Erasmus MC
Universitair Medisch Centrum Rotterdam

Research Assessment

Theme Sophia
2013-2018

Report on the research review according to the Standard Evaluation Protocol 2015-2021
April 2021

Content

Preface

From October 14-16, 2020, an international committee carried out the SEP-evaluation for Theme Sophia of the Erasmus MC in Rotterdam. Because of the COVID-19 situation, an on-site visit was not possible, but thanks to very good preparations, the three-day virtual visit went very smoothly. The committee members were impressed by the high-level, interesting and enthusiastic presentations, the open and constructive discussions with the representatives of the seven departments in the theme, and enjoyed the speed dates with the PhD candidates.

The committee assesses the quality and the relevance of the research in six of the departments within Theme Sophia as very good to excellent. For one new department, the committee could not properly assess the SEP-criteria because this department did not exist for the entirety of the evaluation period. In this report, we summarize our findings and conclusions and give a number of recommendations that could help to make the research of Theme Sophia more sustainable, and we give several advice that hopefully can be used by the leaders of the Erasmus MC to address some theme-overarching challenges.

On behalf of the committee, we would like to thank the dean, the chairs of the departments and their employees for their very warm and informative reception, and Meg van Bogaert and Floor Meijer for their excellent preparations and support before, during and after the visit.

Hans van Goudoever and Nine Knoers
Committee chair and vice chair, Theme Sophia
Amsterdam/Groningen, April 2021

I. Introduction

Assignment to the committee

The Executive Board of Erasmus University Medical Centre Rotterdam (Erasmus MC) initiated an assessment of the scientific research done at the institute during the period 2013-2018. This quality assessment was part of the regular six-year evaluation cycle of the research of Dutch universities and University Medical Centres (UMCs).

The primary units of research at Erasmus MC are its 48 departments, which are (financially) responsible for carrying out the institute-wide research strategy. Each department is led by a head of department, appointed by the Executive Board of Erasmus MC. The head of department is fully responsible for the core functions (research, education, and if applicable patient care as well as for the atmosphere and working environment (diversity & research integrity) of the department. Historically, departments are distributed over nine overarching themes:

1. Biomedical Sciences (6 departments)
2. Brain & Senses (6 departments)
3. Daniel den Hoed (3 departments)
4. Diagnostic & Advice (7 departments)
5. Dijkzigt (8 departments)
6. Health Sciences (4 departments)
7. Sophia (7 departments)
8. SPIN (3 departments)
9. Thorax (3 departments)

For the purposes of this assessment, the Executive Board of Erasmus MC appointed a separate committee of international experts for each of its nine themes, consisting of international experts in the fields of the underlying departments. Each committee conducted its own assessment, amounting to a total of nine assessments. The respective digital site visits to Erasmus MC took place in the period September 2020 to April 2021. The Theme Sophia site visit took place on 14-16 October 2020.

Originally, the members of each committee were intended to meet with one another and with Institute and Department representatives during onsite meetings. These were scheduled to take place in the spring of 2020. However, due to the global Covid-19 pandemic, the site visits to Rotterdam were first postponed and later replaced by remote meetings via a digital platform. In order to partially compensate for the loss of interpersonal interaction during physical meetings, it was decided to schedule additional online meetings between committee members and use interactive working methods.

This report describes the findings, conclusions and recommendations of the committee that assessed the seven departments that are part of the Theme Sophia. Each department is assessed in relation to research programmes and institutes worldwide in similar disciplines and on similar topics.

The committee did not attempt to draw a direct comparison between departments within the theme and Erasmus MC. Nonetheless, it has taken note of the results and strategies of the departments in Theme Sophia and discussed them in relation to each other. The committee emphasizes that the assessments made by the nine committees are not comparable; each committee assessed the theme in question on its own merits.

Assessment criteria

The assessment of Theme Sophia was guided by the Standard Evaluation Protocol 2015-2021 of the Royal Academy of Sciences and Arts of the Netherlands (KNAW), the Netherlands Organisation for Scientific Research (NWO) and the Dutch Association of Universities (VSNU). The three assessment criteria specified in the Standard Evaluation Protocol – (1) research quality, (2) relevance to society and (3) viability – formed the starting point for the assessment. In its report, the committee both qualitatively and quantitatively assesses these criteria, scoring them on a four-point scale, ranging from world leading/excellent (1) to unsatisfactory (4). The meaning of the scores is explained in appendix 4. In accordance with the Standard Evaluation Protocol, the assessment also includes a qualitative appraisal of Erasmus MC's PhD programme, and its research integrity and diversity policies and practices.

In addition to the Standard Evaluation Protocol criteria, the committee took three specific research-related targets into consideration. These are part of Erasmus MC's current strategy (Strategy23), which designates 'Technology & Dedication' as its guiding principles. In the Terms of Reference for the research assessment the Executive Board of Erasmus MC describes the three research-related targets as follows:

1. Positioning ourselves as a partner;
2. Using technology to lead the way in innovation;

3. Focusing on our staff and internal organization.

Committee composition

Members of the committee that assessed the departments of Theme Sophia are:

- Prof. Hans van Goudoever (chair), Amsterdam UMC, The Netherlands;
- Prof. Nine Knoers (vice-chair), University Medical Centre Groningen, the Netherlands;
- Prof. Ole Mogensen, Aarhus University, Denmark;
- Prof. Karl-Dietrich Sievert, Lubeck-Schleswig-Holstein University, Germany;
- Prof. Kerstin von Plessen, Lausanne University Hospital, Switzerland;
- Prof. Paolo de Coppi, UCL Institute of Child Health, United Kingdom;
- Prof. Lucilla Poston, King's College London, United Kingdom;
- Prof. Neena Modi, Imperial College London, United Kingdom.

Dr Meg van Bogaert and Dr Floor Meijer were appointed as independent secretaries to the committee. A short curriculum vitae of each of the committee members is included in appendix 1.

All members of the committee signed a statement of impartiality and confidentiality to ensure a transparent and independent assessment process. Any existing professional relationships between committee members and departments under assessment were reported. The committee concluded that there was no risk in terms of bias or undue influence.

Documentation

Prior to the site visit, the committee received the self-evaluation report of the theme and its underlying departments, including the information and appendices required by Standard Evaluation Protocol. The following additional documents were provided:

- Standard Evaluation Protocol 2015-2021;
- Terms of reference for conducting the site visit;
- A Beginner's Guide to Dutch Academia (The Young Academy, 2018);
- Strategy23 (*Koers23*);
- Strategy18 (*Koers18*).

Working method

Prior to the site visit, the committee members were asked to read the documentation and formulate preliminary assessments and questions for the interviews. In an online kick-off meeting, approximately six weeks prior to the site visit, the committee was introduced to the Standard Evaluation Protocol and agreed upon procedural matters. In a second online meeting, approximately three weeks prior to the site visit, the committee discussed preliminary assessments and formulated questions on relevant topics. These questions were afterwards sent to the heads of department in order to facilitate their preparations for the site visit. On the day before the start of the digital site visit, the committee held a closed online meeting to prepare for the interviews.

Each member of the committee was primarily responsible for the assessment of one specific department. As 'first assessor', he or she took the lead in preparing for the assessment of this department. Furthermore, this committee member chaired the online meetings with department staff and eventually drafted an assessment based on the Standard Evaluation Protocol criteria. For reasons of continuity, a 'second assessor' was appointed to each department. Contrary to the first assessor, the second assessor was not necessarily an expert in the field of the department.

The online site visit of Theme Sophia took place on 14-16 October 2020. During the site visit, the committee met with the Executive Board of Erasmus MC, as well as with representatives of the departments. Each department was given a time slot, which it filled with presentations and interviews. Committee members also spoke with PhD candidates of the departments during two consecutive speed dates and a plenary PhD session. During its final meeting, the committee jointly scored all of the departments. To conclude the visit, the committee presented the main preliminary conclusions to the Executive Board of Erasmus MC and the staff of the departments of Theme Sophia. The schedule for the site visit is included in appendix 2

After the site visit, the chair and the secretaries drafted a first version of the committee report, based on the assessments drawn up by the first assessors. This draft report was circulated to the committee for all members to comment on. Subsequently, the draft report was presented to Erasmus MC for factual corrections and comments. In close consultation with the chair and other

committee members, the secretaries used these comments to finalize the report. The final report was presented to the Executive Board of Erasmus MC.

Structure of the report

This report contains the committee's findings and conclusions on the seven departments of Theme Sophia. In accordance with the Standard Evaluation Protocol, the committee details its assessments on strategy and targets, research quality, societal relevance and viability in separate chapters for all seven departments. These chapters also discuss particularities with respect to PhD training. Overarching and institutional dimensions of such aspects (e.g. policies that are developed at Erasmus MC rather than at the departmental level, general practices at Theme Sophia with respect to PhD training, diversity and research integrity) are assessed in a general chapter that precedes the chapters on the departments. Details on the composition of the committee, the assessment scale and the setup of the digital site visit can be found in the appendices.

II. Erasmus MC and Theme Sophia

Organizational structure

Erasmus MC has traditionally been organized in a decentralized manner. It comprises 48 departments, seven of which are part of Theme Sophia. Departments form the primary units for governance, HR and funding. Each department is led by a head of department appointed by the Executive Board of Erasmus MC. The head of department is integrally responsible for core tasks (research, education and, if applicable, patient care) and for formulating and realizing the associated department goals. Also, the head has to ensure a good atmosphere and working environment (diversity and research integrity) within the department. The head of department receives (first stream) research funding directly from the Executive Board.

The nine themes at Erasmus MC were created in 2012, when departments were grouped based on existing collaborations. The themes are organizational units only. As such they are not responsible for developing research strategies or distributing funds. Within a theme, the combined heads of departments, together with the theme director, form the Theme Board. One of the heads acts as chair. The Theme Board bears collective responsibility for drafting and realizing the annual tactical and operational strategic plan for the theme and is held accountable for this by the Executive Board. The annual strategic plan sets out how themes/departments will achieve the targets set-out by the organization (Strategy23). The theme director is responsible for effective operational management of the theme. The departments within the theme are supported and facilitated in their operational management by the Theme Office. At Theme Sophia, the Sophia Research Desk helps with e.g. grant writing.

The names of the departments and themes are not always self-explanatory for people outside the Erasmus MC.

Theme Sophia

The Sophia's Children Hospital is a prominent part of Erasmus MC. As one of the largest of all nine themes, it is responsible for 27% of the Erasmus MC-wide turnover and unites all medical and surgical specialties in children's health care under one roof. Sophia adopted a life course approach to health and care, aimed at enhancing patient's societal participation. According to the theme's strategic plan, the Sophia Children's Hospital is on course to becoming the largest and most prominent children's hospital in the Netherlands by 2026.

The general argument for bringing the current seven departments together in Theme Sophia was not immediately evident to the committee. This especially concerned the departments of Urology and Gynaecological Oncology, which are not (primarily) focused on paediatric care and therefore appear to be somewhat out of place at a children's hospital. Additional documentation received by the committee clarified that the composition of Theme Sophia reflects cross-links that existed at the time that the themes were formed. In 2012, there were significant collaborations between the department of Obstetrics and Gynaecology and the department of Urology, which included four paediatric urologists. It therefore made sense to include this department in Theme Sophia. Also, the now independent department of Oncological Gynaecology was still a sub-department of the department of Obstetrics and Gynaecology. After reviewing the documentation and speaking to department representatives, the committee is not altogether sure that Theme Sophia is still the most suitable home for each of the current seven departments. Erasmus MC may wish to reconsider this setup in the near future.

Focus areas and Academic Centres of Excellence

The Sophia Children's Hospital has identified four areas in the fields of care, scientific research and education in which it aims to excel (inter)nationally. These areas are prioritized in order to work towards consolidating the leading position of the Sophia Children's Hospital. They can benefit from general and specific fundraising by the Sophia Foundation. A focus area is understood to be a cluster of academic care, research and education around a defined patient group. They create an opportunity for both basic researchers and clinical doctors to collaborate and combine their strengths to accelerate the translation of results from basic research to care. The four focus areas are:

1. Centre for Early Life Course Medicine (7 specialties);
2. Paediatric Thorax Centre (7 specialties);
3. Paediatric Brain Centre (12 specialties);
4. Centre for Rare Diseases (15 specialties).

