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Research Master Health Sciences
Erasmus University Rotterdam
Report of the limited programme assessment

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Executive summary

The outcome of the external assessment of the research master's programme Health Sciences (HS) of Erasmus University Rotterdam (EUR) by an NVAO approved panel is positive.

The two-year full-time programme aims to train students to become excellent professionals in quantitative research methods working in the fields of epidemiology, clinical medicine, and public health in an international environment. The panel highly values that the programme not only educates students for academic careers, but also for society at large as researchers at health organisations and municipal health services. The programme clearly benefits from the embeddedness in NIHES, an internationally renowned centre for quantitative health research. Given the large overlap with the other research master's programme offered by NIHES (Clinical Research), the panel encourages the management to explore the possibility of a merger of the two research master's programmes Health Sciences and Clinical Research.

The panel established that the curriculum is in a transitional phase. From September 2021 onwards, a revised curriculum was initiated. The panel considers both the old and the new curriculum to be an appropriate reflection of the intended learning outcomes of the programme, comprising theoretical and methodological knowledge and skills as well as academic and research skills. The panel welcomes the structural use of online learning activities that facilitate interactive in-class sessions and self-paced learning. The panel is positive about the opportunity for students to choose from many electives to tailor the programme to their specific interests and needs. However, the high number of short electives also brings the risk of fragmentation. The panel advises the programme to monitor closely how students of the current cohort perceive this.

The panel is convinced of the research-oriented focus of the programme. The curriculum provides students ample opportunities to develop research skills in their specific area of interest. The main component of the curriculum concerns the research project (67 EC previous curriculum, 65.8 EC current curriculum). HS students do their research project usually at one of the eight departments that host the HS programme and sometimes at a clinical department of Erasmus MC. According to the panel it is a missed opportunity that students are not encouraged to do their project abroad.

During the research project students are supported by a senior supervisor, a senior faculty member at Erasmus MC or Erasmus University Rotterdam. In addition, students can receive supervision of a junior supervisor. However, the panel noted that some students had only one supervisor and encourages the programme to make sure that all students have at least two supervisors or a supervising team to turn to. The programme could consider introducing an independent advisor, as is already the case in the Clinical Research programme.

Although the panel established that the programme provides a solid research basis for students, it is of the opinion that this research focus is mainly academic. The panel advises increasing the focus on research outside academia in the curriculum and pay more attention to professional career paths.

The panel thinks highly of the staff members, who are acknowledged scientists in their field. During the visit, the panel met very competent and enthusiastic staff members. The study guidance in general appears to be sufficiently well-organised.

The assessment system of the programme is clearly also in a transitional phase, and a lot of work remains to be done. The panel is pleased with the intention of the programme to balance the number of written exams and to increase the number of assignments. The panel is also positive that most assessments will be graded pass/fail. However, the panel also noted that the programme needs to



further elaborate the assessment system and make better use of the learning benefits of formative assessment methods.

The Chamber Research Masters of the Examination Board Erasmus MC (CRMEB) is responsible for the examination and assessment quality of the programme. The panel urges the CRMEB to continue its efforts in monitoring the quality of assessments, not only of the courses but especially of the master's theses.

The theses are the result of empirical studies, have a clear academic style, a proper methodical section, and a critical discussion of results. The panel considered the master's theses to be of good quality and the panel has the impression that graduates achieve the intended learning outcomes of the programme. The panel is positive about the career chances of the graduates of the programme but advises to improve the preparation for a career outside academia.

The chair and the secretary of the panel hereby declare that all panel members have studied this report and that they agree with the judgements laid down in the report. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 18 January 2022

Frans Ramaekers
(chair)

Annemarie Venemans
(secretary)



1. Introduction

1.1 Administrative data

Name of the programme:	M Health Sciences (research)
CROHO number:	60120
Level of the programme:	Master of Science
Orientation of the programme:	Academic
Study load:	120 EC
Location:	Rotterdam
Variant:	Full-time
Specialisations	Epidemiology Clinical epidemiology Genomic & molecular epidemiology Public health epidemiology Biostatistics Medical psychology Health economic analysis* Health decision sciences*
Submission deadline:	1 May 2022

* As of the academic year 2021-2022, these two specialisations are merged into the major Health Decision Sciences & Technology Assessment.

1.2 Introduction

This report focuses on the assessment of the research master's programme Health Sciences. This assessment forms part of a cluster assessment of six research master's programmes at three universities. The cluster was divided into two subclusters, each consisting of three programmes: a health cluster and a molecular cluster. Appendix A provides an overview of the six participating research master's programmes and the composition of the total panel.

The assessment is based on the standards and criteria described in the NVAO Assessment Framework for the Higher Education Accreditation System of the Netherlands 2018 (limited framework). Research master's programmes must meet a number of additional criteria as described by the NVAO (specification of additional criteria for research master's programmes, 2016).

