



The Department of Health Sciences

SELF-EVALUATION

Periodic Research Review

BRIEF SUMMARY

The Department of Health Sciences (DHS) at Karlstad University (KAU) comprises three subjects/disciplines: Nursing Science, Public Health Science and Oral Health Science. During the years 2018–2020, DHS had to terminate three programs (dental hygienist, the discipline of Oral Health, prescriptionist and biomedical analyst), thus having to reduce staff and losing valuable expertise and resources both in research and education. Simultaneously, the department aimed at further developing the health science area. The department succeeded, amidst the pandemic challenges, in reintroducing Oral Health, merging the two subjects Public Health Science and Medical Science and in employing important expertise in Nursing Science and Oral Health Science. The Department of Health Sciences is strategically working to strengthen the research environment's infrastructure and to ensure strategic recruitments as well as to create sustainability in staff qualifications and expertise. Research and education are closely integrated in all of the department's subjects while our international networks are increasingly utilised in our research and degree programs. The number of PhD students is steadily growing, and the implementation of the multidisciplinary Graduate School of Health has proven to be a fruitful platform for the department's PhD students and researchers. There are several research profiles within the DHS, and work is under way to review if Health Sciences could more strongly form a common research profile or at least a few strong profiles. "*By challenging the known and exploring the unknown*", we strive to contribute relevant knowledge that can support the development of equal and sustainable health in the population.

1. LONG-TERM OBJECTIVES AND STRATEGIES

The Department of Health Sciences follows the university's strategic plan 2019–2023 in six areas:

- We are profiled by reputable high-quality academic environments in which research and education are closely linked.
- We have strengthened our attractiveness among current and future students and also provide an attractive workplace.
- Our education and research are characterized by close relationships with the surrounding community.
- We show a high degree of internationalization.
- We work systematically for a socially, economically and environmentally sustainable societal development.
- Our doctoral studies program is increasing in extent and quality.

Regarding the research activities in DHS, we work according to the university's 2030 vision. This stipulates that research should be of high quality and contribute to new knowledge. The research profiles are clear and well known. Basic research has a central place and we work in collaboration with other disciplines and organisations with needs-based research. Through our researchers and teachers our students get current and new perspectives.

The specific objective of DHS is to provide courses and programs of high quality and conduct research in a health-promoting work environment for students and staff.

DHS is continuously permeated by a living regional, national and international collaboration to strengthen and develop good health.

2. ORGANISATION AND MANAGEMENT

2.1. ORGANISATIONAL STRUCTURE AND LEADERSHIP

DHS is part of the Faculty of Health, Science and Technology¹ at Karlstad University (KAU). The head of department manages budget, staff and the work environment, in addition to being responsible for goal achievement in accordance with the objectives and strategies of KAU. The deputy head of the department supports the head of the department and manages the department's courses and programs. There is also administrative support linked to the head and deputy head to facilitate operational work.

At the DHS, there are three disciplines, nursing science, public health sciences (formerly public health sciences and medical sciences) and oral health science. Each discipline has a head of subject appointed by the head of department for support in matters regarding research, recruitment of researchers, development and to represent the discipline both within and outside the university. Each discipline has a director of studies responsible for duty allocation and pedagogical quality.

The department's strategic work is led by a management group (ledningsgrupp) consisting of the Head of the Department, the deputy Head of the Department, Heads of Subjects and Directors of Studies. To these meetings, the HR specialist, financial officer and others are co-opted when appropriate. Furthermore, each subject has its own management team (ledningsteam): the Head of the subject, the Director of Studies together with the Heads of the Department manage operative matters such as recruitment, evaluations, research issues, work environment issues.

DHS offers three undergraduate programs: nursing program, dental hygienist program and public health science program. We also run four one-year master programs in nursing (district nurse, paramedic nurse, operating theatre nurse and ICU nurse) and a master program in public health sciences.

Research in health is a multifaceted field, requiring the collaboration of different expertise, that is, researchers working together on the basis of multidisciplinary perspectives. New knowledge often develops in the borderland between different research disciplines and traditions. This creates opportunities for multidisciplinary cooperation which is mainly manifested in the joint Graduate School of Health. The graduate school offers a strong and creative doctoral program environment in a broader context than any individual subject can offer. Apart from a graduate school board, there is also a multidisciplinary research faculty (kollegium) for all supervisors. The supervisors meet to discuss issues concerning research courses, progression in doctoral studies, research ethics, etc. Moreover, each of the disciplines has a research committee where researchers in the respective disciplines meet. In this forum the researchers clarify goals, direction, develop research strategies and discuss current applications. See figure 1.

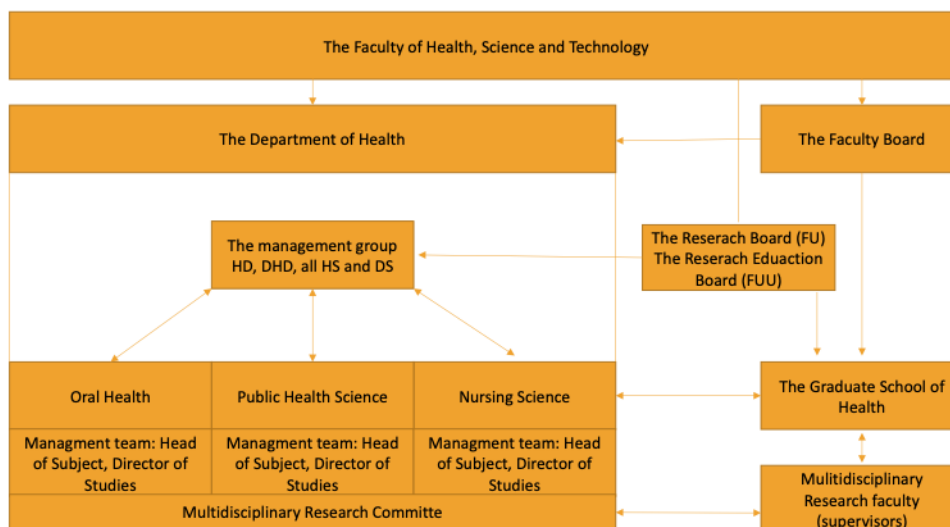


Figure 1. Overview of organisation and research related to leadership

¹ See <https://www.kau.se/en/faculty-health-science-and-technology>

2.1.1 Financial resources

The turnover for the department regarding research is on average for 2018–2020 around SEK 18 million a year (see table 3.1 in Background data). This is approx. 20 % of the total turnover of SEK 90–100 million. The share of external funding has on an average been 12 % during the period.