In addition to the Sophia focus areas, there is another Erasmus MC-wide organizing principle. This is the Academic Centre of Excellence. In total, Erasmus MC has around a hundred Academic Centres of Excellence and this number is still growing. The committee understood that Academic Centre of Excellence are virtual centres that combine research, education and patient care of multiple departments and as such do not have structural financing from the Erasmus MC Executive Board. They are led by one or multiple principal coordinator(s). The four centres mentioned above are each connected to a number of Academic Centres of Excellence. Apart from internally confirmed Academic Centres of Excellence, there are also a number of externally confirmed Centres of Expertise at Erasmus MC.

The committee appreciates Erasmus MC- and Sophia-wide initiatives to place emphasis on certain topics and encourage collaborations in these areas by way of focus areas and Academic Centres of Excellence. At department level, however, a clear and distinct research focus is not always discernible. A general conclusion of the committee is that a number of departments spread themselves too thin by developing multiple research lines that are dependent on a very limited number of research staff members. This inevitably hampers the viability of these departments. The committee recommends creating more focus by pursuing a limited number of promising research interests and letting go of others.
Strengthening research strategies and targets will also promote focus. Preferably, department-wide strategies should address the objectives set out by Strategy23. References to the institute-wide goal of becoming a top tier tech university by convergence with Delft University of Technology (TU Delft) are currently not always part of the future strategies laid out by the departments.

Talent management

An overall conclusion of the committee is that viability is an issue for many of Theme Sophia's departments. Too often valuable and talented young and mid-career researchers pursue opportunities elsewhere and are lost to the departments, while the succession of senior researchers who are due to retire is not secured.

In the committee's opinion, the lack of a formal tenure track is an important factor in these issues. From the documentation and interviews, the committee got the impression that at many departments, promotions depend just on whether the PI thinks a staff member fits in the research area. Early- and mid-career employees seem to have no insights in their career possibilities. This is a situation that requires urgent attention. Ensuring official positions at mid-career level will not just help in retaining talent. It will also increase the attractiveness of Erasmus MC to promising researchers from outside the Netherlands and thereby also the diversity of staff.

Another conclusion is that many young staff members would benefit from establishing a formal mentoring programme. The committee is of the opinion that having an outside mentor is not only helpful to PhD candidates (maybe even bachelor's and master's students) but also to early-career clinician-scientists. Additionally, Erasmus MC could consider providing seeding grants to young talent, as these would help them in gaining independence.

Having dedicated research time for clinicians is another important factor in building viable departments. The committee notes that protected time arrangements should be made in staff contracts. This may also help to improve the work-life balance experienced by staff.

Finally, the committee concludes that impact factor is a key criterion in Erasmus MC's methodology for the assessment of research performance by individual scientists, as well as for the career path from assistant to associate to full professorship. The committee would advise to adopt a broader approach to assessing research performance, such as laid out in the DORA-principles.

PhD training and supervision

Erasmus MC offers three- to four-year (fulltime equivalent) PhD positions in which PhD candidates conduct research, follow a training programme and teach undergraduate students. Until recently, training and supervision practices were shaped at the decentral level and significantly varied from department to department and from supervisor to supervisor. In recent years, initiatives were taken to streamline procedures and practices across Erasmus MC, including the introduction of a Graduate School (operational as of the end of 2020/beginning of 2021) and the central database system Hora Finita (operational as of late 2019) in which the status of all PhD projects is registered. Before the introduction of Hora Finita, Erasmus MC did not centrally keep track of completion times, success rates and next destinations of PhDs, which

is why this type of data was not available to the committee.

PhD training at Erasmus MC is currently organized in five PhD programmes (Health Sciences, Cardiovascular Research, Neuroscience, Biomedical Genetics, Molecular Medicine), each with its own (usually local) research school where candidates follow courses and lectures (NIHES, COEUR, Onwar, MGC and MolMed). Most Sophia PhD candidates are enrolled at the Netherlands Institute for Health Sciences (NIHES). PhD candidates of the department of Clinical Genetics are exclusively enrolled at the Medical Genetics Centre South-West Netherlands (MGC), of which the department is a founding member. From the interviews, the committee concludes that it largely depends on the affiliation of the supervisor which school a PhD candidate joins. When the supervisor is not affiliated, the PhD candidate can shop around for courses without joining a particular school. This does however pose problems in Hora Finita, which requires registration at a research school.

As opposed to the new Graduate School, the research schools have always had a large degree of autonomy; they were never structurally embedded in the organization. During the site visit, the committee learned that the establishment of the Graduate School should be seen as an effort to combine the strengths of the various research schools, thereby ending fragmentation and enhancing the international visibility of both the Research Master and PhD programmes. The new Graduate School will encompass all of the roughly 1500 PhD candidates at Erasmus MC. One of the objectives of the Erasmus MC Graduate School is to improve the information provided to (starting) PhD candidates. At present, it strongly depends on the way in which a department, or even an individual supervisor, has arranged this. PhD candidates indicate that they often have to search for a long time before they find the right information, they depend on their supervisor or older fellow PhD candidates for information about courses, conditions for the PhD, etc. There are research schools that have arranged it well and can serve as best practice in the further development of the Erasmus MC Graduate School, with information brochures, introductory meetings and/or an interview at the start of the PhD trajectory. The committee stimulates the Erasmus MC to set to work on this energetically.

The committee understands this tendency towards centralization but feels that Theme Sophia would benefit from a recognizable track or school for the entire theme. First of all, the committee recommends to promote interaction of PhDs from different departments. From speaking to PhD candidates, the committee concluded that some of the PhDs are already interconnected but there is also a significant number of PhDs that are rather isolated. Furthermore, a recognisable Sophia track or Graduate School could help raise funds that can be put back into research, for example by providing summer courses on specific topics that, because of Theme Sophia's excellent international reputation, might be very attractive for many people around the world.
Lastly, a Sophia track/school could help to emphasize certain areas for which the theme is already well known. Increasing awareness of (and thereby publicity for) existing research would benefit these research areas.

Over the course of their project, PhD candidates are expected to obtain a total of 30 EC from courses offered at the research school and/or Erasmus MC. Participation in external courses, lectures and conferences and teaching undergraduate students also counts towards this total. A one-day course on research integrity is mandatory for all Erasmus MC PhD candidates. Candidates who conduct animal experiments are required to follow a course on laboratory animal science, while candidates who are involved in patient-related research take part in a course on good clinical practice. Candidates that are involved in academic or skills-based teaching are required to obtain a basic teaching qualification. The majority of PhD candidates feel that the quality of the training is adequate. They did mention that skills courses at Erasmus MC-level tend to fill up quickly. Some had to wait several years before being able to join the popular course on academic writing, which seems undesirable to the committee. According to PhDs, the research schools usually communicate clearly on the courses that they offer (by way of emails, website).

A recent development is that educational activities, as well as agreements on supervision, are detailed in a Training and Supervision Plan. This plan is drawn up at the start of a project and signed by the PhD candidate and his/her supervisors. Ideally, it is updated annually and serves as a guide for the yearly evaluation of the progress of the PhD candidate. From the interviews, the committee established that most, but not all, PhDs indeed have Training and Supervision Plans. Some of these were drawn up retrospectively, after the introduction of this new practice. The committee appreciates that annual progress interviews take

place between the PhD candidate and members of the supervision team. It recommends to also involve an independent staff member (a mentor), preferably from a different department, in such progress meetings. While some PhD candidates may not require this, the committee heard from others who would clearly find it helpful to be able to talk through research-related and unrelated issues with someone from outside their department.

The PhD candidates that the committee spoke with are generally very satisfied with the quality of supervision, praising the personal contact with the supervisor and the approachability of supervisors. A large majority of them has two supervisors, a promoter and daily supervisor, but the supervision team can count up to five members, especially for PhD candidates with projects that cross departmental (and theme) borders. The supervision is structured between regular meetings with the direct supervisor once a week or every two weeks and more infrequent, but scheduled meetings with the promoter of the project.

All PhD candidates at Theme Sophia are (automatically) members of the Sophia Researchers Representation. As the committee understood it, this is not so much an interest group for PhD candidates as a group that organizes social events and offers organizational support. A document that informs new PhD candidates on where to go in case of personal problems or integrity issues is under construction.

Career perspectives after the PhD could be discussed more thoroughly from the start. The initiation of the Erasmus MC level graduate school might improve these issues.

To conclude, the committee emphasizes that it welcomes initiatives aimed at standardization of the PhD experience across themes and departments. At the time of the site visit, the success of such measures was still hard to assess. Not all of the measures have fully come into effect. By consequence, the experiences of PhD candidates can vary quite a bit across different supervisors, departments and research schools. The interviews highlighted that this is not necessarily a problem when things run smoothly. However, in case a PhD candidate does run into issues, finding the proper support structure does not seem to be that easy. Often, PhDs seem to depend on immediate colleagues for acquiring the information that they need, as formal information is hard to come by. The committee feels that improvements can be made in this respect.

Research integrity

Erasmus MC endorses the Code of Conduct for research of the Association of Universities in the Netherlands (VSNU) and the revised European Code of Conduct for Research Integrity. As of early 2018, Erasmus MC has its own guidelines in case of scientific misconduct. Furthermore, Erasmus MC policies on academic/scientific integrity are outlined in the Erasmus MC Research Code that covers the following aspects:

- Research with patient data and biomaterial;
- Data management;
- Guidelines for publishing and authorships;
- Guidelines inducements by companies;
- Intellectual property.

As the committee understood it, the decentral implementation of the centralized integrity policy is work-in-progress. In anticipation of this policy, departments are responsible for their own research culture. Theme Sophia has appointed a theme-wide committee to oversee the integrity issues of all departments. All new staff receive the Integrity Handbook (Sophia Quality Manual) and research integrity training is organized periodically by the individual departments. As stated above, all PhD candidates follow a mandatory one-day course on research integrity. For researchers who are involved in patient or human studies, a training requirement for clinical practice is the Basic Regulatory Course and Organization for Clinical Researchers. To the committee, the above signals that integrity is well addressed.

Data management

Erasmus MC aims to generate, store and publicize research data in accordance with legal, academic and ethical requirements and according to the FAIR principles (Findable, Accessible, Interoperable and Reusable) according to the Handbook for Adequate Natural Data Stewardship developed by the Federation of Dutch UMCs.

In 2018, Erasmus MC started an initiative to develop an institute-wide research IT-infrastructure ('Research Suite'). This project deals (amongst others) with:

- Providing the physical infrastructure for data storage and computing power (cloud service);
- Offering data stewardship and governance for the (re)use of different types of data;

- Creation of digital workspaces for researchers where they can safely collaborate with partners inside and outside the Erasmus MC;
- Implementation of data capture tool, electronic lab journal, study/project management (PaNaMa);
- Support with development of study specific data management plans;

The Sophia Research Office will shortly start working together with the Research Suite team to organize the research IT infrastructure for Theme Sophia in more detail.

From the documentation and interviews, the committee got the impression that there is disconnect between Erasmus MC and the departments of Theme Sophia with respect to data management policies and practices. While the dean ensured the committee that data management is prominently on Erasmus MC's agenda and that the necessary infrastructure is expeditiously being put in place, research staff seem to experience significant gaps that hamper their daily work.

Many departments seem to organize their own data management, either because they are not aware of the possibilities of Research Suite or because this infrastructure does not sufficiently suit their needs. In the committee's opinion, aligning the interests of Erasmus MC and the departments with respect to data handling, sharing and transfer possibilities is of great importance. The Research Suite initiative is a good starting point but is not yet matured and not fitting all the needs of individual departments. Further and prompt action is required according to the committee. Erasmus MC would certainly benefit from integrating data from a clinical perspective and research gathered data, both at central and at theme level.

Diversity

The committee concludes that, with respect to diversity, Erasmus MC still has some way to go. Rotterdam is a very culturally and ethnically diverse city, but the staff of Erasmus MC does not yet reflect the full scope of this diversity. When reporting on diversity, the departments mostly seem to refer to gender and not to (e.g.) socio-economical and ethnical diversity. Theme Sophia confirmed that, to date, such aspects are not included in the Erasmus MC diversity policy.

Erasmus MC has specifically developed a number of policy initiatives to support female researchers. These include the Female Talent Class, consisting of various workshops and interventions intended for talented early career researchers (maximum of two years after PhD completion), and the Female Career Development Programme, developed for female scientists (clinical and non-clinical scientists between 4 and 8 years after promotion) who have the potential and ambition to reach the position of associate professor.

Despite these policy initiatives, the gender balance at the top of the staffing pyramid is skewed. Women make up a solid majority (70%) of PhD candidates, but only a minority (25%) of full professors. Erasmus MC is well aware that current female talent development programmes, whilst helping to make a difference, have (so far) not been able to close the gender gap. To this end, further actions are required.