1.3 Panel composition

In total, seven panel members participated in this cluster assessment. Three panel members participated in all assessments (the core panel). In addition, each cluster subpanel included two extra panel members (see Appendix A). The panel that assessed this research master's programme consisted of the following members:



- Prof. Frans Ramaekers (chair), professor emeritus Molecular Cell Biology, Maastricht University;
- Dr. Jolanda van der Zee, associate professor in Education of Biomedical Science and Medicine, Leiden University;
- Prof. Marieke van der Schaaf, professor of Research and Development of Health Professions Education, University Medical Center Utrecht;
- Prof. Monique Breteler, Director of Population Health Sciences, German Center for Neurodegenerative Diseases (DZNE), professor of Population Health Sciences, University of Bonn, Germany;
- Lotte Klein BSc (student member), student M Clinical and Psychosocial Epidemiology (research), University of Groningen.

The panel was supported by dr. Annemarie Venemans-Jellema, who acted as secretary.

All panel members and the secretary have signed a declaration of independence and confidentiality. In this declaration they affirm not to have had any business or personal ties with the programme in question for at least five years prior to the review.

The NVAO approved the composition of the panel on 25 May 2021.

1.4 Working method

Preparation

On 28 June 2021, the panel of the entire cluster held a general online kick off meeting. In this meeting, the panel received an introduction to the assessment framework and discussed the working methods in preparation to and during the site visits.

The programme drew up a self-evaluation report describing the programme's strengths and weaknesses. This self-evaluation report included a chapter in which the students reflected on the programme. The panel members prepared the assessment by analysing the self-evaluation report and the appendices provided by the institution. The panel also studied a selection of fifteen master's theses and the accompanying assessment forms from the programme. The theses selection was made by the panel's secretary based on a provided list of at least thirty theses of the most recent years. The panel studied at least one thesis of each specialisation. In the selection, consideration was given to a variation in assessments (grades) and topics.

The panel members individually formulated their preliminary findings and a number of questions they wanted to raise during the site visit. The secretary made an overview of these preliminary findings and questions and sent it to the panel members as a starting point for the preparation of the panel during the site visit.

Visit

The site visit took place on 29 September 2021 (see Appendix B for the schedule). During the preparatory meeting, the panel discussed the preliminary findings and decided which questions to raise in their meetings with the programme representatives. During the visit, the panel spoke with representatives of the management, students, lecturers, alumni, and Examination Board. Everybody involved in the programme had the opportunity to inform the panel in confidence about matters they consider important to the assessment. No one made use of this opportunity. The panel used the last



part of the visit to evaluate the interviews and had a second meeting with the programme's management to receive answers to any remaining questions. At the end of the visit, the chair presented the panel's preliminary findings and impressions of the programme.

Report

The secretary drew up a draft report based on the panel's findings. This draft report was presented to the members of the panel and adjusted on the basis of their feedback. After adjustments, the draft report was sent to the institution for verification of factual inaccuracies. The secretary discussed the programme's comments with the chair, after which the secretary drew up the final report and circulated it to the panel for a final round of comments.

The report follows the four standards of the NVAO's Assessment Framework 2018 (limited framework): 1) the intended learning outcomes, 2) the teaching-learning environment, 3) assessment, and 4) achieved learning outcomes. Regarding each of the standards, the assessment panel gave a substantiated judgement on a three-point scale: meets, does not meet, or partially meets the standard. The panel subsequently gave a substantiated final conclusion regarding the quality of the programme, also on a three-point scale: positive, conditionally positive, or negative.

Development dialogue

Although clearly separated from the process of the programme assessment, the assessment panel members and programme representatives will conduct a development dialogue in early 2022, with the objective of discussing future developments of the programme in light of the outcomes of the assessment report.



2. Review

2.1 Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Findings, analysis, and considerations

The research master's programme in Health Sciences (HS) at Erasmus Medical Centre (Erasmus MC) is one of three master programmes offered by the Netherlands Institute for Health Sciences (NIHES). NIHES provides graduate and postgraduate education in medicine and health sciences. Other NIHES master's programmes are the research master's programme in Clinical Research (CR, 120 EC) and the master's programme in Health Sciences (70 EC). The departments of Epidemiology and Public Health are the main hosts of the HS programme, in addition to five other departments.

HS envisions training students to become excellent researchers in quantitative health research methodologies by offering a programme tailored to their development needs and interests in the field of health sciences. It is the aim of the programme to deliver excellent professionals in quantitative research methods working in the fields of epidemiology, clinical medicine, and public health in an international environment. The panel is pleased that the programme not only educates students for academic careers, but also for society at large as researchers at health organisations and municipal health services.

The programme has compared its programme to that of other research master's programmes in the field of health sciences or epidemiology. According to the self-evaluation report, HS distinguishes itself by offering a programme with a specific focus on methodological training in quantitative research methods, applied to the broad fields of clinical epidemiology and public health in an international setting. The panel agrees that a research master's programme with this focus is not offered at other universities in the Netherlands. The panel established that the programme clearly benefits from its embedding in NIHES, an internationally renowned centre for quantitative health research.