As seen in table 4.1 in the appendix Background data, DHS researchers are active in applying for external funding, at an average of 17 funding applications a year. Although, the average success rate is low (8%), this is not uncommon, especially concerning nursing research applications. Reasons for this are also that a) Nursing science has, historically, not had to actively apply for external funding as they have had a high supply of doctoral funding from Norway and research collaboration with Norway, which has generated extended research time; b) The department has also worked closely with the County Council of Värmland, (now Region Värmland) and before 2020 the granted funding of doctoral students, for instance, was not registered; c) The young researchers in Public Health Sciences have external research funding directly from authorities or the public sector which are not recorded in the present statistics; d) Researchers related to the closed down programs had to put all research activities aside and focus only on ways to ensure that program students could complete their studies; e) The low success rate in 2019 might be explained by the delay of funding from Region Värmland .

The low success rate must of course be taken seriously and during the last year more researchers were applying for external and internal funding. However, the department needs to find ways to support the conditions for researchers to become more competitive in their applications and secure the resources required to make sure that researchers are relieved from some regular duties if they get funding.

2.2. CONDITIONS FOR RESEARCH AT DEPARTMENT OF HEALTH SCIENCES

2.2.1 Expertise, recruitment and capacity for renewal

Departmental expertise spans over the included disciplines (3.1, table 1). Recruitment is a challenge in all disciplines especially for PhDs in oral health and nursing. The strategy to keep and recruit staff to DHS is multifaceted and the department strives for all teachers to be given professional development time with research opportunities as the time allocated to lecturers does not usually include research but only pedagogical development. The researchers, on the other hand, have all been allocated research time; a) all new senior lecturers receive a generous 30% professional development time during the first two years to apply for external funding. After that, all teachers with a doctorate have 20% internally funded research time; b) DHS finances postgraduate education for lectures; c) in collaboration with RV, we fund clinical lecturers; d) all professors receive 50% research time funded by state allocation to research and development (Vg 5) and some, in addition, have supervision time for doctoral students.

The distribution between research and teaching has varied somewhat for the period of evaluation. Table 1 reflects a low distribution of research at the Department of Health Science but this might be due to the fact that in nursing, the majority of staff are lecturers only registered for teaching and not for research (29 Full Time Equivalents — 51.79 Full Time Equivalents for 2020). Thus, in 2020, only 22.8 Full Time Equivalents were qualified as researchers in the department (Table 1.1). The number of PhD students remained stable at 14 PhD students during the evaluation period. In total, 10 PhD students earned a Doctor's Degree during this time (Table 2.1: 2.2).

2.2.2. Research infrastructure and good research practice

Research in Nursing and Oral Health does not require any specific technical infrastructures at Kau. When research is conducted in a clinical context all infrastructure is provided by the caregivers, sometimes at the expense of DHS. In Public Health Science, we manage big sets of biological and environmental samples (dust and air) in relation to the SELMA project. In a biobank coordinated by Region Värmland, we have stored samples of blood/serum, urine, saliva, hair, teeth, buccal swabs, etc. from more than 2 300 pregnant women and their children for further analyses of exposure and outcome biomarkers including genetics (GWAS) and epigenetics (EWAS). In SELMA, we also have huge databases including information on environmental exposures, health outcomes in several aspects, and background factors for proper statistical modelling. Established data and stored samples (for further analyses) in SELMA are unique in the world and since 2019 work has been initiated for higher security and quality assurance in line with GDPR, ethics and other legal rules. One of our senior lecturers at PHS currently has the role of data manager for the SELMA database. Besides, an important infrastructure remains/exists for Medical Science research, where the department has three cell culture rooms as this research now begins to take shape again after the closure.

Moreover, it should be added that the department has worked hard over the past four years to develop an organizational infrastructure that benefits the overall research environment as well as the research education environment. The department now has a multidisciplinary research faculty and a supervisory committee that handles operational and strategic quality issues (Figure 1). An administrator has been appointed with responsibility for research and doctoral studies to the benefit of researchers as well as doctoral students.

2.3. RESEARCH CULTURE AT THE DEPARTMENT OF HEALTH SCIENCE

At the DHS, we aim to engage all staff members in research activities and all researchers in educational activities. As a whole, the DHS has a well-developed research culture with routines regarding the planning and implementation of research and doctoral studies. Besides the collegial research meetings mentioned above, all disciplines arrange intradisciplinary meetings continuously as well as recurrent open seminars. The department strives for strong international collaboration and in recent years has encouraged increasing the proportion of international visiting researchers as well as integrating them into doctoral degree programs. As KaU is a mid-sized university, researchers are also encouraged to join some of the university's research centers to strengthen thematic orientations such as The Centre for Research on the Mental Health and Life Circumstances of Children and Youth (CBU) and Centre for Societal Risk Research (CSR).

All research projects are reviewed ethically in internal seminars and, when applicable, by the University's research ethics committee or by the Swedish Ethical Review Authority.

2.3.1. Internationalisation

The department actively strives to work in accordance with Karlstad University's vision 2030, which has an emphasis on strong internationalisation in research and education. The majority of the department's researchers are engaged in international networks, consortiums and international groups. Consequently, it is common to co-publish with others, both national and international researchers within the department. This is evident (Table 6.1) by the fact that more than half (59%) of the publications from the department are based on international collaborations. It should be noted that this is true despite the fact that several experienced professors and researchers have, for personal reasons, left the department over the past four years. This indicates that the remaining researchers, both junior and senior, are also focusing on building relevant and rewarding international contacts. The department regularly receives international visiting researchers and so also during the period of relevance to this evaluation. They are, for example, engaged in our doctoral programs, or as supervisors, or as members of some of the department's research projects.

Researchers at the departments are also actively engaged as reviewers for several international peer-review journals: *Disability and Rehabilitation*; *Journal of Advanced Nursing*; *Clinical Nutrition*; *Journal of Palliative Care*; *Cancer Nursing*; *European Journal of Cancer Care*; *International Journal of Older People Nursing*; *Journal of Clinical Nursing*; *European Journal of Oncology*; *Journal of Tissue Viability*; *Applied Nursing Research*; *Odontology*; *Oral Health*; *Public Health*; *Behavioural Health*; *Aging*. Several are also members of Editorial Boards for journals such as: *Cancer Nursing*; *Cancer Care Research Online*; *International Journal of Dental Hygienist*; *Nordic Journal of Nursing Research*.