III. Child & Adolescent Psychiatry/Psychology

Research quality	Excellent (1)
Relevance to society	Excellent (1)
Viability	Good (3)

Mission and Strategy

The mission of the Department of Child and Adolescent Psychiatry/Psychology (CAPP) is to provide the highest quality of care to children, adolescents and young adults with complex psychiatric disorders. It performs translational research, as well as clinical and population-based studies to generate new knowledge and that contribute to optimizing mental health and quality of life for children and adolescents.

Since the arrival of the present head of department, as well as other senior researchers with and excellent academic reputation, the department has evolved towards being well-structured with clear pillars of patient groups and map research. The governance and management of the department is shifting, with the ambition to also provide visibility of the mid-career talents in the department. Cross-fertilization is taking place and the previously scattered portfolio is steadily being changed into a collaborative and coherent research profile. The committee supports this evolvement that is continuing and will be doing so during the upcoming period.

As will also be described in more detail below, researchers are responsible for all aspects of their research, as well as having to do teaching and/or clinical work. Doing 'everything' themselves leads to research projects taking rather long before results are published and it requires a lot of effort to acquire the necessary knowledge and understanding. One issue that came up during the site visit was that it is difficult for the PI's and researchers without managerial positions to know in which forum to propose new ideas and structures that could improve the department. This could easily be integrated into the current structure of the department management. In the interviews as well as this report, the committee focused on suggestions and recommendations for maintaining sustainability in an international context.

Research quality

The longitudinal research with an epidemiological, preventive and clinical approach focuses on three domains: Neuroscience, Deep Phenotyping and E-health intervention. The research in this department includes not only psychiatric populations, but also general and high-risk populations, which makes the research cutting edge in terms of new avenues in a broader mental health concept that takes into account preventive approaches.

The committee praises the initiative by the new head of department to focus on several core domains with clearly defined populations and to attempt harmonization of the measures used and followed-up. In the review period, this group evolved from a predominant perspective rooted in epidemiology towards connecting the research progressively with their rich clinic. By way of longitudinal studies the research as well as the approaches are being harmonized. The academic output is excellent in an international context, but also in the context of Theme Sophia in terms of publications and grant funding. In terms of the academic reputation of the department management, it is likewise excellent, with a major visibility in several important committees and as a motor for pan-European initiatives and a wide and important network of researchers.

Generation R is a major asset for the department as an enormous source of data. It has been long time established and worldwide leading. The CAPP department plays a major role in this project and by connecting the Brain Centre project with Generation R a valuable source of data is available to do high quality research.

The head of the department is well known and one of the leading researchers in the area of high-risk studies. Several other senior researchers are highly acknowledged in the scientific community for their important contribution to national and international collaborative efforts.

All in all, the basis for the scientific work in this department is strong. The current transition, such as merging of several methods and at the same time focusing on distinct subjects and populations, with a harmonization of approaches in a longitudinal perspectives, has clear potential for the future.

Relevance to society

The committee is impressed with the effort and results of this department towards societal impact and implementation of research outcomes. The translational pipeline from basic to clinical research is clearly present. The virtual reality, e-

health and harmonizing at clinical level projects clearly show the added value of the research to society and thus show new ways of integrating the direct view of the young person/patient into the research projects. Moreover, user groups support research studies during their planning and execution, as well as the interpretation of data. In the past, an excellent collaboration with the study populations has already assured the long-term follow-up in the Generation R and the long-term 'at risk' studies.

Excellent collaboration with patient associations is put into place with the aim of the head of department to build a strong case with the affected families and thus improving the attention of the general population and the politicians towards youth mental health, which could help to strengthen the status of child and adolescent psychiatry in the Netherlands.

With the youth act, there is a major risk of segregation in the field of child psychiatry in the Netherlands and sadly patients may return to a disconnected system after treatment at Erasmus MC. Continuous education of all those partners involved in treatment of the same patients seem challenging, but important. Hence, the committee suggests to put into place more collaboration with this part of Child and Adolescent psychiatry which often will follow up the same patients, but surely with other perspectives and less knowledge of 'international standards'. This could be by education, consultation or the building of networks, which may also have a positive impact on access to patient populations and follow-up.

On another note, the committee suggests to put in place a (master's) education in the area of expertise of this department (e.g. clinical neuroscience or imaging). As the committee realizes that a full master's programme might not be feasible in the short run, it can imagine that it would be more realistic in the short term for the department to focus on shorter continuous education in the field. Not only could it help to sustain the financial situation in the future, it would also have a positive impact and increase the visibility of the department.

Viability

Despite the excellent track record of the past six years, the department has a number of crucial challenges that need to be addressed. First, the funding has been stable over the review period, with a slight increase in 2018. Combined with the plan of the current head to integrate the three domains (pillars), this is solid basis for the future. In order to give a further stimulus to the quality of the research, the committee believes that within the plans a further focus of the research is important. Many of the PIs work in different domains and on different topics. Ideally, they should work together within a strong research environment and with other departments or even other institutions. The second challenge is also related to the focus of the research and is to bring together the clinic and research at a daily base in the department. The department includes a high number of studies devoted to the 'general population or at-risk populations'. Integration of these two aspects will lead to further impact, both academic and societal. The committee sees opportunities for this, including the progressive way of integrating e-health into child psychiatry which is novel and being done at large scale. Also, in Artificial Intelligence there are opportunities, given the wealth of accessible data, although data solutions should first be in place.

The third challenge is one that is relevant for all departments in Theme Sophia and is providing a clear career path for early and mid-career academic staff. Only a minority of these researchers have permanent and stable positions. The progression and quality of this department depends on this talented group and would benefit from them having more secure career planning, as well as a higher number of securely funded PI's. This would allow mid-career researchers to build their own group rather than being obliged to fight for their own position. The committee understands that the department is partly depending on a Erasmus MC-wide strategy, but emphasizes that bright researchers might be lost due to lack of career progression.

Fourth, in the interview with the department management it was mentioned that it is difficult to find new colleagues. Private practice is attractive to many clinical psychiatrists and the department cannot offer the salary offered by the private sector. In addition, there is currently a shortage of mental health professionals in the field of youth mental health, partly because of the national policy to fund child and adolescent psychiatric care through the Child Care Act instead of the Health Insurance Act. The beforementioned continuous education might increase visibility of the department and make it more attractive. This department with high quality research in different domains in an international context has the ideal basis to attract people interested in this speciality and the courses that the department can offer. The

visibility of the department will probably increase in the next years if resources are sufficiently put into this area (website, education, different kinds of networks, national and international organization of congresses and other possibilities to promote the department).

The final and most important challenge concerns data-management. Part of the excellent research that was performed in the period of the review, was based on the flagship programme Generation R. The committee is of the opinion that Generation R is a major strength that could be exploited even more. The department should more deliberately and proactively point out its crucial role in Generation R within Erasmus MC. A major challenge that prevents the department from further excelling with the research in Generation R seems to be due to lacking the right solutions for data-management. The quality of the research is depending on the quality of data and the availability of data from different sources in a single system. Although the Generation R project is a major asset, the fact that it has existed for a long time is also a disadvantage. At the time of initiation, state-of-the art methods were used, but the infrastructure is now somewhat outdated and needs to be reviewed to find more adequate solutions and to define the responsibilities clearly.

The dean of Erasmus MC invited the department to work with the organization in Research Suite to make it easy for research purposes to integrate different routes of acquiring data. Also, issues relating to data privacy and dynamic informed consent procedures are topics that can and should be included in these novel approaches. This idea is about to be put into place by the management of the department, which is to be commended. In the interview with the academic researchers of the department, it appeared that these ideas and developments are not always integrated at the mid-career level. The committee got the impression that research time for some Generation R researchers is currently being spent inappropriately on database management and data-sharing. To the committee it is unclear if the developments at Erasmus MC level penetrate into all levels of the department (communication issue), or if the system at Erasmus MC level is not fitting the requirements of this department. Anyhow, this is a major issue that could contribute to even improve the already excellent research output of the department. Relating to this issue, the committee points out that major international efforts are currently taking place that deal with issues on standardizing approaches, common coding and dealing with data. In order to prevent Generation R and the Paediatric Brain Centre project from going from an asset to a backlog, the committee recommends not only developing and implementing solutions locally, but also connecting them to international developments.

5.

PhD training

The recruitment of PhD candidates follows a structured selection process (written application, interview and an ad-hoc writing task), which is to be congratulated. Also, it is advantageous for the PhD candidates to be part of larger research programmes, which facilitates their integration into the clinic and the research environment likewise.

Recommendations

The committee's recommendations are:

1. Put more emphasis on continuous education and master's education to gain more visibility and attract colleagues, as well as gain from a financial support.
2. Try to achieve more secured PI positions and try to enhance career planning for mid-career researchers in key positions
3. Further harmonize data-collection between clinics and research, as well as between the different domains of research in integrating major international efforts that are currently taking place and deal with issues on standardizing approaches, common coding and dealing with data-or better implementation of what is already in place in Erasmus MC.
4. Sharing of data-handling and administrative tasks across projects could limit the responsibilities and enhance the use of time of each researcher and contribute to 'professionalizing' the system. This would make the set-up more sustainable, especially in the view of the immense volume of data collected in the department.

IV. Clinical Genetics

Research quality	Excellent (1)
Relevance to society	Excellent (1)
Viability	Very Good (2)

Mission and Strategy

The Department of Clinical Genetics is one of the larger research departments at Theme Sophia. In the committee's opinion, it has a clear mission and research focus. The mission of the department is to improve the identification, treatment and prevention of inherited disease through state-of-the-art multi-omics, while its focus lies on unravelling the genetic background and pathogenic mechanisms of these inherited diseases and on the development.

The department's research can be divided into four research lines. The research lines in Neurogenetics and Rare disorders existed prior to 2013, while the research lines in Prenatal genetics and Cardiovascular genetics were added during the review period. These research lines are still in a start-up phase. The aim of the neurogenetic research line (1) is to get a better understanding of the (patho)physiology of the nervous system and to identify the genetic basis and pathologies of the nervous system. Movement disorders, a specific form of intellectual disability (fragile X) and disorders of brain development are the focus of this research line. The aim of the rare diseases line is (2) to understand the genetics and molecular pathology of rare disorders and develop therapeutic strategies using chemical, gene- and cell-based strategies. Gastro-intestinal diseases, rare cancer syndromes, metabolic diseases and myopia are the focus of this research line. The aim of the prenatal genetics line (3) is to understand the impact of novel technological advances before implementation into the prenatal genetic clinic. Important focus lies on the accuracy and diagnostic yield of these advances techniques, and ethical, legal and societal aspects. The aim of the cardiovascular genetics line (4), a relatively new research line, is to improve genome diagnostics of patients with cardiogenetic disorders. Aortic aneurysms, cardiomyopathies and congenital heart defects are the focus of this research line.

The department has the necessary state-of-the art infrastructure to fulfil its mission and strategy and has many successful national and international collaborations.

Research quality

The scientific quality of the department is excellent, as evidenced by its scientific output and clear contributions made to scientific knowledge, the number of prestigious (inter)national scientific prizes awarded to the department and the steady external funding, also in economically difficult periods. Important examples of the department's scientific contributions are the identification of novel disease genes, the development of *in vitro* and *in vivo* disease models, a patent on the role of LRP10 protein in pathogenesis of common diseases, innovative developments for treatment of rare disorders, and the development of new counselling models.

During the interviews, the committee was impressed by the high level of the scientific presentations given by young PIs of the department. It was a great pleasure to feel their enthusiasm and ambition for top level science and their drive to really make a significant contribution. The research group of the department has increased in size since 2013, from a small number of PIs to 19 PIs, and there is an overall improvement in their research output. Both the MNSC score and the percentage of top 10% cited publications reflects the department's excellent scientific quality and relevance and shows an increasing scientific impact. Since 2013, the strategy of the department is to solely publish high-quality research. This has clearly paid off.

The neurogenetics line is a very successful and internationally renowned research line. Historically this line has been very strong in gene identification and disease modelling. The introduction of new focus areas within this line is timely and innovative. The scientific quality of this line is reflected in publications in high impact journals. The rare disorders line is also a successful research line; next to gene identification, there is focus on gene therapy. The scientific quality in this line is also reflected in publications in high impact journals. The prenatal and cardiogenetics lines are still in development. Both lines are directly coupled to diagnostics (improve genetic testing) and care (counselling). The publications that have come out of these lines are certainly impressive and hold a clear promise for the future. The results of all four research lines have an impact on clinical practice: diagnostics, counselling and, in the longer term, therapy.