HS formulated intended learning outcomes in line with the Dublin descriptors. The panel verified the relationship between the intended learning outcomes and the Dublin descriptors. It observed that all Dublin descriptors are evident in the intended learning outcomes. The panel is of the opinion that the intended learning outcomes are conventional, focusing on the knowledge and skills of a researcher in quantitative methods and culminating in written work. According to the panel this corresponds with general, internationally accepted descriptions of a master's programme with an academic research orientation. However, the panel is of the opinion that the intended learning outcomes should be regularly evaluated on being sufficiently future oriented. To be more future oriented, the panel advises integrating students' personal and professional development in its intended learning outcomes. According to the panel, these learning outcomes should reflect the preparation of students for the complex, rapidly changing context. This underlines a need for more attention in the curriculum to the social impact of research and to changing visions on research, such as open science.

The panel also assessed the research master's programme Clinical Research. Reading the self-evaluation reports of both HS and CR, the panel noted that these research master's programmes are to a large extent the same. Both programmes have almost the same learning outcomes, the same



curriculum, and the same teaching staff. The main difference between the two programmes concerns the (choice of the) research project and the research supervision.

During the site visit, the panel established that students have the feeling to be part of NIHES instead of HS. In fact, some students didn't even know that there were different programmes. During the site visit, the management indicated that it has been regularly discussed whether it would be desirable to merge the two research master's programmes offered by NIHES. The panel is in favour of such a merger and encourages the NIHES management to seriously explore this possibility. If the outcome of this exploration is that merging the programmes will not result in a more efficient and improved programme, the panel recommends that the distinction between the two programmes be made clearer. This distinction should also be reflected in a clearer distinction of the learning outcomes between the two research master's programmes.

In the eyes of the panel, the research-oriented nature of this research master's programme has been substantiated in the intended learning outcomes. However, it struck the panel that the intended learning outcomes of the 70 EC postgraduate master 'Health Sciences' are exactly the same. The panel encourages the programme to make the distinction between this research master's degree and a postgraduate master's degree more explicit in the learning outcomes.

Conclusion

The panel concludes that the intended learning outcomes are well described in terms of level and orientation and reflect the research orientated nature of the research master's programme. The programme therefore meets standard 1.

2.2 Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Findings, analysis, and considerations

Curriculum

The research master's programme HS is a two-year full-time programme of 120 EC, divided into four semesters. Until 2020/2021, the programme consisted of common core courses, specialisation-specific courses, elective courses, and a research project. A complete outline of the curriculum can be found in Appendix E, figure 1.

The panel considers the curriculum to be an appropriate reflection of the intended learning outcomes of the programme, comprising theoretical and methodological knowledge and skills as well as academic and research skills.

At the start of the former programme, students chose one of the specialisations: Epidemiology, Clinical Epidemiology, Genomic & Molecular Epidemiology, Public Health Epidemiology, Health Economic Analysis (from 2014 onwards), Medical Psychology (from 2017 onwards), Biostatistics (from 2017 onwards) and Health Decision Sciences (from 2019). Based on this specialisation, students participated



in specialisation-specific introductory courses of the Erasmus Summer Programme (ESP), focusing on the principles and methods of applied quantitative research in medicine and health care. After the ESP, students followed common core courses on study design and biostatistics, required specialisation-specific courses (in semester 1,2 and 4), and electives (mainly in semester 2 and 4). In the second semester, students started with their research project. In the third and fourth semester, students spent most of their time on their research project.

During the entire programme, students follow compulsory courses on Lifelong Learning Skills (LLS), consisting of one-day modules focusing on scientific integrity and intercultural communication, and a series of peer-to-peer support group meetings. Next to these LLS compulsory courses, students chose some LLS electives, including electives on leadership and teamwork, presentation skills and networking skills. In addition, students are required to attend 12 research seminars per year. Visiting conference meetings also counts towards the number of research seminars. Students maintain a Personal Education Programme (PEP), in which they plan their programme, register meetings with their supervisor, and register the attended seminars.

From September 2021, a revised curriculum has started (see also Appendix E, figure 2). An important change in the revised programme is a core curriculum in the first semester that is the same for both HS students and CR students. All specialisation-specific courses have become electives and are scheduled in the second and fourth semester and second ESP.

The panel studied the new and the old curriculum and is convinced that it covers in both cases many topics and competences without becoming superficial. The panel is in general positive about the coherence and structure of the curriculum. It considers the curriculum as recognisable for students with a common foundation, and a gradual build-up in core curriculum and a series of lifelong learning courses throughout the programme.

A point of attention in the previous curriculum was that the programme culminated in seven separate specialisations with a very limited number of students per specialisation. The panel considered the differences in specialisations not very clear-cut and the panel was pleased to hear that the structure of the curriculum is changed in such a way that these specialisations will be left in the new curriculum.