2.3.2. Gender equality

At DHS, there is no equal distribution between men and women. Predominantly, staff are women regardless of employment category. This reflects the pattern in the care professions where the dominance of women has always been strong except in the medical profession. On the other hand, there is a better balance in Public Health Science, where four out of seven are men. According to Background data, the proportion of research among men and women has differed over the years but men professors seem to have had more research than women professors (see Table 1.1). Gender equality in relation to research time among senior researchers has improved over time, although certain research is not visible in the table as it is registered differently for many researchers in Nursing.

2.3.3 Disciplinary transparency

As previously mentioned under infrastructure, the department has various fora for stimulating disciplinary transparency: a) regular research faculty meetings where applications are reviewed; b) supervisory committee meetings where research plans and dissertations are reviewed; c) the graduate school of health has regular seminars and courses; d) guest researchers conduct seminars. Moreover, strategic decisions and overarching discussions take place concerning research and third-cycle education in the management team at the department.

3. EXPERTISE PROFILE

3.1. GENERAL EXPERTISE AT THE DEPARTMENT OF HEALTH SCIENCE

The research staff at the department are either registered nurses with a doctorate in nursing, public health doctorates, or registered dental hygienists with a doctorate in Oral health. During the evaluation period, we have grown from 45.65 full-time equivalents in 2018 to 51.79 in 2020. As part of our multifaceted approach to recruitment, three former PhD students have been recruited as senior lecturers.

For this self-evaluation, it is important to acknowledge that the subject of Nursing has only had one professorship for the main part of the evaluation period. This has resulted in a variety of challenges in relation to the proliferation of the available research program and the construction of active and successful research groups within the program. Subsequently, the main bulk of research produced in Nursing has until more recently mainly grown out of individual PhD projects. It is, however, worth noting that some of these PhD projects have resulted in new important research questions, now explored in externally funded post-doctoral projects. As a remedy for these challenges, the Faculty of Health, Science and Technology, together with the department, made the decision (2019) to strategically support the build-up of a more sustainable and coherent research profile in the subject of Nursing. Part of this strategy included the recruitment of a further four professors in Nursing (2020). Simultaneously, the department encouraged and facilitated for lecturers to take up doctoral studies, and at present six lecturers are completing a PhD. We have also succeeded in securing a researcher in Nursing from the Region Värmland.

For the subject of Oral Health, the department has succeeded in recruiting three lecturers where one is a Reader, which corresponds to 14% of active PhDs in Sweden. As part of the vice chancellor's investment in re-launching the dental hygienist program, two doctoral students were recruited in 2019. In addition, two doctoral students, externally funded by cooperating regions, are now on their way.

Regarding the subject of Public Health, several related challenges are imminent: (i) the only professor will retire within the next five years, (ii) the number of senior researchers in the subject is low and thus (iii) there are few doctoral students and potential post-doctoral researchers. This is likely to severely affect the SELMA study which needs a principal investigator replacement as well as the subject of Public Health in regard to critical mass and the study program offered. Consequently, the department now strategically works on recruiting senior lecturers and professors in Public Health.

3.2. ACADEMIC COLLABORATIONS, NETWORKS AND ENGAGEMENTS

At the department, several academic collaborations, networks and engagements (3.2) are intertwined with our collaborations and interactions with the surrounding community (5). Despite this we have decided to evaluate and present them as separate units.

3.2.1 Nursing Science

In nursing, there are several academic research networks and collaborations conducted, regionally (e.g. Regional Oncological Association), nationally (e.g. Digital Well²), and internationally (e.g. The European Academy of Nursing Science;³ the European Network of Nursing Academies;⁴ and the European Pressure Ulcer Advisory Panel⁵). Several of the more senior and junior researchers also have close academic collaborations with some of the Nordic Countries, mainly Norway, which can be explained by the proximity to the Norwegian border from Karlstad University (about 2 hours). Thus, Nursing has a long tradition of supporting Norwegian HEIs without the entitlement to offer doctoral studies to support their teaching staff towards a PhD. For example, three of the professors in Nursing at the department have joint chairs (e.g. Inland Norway University of Applied Sciences; Østfold University College and Oslo Lovisenberg Diaconal University College in Oslo). One of the Professors in Nursing (J. Nilsson) has, since 2020, been the principal investigator in a larger Erasmus project, titled "Capacity Building in Nursing Education in Indonesia" (external funding for €900 000), including seven Scandinavian Higher Education Institutions together with Indonesia. CABNEI aims to support educators to utilize and implement teaching strategies promoting quality and sustainability in the nursing programs as a means to raise the qualifications of future registered nurses in clinical practice. Besides close Nordic academic research

² <https://digitalwellarena.se/about-digitalwell-arena/>

³ <https://european-academy-of-nursing-science.com>

⁴ <https://en-na.eu>

⁵ <https://www.epuap.org>

collaborations, the researchers in Nursing are additionally engaged in collaborative research projects with Swedish HEIs such as Luleå University, Ersta Sköndal University College and Göteborg University, University of Borås, Jönköping and Dalarna Universities.

3.2.2. Public Health Science

In Public Health Science several research projects are conducted in close collaboration with Region Värmland. Several professionals (e.g., psychiatrists and physicians) from Region Värmland are affiliated with Public Health Science in collaborating on research projects and teaching in our courses. Public Health Science have strong international connections, primarily via the SELMA study (e.g., in large projects funded by Horizon 2020 and US-NIH, see above). SELMA has established an interactive approach in close collaboration with national and international partners. Bornehag is further adjunct professor at Icahn School of Medicine at Mount Sinai (MSSM), NY, USA, a highly ranked medical research institution in the US. PHS has a close collaboration with MSSM regarding the development of advanced statistical models in environmental epidemiology in SELMA and the development of approaches for investigating resilience factors, an area in which MSSM is world leading. Another example is Centre for Injury Prevention and Research in Bangladesh which, together with KAU, has financed a doctoral student who defended his thesis at KAU in 2019. This has led to a continued collaboration which has resulted in an application involving a new study of child maltreatment during Covid-19 in Bangladesh. Researchers are also involved in networks such as Nordic Health Promotion Network and Nordic Association for Prevention of Child Abuse

In terms of collaboration, one partnership has been missing – clinical professionals tied to PHS, acting as experts in medical research questions. Our strategy to counteract this lack has been to affiliate with physician psychiatrists via Region Värmland and Region Örebro/Örebro University. Another aspect concerns collaboration on research applications. While applications related to SELMA are almost always processed in conjunction with other universities, our other research tracks could be further developed in this matter.