There are steady levels of funding; the department is especially strong in winning EU collaborative grants and innovation grants. Personal top grants

(NWO Vidi/Vici, ERC) are limited, although there are a few NWO Veni grants and prestigious fellowships for talented young scientists. The committee advises the department to invest more in collaborations with industry/other private partners in order to increase fourth stream funding. In addition, these partnerships may also be important for implementation of certain findings, developments of drugs, etc.

The international visibility of the department and its scientific staff needs further improvement. Although the self-evaluation report lists some invited lectures at prestigious world conferences, the number is limited. The same is true for editorial board memberships and memberships of international scientific committees. The department acknowledges that visibility needs improvement and has recently invested in hiring experts to do an evaluation and write a plan of action, and to train PI's. It also sees possibilities in improving its visibility via memberships of European Reference Networks (ERNs). The committee sees two additional opportunities to increase international visibility. The first is to make more use of the fact that several scientific staff members coordinate large EU granted consortia. The second is to investigate, together with Erasmus MC, possibilities to highlight the departmental research either via the Erasmus MC website or via other digital means.

Relevance to society

The department's mission is to improve the identification, treatment and prevention of inherited diseases through state-of-the-art multi-omics. In the committee's opinion this mission is accomplished to a very high degree, resulting in an excellent societal relevance. Many of the department's scientific findings have immediate impact on diagnostics, counselling, surveillance, screening and prevention, and thereby on patients and families with rare inherited diseases. Novel genes identified find their way in genome diagnostic laboratories, and in that way are of great value to clinicians and to patients with inherited disorders and their families. New counselling models can be implemented in clinical genetic counselling. In addition, some of the department's work has had an impact on screening programmes (Lynch syndrome, prenatal screening). The role of the department in introducing non-invasive prenatal testing (NIPT) in the Netherlands is widely recognized as being of great importance for pregnant women and eventually having an impact on the total population. As such, it is of enormous value. The department is also dedicated to taking the next step towards curing patients with rare inherited diseases and has made several investments to reach that goal. Finally, the department has made 'impact on society' a specific research subject, which emphasizes how serious it is taking relevance to society.

An applaudable way in which the department aims to make a difference for patients and society, is by engaging with relevant stakeholders. The committee concludes that there is very good collaboration with patient advocacy groups. Furthermore, the department invests in interacting with and informing patients (via patient days) and the general public (through a public lecture series). Also, it actively communicates with the public on ethically difficult subjects such as the organization of the public debate on germline modifications. The department develops (digital) tools to more easily inform the public, which the committee considers a very good initiative. Finally, the committee was pleased to learn that the department is setting up a two-year master's programme Genetics in Society, in order to educate scientists that can build bridges between genomic science and society.

Viability

The department has a clear strategy for the future, with consistent targets. These are challenging but feasible and include whole genome sequencing (WGS) in diagnostics, understanding non-coding variation, functional testing of variants of uncertain significance, ethics and communication around foetal genetic testing/screening and developing and testing new therapies for rare disorders.

The department is financially healthy and has enough reserves to stay that way and make future investments. The department is flexible and acknowledges the many opportunities that come from technological developments. Genetics is becoming more and more important in clinical care, in society and the department uses that momentum appropriately. In the committee's opinion, it deals with the societal and ethical questions that are related to developments in genetics/genomics in a responsible manner. The department has started research into the latter topic and also actively enters into a dialogue with the public. The department expresses good self-reflection, it knows its weaknesses and makes feasible plans to act upon them.

The only aspect that is worrisome, is the fact that there are too many senior group leaders and it will

take time to build up a sufficient number of experienced younger leaders to take over. The introduction of tenure track positions for young talented researchers is promising but does not solve the more immediate needs. The department has recently attracted a new research chair for the department, who will start in 2021. The committee is enthusiastic about this new appointment but stresses the importance of appointing more successors at the level of (associate) professor in the coming years. Specifically, it encourages the department to attract females for those positions, in order to improve the gender balance at the top level in the department. Here, the department could benefit from support of the Executive Board.

The department is presently going through very difficult times, because of the severe illness of the head of department. He is a charismatic leader who is highly valued among the employees of the department and has been of enormous importance in building the department to its present high level, attracting many young scientists to the department. The department will have an interim head as of November 1, 2020. Recruitment for a permanent head will start in 2021. The committee was impressed by the motivation, the internal strength and the unity displayed by senior staff and young researchers during the interviews, as well as by their concrete plans to continue the good work of their leader and capability to cope with the situation, in spite of being intensely sad. The committee strongly advises the Executive Board to actively support the department in dealing with this difficult situation and in finding a permanent head. The committee understood that last time it took seven years to find a department chair. A repeat of that situation should obviously be avoided. The committee recommends that the department and the Executive Board do not limit themselves to the Netherlands in their search, but also look abroad for possible candidates.

PhD training

All PhD candidates of the department of Clinical Genetics are enrolled at the research school Medical Genetics Centre South-West Netherlands (MGC), of which the department is a founding member. At MGC, PhD candidates interact with fellow PhDs from outside of their own department and Erasmus MC. The training programme covers a wide range of aspects in the fields of cellular biology and molecular and medical genetics. The department is involved in several MGC courses, including Protein aggregation disorders: from clinic to therapy, NGS in the clinics and Functional Genetics. The department is clearly pleased with its ties to MGC and would like to like to maintain these, even as a local Graduate School is established at Erasmus MC. Being a part of MGC is said to greatly facilitate collaboration with other regional universities. The PhD candidates are enthusiastic about the MGC training programme. Some of the compulsory courses, however, have long waiting lists which frustrates their need to perform experimental work. In particular the course on safe laboratory techniques was said to have a long waiting time.

PhD candidates the committee spoke with described their supervisors as easily accessible and supportive. They are happy with the quality of the supervision and praised the personal contact with the supervisor. PhD candidates experience a lot of freedom, which they like. They also consider the department an inspiring working environment, with research ranging from fundamental to clinical studies. PhDs candidates work extremely hard, also during weekends, which mostly they do not seem to mind; they like to take as much as possible from their PhD experience. The committee was impressed by the motivation, drive and hard-working attitude of PhD candidates. At the same time, it asks the department to keep paying attention to their work-life balance.

Recommendations

The committee recommends to:

1) Invest more in collaborations with industry/other private partners.
2) Improve visibility by digital means and by making more use of the scientific staff's coordinating positions in EU consortia.
3) Invest in appointing more (female) (associate) professors to succeed the present senior leaders that are expected to retire.
4) Arrange a training and supervision plan for all PhD candidates in the department.
5) Add an independent researcher (preferably from another department) to the annual review committee for PhDs.
6) Keep paying attention to the work-life balance of PhD candidates.
7) Find a permanent head reasonably fast. This is the most important recommendation, the department would strongly benefit from support of the Erasmus MC. The department and the Executive Board should not limit themselves to the Netherlands in their search, but also look abroad for possible candidates.

V. Gynaecological Oncology

Research quality	Assessment presently not possible
Relevance to society	Assessment presently not possible
Viability	Assessment presently not possible

The Department of Gynaecological Oncology (GO) did not exist for the entirety of the evaluation period, making it difficult to properly evaluate the SEP criteria. At present, the committee found it inappropriate to assign numerical scores. It has therefore limited itself to qualitative comments on the criteria.

Mission and Strategy

The department of Gynaecological Oncology is a very small department consisting of five gynaecological oncologists, two fellows and two PhD candidates. For the gynaecological oncologists research time is limited to one day a week (0.2 FTE).

The Department of Genetic Oncology has been an independent research unit since mid-2017. Prior to that, Gynaecological Oncology was a sub-speciality of the department of Obstetrics and Gynaecology. The separation from this department was driven by the wish to collaborate with Leiden University Medical Centre (LUMC)'s department of Gynaecological Oncology. This intended collaboration also included plans for appointing a common professor. For a reason that the committee is not aware of, the plans did not work out and Gynaecological Oncology is now a separate department within Theme Sophia. In January 2019, one of the gynaecological oncologists was appointed head of department, replacing the former leader of the sub-speciality who retired.

In the committee's opinion, being a young department offers a promising opportunity for building something from the ground up. So far, however, Gynaecological Oncology has not yet been able to capitalize on this prospect. It has left a very solid research department (Obstetrics and Gynaecology) and is still adjusting to the new situation of being on its own. The committee advises the department to take a step back and thoroughly analyse existing weaknesses and threats. Based on that analysis, the department should develop a strategy and detailed plans for the future.

One thing that became very clear during the interviews is that Gynaecological Oncology currently lacks scientific leadership (i.e. a professor) and academic affiliations (i.e. associate professors). The committee also considered the question whether Gynaecological Oncology has the critical clinical and academic mass to become an independent and viable department or if it needs to collaborate or become a part of other departments (i.e. Department of Oncology). Since Theme Sophia does not have a particular oncological focus, the benefits of remaining part of this theme are not altogether clear to the committee. Having performed a critical analysis and getting its scientific affiliations on track, Gynaecological Oncology could start focusing on building a new, solid research unit which most likely should be in collaboration with others.

The department's mission is to embed excellent research in the excellent care of patients with gynaecological (pre)malignancies. It aims to contribute to improved care and knowledge by performing clinical studies, translational research and population-based research. Gynaecological Oncology has four research lines: (1) Novel surgical techniques in gynaecological cancer; (2) Gynaecological pre-malignancies; (3) Evaluation of diagnosis and care; and (4) Hereditary tumours. The fact that the department has focused its research according to the female anatomy (ovarian, endometrial, cervix, and vulva cancer) corresponds to the dedication of the five senior gynaecological oncologists. In the committee's opinion, however, building-up a new, small research unit may benefit from focusing on a maximum of one to two research fields of interest and building-up a team around these fields, focusing on organization and teamwork.

On its four research lines, the department collaborates with other departments in the Gynaecological Tumours ACE within Erasmus MC. Regional collaboration (Southwest Netherlands) seems to function well. There is access to a sufficient patient population for clinical studies and the department is also participating in the national work with guidelines and some scientific studies. There are no current international collaborations, as the previous collaboration with the Mansoura University Clinic in Egypt has come to an end. It should be considered to connect to other internationally departments in order to benefit from international collaborations.

Research quality

From a vision document received prior to the site visit, the committee concludes that the department published eight articles in 2018, four in 2017, and fifteen in 2016. Information on MNCS, first authorships or other indicators of research quality was not available to the committee.

From the interviews, the committee established that senior members of the department have very little time for research. In view of this fact, the scientific output seems satisfactory. The department has initiated three randomized controlled trials, of which two are national, which is impressive considering the number of researchers and the limited research time available to them. During the interviews it became clear that some of the current clinical studies have an underlining biobanking strategy (i.e. tissue and/or blood samples). In order to reach an international research level the department is advised to focus on more basic research including translational projects in addition to clinical investigations. Biobanking is a good strategy for the future and should thus be encouraged.

The committee was surprised to learn that pharmaceutical companies (i.e. in the PlasmaJet and HPV vaccine trials) were not economically involved in the studies, offering support in kind rather than providing financial means. This may give the department the benefit of being independent but on the other hand, Gynaecological Oncology needs more structural funding for its research. Collaboration with pharmaceutical companies (i.e. vaccine studies) can generate money that can be used for academic studies and this could be considered a part of a future scientific strategy.

Relevance to society

The department demonstrates its relevance to society by pursuing clinical questions that have relevance for individual patients (improvement of survival and quality of life, QoL) and the general population (publications in *Nederland HP Kankervrij*, increasing cost effectiveness). The patient association Olijf is involved in its efforts to improve patient care by way of quarterly meetings in which ideas for studies are discussed.

Even though it is too soon to assign a numerical score to the department's societal relevance, the committee is of the opinion that most of its ongoing studies are relevant to patients and deliver results that can be applied in the daily clinic. The committee particularly appreciates the collaboration with Olijf and encourages the department to continue this good collaboration. The department could even consider making patients a part of future protocols. Furthermore, the committee was pleased that some of the current projects are evaluated economically and by QoL questionnaires.

Viability

The viability of Gynaecological Oncology as an independent research unit within Theme Sophia is not immediately apparent. Since being on its own, the department has had to face the reality of having a very small staff with many clinical responsibilities and therefore limited time for writing research proposals and grant applications. Currently there is a lack of structural funding.