Another point of attention is the number and programming of the elective courses. The elective courses are short and intensive, often less than one week. Although this offers students the opportunity to choose from many courses to tailor the programme to their specific interests and needs, it also brings a risk of fragmentation. It can also lead to too much dispersion for students when the overarching curriculum is not clear to them. In addition, the timing of the elective courses in the second semester of the second year is not ideal, because it makes these courses not supportive for the research project. During the site visit this risk was endorsed by students. The panel advises the programme to monitor closely how students of the current cohort perceive this.

The main component of the curriculum concerns the research project (67 EC previous curriculum, 65.8 EC current curriculum). During the research project, students prove their ability to apply the knowledge and skills they have gained over the course of the programme to conduct their own research, culminating in a publishable research paper. A research project is usually done at one of the eight departments of the Erasmus MC that host the HS programme and sometimes at a clinical department of Erasmus MC. During this project students are supported by a personal supervisor. All supervisors are senior faculty members at Erasmus MC or at the Erasmus School of Health Policy & Management with considerable experience (PhD level at least) in one or more of the specific research subjects. The self-evaluation document states that students also work with a junior supervisor, with whom they have contact more frequently and who supervises them more directly on their research project. In general, students were pleased with their supervision. During the site visit, however, some students mentioned



that they had only one supervisor, which might be a risk when the interaction with the supervisor is less constructive. The panel considers this undesirable and recommends to make sure that students have at least two supervisors or a supervising team to turn to. In addition, the programme could consider introducing an independent advisor, as is already the case in the CR programme.

The self-evaluation report states that in exceptional cases (<2% of theses), the master's thesis is an extensive study protocol. This protocol needs to be sufficiently well-written and detailed for submission to a medical review board, it needs to be a particularly complex study, with an excellent review of the literature, and a very well-developed data analysis paragraph. However, the panel strongly recommends that this should not be allowed, as development as a researcher demands that research master's students get acquainted with the entire research cycle.

During the site visit, students indicated that they sometimes felt limited in the methods and analyses they learned during their research project. The panel discussed with the management the possibility of introducing two shorter research projects instead of one long research project. Despite the fact that the management prefers a single research project, the panel encourages the management to consider allowing the split-up of the project or to find another way for students to gain experience with different research topics and methods. A key additional benefit of two research projects is that this would make students less dependent on the same supervisor for a longer period. Moreover, this would also offer more possibilities for students to follow an international research internship or to follow an internship outside academia, for example at a public health organisation.

The panel is convinced of the research-oriented focus of the programme. The curriculum provides students ample opportunities to develop research skills in their specific area of interest. The academic context to the programme is not only embodied in the staff members and the curriculum, but also in the opportunities for students to get involved in their supervisor's research and to participate in a wide range of research seminars, workshops, and conferences.

Although the panel established that the programme provides a solid research basis for students, it is of the opinion that the research focus is mainly academic. The panel believes that an applied focus can become more apparent in the programme, for example by collaborating more with research organisations outside academia for internships, by inviting more guest lecturers, and by increasing the participation of alumni in the programme.

The panel noted that the programme seems to be mainly monodisciplinary in orientation. It believes that an interdisciplinary environment is important to study research nowadays. With its diversity of departments, the programme has the potential to offer truly interdisciplinary research. In a number of theses, the panel also established some evidence of this interdisciplinarity. However, the panel is of the opinion that the programme can take further steps in developing students' skills to deal with interdisciplinarity during the courses.

The programme claims to have a fully international learning environment. The panel agrees that a substantial part of the student (between 16% and 39%) and staff population is international. However, the panel noted that there is hardly any opportunity for students to perform an international research project. The panel states that going abroad helps students to develop a truly international orientation and to start building their own international research network. Since the programme has sufficient international contacts, for example with Harvard University and the Institute of Social and Preventive Medicine in Bern, there should be opportunities to strengthen international exchange. The panel recommends the programme to encourage (especially the Dutch) students to spend part of their studies at a university abroad.



The language of instruction is English. The programme management substantiates its choice by arguing that it allows the international staff to convey their knowledge, providing students with the opportunity to get in touch with a broad range of researchers in an international field. In addition, the use of English facilitates an international classroom. The panel supports this choice.

The educational principles of the HS research master are 1) student ownership, active learning and personalised learning; 2) the embedding in a research environment using the apprenticeship model; and 3) integrated education using the scaffolding model. The panel is of the opinion that this didactical concept fits well with a research master's programme. After studying the curriculum, it also recognised aspects of this concept in the programme, such as the strong embeddedness in the research environment and the personalised learning by the many electives. When asking students and staff about the didactical concept, the panel noticed that they were not aware of these didactical strategies. The panel advises the programme management that the educational philosophy not only exists on paper, but that it will be consistently implemented and is recognised by students and staff.

The programme uses several teaching methods. A lot of effort has been put into offering technology-enhanced learning activities as preparation for the interactive in-class sessions. The panel is positive about this blended format that facilitates self-paced learning.

Admission

HS aims at enrolling between twenty to forty new students per academic year. The average number of students actually starting the programme is 23 students per year over the past six years. The programme has an inflow from different bachelor's programmes. Almost one third of the HS students comes from abroad.