3.2.3 Oral Health Science

After grants for “Teaching Sabbatical Fellow” in 2018, our Reader has since 2019 a non-salaried appointment as an associate faculty at the rank of adjunct assistant professor in the Division of Dental Hygiene, Ohio State University. As a result, research projects have been established. Our researchers have been invited as speakers and lecturers at both national and international events and conferences.

Researchers have also academic collaborations in several research projects both regional (Psychiatric care in Region Värmland), and national (School of Health Sciences in Jönköping, Linnaeus University and universities at Linköping, Gothenburg, Malmö and Örebro, The institution of Odontology in Region Jönköping, Social services in Jönköping Community, Orofacial medicine at Skaraborg hospital) and International cooperation (Ohio State University, Boston University, Indiana University Southeast, Leuven University in Belgien, Innlandet University in Norway). Karlstad University has membership in South Africa Sweden University Forum (SASUF), where one OH researcher is involved in a project in cooperation with Malmö University and the University of the Witwatersrand, Johannesburg. Region Värmland is a responsible record holder for a national data register based on a Swedish Quality Registry for dental health care and has since 2008 gathered dental data concerning more than six million patients. The data are automatically extracted from patient dental data electronic records. The database is a unique opportunity for research and has, for example, been used for a master thesis in OH at KAU.

4. RESEARCH AREAS AND RESULTS

In this section we describe research areas and important findings from disciplinary research in the Department of Health Sciences

4.1. NURSING SCIENCE

At DHS research in Nursing is mainly based on the research program: Promoting Health and Quality of Care, and its three overarching research areas (i) Models and Innovations for Safe Care, (ii) Management of Complex Ill-Health Conditions, and (iii) Competence and Professional Development in Nursing. Research within this platform is conducted with a variety of methods (e.g., quantitative, qualitative and mixed method designs)

and comprises, for example, theory and method development, as well as intervention and implementation research. During the evaluation period, the research staff varied, initially consisting of one professor, two Readers, and nine senior lecturers. It is worth noting that the research production in Nursing is reasonably high, particularly considering that staff in general have an overly heavy teaching load throughout the academic year. The undergraduate and master level programs have the largest number of students at the University, and this requires substantial teaching input by all staff in the subject.

Despite the pandemic situation and the enforced remote working from home since April last year, nursing has, among other things, successfully closed a five-year contract with a higher educational institution [HEI] in Norway. The contract mainly focuses on developing a Nordic collaboration with the Norwegian HEIs programmatic platform of research in Nursing focusing on “Continuity of Care”, closely related to one of the themes at Karlstad University, i.e., “Quality of Care”. This collaboration now mainly centres on four different PhD projects (three Norwegian totalling approx. SEK 9 million and one Swedish) for which a Nordic research team is divided into supervisory teams. The projects are all designed within a set framework, namely (i) the MRC framework for complex interventions – to ensure quality in design and methods, (ii) Patient and Public involvement – to set research agendas ensuring high priority research questions, and (iii) EViR – to make justifiable research priorities.

At present, knowledge development in nursing is particularly known, both nationally and internationally, for partaking in instrument development (Nilsson et al., 2018). There is a long tradition and expertise in, for example, using the instrument ‘Quality from the Patients Perspective’ (QPP), originating in Karlstad University and Nursing. QPP nowadays excels with a large number of different versions for use in a variety of care contexts. Other areas are research on palliative care and, for example, the development and importance of contact nurses in oncological care (continuity and quality of care) (Charalambous et al., 2018). Another area in cancer care is the multidisciplinary project (SyCl research group), investigating the relationship between symptom clusters and biomarkers in patients with cancer. Other research focuses on welfare technology, patient safety, e.g. pressure ulcers, missed nursing care and clinical outcomes. Here with a particular interest in healthcare technology in operation rooms (Sving et al., 2020), and pressure ulcers teams. The subject has also had an impact on educational research especially in areas such as peer-learning and development of nursing competency. The latter with the development and usage of the Nurse Professional Competence Scale (NPC - translated into 22 languages) and Ambulance Nurse Competence Scale. Two of the newly recruited Professors are engaged in elderly research such as: (i) research, focusing on older people in need of care or not, and those who provide care. The older persons, next of kin, care students and their learning as well as the management and the organisation of care are included in the research (Claeson et al., 2020), and (ii) older people’s care outside the hospital context in relation to the fundamentals of care, continuity and quality of care, frailty and functional decline. Hence, five doctoral students are engaged in these two professors’ research areas. However, all in all seven doctoral students in Nursing are conducting their PhD projects in elderly research. The majority of staff is also regularly engaged in third mission tasks engaging in op-ed articles, editorials and current issues.

Concrete examples – outcomes during the period 2018–2020:

- External funding 2 year multicentre project – AFA Insurance.⁶ Principal Investigator Professor M Larsson for the research group “Quality Care Near the End of Life” (QCNEoL). Exploring impact on the palliative care working environment during C-19 in relation to quality of care and health care professionals health.
- QCNEoL research group has at present two ongoing PhD projects, (i) family carers preferences for support in relation to caring for family members at home at the end-of-life and home death and (ii) young people’s needs and preferences for support when living with a parent with incurable cancer.
- European multi-centre study cohort study – PUCOVID: C-19 Pressure Ulcers Consortium. Consortium member Professor C. Bååth. Investigating pressure ulcer incidence among European patients with C-19 at intensive care units compared to patients at intensive care without C-19. At present, this study is at the data collection stage.
- CoNCoM – Cross-Sectional study design. Principal Investigator Professor M. Larsson. This project explores professional competence and factors of importance for the specific function as a contact nurse. One paper under review, three papers in manuscript.