In the committee's opinion, Gynaecological Oncology will probably be able to survive as a clinical department due to its dedicated clinicians, who maintain good collaborations within Erasmus MC, regionally, and nationally. However, much work will have to be done in order to survive as an independent research unit at an international, competitive level. Some of the necessary efforts (i.e. performing a SWOT-analysis, creating more critical mass, recruiting and teambuilding, focusing the research, developing a research strategy and plan) can be undertaken by the department itself, with or without coaching. For some important aspects, however, the department needs help from Erasmus MC and/or Theme Sophia. The research unit needs to be kickstarted by bringing in funding, research leadership and academic affiliations. Furthermore, close internal and maybe even external collaborations must be initiated. In the committee's opinion this raises the question of whether the department is currently ideally placed within Theme Sophia or could potentially be better accommodated in a different theme.

PhD training

The department currently has four PhD candidates, three of which have graduated as gynaecologists. During the site visit, the committee spoke with two of them, one of whom is clinically employed outside of Erasmus MC. While PhD candidates appreciate the training and supervision provided to them, they also clearly recognize some of the particular challenges that the department is faced with. PhD candidates mentioned that they miss scientific leadership at the department and worry that the lack of a professor will impact their PhD completion. At the same time, they fully

acknowledge and appreciate the extent of the efforts undertaken by the gynaecological oncologists and the head of department.

Recommendations

The committee recommends to:

1. Perform an honest and comprehensive SWOT-analysis
2. Develop a research strategy and focus on a maximum of two research areas. The strategy should include recruitment of academic staff (i.e. professor and associated professors), teambuilding, and clinical, and basic research
3. Together with Erasmus MC realize that the survival of Gynaecological Oncology depends on (a time limited) financial support for research and mentoring/coaching by successful researchers outside the department.
4. Consider if Theme Sofia is the right theme to stimulate the development of the department. It seems as if Gynaecological Oncology potentially could potentially be better accommodated in a different theme.

VI. Obstetrics & Gynaecology

Research quality	Very good (2)
Relevance to society	Very good (2)
Viability	Good (3)

Mission and strategy

The mission of the Obstetrics & Gynaecology department is to improve the health of current and next generations by using an early life course integrated approach – from preconception to the neonatal period – in clinical and translational research, care and value-based health care outcomes. This is achieved in close collaboration with (inter)national partners, patient advocacy groups and national governments.

The presentation of this department's work under the aegis of The Centre for Early Life Course Medicine, one of Theme Sophia's four focus areas, emphasizes the overarching and well implemented strategy of this forward-thinking team. Indeed, this department together with others integrated in the Centre e.g. CAPP and the core Generation R programme, are recognized internationally as pioneers in the life course approach to research into health and disease internationally and should be congratulated for this forward thinking. Internationally, research teams in physical and mental health arenas are increasingly adopting a similar strategic approach to the early life origins of health and disease. The head of department is to be congratulated for his authoritative work *A text book of Obstetrics and Gynaecology, a Life Course approach*, which is the first of its kind.

The alignment of the research to The Centre for Life Course Medicine, as opposed to the department, nonetheless presents managerial and fiscal issues, as the department and centre have different leaders and management, and the department is the budget holder, not the centre. As acknowledged by the team there is considerable overlap between the two, and the overarching organizational strategy remains as work in progress.

The research is divided into two research lines:
(1) Ovarian, embryonic, foetal and neonatal health;
(2) Societal Valorisation.

Agreed by the leaders, these at present appear less coordinated than some others, including many small or emerging projects.

The targets of increasing permanent staff by 10 people is realistic given the likely expansion of the larger and most successful elements of the research programme. The target to attract at least two EU grants is achievable and development of the grants would sharpen the focus on the most fruitful areas of research.

Research quality

Several elements of the research in this department are undoubtedly world leading. Many of the outputs have derived from unique population cohorts, a great strength of the research.

In the fertility arena, IVF research including the Rotterdam Periconceptional longitudinal cohort and the highly innovative IVF ReceptivFity tool are strong. The Smarter Pregnancy web-based platforms have proven an effective intervention, leading to several international collaborations and a societal impact (see below). The work on embryonic growth with Generation R has also been of high impact, as has the research on PCOS management. The research and international collaborative effort on smoking cessations in pregnancy has had very high impact, as has the recent paper suggesting premature birth during the Covid-19 pandemic, which within a few days stimulated the UK NHS to develop a group to undertake a similar investigation in the UK.
There are, however, some weaknesses which influenced the overall rating by the committee, and inevitably reduced the overall quality of the research outputs. The first is research grant funding. Part of it was good, but overall, the committee did not see evidence for large programmatic grants as might be expected. Substantive local municipal funding reflects the excellent emphasis on the health of the local population, but unfortunately because of its inclusion in the fourth category of research funding is not appropriately recognised by Erasmus MC. This seems unreasonable. Furthermore, there is some evidence of leadership of large national or international consortia, other than HP4All, Generation R, the smoking cessation programme or COVID (iPOP) research.

Relevance to society

There is a very impressive societal element to research in this department. This includes the development of the Smarter Pregnancy tool, and later versions for use in the local (and now international) population. The collaboration with TU Delft also seems to be one of the most

established in Theme Sophia, with the planned development of the Life Course app for healthy coaching across life. The development of the innovative preconception clinic is an excellent example of translation of research to clinical care and management, as is the initiation of the life course clinic. The development of a smoking cessation programme with the WHO for LMIC has enormous potential for societal benefit in relation to prevention of foetal growth restriction, and improved infant outcomes. Important work is done in the domain of 'social obstetrics' the department addressing social and other non-medical risk factors for adverse outcomes of reproduction. One challenge of the department identified by the committee in the relevance to society is that there is limited evidence of exploiting potential societal benefit. However, not all research can immediately be of benefit to the community.

Viability

The variable strength of research in the programme, and the lack of some focus lessens the long-term viability of the centre's (departmental) research programme. There is no question that the research will be sustained but whether it will grow is less certain at present. A sharpened focus on fewer research groups, with fewer, but more high impact publications would increase confidence in the long-term expansion of the programme.
As mentioned in the Strategy paragraph of this report, the present research lines are more opportunistic, rather than strategic alignments. The considerable overlap between the two research lines reduces clarity, and some rethinking of this paradigm and strategy is required. Implicit in this is the need for greater focus, coordination of the most successful elements of the existing portfolio, and potential cessation of some less successful elements of the programme. A lack of cohesion between the existing research groupings was obvious in the presentations by the mid-career researchers, all of which were excellent but disparate in subject area. This does not foster centre intergroup cross-learning and could lead to competition rather than collaboration.

The faculty have an impressive breadth of expertise, and a largely unmet potential for development of e.g. a Master's course or short postgraduate training courses.

PhD training

The Erasmus MC PhD training programme offers useful generic training courses, and most students seem to have enrolled in the Training & Supervision Plan and a sound and effective supervisory structure was evident. Interaction between the students seemed informal rather than structured, potentially leading to missed opportunities for collaboration and shared learning.

Clearly some researchers are doing a PhD only for the purpose of getting a clinical post. However, according to the committee there is no evidence that this reduces their interest and it even may have considerable benefit.

The committee points out a current lack of awareness of future career structures amongst the clinical and non-clinical PhD students. Efforts should be made to improve on this.

Recommendations

The committee recommends to:

1. Revise the research strategy to be more focussed on profitable (Science and Society) areas.
2. Apply for substantive funding in these focus areas.
3. Expand educational activities; short postgraduate courses, master's degree on Life Course and e.g. a Sophia doctoral training programme.
4. Develop with Theme Sophia, an improved annual appraisal to include research career development, not only clinical.

VII. Paediatrics

Research quality	Excellent (1)
Relevance to society	Very good (2)
Viability	Very good (2)

Mission and strategy

The Department of Paediatrics aims for excellent care of children with severe, complex or rare diseases. It is convinced that it can only achieve this through excellent, happy and well-integrated teams that strive to continuously improve care. The Erasmus MC-Sophia Children's Hospital's mission is: 'Taking care of the next generation together'.

The structure of the department is complicated but seems to work well in most aspects for the local team. The high calibre of senior staff coupled with a steady number of PhD candidates sustains the department's strong research quality. However, it was difficult to be certain that senior investigator research time is protected sufficiently from the inevitable demands of clinical responsibilities. Without institutional support for protected time, clinical researchers often feel guilty that they are letting their colleagues down if their research takes them away from clinical work. The route for post-doctoral career progression to professorial level is not entirely clear. There is a balance to be struck that could be improved in relation to supporting senior research staff. This would help drive a more sustained long-term research strategy that would in turn attract higher international recognition.

Research quality

The work in this department is internationally recognized. One of the great strengths is the opportunities that clinical trainees have to do research, leading to high impact of the research. However, there is a viability issue with a new PhD candidate every few years.

The committee is impressed by the translational research in this department and the strong link between basic and clinical research. Quality within the department is variable: a vast part of the work is world leading/excellent, other work is good or very good. All groups have strong links with basic science, despite the fact that there is only one paediatric lab. The lab tries to facilitate all sub-departments, which means that there is a constant turnover of many small projects rather than a solid underpinning. This leads to opportunities and new expertise being added but also possible adverse impact on building core strengths. It is essential to relate paediatric and adult outputs and impact. The committee is therefore very positive about the collaboration with adult research departments and their labs.

Not all groups in the department did similarly well in obtaining grants. The committee was surprised about some of the low grant income. This might go back to strongly depending on PhD candidates, but also to a lack of clear strategy.

For clinicians who want to do research the system seems clear, but not uniform to all. The work is not assigned 50-50 between research and clinic. This is different from other countries, but the committee has the impression that it works in this department.

Generation R is excellent and is considered a flagship. But getting the work actually done is sometimes frustrating for those who are not in senior positions. The committee wonders whether funding decisions are resulting in this being put to its best use and whether opportunities for even more added value are being grasped. The Board of Generation R reports to the dean, which provides this core facility with a very strong basis. The data management pipeline starts with data collections, as well as a properly curated dataset. The committee recommends the core facility to clarify the strategy for this data pipeline.

Relevance to society

The relevance to society is predominantly visible in Generation R research, which is focussed on society. All other types or research in this department are focussed in tertiary care though many of the diseases studied are predominantly seen in primary and secondary care. The committee also learned it is a challenge to secure sufficient patient numbers for many diseases. As the Netherlands is a small country, stronger relationships with other primary, secondary and tertiary centres would seem to be achievable to mutual benefit, for example by establishing hub and spoke operational structures in place of centralization. This would facilitate closer links with communities, including hard-to-reach groups.

Viability

Paediatrics is a very large department with many different lines of research that are strongly dependent on the success of external research grants. Although formal criteria for promotion are available, there is no clear pathway for the researchers. Without a structured development of

a career plan for research personnel, starting at the PhD level up to senior level, it will be difficult to strongly increase coherence within the department. Choosing the four profile areas should help in making further choices and focusing. Although the talent within the department and Erasmus MC is obvious, science will benefit from exposure from wide input of expertise. There are opportunities to get more external expertise and talent into the department, who can create a buzz and give a boost to international collaboration.

The size of this department guarantees the continued existence of a strong department in the future. There will always be excellent groups that pop-up and get grants, do very good work and excel, while other groups might reduce in size and even disappear. If the department wants to take the next step and act as a European or world leader in certain areas, it should be more secure in its funding and career pathways. Although the size makes the department viable, it seems to lack a strategic plan that is essential for taking this next step. The challenge is to demonstrate that the output is internationally leading in an increasingly competitive world. The committee recommends to the department to think about what is needed to go forward.

The committee noticed that many of the aspects that were discussed during the site visit are related to leadership. The position and strategic view of the head of department is essential for a bright future, but the committee did not get the impression that this position was considered a key position by many of the researchers in the department. This might have to do with the size of the department, resulting in relatively autonomous sub-departments with their own strategy, funding and staffing.

The head of the paediatrics department mentioned a sort of tenure track, although no official tenure-track programme exists. There are rules to get to the next level, but a clear plan on how to reach this next level was missing. The committee is of the opinion that a transparent track for talented people should be in place. It is easy when one grows up within a certain system to be blind to the fact that it might not be the best system for everyone. Having protected research time is important and essential, similar is explicit support to women and men with families. By promoting people who are promising early on in their career, the department and theme might disadvantage women and men with families or late-developers. The committee would have preferred some formally regulated protected research time.