The HS research master is open for students with an academic bachelor's degree from a discipline in or related to clinical medicine or public health. Other admission criteria are English language proficiency, interest in performing quantitative research, and study results. Applicants are asked to write a motivation letter and in some cases an interview is part of the selection procedure.

Based on conversations with the management, the panel established that the programme is highly selective. However, according to the panel the admission process is not completely transparent. The selection interviews are performed by the programme directors of the specialisations. However, every programme director uses his or her own criteria for this interview. The panel advises the programme to introduce one selection committee and formulate clear criteria.

Staff

One of the appendices to the self-evaluation report contains a list of all academic staff members participating in the programme. Most of the teachers (92%) are tenured at the level of assistant, associate or full professor. Around 30% of the teaching staff is international, of which 25% holds an appointment at Erasmus MC and 75% are guest lecturers.

The panel acknowledges the staff's excellent scientific quality and international academic reputation. The excellent research quality of the teachers is also evident from last year's positive research assessment. According to this research assessment, the scientific achievements of departments involved in the programme, astonishing in their breadth and depth, have a major impact on the health of the public, in Rotterdam, in the Netherlands, in Europe and in the world.



The panel is of the opinion that on the one hand, the excellent research contributes to the relevance of the programme, and on the other hand, it also offers students optimum opportunities to get to know the scientific professional field.

The panel has met with a team of HS lecturers. It is clear to the panel that students are part of a high-quality and committed research environment. The content of the courses is closely connected to the research conducted by teachers and supervisors within the HS research master, so that students are up to date on recent developments and findings and participate in current research.

During the site visit, the panel confirmed the involvement and enthusiasm of the staff. In addition, students were very pleased with the involvement of staff members. According to the students, there is always a lot of interaction between the staff and the students. Guest lecturers are appreciated because they add different perspectives and bring a lot of value on specific topics.

It is university-wide policy that all staff members possess a University Teaching Qualification (UTQ) or Senior University Teaching Qualification (SUTQ). Of all teaching staff appointed at Erasmus MC, 70% holds or trains for a UTQ and 8% holds or trains for a SUTQ. The panel encourages the programme management to foster UTQ-SUTQ certification among lecturers.

Study load and study guidance/mentoring

During the site visit the panel made inquiries about the feasibility of the programme. Students experience a heavy workload, especially in the first courses of the first year. They ascribe this to the diversity of the student cohort, because courses are also open to external participants (mostly PhD students). It struck the panel that at the start of the programme, students were not aware of the mix of students within the courses. Although the students with whom the panel met appreciate that they are intellectually challenged, they felt thrown in at the deep end. The panel recommends the programme to be more transparent to students about the student cohort and expectations. In addition, more explicit attention should be paid to the difference in entrance level.

Three programme coordinators involved in student counselling keep track of the study results of each student, and meet with a student if the results are insufficient for more than one course. In addition, students can contact their programme coordinator in case of study-related or personal problems.

However, according to the panel, coaching and tutoring must be better structured and embedded in the curriculum and not solely available for students who seek advice. Therefore, the panel recommends investing in tutors and strengthen coaching and mentorship of students during their trajectory. The panel is pleased with the recent introduction of an independent student advisor who will be appointed by the Graduate School and is available for all students who seek advice from a counsellor not related to the programme organization.

The panel is also pleased with the introduction of a buddy system in which second-year students guide one or more first-year students to familiarise them with the programme and with their daily live in Rotterdam.

COVID-19

Due to the COVID-19 pandemic, almost all education of the programme in the past year switched to online teaching and assessment in the past year. The panel asked students and teachers about their experience with online teaching. Whilst COVID-19 evidently had an impact on the interaction between students and teachers, both are positively surprised about the online possibilities. Students mentioned



that there was still a lot of discussion possible. However, they preferred more face-to-face interaction with fellow students. The panel concluded that although the COVID-19 situation is not an optimal teaching and learning situation, the programme still allows students to achieve the academic objectives.

From the interview with the management, the panel understood that all education will still be online this fall. Next year, the programme will probably offer a hybrid programme, in which students can choose to participate online or physically. The panel recommends the programme not to structurally switch to an online variant of the programme, because this requires a different didactic approach.

Conclusion

The panel concludes that the programme fulfils all specific requirements for the teaching and learning environment of a research master's programme and therefore meets standard 2.

2.3 Student assessment

The programme has an adequate system of student assessment in place.

Findings, analysis, and considerations

Assessment policy and methods

The panel took note of the programme's vision on assessment in which it strives to design assessment that challenges students to be creative, develop ideas themselves and carry them out. The programme stands for assessment in learning as it utilises it to contribute to the development of knowledge, insight, skills and attitude, rather than only evaluate knowledge. The panel was pleased with this vision on paper, however, in practice it established that it needs further elaboration and implementation.