⁶ <https://www.afaforsakring.se/andra-sprak/engelska/>

- QOPCoN, Externally funded – Cross-sectional Design. Principal Investigator Professor M. Larsson. This project investigates the patients' perceptions of the care received from the contact nurse, as well as the organisational prerequisites for the contact nurses. Two reports [in Swedish], one paper under review, four papers in manuscript. This project is ongoing and one RA will be recruited in spring 2022.
- The Nurse Professional Competence Research Project (Includes several Swedish and international HEIs such as in the UK and Australia). Principal Investigator Professor J. Nilsson. The aim of the research conducted by this group is to contribute to increased knowledge about self-reported professional competence among student nurses and registered nurses, and thereby enhancing the quality of nursing education and optimizing the quality of nursing care. Eight papers published within the time frame of this self evaluation.

4.2. PUBLIC HEALTH SCIENCE

Public Health Science is interdisciplinary and includes researchers and teachers in several public health areas. The focus is on children's health and development including two overarching research areas: environmental medicine and social medicine. We conduct epidemiological research with quantitative as well as qualitative designs. During the period of 2018–2020, the staff consisted of one professor, three Readers, three senior lecturers, and five doctoral students. In addition, we had three affiliated researchers, one psychiatrist and one physician from Region Värmland and Örebro University, and one from Uppsala University in experimental toxicology.

The largest and most long-standing project in our discipline is SELMA, representing the environmental medicine area (PI C-G Bornehag). The SELMA study started in 2007 and follows more than 2 000 mother-child pairs from early pregnancy over birth and upwards in the life of the child. The overall aim of SELMA is to investigate the importance of early life exposure to risk and resilience factors for children's health and development in four domains: sexual development, metabolism and growth, neurodevelopment, and immunological diseases. SELMA is further a cornerstone in three Horizon 2020 projects (EDC-MixRisk, ENDpoiNTs, ATHENA) and in two US-NIH projects (PRIME and A-PED), and the basis of a Swedish Formas project (RACH-Mix).

The second research strand, social medicine, includes research on child mental health and child vulnerability and maltreatment. One of our researchers, C. Jernbro, is (since 2020) the PI for the on-going *National survey on child maltreatment*, carried out on behalf of the government on a regular basis since the year 2000. A new national study, including a national school-based survey, a questionnaire and interview study with parents, has been planned for the year 2020 and will be carried out 2021/2022, aiming at examining the prevalence of various forms of violence against children, and risk and protective factors for violence. Further, during 2019, a project called *Creating Good Life Skills*, commissioned by Länsförsäkringar and Mind, and in collaboration with Malmö University, started (PI L.Beckman). The aim is to get more knowledge of adolescents' and professionals' views on mental health and life skills among adolescents, the challenges they face, and the skills they need to cope with everyday life. Another project at the beginning of the Covid-19 pandemic included *older people's experiences of compliance with recommendations and isolation* (PI L.Beckman). Over 1 800 participated in a questionnaire survey and 41 were interviewed. Further, one project concerned suicide, and together with four universities in the USA, a project is under way to prevent suicide in people with mental illness. The study (*Suicidal Treatment Alternatives for Teens (START)*) started in 2019 and data were collected in the USA. The study recruited people with suicidal thoughts into two randomized groups, treatment as usual or interventional treatment. The goal is to gain evidence to form new clinical guidelines (PI D. Lin).

A few examples of concrete outcomes during the period 2018–2020:

- The SELMA study is the basis for more than 60 peer-reviewed articles and around 10 articles in pipeline (35 peer review articles during the period 2018–2020), three completed PhD theses and five PhD works-in-progress, and collaborations with more than 30 national and international partners in Europe, US, China, and Australia. Currently, SELMA is the basis for more than five international project proposals under review in Sweden, the EU, and Canada. The principal investigator (PI) of the SELMA study, CG Bornehag, is on Stanford University's list of the world's top 2% scientists in 2020 and 2021.⁷
- With SELMA as a base, we have a close collaboration with Uppsala University in environmental toxicology (in-vitro models) with focus on epigenetic mechanisms as a potential mediator for how the environment

⁷ Baas, Jeroen; Boyack, Kevin; Ioannidis, John P.A. (2021), "August 2021 data-update for "Updated science-wide author databases of standardized citation indicators"", Mendeley Data, V3, doi: 10.17632/btchxktyw.3

impacts on human health and development (Prof. Joelle Ruegg at Uppsala University, environmental toxicology is affiliated with PHS). Our findings aim at developing new biomarkers and establish knowledge on biological mechanisms and pathways which are important for proper risk assessment and risk governance.

- The maltreatment surveys are government assignments, and they form the basis for strategies in the area of violence against children. There is now a proposal for a national strategy for preventing violence against children: <https://www.regeringen.se/rattsliga-dokument/kommittedirektiv/2021/05/dir.-202129/>
- The results from Creating Good Life Skills were spread nationally via two reports and also presented to authorities, e.g., the Public Health Agency of Sweden, and Almedalsveckan
- Public Health Science is strongly in line with Karlstad Universities' strategies and profiling of 2019-2023 (C2018/313). Among the six strategic goals, some aspects might be particularly emphasized and mentioned in relation to our research: Firstly, our research is strongly integrated with our education. For a more detailed description of this, please see section 5. During the years 2018–2020 we submitted approx. 35 applications to national, European and American funding bodies. Most of them were in collaboration with other universities. The research production in PHS is high in relation to the number of researchers. We publish in high-ranked journals and the publications are cited quite well (see section 7 more for details).

4.3. ORAL HEALTH SCIENCES

Based on the strategic start of a new dental hygienist program in 2019, a plan for recruiting researchers and PhD students was made. As a result, three assistant professors (PhD), of which one is a Reader and two PhD students were recruited. Two external Odont Dr (dentists) are also connected as adjunct and affiliated lecturers. One more assistant professor was recruited at the end of 2020. The discipline of Oral Health is an upcoming research area at the department, in which research projects and articles have been published increasingly since 2019.

Research in Oral Health covers several research areas in line with national and international knowledge development in dental care and is characterised by the importance of health factors for oral health in different social groups and throughout the life cycle, such as associations between socioeconomic and psychosocial factors and oral health, general health (diabetes, sleep apnea, head and neck cancer) and oral health, cooperation strategies of oral health in elderly care and health promotion efforts at dental public care clinics.