The relationship between the Generation R project and paediatrics is a major strength that could be developed further for wide benefit. Being a core facility that is world famous, Generation R really adds to the reputation of the Erasmus MC, Theme Sophia and the Paediatric Department. The core facility not only provides external visibility, but also offers potential facilities for conducting research. Collaboration with other departments is essential for a bright future of Generation R. This requires good lines of communication with other Erasmus MC departments. While the connection to the dean and central office seems well developed, the link to the rest of the Faculty is not so strong. Also, international opportunities for collaboration are huge, although these require more focus on data sharing and data science. The committee is of the opinion that using A.I. applications in the future is important and that the unique ties with the TU Delft should be strengthened to a much greater extent

Recommendations

The committee recommends to:

1. carefully think how to best facilitate early and midcareer researchers, grow the next generation of leaders, and attract new blood. The committee applauds the vision that encourages research experience for clinicians. Structure is needed to maintain sustainability as they do a lot of work and put in a lot of effort.
2. give consideration to identifying protected research time within job plans for researchers; these could be subject to annual review so that those who are progressing academically are supported, while those who would be stronger in supporting clinical roles are also recognized for the value they bring to an integrated department. Communication of transparent criteria for promotion would be helpful.
3. Technology and data science feature among institutional priorities. There is a goal for ‘every patient to be included in research’. The committee applauds this but it requires a coordinated approach to data that encompasses technical, regulatory, and public engagement aspects to achieve this.
4. developing a strategic vision for international collaboration and leadership.

VIII. Paediatric Surgery & Intensive Care

Research quality	Excellent (1)
Relevance to society	Very good (2)
Viability	Good (3)

Mission and strategy

The mission of the Paediatric Surgery Department is to provide the best emergency care and long-term follow-up care of children born with congenital anatomical malformations (CAMs) and critically ill children (and their families) by continuously improving patient care and treatment modalities (Plan-do-check-act). To achieve this, clinical research and patient monitoring is combined with basic and translational research.

The department is well-structured with strong research, both clinical and basic. The quality of the research is outstanding and has been for a number of years. The research is organized in four pillars: Basic and Translational Science, Clinical research in Congenital Anatomical Malformations, Critical Illness and Pharmacology, Metabolism and Nutrition and Follow-up. The committee fully supports the change in order of the four pillars. By moving the Critical Illness and Pharmacology, Metabolism & Nutrition research to the third pillar in the diagram, the department ensures that there is a logical coherence in all research and all pillars are now embedded in the department. The changing in order of pillars implies more integration with critical care and the surgical unit.

Research quality

This department is very productive and the quality of the research and the output have been outstanding in the period of this review.

The research in the first pillar (Basic and Translational Science) shows the impact of the department in basic science, with a clear and impressive number and impact of publications. Also, the work in the two clinical pillars is of very high quality. In the second pillar (Clinical research in Congenital Anatomical Malformations) the committee observes some very nice example of translational research. The Pharmacology pillar has achieved impressive results and clearly is a productive group with large societal impact. The fourth pillar focuses on follow-up studies and is a clear asset to the department. The leadership of this group is internationally recognized and created an impressive network. The Department is among the strongest in Europe and there is a clear International Leadership which has recently led to the successful application of the ERNICA (European Reference Network for rare Inherited and Congenital (digestive and gastrointestinal) Anomalies).

The connection between the basic and clinical research is growing. The committee is of the opinion that the department is at the point of taking the next step in making this interaction profitable in high-impact publications and more relevance of the results at international level. Particularly the interaction between the basic research pillar and the Clinical research in Congenital Anatomical Malformations is already clear and successful. More scientific interactions between the 3rd pillar and the other pillars would also be advisable.

Relevance to society

The committee notes that concerning relevance there are differences between the pillars. All do well and show to have impact, although the work on the impact of parenteral nutrition in pillar 3 is clearly excellent. in nearly all paediatric intensive care and neonatal units in the world and should be used as an example for other clinical work performed in the other pillars.

The tradition in the department to combine basic and clinical research led to impact on patient care. This is a clear strength of the department and the increased connection between the pillars will even further strengthen this in the future.

Long term follow-up studies conducted by the department are an example of excellence and had an impact on organizing CAM patients' clinics internationally.

Viability

The research that was done in this department in the period of the review is impressive. The committee is of the opinion that the department has the potential to become leading in Europe in this area, although this requires making a number of choices for the future. To bring the systems approach to the next level, strategic focus is required on developing infrastructure for big data and follow-up for the entire Erasmus MC. There are opportunities and in this part of the report the committee provides suggestions to help the department seize these opportunities.

The committee noted a strong connection between the basic and clinical research of the first and second pillar. To further excel, the committee encourages the department to also connect the other pillars with the basic science pillar and to connect the clinical pillars together with join meetings, journal clubs and projects. That will strengthen the quality of the research and outcomes even more and will lead to higher impact publications. By increasing collaboration across the department, coherence will improve and the quality of the output will further increase. The committee noticed that many of the mid-career researchers focus on their own work and sometimes function in siloes next to each other rather than looking for synergy in their work. Not only the strengthening of the connection within and between the four pillars in the department is an opportunity, interacting and collaborating with other departments will expand and increase the viability of the department. Although the work in the follow-up pillar already is of very good quality, the committee is of the opinion that by connecting to Generation R it will have proper control groups to match the patients.

The department has to deal with two major challenges in order to assure a viable future. The first challenge, relevant to all departments in Theme Sophia, is increasing career development opportunities. To become internationally leading in the long term, structured development of research talent is required. There should be clear requirements on what is expected of a talented researcher to get to the next level. Currently this decision seems to be too much depending on the decision by the head of department. By [implementing] a clear structure and definition of requirements, and the institutionalization of career paths, the individual researchers, department and entire Theme Sophia will benefit. A necessary part of this development is establishing a mentoring programme. This is important already at the PhD level, but should continue throughout the careers of researchers. The committee learned of the existence of an institute-wide career development training that includes mentoring. This is an excellent initiative that should be available to many more early and mid-career researchers. Another struggle of researchers is to balance clinical work and research. Protected research time is important in building an academic career and this aspect should also be structured and criteria made objective. While this aspect has somehow developed over the years for junior researchers, the mid-career researchers (postdoc and junior faculty) seem to struggle to find a balance between clinical and research (for medical doctors) or opportunities to flourish as young PI (for scientists).

The second major challenge relates to the infrastructure for data collecting, data storage, data sharing and data analysis. During the site visit the committee had an important discussion on the use of databases. Similar to facilitating career development, Erasmus MC has an important role in setting up and maintaining a suitable infrastructure.

Recommendations

The committee recommends to:

1. increase collaborations among the different pillars, in particularly between the 3rd pillar and the other pillars.
2. designing of an overall strategy for the department, with the aim to focus on the areas in which the department can be an international leader.
3. offer (peer review/competitive) protected research times for some of the senior researchers (e.g. based on peer review of their research). This will help the department to retain the most successful researchers and built a critical mass with long term viability.

IX. Urology

Research quality	Very good (2)
Relevance to society	Very good (2)
Viability	Good (3)

Mission and strategy

The department of Urology has a clear mission, which is to improve the diagnosis, treatment and outcome in patients with urologic diseases by conducting translational research, clinical and epidemiological studies and the education of candidates and professionals in that field. The department aims to achieve this in close collaboration with regional and (inter)national academic partners, industries and patient advocacy groups, with its motto 'research = care'.

The department encompasses four clinical research lines, which together cover the entire field of Urology: (1) oncology (subdivided into prostate and bladder/urothelium cancer), (2) functional/reconstruction, (3) paediatric and (4) reproductive urology (andrology). On the one hand, the focus on paediatric and reproductive urology offers obvious cross-links with other departments within Sophia. On the other hand, the department is tightly connected to Theme Daniel den Hoed (oncology) because of its strong cancer research.
Over the last decades, the oncology research line (and particularly prostate cancer research), has become a trademark for the department. Its strategy of developing and progressing research from clinical questions is now a major source of strength. A strategy to implement cancer initiatives over a wide spectrum to answer clinical questions is used. This includes the return to the 'bench' through bio-banking, animal and 3D-cell modelling, genomics/ proteomics, and bioinformatics that has been embedded into the programme by public health officials and epidemiologists. Using the same strategy, the group has demonstrated growing success with a second cancer entity (bladder cancer). Here, specific mention should be made of the excellent leadership demonstrated by a young and enthusiastic female PI, who has integrated the opportunities that Sophia and Erasmus MC have to offer.

The second research line, functional/ reconstructive urology, has benefited from a strategy of promoting the group's national and international clinical and research work. In particular, the focus on urinary incontinence research has enhanced this group's (inter)national standing. Functional urology also maintains a successful cooperation with TU Delft. Collaborations such as these have produced a strong fusion between Erasmus MC and engineering, resulting in new and highly driven clinical approaches and increased funding.

The third research line, paediatric urology, was once one of the main reasons for including urology in Theme Sophia. In recent years, this line has been moved closer to functional urology, thereby endeavouring to strengthen it. This was accompanied by a modification of the organizational structure, as well as a variety of other strategic actions. Nevertheless, in an oncology-driven environment, it seems difficult to obtain sufficient funding for this key societal issue. In addition to internal collaborations with functional urology, the committee advises to investigate options for cross-departmental research and clinical cooperation with paediatric surgery.

The fourth research line, reproductive urology relies largely on a single researcher who divides his attention between testicular cancer and male reproductive medicine. In order to ensure critical mass and continuity, this line would benefit from developing (cross-)departmental collaborations (see further recommendations under 'viability').

Research quality

The success of individual groups is reflected in the statistics on funding and publications (1.5-2.5 million euro in annual external funding, 485 publications, MNCS >2.0). Also, the department has nurtured very strong collaborations on an international level (EAU, Marie Curie, Horizon2020, ERSEC, GAP3, Transport etc.) as well as within the Netherlands (Anser, Pioneer, national ProBio Biobank study etc.).

The committee notes that there is some unevenness in results across the four research lines. Different research lines are in different stages of development. In the primary field of interest, the department's contribution to science and technology is outstanding and internationally recognized. Especially in the field of oncological urology, the group is either (inter)nationally leading or competitive. Team leaders are involved with several guideline boards and some of the staff also serve on industry advisory boards. Furthermore, there is a strong group of PhD candidates and a good amount of funding by pharma industry and national and international research funds.

Functional urology is also doing very well. A new collaboration with TU Delft resulted in a new bladder pacemaker, helping to further strengthen the group's position within the Netherlands. The group has also increased its impact on the field of functional urology as a whole, due to its influence in several societies such the International Continence Society and International Neuro-urology Society. Paediatric urology and reproductive urology are not yet as strong and internationally visible as the other research lines. In particular, male fertility is a research line that would benefit from greater internal openness and could be strengthened by being more interdisciplinary.

While the committee appreciates that the department is successfully expanding into promising new fields with good funding opportunities (bladder cancer), it feels that efforts should also be made to ensure that some of the existing lines are not left behind. Especially the non-oncologic research lines, which are the closest to Theme Sophia, require strengthening. The recent achievements of functional urology could be taken as a positive example for the remaining two lines.

Relevance to society

The committee concludes that the Department of Urology has convincingly embraced its motto of translating research outcomes into care for the population. The department deals with diseases with major societal and economic impact and making a difference for patients and society is clearly a focus in its policy, investments, communication and information.

The documentation and interviews highlighted a number of projects that make the department highly relevant to society, the nation and research partners. For instance, the department has developed PSA diagnostics and provided these tools to General Practitioners, thereby making them available to the community. The establishment of a BioBanking opened up the opportunity of not just progressing research work (exosomes as biomarkers, small non-coding RNAs as molecular markers), but also of establishing future individualized therapy for prostate cancer treatments related to their genomic research. Furthermore, the department has progressively collaborated in the treatment of prostate cancer by developing a novel PSMA-nanobody for PSMA-targeted imaging and radiotherapy.

A similar development was demonstrated in the field of urothelial cancer through the European MOLCARTUC project on the molecular characterization of upper urothelial cancer. The outcomes of this project will be reflected into society. Functional Urology was awarded national research funding in order to progress work related to re-usable catheters. Also, it has developed a neuro-stimulator in collaboration with the TU Delft, which is in the process of further evaluation. Paediatric urology might not be as strong as oncological urology, but within the paediatric society, the group holds an important position. It plays a leading role in the education of the next generation of Dutch paediatric urologists.

The committee specifically appreciates that there is very good collaboration with patient advocacy groups. The department constantly interacts with relevant stakeholders (including patients, professional organizations and policy makers) to translate research findings into guidelines, training modules and informative tools. With movements like 'Movember' and related projects, the department maintains close contact with the community through General Practitioners and patient information days.