The panel established that the programme is in a transitional phase. In the previous curriculum, most courses were assessed by a written exam. In the curriculum that started last September, the programme will balance the number of written exams and increase the number of assignments. The panel strongly supports this transition because the use of assignments fits well with the vision on assessment of this research master. The panel understood that the programme intends to use rubrics for every summative assignment in order to make the assessment as transparent and objective as possible, and to provide students with useful feedback. The panel endorses the use of rubrics and encourages the programme also to introduce clear assessment criteria as soon as possible and make those criteria transparent to students.

The core competence exam is the only written exam included in the revised curriculum. The aim of this exam is to assess the knowledge of students of the core concepts of epidemiology. This allows students to work on integrating the material from different courses and linking concepts, instead of considering each course's material separately. The exam takes place at the end of the core curriculum in the first semester and will be organised digitally through Testvision. Questions will be pulled from a question bank that will be developed in the coming years. According to the panel, it is important that students also learn from this exam. Therefore, it encourages the programme to balance a summative assessment function with a formative assessment function, for instance by providing students feedback on the content of the exam before and after the examination, and by linking supervision and mentoring to this exam.



In the revised curriculum all assessments will be graded pass/fail, with the exception of the performance of the research project and the written master's thesis, which will be graded numerically. In the eyes of the panel, this new grading system can contribute to the principles of personalised and integrative learning. The panel is of the opinion that with the introduction of this grading system, providing qualitative feedback and coaching of students is very important to support students' learning processes. Additionally, adequate communication to students and to future employers (through elaboration on the grades list) is necessary to overcome the barrier and worries students might have about not receiving numerical grades.

During the site visit, the panel discussed the use of formative assessment during several interviews. The programme management indicated that several courses already make use of formative testing. However, the panel noticed from discussions with students and staff that there is room for improvement in the way formative assessment is organised. According to the panel, the programme needs to give (more systematically) attention to formative assessment as a learning tool throughout the courses.

Grading of the theses

The panel studied the thesis assessment forms and the thesis assessment procedure for grading the master's theses. The supervisor assesses the student's conduct and attitude, execution of the project, focus on results and organisation skills, and ability to cooperate. Since 2020, the master's thesis is assessed by the supervisor and by an independent second assessor separately, who both assess the paper on its introduction, methods, results, discussion, organisation, structure and writing style. The first and second assessor have at least a PhD degree and work within Erasmus MC or Erasmus School of Health Policy & Management. To maintain independence, the second assessor cannot have been directly involved in the student's research project, and assesses the research paper without having seen the assessment of the first assessor. The final grade is based on the assessment of the student's performance during the project by the supervisor (1/3) and of the thesis (supervisor 1/3; second assessor 1/3).

The panel has reviewed a sample of fifteen research master's theses, including the assessment forms. The panel noted that different assessment forms are used over the years. In addition, the thesis assessment forms contained very limited qualitative feedback. The panel discussed this with the programme management. The management explained that the thesis assessment procedure has been under development recently. In 2020, a new form with a rubric has been introduced. Based on initial findings, the form was further adapted per 1 September 2021, for example by making narrative feedback on each criterium mandatory. The panel concluded that with these new modifications, and if carried out correctly by the supervisors, the assessment system of master's theses is adequate.

In addition to the grading of the research project there are several other formal assessments of the research project: 1) a research proposal; 2) a midterm presentation and end presentation; and 3) a defence. The panel noted that the amount of formative feedback during the research project differs strongly per supervisor. The panel welcomes the fact that students keep a Personal Education Programme (PEP): a document in which students plan their personal programme portfolio, that is signed off by their supervisor. However, at this moment the PEP is only used to collect formal assessments. In order to further enhance the quality of the assessment, the panel suggests to structure the formative feedback during the research project, for instance by using the PEP.

Examination Board



The Examination Board (EB) is responsible for the examination and assessment quality of all bachelor's and master's programmes at Erasmus MC. In 2018, the Research Master Examination Board joined forces with the EB of the bachelor's and master's programme Medicine and has become the Chamber Research Masters of the EB Erasmus MC (CRMEB). The CRMEB operates as an independent body and safeguards the quality and level of the assessments, assessment system and achievement of learning outcomes, determines whether students meet the requirements set out in the Teaching and Examination Regulations (TER), and sets the rules and guidelines that are supplementary to the TER for the five research master's programmes and postgraduate master's programme.

Since 2018 the CRMEB has further professionalised, for example by introducing the Assessment Carrousel. The Assessment Carrousel consists of two examiners of the programme, one assessment expert, one member of the programme board, and two members of the CRMEB. The Assessment Carrousel has access to the assessment files, checks the quality of the exams, inspects the evaluations, assesses the format of the exam and evaluation, monitors the exam procedure and, if necessary, advises the programme board and reports to the CRMEB. The programme aims to rotate all courses on a four-year schedule, with particular attention to the core courses that are required for all students. The thesis assessment will be evaluated on a yearly basis. Due to the large number of assessments, the CRMEB has not yet reviewed all assessments, thesis assessments will start at the end of this year.

The panel urges the CRMEB to continue its efforts in monitoring the quality of assessments, not only of the courses but especially of the master's theses. It is confident that the CRMEB is well equipped and positioned to safeguard the quality of the assessments, but a lot of work remains to be done. Adequate support and facilitation of the CRMEB by the organisation is therefore very important.