The profile area is defined by a public health perspective and promotes transdisciplinary cooperation at local, national and international levels. Research cooperation involves other disciplines, such as odontology, medicine, nursing, occupational therapy, public health science, gerontology and psychology, which show the broad contribution to knowledge development in oral health research. Apart from research publications, oral health researchers have published text books in Gerodontology and Dental Public Health.

Examples of concrete outcomes during the period 2018–2020:

- **ORAL HEALTH AMONG CHILDREN AND ADOLESCENTS**

Inequalities in dental health among children in families that are socioeconomically weak are studied both through national register data and empirically. It is a multicenter and multidisciplinary project involving oral health, odontology and social work, funded by The National Board of Institutional Care (*Statens institutionsstyrelse*, or *SiS*), an independent Swedish government agency that provides individually tailored compulsory care for young people with psychosocial problems and for adults with substance abuse.

- **ORAL HEALTH AMONG OLDER PEOPLE**

“Healthy Ageing” – Through both empirical and national quality register data, the project studies oral health in combination with older people’s quality of life, as well as in relation to physical and psychosocial factors among the ageing population. The project has resulted in both several research articles and presentations at national and international conferences. The project involves national as well as internal cooperation. Intervention projects in digital technology with the aim of providing support for older people’s oral health is a PhD project, involving a multidisciplinary research team.

- **ORAL HEALTH AMONG ADULTS**

Empirical studies of support for the maintenance of good oral health among people with mental illness is a PhD project, involving a multidisciplinary approach, an international research team and cooperation with PsykosR (Swedish national network for psychosis care) and is an important and unique link between the research team, the heads of operations, staff and people with severe mental illness.

The OSA project: Studies on oral health and sleep apnea are conducted from both professional and patient perspectives. The research is performed through national and international cooperation, and is part of a PhD thesis as well teaching material for dental hygienist students.

DOiT (Dental Organisation in Transition), physical and psychosocial health among dental professionals, is a national and international cooperation, which has been presented in several international research journals and at conferences.

5. COLLABORATION AND INTERACTIONS WITH THE SURROUNDING COMMUNITY

Collaborations and interactions in the area of health and oral care services are common features of our activities, and schools, authorities and voluntary organizations in the surrounding community are regular partners of the research conducted at the Department of Health Sciences. We aim to produce research that is useful clinically and in other contexts operationally.

5.1. NURSING SCIENCE

The degree programs (BScN/MNSc) and our research are also marked by close relations with the surrounding community and Region Värmland, the county hospitals and with the sixteen municipalities in Värmland. In some of the degree programs, close collaborations are more national, e.g., specialisation in operating theatre RN and district nurse, and reaches beyond the county of Värmland as part of a purposeful strategy for quality development. Nursing science displays a high degree of international engagements and collaborations. This is true of students and teachers academic exchange programs (e.g. India, South Africa and Belgium) as well as for educational research collaborations (e.g. Capacity building in nursing education in Indonesia – CABNEI). In the multidisciplinary Graduate School of Health where the PhD students in Nursing, Oral Health and Public Health are enrolled, nursing is an active partner and the chair of the school is at present one of the Professors of Nursing. The graduate school offers PhD courses, among which Research Methodology in Health Service Research, Health from an Interdisciplinary Science Perspective, Systematic Literature Reviews within Health Science and Grounded Theory are highly attractive to students. These courses are good examples of national and international collaborations as they offer a mix of local teachers (all active researchers in the programmatic research milieu) and well-known international colleagues in the course areas. During the last 24 months, one new PhD course has been developed and eight new PhD nursing students have been admitted. Hence, it is fair to state that PhD education has increased both in extent and in quality. During 2020 alone, Nursing Science was mentioned in relation to research approximately 20 times in public media.

5.2. PUBLIC HEALTH SCIENCE

Researchers in Public Health Science are active in national and international collaborations in different projects (see above). All research conducted is published in international open-access peer-reviewed journals, and disseminated at international conferences, both via keynote speakers as well as oral or poster presentations, and reported to and discussed with governmental authorities. The researchers frequently appear in the media, and specifically CG Bornehag's research was referred to nearly 70 times in the media during 2020, nationally as well as internationally.⁸ Our researchers also participate in educational settings, and as authors of popular science texts.

Collaboration is one of the cornerstones in public health, and our researchers have extensive partners that facilitate conducting and disseminating research. During the period 2018–2020 there were ongoing collaborations with the Children's Welfare Foundation (Stiftelsen Allmänna Barnhuset), which has financed part of Jernbro's research for several years. An important task in that collaboration is to disseminate research results to the public through popular science reports and seminars. In 2020, two of our researchers were commissioned by Länsstyrelsen Örebro to conduct a literature review concerning universal parental support programs (Persson, Jernbro), and collaborated with The Swedish National Agency for Education (research

⁸ <https://www.news24.com/health24/Parenting/Pregnancy/News/this-common-chemical-may-be-tied-to-language-delay-in-kids-20181119>

monitoring health-promoting perspective). In another collaboration, initiated by the municipality, PHS was invited to develop a tool for schools to evaluate their outdoor environments. PHS is also active in SWACCS (Swedish Academic Consortium on Chemical Safety), which is a cooperation between scientists at 13 Swedish universities, offering academic support to the pursuit of a chemical-safe world. Bornehag is in the executive group (SWEG), and responsible for the research seminar program

One example of research result dissemination was a seminar series held at the local museum (Värmlands Museum) where each researcher presented issues close to their hearts for an hour. Such active way of disseminating research effectively contributes to knowledge development and lifelong learning.

5.3. ORAL HEALTH SCIENCE

In 2020, a cooperation agreement was entered between the Public Dental Service, Region Värmland and Karlstad University and the first Academic Public Dental Clinic (Swe. Akademisk Folktandvårdsklinik, AFK) in Sweden was launched in Karlstad. AFK, which is located at the Public Dental Service, Kronoparken, is in close proximity to the university. Through AFK, strategies for development and clinical research activities have started. The management board, responsible for overriding issues, consists of representatives from the region and the university. A working council, consisting of representatives from dental care and Kau, works with strategies for collaborative research and education, for the benefit of both educational and professional development. An academic clinical assistant professor (ACAP) is responsible for the overall quality on behalf of Kau. In order to collaborate with the dental care section, a program agreement has also been drawn up between several regions and Kau, for the purpose of securing the scope and quality of students' external clinical placement.