Viability

With respect to viability, the committee concludes that oncology is in an excellent place, but there are opportunities to strengthen paediatric and reproductive urology, which do not benefit from the same funding opportunities. Although efforts have already been made to strengthen these 'less strong' areas of urology research, further action is required. The committee is of the opinion that strategic partnerships are key in this respect. The department could use the experiences of already established research groups outside of the department (e.g. paediatric surgery, reproductive urology) to promote the success of its own groups.

For testicular cancer, developing cross-departmental collaborations may entail cooperation with the group working on urothelium cancer. This would also lead to greater utilization of Sophia-based state-of-the-art data research infrastructure. With respect to male reproductive medicine, the committee advises to develop collaborations with the gynaecologic reproductive group. Research funds for this topic were said to be significantly lower than for oncology research but combining efforts may help to elevate this important topic. It may also offer the opportunity to use research units in a more synergistic and effective way.

In terms of leadership, the department is at an important crossroads because the head of department will step back by the end of 2020. The committee embraces the decision to appoint his successor from within the department, more specifically from the oncology (bladder) group. In general, the committee is of the opinion that age-related leadership within the individual research lines/groups should be evaluated in order to ensure the timely passing and sharing of knowledge, data, etc. The fact that individual groups are led by clinicians is, in the committee's opinion, both a strength and a weakness (pro: bed-bench-bed, con: research driven questions might be able to be developed to influence clinically driven research).

The programme has been able to advance some of its promising young researchers (in andrology and bladder cancer). Nonetheless, the absence of a formal tenure track is still considered a hindrance. While young PIs have become integrated in the department through the work of senior PIs and staff, their guidance towards the next step in their career requires more focused attention.

A final remark concerns Erasmus MC's ICT infrastructure, which does not seem to meet the needs of the department. The department eagerly awaits the institutional infrastructure and policy for data management that is currently under development.

PhD training

The department staff currently includes 12 PhD candidates. The committee was impressed by the motivation, drive and hard-working attitude of the PhD candidates that it spoke with during the site visit. In addition to their primary topics, they work on at least one additional smaller project(s). The PhDs are enthusiastic about the training programme offered by the research school to which they are affiliated. Many emphasized, however, that some of the compulsory courses have long waiting lists, which frustrates their needs to finalize their experimental work.

PhD candidates report that they are trained and supervised by PI's. Although they work on different topics, the working environment is competitive. Not all PhD candidates have training and supervision plans. The committee strongly advises to draw up a TSP for every starting PhD candidate and evaluate progress annually. Another area of improvement are the Erasmus MC-wide criteria for obtaining a PhD, which are based on publication metrics. In some subfields of urology (i.e. oncological urology) these are easier to reach than in others (i.e. functional urology).

Recommendations

The committee recommends to:

1. The department's oncology research is strong and the team works hard to maintain their international position. A regular internal event that reviews all ongoing research areas within the department could be a concurrent opportunity to perform external PhD evaluations. Similarly, meetings within Sophia's interdisciplinary structure might also be an opportunity to find partners for future research and collaborations, which has not been the focus of this successful department.
2. Set up 3-year goals on how to strengthen the weaker research areas – especially with the guidance of the new department chair, whose strong focus is oncology.
3. Ensure that the non-oncology fields have at least one PhD candidate that has a close connection with the oncology group(s) within their department and/or interdisciplinary within Sophia.
4. Continue to strengthen PhD candidates, especially with regard to their work efforts. An external evaluation would be helpful to highlight their visibility, which will result in a stronger reflection, both nationally and internationally, on the department.

Appendices

Appendix 1: Short Curricula Vitae of committee members

Professor **Hans van Goudoever** (chair) is full professor in Paediatrics at Amsterdam University and Vrije Universiteit. . Van Goudoever received his medical and paediatric training at the Erasmus University Rotterdam and performed research for his PhD on Nitrogen metabolism in preterm infant in 1993. After a postdoc at Bayer College of Medicine, Houston, Texas, he returned to Rotterdam in 2000 where he was trained as a neonatologist. He became professor and chair of neonatology in 2004. Currently he is professor of Paediatrics at Emma Children's Hospital, Amsterdam UMC and Director of the Dutch national Human Milk Bank. Since 2014 he is member of the National Health Council. His research focus is on Foetal and neonatal nutrition and gastroenterology, and patient (parent) empowerment. He received a ZonMW pearl In 2021 and was award the 2nd place In societal Impact research In 2020.

Professor **Nine Knoers** (vice chair) was appointed full professor (2003) in Nijmegen. From 2011–2018, she was a full professor at Utrecht University and head of the Department of Medical Genetics at the University Medical Centre Utrecht (UMCU). In 2018 she has become a full professor at the University of Groningen and head of the Department of Genetics at the University Medical Centre Groningen (UMCG). She was chair of the Dutch Society of Clinical Genetics from 2007–2015 and a Member of the Dutch Health Council from 2008–2018. In 2017, she was made an honorary member of the Dutch Society of Clinical Genetics, in recognition of her major contributions to clinical genetics and to the professionalization of the society. Her research focuses on identifying genes for inherited renal disorders and their patho-physiology. The ultimate aim of her studies is to find clues for new treatments for these disorders. Over many years, her team has substantially contributed to the elucidation of genes involved in hereditary kidney diseases, including the V2R and AQP2 genes for nephrogenic diabetes insipidus, and genes involved in renal hypomagnesemia, syndromic nephron-ophthisis, and CAKUT. Knoers has an extensive national and international network, is a member of several European consortia working on genetic renal disorders (EUNEFRON, EURenOmics, ERKNet), and coordinates the Dutch Scientific Consortium on renal ciliopathies 'Kouncil'. She was awarded the Donald Seldin Lectureship of the International Society of Nephrology (World Congress Nephrology 2013, Hong Kong), in recognition of her major contribution to the basic science related to nephrology. From 2014 to 2019, she was editor of the international scientific journal Nephron.

Paolo De Coppi is a Consultant Paediatric Surgeon at Great Ormond Street Hospital (GOSH), and Reader and Head of Stem Cells and Regenerative Medicine at the UCL Institute of Child Health in London. He has been an Honorary Professor at the KU Leuven, Belgium, since 2013, an Adjunct Assistant Professor at the Wake Forest Institute for Regenerative Medicine, Wake Forest University in Winston-Salem, North Carolina, since 2009 and an Honorary Assistant Professor in Paediatric Surgery at the University of Padua, Italy, since 2005. Professor De Coppi has a special interest in congenital malformations and their treatment using minimally invasive techniques. He has focused his research interests on stem cells and tissue engineering by trying to find new modalities for the treatment of complex congenital anomalies. While working with Anthony Atala, M.D., at the Boston Children's Hospital (Massachusetts), De Coppi identified the possibility of using stem cells from amniotic fluid for therapeutic applications. This finding generated an international patent and garnered the cover story of Nature Biotechnology in 2007. It has also opened the door to discovery for novel approaches to correct congenital malformations. More recently, his team has demonstrated that these cells are able to differentiate into various tissues and to replace functional activity in animal model of diseases. De Coppi is now focused on developing reliable methods for stem cell isolation, expansion and differentiation at a clinical level (GMP-grade). De Coppi has published more than 150 peer-reviewed articles in journals such as The Lancet, Nature Biotechnology, PNAS, Blood and FASEB Journal. He has supervised more than 30 research fellow and PhD candidates and has been awarded various national and international grants.Since 2009, he has been on the editorial boards of Paediatric Surgery International, Stem Cell Development, and Fetal and Maternal Medicine Review. As of 2011 he has been Senior Editor for Stem Cell Translational Medicine, a lead journal in the field of translational stem cells.

Neena Modi is Professor of Neonatal Medicine at Imperial College London and Consultant in Neonatal Medicine at Chelsea and Westminster NHS Foundation Trust. She is a Fellow of the Academy of Medical Sciences. She has a national and international profile as a medical leader and

clinical scientist. She heads the Neonatal Medicine Research Group at Imperial, and the Neonatal Data Analysis Unit. She has held by election, the three leading national children's research positions in the UK, President of the Neonatal Society (2012-15), President of the Academic Paediatrics Association of Great Britain and Ireland (2014-15), and Royal College of Paediatrics and Child Health Vice-President for Science and Research (2009-15). She chaired the British Medical Journal Ethics Committee from 2010-2015 and serves currently on a number of research committees and working groups. She is the current president of the UK Medical Women's Federation (2020-2022), the immediate past-president of the UK Royal College of Paediatrics and Child Health (2015-18), and the president-elect of the British Medical Association. Her contributions have included supporting junior doctors during a major national dispute, national reports on children's biomedical research and child health in the UK, and campaigning in relation to UK health services, environmental issues and child refugees. She led the establishment of a Child Health Research Collaboration and Children's Research Fellowship Fund. She is an advocate for child health and well-being, and campaigner for the retention of the National Health Service as a primarily publicly funded, publicly delivered healthcare system.

Ole Mogensen is professor at the Institute of Clinical Medicine, Aarhus University and scientific chair of the Department of Gynaecology and Obstetrics at Aarhus University Hospital. He is sub-specialized into gynaecological oncology and is part time working as senior consultant with gynaecological cancer surgery at Aarhus University Hospital. He has been director of the Department of Gynaecology and Obstetrics and director of Pelvic Cancer at Karolinska University Hospital. He was awarded the Danish Cancer Society's prize of honour in 2011 for his innovative contribution to the treatment of cancer patients and for putting the patient into focus. His research interests are focused on different aspects (molecular, translational, clinical, and patient perspective) of gynaecological cancer. His has been professor since 2006 at different institutions (University of Southern Denmark, The Karolinska Institute, and Aarhus University).

Professor **Karl-Dietrich Sievert, MD, PhD,** serves as a leading physician and Section Director in Neuro-urology and Reconstructive Surgery at the Klinikum Lippe in Detmold, Germany. Besides his fulltime commitment to the clinic, his primary focus has been to contribute to the start-up university medical school (OWL) in Bielefeld, Germany. He is also an Assistant Professor of Reconstructive Urology at AKH in Vienna, Austria.
Previously Sievert was the Vice Chair of Urology at the University Hospital of Tübingen. In his career he has initiated several interdisciplinary pelvic floor continence centres that he considers a key element of standard patient care (Urology, OBGYN, Neurology, General Surgery, Geriatric, Physiotherapy). He completed international fellowships at the UC Urology Department in San Francisco, CA USA with Professors Emil Tanagho and Tom Lue and at the Urology and Nephrology Centre in Mansoura, Egypt with Professors Mohamed Ghoneim and Hassan Abol-Enein. His clinical and basic research interests include oncology (investigation of advanced detection tools and reduced invasiveness for improved functional outcome using anatomical and clinical findings), neuro-urology (diagnosis and treatment of urological nerve disorders), incontinence (pathophysiology), reconstructive surgery (medical devices, tissue engineering and stem cell treatments), pharmacotherapy and progressive and innovative treatment of spinal cord injured patients, such as early SNM implantation, for which he won the Klee Innovation Prize. He has initiated novel clinical trials where he is a principal investigator. In recent years he became one of the few urologic experts in the stem cell and tissue-engineering field that has focused on the real-time processes of bringing research initiatives from the laboratory to clinic and holds a number of international patents. Since 2017, he has served on the editorial board of the Urology Practice, a journal that endeavours to establish links between research and clinic.

Professor **Kerstin von Plessen** is a child and adolescent psychiatrist with an interest in the neurobiological basis of mental illness, with a view to prevention and early intervention. She has been full professor at the University of Copenhagen from 2012-2017, and from 2017 Lausanne, also taking the responsibility as head of the Division of Child and Adolescent Psychiatry (SUPEA) at the CHUV. Her research focuses on the neurobiological basis of diseases such as schizophrenia and bipolar disorders. Identifying at-risk patients will enable rapid diagnosis and treatment, which is often essential. The aim is to identify problems that are not yet diseases'. The study of these factors, which facilitate recovery, compensation and plasticity, is another line of research. Trained at the Scandinavian school - she completed her specialization in child psychiatry and her training in psychotherapy in Norway and taught at the

University of Copenhagen - Kerstin von Plessen advocates a vision of child and adolescent psychiatry oriented towards outpatient care and facilitation of autonomy of young people and families whenever possible. Proximity is important for patient care, but also for family support. Kerstin Plessen leads several longitudinal studies in the Capital Region of Denmark, at the University of Copenhagen and at the University of Bergen, which study the development of emotion regulation in children with ADHD and TS. Furthermore, she is co-responsible for a study with a longitudinal perspective mapping dimensional assessments of children with a high risk of developing psychiatric disorders (The Danish High Risk and Resilience Study – VIA7).