Conclusion

The panel concludes that HS has an adequate assessment system. The programme therefore meets standard 3.

2.4 Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings, analysis, and considerations

The master's thesis serves as the final evaluation of research competence to demonstrate that the academic objectives of the programme have been realised. The panel read fifteen theses of the programme. In general, it considered these to be of good quality. The theses are the result of an empirical study, have a clear academic style, a proper methodical section, and a critical discussion of results. All theses the panel studied demonstrate that students have the ability to conduct research at a research master's level. The panel agrees with all grades and would have given the same marks, deviating maximally by 0.5 only, sometimes giving a slightly higher or slightly lower grade than the two original assessors. In the opinion of the panel, a number of theses are suitable for publication. The panel is convinced that graduates achieve the intended learning outcomes of the programme. A point of attention is the inflation in thesis grades in recent years. The panel suggests the programme to monitor this.

The Health Sciences programme was recently re-accredited by *de Vereniging voor Epidemiologie* (VVE; Dutch Society for Epidemiology). All students in the specialisations/majors Epidemiology, Clinical



Epidemiology, Genomic & Molecular Epidemiology, Public Health Epidemiology or Health Decision Sciences (& Technology Assessment), who have completed the core curriculum, electives, and performed their research under the guidance of a VvE registered epidemiologist can be registered as Epidemiologist A. In the revised curriculum, all students have the opportunity to be registered as Epidemiologist. The panel recognises the added value of this registration for students.

More than half of the alumni have found positions as PhD student (56%). Others found positions as data manager, researcher at a pharmaceutical company, medical doctor or as consultant. During the site visit, alumni reported that they were satisfied with their education and felt well-prepared for a job as a researcher. According to the alumni who met with the panel, the preparation for a career outside academia could be improved. As 44% end up in a professional career outside research, the panel advises to pay more attention to career paths outside academia for example by career talks with alumni and career markets, and by offering the opportunity to conduct a (second) research project outside Erasmus MC. The panel is pleased that the programme is currently developing an alumni policy and encourages the programme to further strengthen the ties with alumni for example by inviting them as guest lecturers.

Conclusion

The panel concludes that students of the programme achieve an adequate final level and find suitable jobs. The programme therefore meets standard 4.



3. Strengths and recommendations

3.1 Strengths of the programme

The panel is impressed by the following features:

- Curriculum structure – The programme has a core structure as well as elective courses, which gives students ample opportunity to tailor the programme to their own interests;
- Research basis – The programme has a strong research component, both in the courses and in the research project;
- Teaching team – The teaching staff is dedicated and well-qualified. Staff members are experts in their respective areas, bringing in the latest developments in their field;
- Research environment – The programme is educated at NIHES, known as a renowned research institute.

3.2 Recommendations

For further improvement of the programme, the panel makes the following recommendations:

- Merging – Explore the possibility to merge with the research master's programme CR and the possibility to merge some specialisations within the HS programme;
- Assessment – a) formulate clear assessment criteria and make those criteria transparent to tutors and students; b) include formative assessment of courses and research project more systematically in the learning trajectory of students. With the introduction of the pass/fail system, it even has become more important to provide qualitative feedback to support students' learning processes; c) continue monitoring the quality of assessments, not only of the courses but especially of the master's theses;
- Two supervisors – Ensure that all students have at least two supervisors or a supervising team to turn to. Consider introducing an independent advisor, as is already the case in the programme CR;
- Applied research – Increase the focus on research outside academia in the curriculum and pay more attention to professional career paths;
- Internationalisation – Encourage students to do part of their study abroad;
- Electives – Monitor among students whether the high number and scheduling of the electives leads to a fragmentation of the programme.



4. Conclusion

The panel has found that the intended learning outcomes (standard 1), the teaching- learning environment (standard 2), the assessment system (standard 3) and the achieved learning outcomes (standard 4) meet the criteria.

The intended learning outcomes reflect the programme's aims and vision and are in line with the discipline and international requirements. The curriculum, the teaching methods, the quality of the teaching staff and the assessment system enable the incoming students to achieve the intended learning outcomes.

Standard	Judgement
Standard 1	Meets the standard
Standard 2	Meets the standard
Standard 3	Meets the standard
Standard 4	Meets the standard
Final conclusion	Positive



Appendix A – Panel composition and programmes of the cluster

The cluster consists of six research master's programmes:

66586	M Cardiovascular Research (research)	Vrije University Amsterdam
60312	M Clinical Research (research)	Erasmus University Rotterdam
60120	M Health Sciences (research)	Erasmus University Rotterdam
60375	M Infection and Immunity (research)	Erasmus University Rotterdam
60322	M Molecular Mechanisms of Disease (research)	Radboud University Nijmegen
60279	M Molecular Medicine (research)	Erasmus University Rotterdam

Panel composition of the cluster

Core panel

- Prof. dr. F.C.S. (Frans) Ramaekers, professor emeritus Molecular Cell Biology, Maastricht University;
- Prof. dr. M. (Marieke) van der Schaaf, professor of Research and Development of Health Professions Education, University Medical Center Utrecht;
- Dr. J. (Jolanda) van der Zee, associate professor in Education of Biomedical Science and Medicine, Leiden University.