Oral health researchers are involved in expert assignments for The National Board of Health and Welfare's national guidelines for dental care, for example, and for Swedish Higher Education Authority and The National Professional Association of Dental Hygienists. The researchers regularly appear in the media, in educational settings, and as authors of popular scientific texts.

6. INTERACTIONS BETWEEN RESEARCH AND EDUCATION

6.1. NURSING SCIENCE

Research in nursing resonates reasonably well with Karlstad University's strategies and profiling (C2018/313), particularly regarding prominent areas. All researchers in Nursing have an active engagement and a substantial part of the teaching in a wide variety of the degree program (BScN/MNSc) courses, regardless of level, while also acting as examiners. One example of research and education interrelation is the person-centered pedagogical model used in clinical nursing placements, which has been developed and researched alternately for the last 20 years. This model is widespread among HEIs in Sweden and close collaboration between academia and research is taking place with Malmö University, for example. Under this heading, it is also of importance to acknowledge that several of the vital research areas in nursing, such as palliative care, symptom management, wound management (pressure ulcers) and contact nurses in cancer care, are the core of several courses (n= 5, 7.5 ECTS each) as well as of undergraduate and master-level programs in Nursing. These attractive courses are taught by active researchers in the relevant area, who are heavily engaged in the continuous development, administration, management, examination and teaching. Thus, the most recent knowledge derived from the research conducted in these areas is therefore a constant part of these courses offered. Some of this knowledge is also conveyed by the nursing researchers in their endeavor to write, contribute and edit textbooks for nursing students at all university levels as well as to partake in important development of national and international guidelines (such as on pressure ulcers by Professor C. Bååth and in nutritional care and health care promotion in cancer care by Professor M. Larsson).

6.2. PUBLIC HEALTH SCIENCE

A central part of the students' learning process is the connection between education and research. PHS is historically a research subject, but has in recent years increased its course activities dramatically. In 2011, PHS

started a MS program based on our research. During the last five years, 18 courses at undergraduate level and 6 at master level have been developed. The connection between research and teaching is high. Most teachers have a background in PHS, have at least a PhD degree and are active researchers in different projects and have teaching assignments at Swedish Universities such as Göteborgs U, Lund U, Örebro U, KI, Stockholm U, and Uppsala U. PHS is also active in the Graduate School of Health where the PhD students in Nursing, Oral Health, and PHS are enrolled (for a more detailed description of the Graduate School, see Nursing).

The current PHS research tracks are, for example: health promotion, vulnerability and child maltreatment, mental health, environmental chemicals and health. Overall, the connection between PHS's courses of study and research is strong. It is also something that students usually appreciate, which is visible in various program evaluations.

In each course, experts and also researchers in relevant course areas are invited to present examples from the latest research in the field and, in relation to education, to deepen the students' learning process. In the autumn of 2019, for example, PHS invited to an open seminar for students at undergraduate and master level as part of the course "Environmental chemicals and health with a focus on children", where leading American researchers together with researchers from PHS presented a series of mini-lectures with the latest research findings in this area (based on data from own research). In addition, PHS conducts most courses in research methods and here the teachers' research background is crucial to giving courses with high scientific methodological quality. Regarding, for example, "Qualitative scientific method" both students at advanced level and at doctoral level study together (but assessed on different learning objectives), which is a rewarding meeting between students and doctoral students. This leads to in-depth seminar discussions that link education and research. This is also an element that gives students at the master level the opportunity to gain insights into future career opportunities in research in the field of public health.

PHS is constantly relevant from a societal perspective and research findings are continuously developed, among other things with the help of PHS's own researchers. It is also part of the development work that is done in education and in course work to ensure ongoing research updates. Likewise, as a rule, there are always research articles and/or research overviews in the course literature, or as additional course literature. Thus, PHS has a tradition of always weaving research articles into courses, which are either processed in lectures, group work, assignments and/or seminars. Several assignments that have previously been reported on are also about reviewing research articles and presenting them at an examining seminar. Most of the visiting lecturers at PHS are PhDs and present knowledge and research from their special field, which further strengthens the scientific basis of teaching (such as health care clinics).

We have further published Swedish and international book chapters in student literature, for example, a chapter in the book "Evidence-based student health".⁹ One example when education has stimulated research is an evaluation of a flipped classroom approach.¹⁰ Challenges here relate primarily to what we mentioned above: the lack of clinical lectures to help teach in our programs. In 2020, one of our Readers (a psychiatrist) left and moved to Australia, which affected the subject's overall expertise.

6.3. ORAL HEALTH SCIENCES

Through the collaboration agreement on AFK, strategies for interactions with research and education is a main goal aiming to increase the quality of courses in the dental hygiene program. An example is to implement research methods in quality improvement efforts within dental health care in clinical courses. An evidence-based model for supervising is produced by the ACAP to be used for both supervisors at AFK and for supervisors at the Public Dental clinics. The ACAP at the dental hygienist program is responsible for all clinical courses aiming to strengthen the link between education and evidence-based research and methods. Mandatory courses in research methods and theory are also a part of the dental hygiene program. The students also draw up a research plan that forms the basis for a degree project in oral health. The students are encouraged and given the opportunity to take part in the existing oral health research projects. Researchers in oral health are responsible for and plan all research-related courses and are also. Researchers from both oral health and other disciplines (odontology, medicine, public health, psychology etc.) are involved in seminars related to both clinical courses at AFK and theoretical courses.

⁹ **Att förebygga olycksfall, mobbning och våld** (2017). Milerad, J & **Beckman**, L i Evidensbaserad elevhälsa (ed.) Milerad & Lindgren, p. 397-416

¹⁰ Holm, P & **Beckman**, L. Flipped or traditional in online teaching? Two different strategies to handle teaching in nursing education during the COVID-19 pandemic. Under review, revise, in International Journal of Nursing Education Scholarship.

By using student literature written by the oral health researchers at the department, research contributes to the quality of the dental hygienist courses but also for other programs at the department as the subjects are also related to nursing and public health areas (gerontology, public health and domestic violence). OH is also involved in a multicenter and multidisciplinary research project in health promotion in higher education.¹¹

Based on a research collaboration at the Ohio State University (since 2019), a multicenter research project has started for developing knowledge in oral health and sleep apnea involving dental hygiene students at three Swedish universities (Karlstad, Jönköping, Kristianstad), one in Norway (Inland Norway University of Applied Sciences) and two universities in the USA (Ohio State University, Hocking College). Centre for Teaching and Learning (UPE) at Kau supports and stimulates the development of university teachers' teaching expertise with evidence-based pedagogical tools both for campus and distance learning.

