doctoral education based on parents' level of education and foreign background. Students and doctoral students whose parents have at least three years of post-secondary education are over-represented at higher education institutions in general, but to an even higher degree at KI. Over-representation is greatest in medical and psychological programmes and in doctoral education, with over 60%. By comparison, 28% of the Swedish population is highly educated.

KI's proportion of students with a foreign background is higher than other institutions of higher education (>40% in all but two programmes), also compared to the entire population (25% in 2019). Groups categorized as "Swedish national background" and "foreign national background" are heterogeneous and cover different experiences in terms of, among other things, ethnicity and social background.

Foreign background should not be confused with international students and doctoral students who have arrived in Sweden for the purpose of education. It is mainly international students who apply to KI's master's programme, all of which are taught in English. 37% of KI's doctoral students are international, which is close to the average for doctoral students in Sweden (40%).

The Stockholm ALF region's funding to clinical research projects and clinical research positions is well distributed among different age groups. The clinical positions clearly target clinical researchers at different ages. The mean age is higher for the research positions at more senior levels (Table 3). For project funding, researchers in the age group 50–59 years receive the largest share of the ALF medicine funding, but the mean granted sum is distributed relatively even in all age groups (Table 4).

Table 3 Age distribution among clinical research positions granted 2022

Position	Number of positions	Age Youngest	Oldest	Mean
Research residency	5	29	39	33
Clinical postdoc	10	31	58	40
Clinical researcher	8	39	52	45
Senior clinical researcher	7	46	56	50
<i>Total</i>	<i>30</i>	<i>29</i>	<i>58</i>	<i>43</i>

Table 4 ALF Medicine 2022: a) age distribution of main applicants and b) granted applications by age groups; number of grants and grant amounts by age groups

a)

Number	Youngest	Oldest	Mean age
179	34	77	54

b)

Age group	Number of granted applications	Sum of granted amount	Mean granted amount
30-39	11	8 450 000	768 182
40-49	47	32 800 000	697 872
50-59	71	71 950 000	1 013 380
60-69	43	39 500 000	918 605
70-79	7	6 900 000	985 714
<i>Total</i>	<i>179</i>	<i>159 600 000</i>	<i>891 620</i>