Health Cluster

- Prof. dr. M.B. (Monique) Breteler, Director of Population Health Sciences, German Center for Neurodegenerative Diseases (DZNE), professor of Population Health Sciences, University of Bonn, Germany;
- L.M. (Lotte) Klein BSc, student M Clinical and Psychosocial Epidemiology (research), University of Groningen.

Molecular Cluster

- Prof. dr. J. (John) Creemers, professor of Biomedical Science, KU Leuven;
- V.E.J.M. (Victoria) Palasantzas MSc, student M Molecular Medicine and Innovative Treatment (research), University of Groningen (graduated in 2021).



Appendix B – Schedule of the visit

29 September, 2021

Time	Session
08.30 – 10.00	Preparation panel
10.00 – 10.45	Management
10.45 – 11.00	Evaluation
11.00 – 12.00	Students and alumni
12.00 – 12.30	Document review
12.30 – 13.15	Lunch
13.15 – 14.00	Lecturers
14.00 – 14.30	Guided tour of the Education Centre
14.30 – 15.00	Examination Board
15.00 – 15.30	Evaluation and preparing questions for management
15.30 – 16.00	Second meeting management
16.00 – 17.30	Evaluation
17.30 – 17.45	Presentation of first findings



Appendix C – Documents studied

- Self-evaluation report with appendices
 - Appendix 1 – Departments and institutes participating in the programme
 - Appendix 2 – Intended learning outcomes Research Master Health Sciences
 - Appendix 3 – Success rate and teacher education
 - Appendix 4 – Recommendations of the previous assessment panel
 - Appendix 5 – Overview of appendices that are digitally available
- Fifteen theses with assessment forms
- Teaching and Examination Regulations Research Masters 2021-2022 with addendum and appendices
- Rules and Regulations 2020-2021
- Annual report Examination Board Erasmus MC 2019-2020
- Description of specialisations
- Programme overviews RM Health Sciences 2020/2021 and 2021/2022
- Assessment policy and assessment plan
- Educational vision Research Masters Erasmus MC
- Final SEP report Health Sciences Erasmus MC

Documents made available during the site visit

- Course selection
 - Advanced topics in decision making in medicine
 - Repeated measurements
 - Using R for decision making
- Timeline since previous accreditation
- List core competences
- Study guide 2021-2022
- Annual report ECRM 2019-2020
- Personal Education Plan 2021-2022
- Assessment form group presentation
- Assessment form group assignment
- Research assessment form 2020-2021
- Research assessment form 2021-2022
- Update success rate



Appendix D – Abbreviations

BoE	Board of Examiners
CR	M Clinical Research (research)
CRMEB	Chamber Research Master Examination Board
EB	Examination Board
EC	European Credit
EER	Education and Examination Regulations
ESP	Erasmus Summer Programme
HS	M Health Sciences (research)
LLS	Lifelong Learning Skills
NVAO	<i>Nederlands-Vlaamse Accreditatieorganisatie</i>
PEP	Personal Education Plan
PhD	Philosophiae Doctor
SEP	Standard/Strategy Evaluation Protocol
TER	Teaching and Examination Regulations
UTQ	University Teaching Qualification
VE	<i>Vereniging voor Epidemiologie</i> (Society for Epidemiology)



Appendix E – Outline of the programme

Figure 1 Curriculum (until 2020/2021)

First semester					Second semester		
ESP (4.2 EC)	Study design (4.3 EC)	Biostatistics I (5.7 EC)	Specialisation-specific courses (A)	Biostatistics II (4.3 EC)	Specialisation-specific courses / Electives (B) (A+B+C=16.5 EC)		
	Lifelong Learning Skills					Research (32 EC)	ESP (C)

Second year

First semester		Second semester	
Research (35 EC)			
		Specialisation-specific courses / Electives (D) (13.2 EC)	ESP (D)
Lifelong Learning Skills (yr 1 + yr 2: 4.8 EC)			



Figure 2 Revised curriculum (from 2021/2022)

First year

First semester								Second semester		
Review mathematics and introduction to statistics (1 EC)	ESP (4.2 EC)	Study design (4 EC)	Biostatistics I (4.5 EC)	Biostatistics II (4.5 EC)	Clinical epidemiology (3 EC)	Public Health Research (3 EC)	Selected topics in epidemiology (3 EC)	Core competences exam (1 EC)	Electives A (A+B=10 EC)	Electives ESP (B)
Lifelong Learning Skills										

Second year

First semester			Second semester	
Research (35 EC)			Electives C (C+D=10 EC)	
			Core competences video (1 EC)	Electives ESP (D)
Lifelong Learning Skills (yr 1 + yr 2: 5 EC)				