Appendix 2: Schedule of the site visit

Tuesday 13 October 2020

Time	Topic
17.00 -19.00	Preparatory meeting committee

Wednesday 14 October 2020

Time	Topic	
13.45-14.15	Welcome & general introduction by the dean (dean, Theme Board members and committee)	
14.15-14.30	General introduction Research organization Theme Sophia (by Head of dept. Pediatrics) Attendees: committee members, secretaries and Heads of Department	
14.30-14.45	Introduction and preparation **Pediatric Surgery** Attendees: Secretary and committee members	Introduction and preparation **Gynaecological Oncology** Attendees: Secretary and committee members
14.45-15.45	**Department of Pediatric Surgery session 1** Management/Leading staff	**Department of Gynaecological Oncology session 1** Management/Leading staff
15.45-15.55	Committee members: break	Committee members: break
15.55-16.10	Debriefing first session Pediatric Surgery Attendees: Secretary and committee members	Debriefing first session Gynaecological Oncology Attendees: Secretary and committee members
16.10-17.10	**Department of Pediatric Surgery session 2** Academic staff	**Department of Gynaecological Oncology session 2** Academic staff
17.10-17.20	Committee members: break	Committee members: break
17.20-17.35	Debriefing second session Pediatric Surgery Attendees: Secretary and committee members	Debriefing second session Gynaecological Oncology Attendees: Secretary and committee members
17.35-18.05	Feedback with committee members and discuss concept report Pediatric Surgery Attendees: Secretary and committee members	Feedback with committee members and discuss concept report Gynaecological Oncology Attendees: Secretary and committee members
18.05-18.35	Debriefing day 1 with complete committee	

Thursday 15 October 2020

Time	Topic	
09.00-09.15	Introduction and preparation **Department CAPP** Attendees: Secretary and committee members	Introduction and preparation **Department Clinical Genetics** Attendees: Secretary and committee members
09.15-10.15	**Department of CAPP session 1** Management/Leading staff	**Department of Clinical Genetics session 1** Management/Leading staff
10.15-10.25	Committee members: break	Committee members: break
10.25-10.35	Debriefing first session **CAPP** Attendees: Secretary and committee members	Debriefing first session Clinical Genetics Attendees: Secretary and committee members
10.35-11.35	**Department of CAPP session 2** Academic staff	**Department of Clinical Genetics session 2** Academic staff
11.35-11.45	Committee members: break	Committee members: break
11.45-12.00	Debriefing second session **CAPP** Attendees: Secretary and committee members	Debriefing second session **Clinical Genetics** Attendees: Secretary and committee members
12.00-12.30	Feedback with committee members and discuss concept report **CAPP** Attendees: Secretary and committee members	Feedback with committee members and discuss concept report **Clinical Genetics** Attendees: Secretary and committee members
12.30-13.30	Committee members: lunch break	
13.30-13.45	Introduction and preparation **Department Paediatrics** Attendees: Secretary and committee members	
13.45-14.45	**Department of Paediatrics session 1** Management/Leading staff	
14.45-15.00	Debriefing first session **Paediatrics** Attendees: Secretary and committee members	
15.00-16.00	**Department of Paediatrics session 2** Academic staff	
16.00-16.15	Committee members: break	
16.15-17.15	**Department of Paediatrics session 3** Academic staff	
17.15-17.35	Debriefing **Paediatrics** sessions and discuss draft report Attendees: Secretary and committee members	
17.35-18.00	Questions by committee to dean	

Friday 16 October 2020

Time	Topic	
09.00-09.15	Introduction and preparation **Department Obstetrics and Gynaecology** Attendees: Secretary and committee members	Introduction and preparation **Department Urology** Attendees: Secretary and committee members
09.15-10.15	**Department of Obstetrics and Gynaecology session 1** Management/Leading staff	**Department of Urology session 1** Management/Leading staff
10.15-10.25	Committee members: break	Committee members: break
10.25-10.35	Debriefing first session **Obstetrics and Gynaecology** Attendees: Secretary and committee members	Debriefing first session **Urology** Attendees: Secretary and committee members
10.35-11.35	**Department of Obstetrics and Gynaecology session 2** Academic staff	**Department of Urology session 2** Academic staff
11.35-11.45	Committee members: break	Committee members: break
11.45-12.00	Debriefing second session **Obstetrics and Gynaecology** Attendees: Secretary and committee members	Debriefing second session **Urology** Attendees: Secretary and committee members
12.00-12.30	Feedback with committee members and discuss concept report **Obstetrics and Gynaecology** Attendees: Secretary and committee members	Feedback with committee members and discuss concept report **Urology** Attendees: Secretary and committee members
12.30-13.35	Committee members: lunch break	
13.30-13.45	General introduction of online speed date session by secretaries Attendees: PhD candidates and secretaries	
13.45-14.00	Speed date Round 1	
14.00-14.25	Speed date Round 2	
14.25-14.50	General session PhD students and committee members	
14.50-15.05	Debriefing session PhD students by committee members	
15.05-15.15	Committee members: break	
15.15-16.30	Preparation for giving general feedback by committee members	
16.30-17.30	Feedback session to Heads of Department and dean by committee	
17.30-17.45	Time for questions by Heads of Department and dean	
17.45-18.00	Final appointments by committee/ conclusion of site visit.	

Appendix 3: Quantitative data

Child & Adolescent Psychiatry/Psychology (CAPP) Department

Composition of the department

	2013		2014		2015		2016		2017		2018	
	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE
Scientific staff	40	21.08	30	16.52	24	13.28	20	10.93	26	11.32	25	11.38
Support staff	20	5.75	12	3.63	9	3.24	9	3.24	12	3.45	10	3.75
Total staff	**60**	**26.83**	**42**	**20.15**	**33**	**16.52**	**29**	**14.17**	**38**	**14.76**	**35**	**15.13**

Financing of the department

	2013		2014		2015		2016		2017		2018	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Direct funding	12.12	54%	9.18	45%	7.90	36%	8.36	36%	11.15	44%	13.25	44%
Research grants	1.20	5%	1.4	7%	2.0	9%	2.2	10%	2.4	9%	4.0	13%
Contract research	9.20	41%	10.0	48%	11.8	55%	12.5	54%	11.9	47%	12.7	43%
Total funding	**22.52**		**20.58**		**21.70**		**23.06**		**25.45**		**29.95**	

Clinical Genetics Department

Composition of the department

	2013		2014		2015		2016		2017		2018	
	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE
Scientific staff	22	12.71	22	14.32	25	21.37	23	20.57	27	25.92	30	29.49
Support staff	15	7.91	16	10.47	16	8.77	12	6.50	13	8.44	14	9.93
Total staff	**37**	**20.62**	**38**	**24.79**	**41**	**30.14**	**39**	**27.07**	**42**	**34.36**	**45**	**39.42**

Financing of the department

	2013		2014		2015		2016		2017		2018	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Direct funding	14.24	69%	12.59	51%	12	40%	11.99	44%	13.55	39%	13.6	35%
Research grants	1.33	6%	2.14	9%	3.25	11%	2.66	10%	3.73	11%	3.79	10%
Contract research	5.04	24%	10.06	41%	14.89	49%	12.42	46%	17.08	50%	22.03	56%
Total funding	**20.62**		**24.79**		**30.14**		**27.07**		**34.36**		**39.42**	

Gynaecological Oncology Department

No information was provided on this department in the self-evaluation report.

Obstetrics & Gynaecology Department

Composition of the department

	2013		2014		2015		2016		2017		2018	
	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE
Scientific staff	46	24.40	45	27.82	45	27.97	40	31.08	36	32.96	23	39.25
Support staff	24	7.99	20	8.64	16	9.59	19	10.27	19	9.80	23	7.86
Total staff	**70**	**32.4**	**65**	**36.46**	**61**	**37.65**	**59**	**41.35**	**55**	**42.76**	**46**	**47.11**

N.B. The numbers have been corrected by the Department's financial controller: research projects of the Sophia theme are largely managed through the Sophia Research BV, which has a separate accounting system. In this table the total amount of research staff FTE (so not the number of staff!) that has been registered through the BV has been added.

Financing of the department

	2013		2014		2015		2016		2017		2018	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Direct funding	22.6	66%	21.8	61%	19.2	52%	18	46%	19.5	52%	21.656	%
Research grants	1.63	5%	3.49	10%	4.03	11%	3.79	10%	3.4	9%	2.01	5%
Contract research	10.01	29%	10.6	30%	13.98	38%	17.04	44%	14.64	39%	14.75	38%
Total funding	**34.24**		**35.89**		**37.21**				**37.54**		**38.37**	

Paediatrics Department

Composition of the department

	2013		2014		2015		2016		2017		2018	
	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE
Scientific staff	184	124.2	193	123.5	203	119.3	216	114.3	184	103.5	195	106.8
Support staff	25	12.4	24	13.4	26	12.6	35	14.8	31	14.6	58	16.0
Total staff	**209**	**136.6**	**217**	**136.9**	**229**	**131.9**	**251**	**129.1**	**215**	**118.1**	**253**	**122.9**

Financing of the department

	2013		2014		2015		2016		2017		2018	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Direct funding	33.67	25%	38.15	28%	38.53	29%	38.07	29%	33.64	28%	34.06	28%
Research grants	7.99	6%	8.29	6%	7.83	6%	8.63	7%	6.15	5%	7.12	6%
Contract research	94.97	70%	90.42	66%	85.5	65%	82.42	64%	78.33	66%	81.67	66%
Total funding	**136.63**		**136.68**		**131.86**		**129.12**		**118.12**		**122.85**	

Paediatric Surgery and Intensive Care Department

Composition of the department

	2013		2014		2015		2016		2017		2018	
	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE
Scientific staff	25	14.73	25	10.60	26	9.36	13	4.40	10	4.01	6	3.38
Support staff	10	3.24	13	4.27	12	3.64	8	2.57	9	2.49	8	2.44
Total staff	**35**	**17.97**	**38**	**14.87**	**38**	**13.00**	**21**	**6.97**	**19**	**6.50**	**14**	**5.82**

Financing of the department

	2013		2014		2015		2016		2017		2018	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Direct funding	6.00	33%	4.96	33%	5.46	42%	4.37	63%	4.42	68%	4.65	80%
Contract research	11.97	67%	9.90	67%	7.54	58%	2.59	37%	2.08	32%	1.17	20%
Total funding	**17.97**		**14.87**		**13.00**				**6.50**		**5.82**	

Urology Department

Composition of the department

	2013		2014		2015		2016		2017		2018	
	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE	#	FTE
Scientific staff	28	21.12	29	21.67	26	21.09	20	15.60	24	16.45	27	21.41
Support staff	18	13.05	19	14.93	20	14.13	17	10.79	18	9.37	16	9.40
Total staff	**46**	**34.16**	**48**	**36.59**	**46**	**35.22**	**37**	**26.39**	**42**	**25.82**	**43**	**30.80**

Financing of the department

	2013		2014		2015		2016		2017		2018	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Direct funding	6.72	20%	8.46	23%	11.98	34%	11.84	45%	11.68	45%	15.11	49%
Research grants	4.56	13%	4.48	12%	3.86	11%	2.17	8%	2.82	11%	2.98	10%
Contract research	22.88	67%	23.65	65%	19.39	55%	12.38	47%	11.32	44%	12.71	41%
Total funding	**34.16**		**36.59**		**35.22**		**26.39**		**25.82**		**30.80**	

Appendix 4: SEP Assessment Scale

	Meaning	*Research quality*	*Relevance to society*	*Viability*
1	World leading/ excellent	The relevant research unit has been shown to be one of the few most influential research groups in the world in its particular field.	The relevant research unit is recognised for making an outstanding contribution to society.	The relevant research unit is excellently equipped for the future.
2	Very good	The relevant research unit conducts very good, internationally recognised research.	The relevant research unit is recognised for making a very good contribution to society.	The relevant research unit is very well equipped for the future.
3	Good	The relevant research unit conducts good research.	The relevant research unit is recognised for making a good contribution to society.	The relevant research unit makes responsible strategic decisions and is therefore well equipped for the future.
4	Unsatisfactory	The relevant research unit does not achieve satisfactory results in its field.	The relevant research unit does not make a satisfactory contribution to society.	The relevant research unit is not adequately equipped for the future.