7. PUBLICATION LIST

- Tanner, E. M., **Hallerbäck, M. U.**, Wikström, S., Lindh, C., Kiviranta, H., Gennings, C., & **Bornehag, C. G.** (2020). Early prenatal exposure to suspected endocrine disruptor mixtures is associated with lower IQ at age seven. *Environment international*, 134, 105185. *Impact factor 9.6, 55 cites*
- Wikström, S., Lindh, C. H., **Shu, H.**, & **Bornehag, C. G.** (2019). Early pregnancy serum levels of perfluoroalkyl substances and risk of preeclampsia in Swedish women. *Scientific reports*, 9(1), 1-7. *Impact factor 5.1, cites 29.*
- Bornehag, C. G.**, Lindh, C., Reichenberg, A., Wikström, S., Hallerback, M. U., Evans, S. F., ... & Swan, S. H. (2018). Association of prenatal phthalate exposure with language development in early childhood. *JAMA pediatrics*, 172(12), 1169-1176. *Impact factor 10, cites 36.*
- Gustavsson, J., & **Beckman, L.** (2020). Compliance with recommendations and mental health consequences among elderly in Sweden during the initial phase of the COVID-19 pandemic—a cross sectional online survey. *International journal of environmental research and public health*, 17(15), 5380. *Both authors contributed equally. Impact factor 3.39, 41 cites*
- André Kramer AC**, Pivodic A, Hakeberg M, Östberg AL. Multilevel analysis of dental caries in Swedish children and adolescents in relation to socioeconomic status. *Caries Res* 2019;53:96-106.
- Lindmark U, Jansson H, Lannering C, Johansson L. Oral health matters for the nutritional status of older persons—A population-based study. *J Clin Nurs*. 2018 Mar;27(5-6):1143-1152.
- Charalambous A, Wells M, Campbell P, Claire Torrens C, Östlund U, Oldenmenger W, Patiraki E, Sharp L, Nohavova I, Domenech-Climent N, Eicher M, Farrell C, **Larsson M, Olsson C**, Simpson M, Wiseman T & Kelly D. (2018). The interventions led or delivered by cancer nurses: A scoping review of trials. *International Journal of Nursing Studies*. 86, 36-43. *Impact Factor: 3.78*
- Claeson, M., Jonsson, L-L., Lindberg, E., & **Josefsson, K.** (2020). What implies registered nurses' leadership close to the older adult? A systematic literature review. *BMC Nursing*, 19, 30. doi.org/10.1186/s12912-020-00413-1. *Impact Factor: 2.28*
- Nilsson J, Engström M, Florin J, Gardulf A, Carlsson M. (2018). A short version of the nurse professional competence scale for measuring nurses' self-reported competence. *Nurse Education Today*, 20, 71:233-239. *Impact Factor: 3.44*
- Sving E., Bååth C., Gunningberg L & Björn C. (2020). The experiences of operating room teams working with real-time feedback of interface pressure to prevent pressure injuries- A feasibility study. *Perioperative Care and Operating Room Management* 20, 1-8. *Impact Factor: 1.21*

¹¹ **Lindmark U.**, Ahlstrand I, Ekman A., Berg L., Hedén L., Källstrand J., Larsson M., Nunstedt H., Oxelmark L., Pennbrant S., Sundler A., Larsson I. Health-promoting factors in higher education for a sustainable working life - protocol for a multicenter longitudinal study. *BMC Public Health* (2020) 20:233



The Department of Health Sciences

BACKGROUND DATA

Periodic Research Review

INTRODUCTION

The purpose of the background data is to provide an overview of the evaluation unit, the Department of Health Sciences, regarding: staff, economy, research funding, internationalisation, bibliometrics, collaborations and utilization of research for the period of 2018-2020. Details regarding data source or possible deviation will be stated in the individual figure text.

STAFF

Table 1.1. Staff via category, full-time equivalents (FTE) and FTE distribution between research and teaching.

The table only includes research staff employed at the evaluation unit. In cases where staff is not employed at the evaluation unit (a research centre and targeted initiative), an account string is used at the evaluation unit to identify individuals who are part of the unit. Staff categories, separated by gender, that are included in the table are lecturers, senior lecturers, professors, researchers, career-development positions and visiting researcher fellows.

2020

POSITION	GENDER	FTE	PROPORTION TEACHING	PROPORTION RESEARCH
Adjunct teacher	M	0,01	100	0
Professor	F	3,15	56	44
Professor	M	0,99	20	80
Lecturer	F	24,98	95	5
Lecturer	M	4,00	87	13
Senior lecturer	K	15,96	83	17
Senior lecturer	M	2,70	83	17
TOTAL		51,79	87	13

Source: The personal administrative system, Primula

2019

POSITION	GENDER	FTE	PROPORTION TEACHING	PROPORTION RESEARCH
Professor	F	0,80	23	77
Professor	M	0,89	3	97
Senior professor	F	0,14	32	68
Lecturer	F	22,23	98	2
Lecturer	M	3,66	80	20
Senior lecturer	F	12,48	86	14
Senior lecturer	M	3,00	75	25
Adjunct senior lecturer	F	0,03		100
TOTAL		43,23	88	12

Source: The personal administrative system, Primula

2018

POSITION	GENDER	FTE	PROPORTION TEACHING	PROPORTION RESEARCH
Professor	F	1,41	54	46
Professor	M	0,98	21	79
Senior professor	F	0,16	8	92
Lecturer	F	23,53	98	2
Lecturer	M	3,67	80	20
Senior lecturer	F	12,50	90	10
Senior lecturer	M	3,23	82	18
Adjunct senior lecturer	F	0,16	0	100
TOTAL		45,64	90	10

Source: The personal administrative system, Primula

Table 1.2. Career-development levels among teachers, number of full-time equivalents

	PROPORTION TEACHERS WITH A COMPLETED PHD	PROPORTION OF READERS AMONG SENIOR LECTURERS
2020		
Female	47%	25%
Male	51%	66%
TOTAL	48%	32%
2019		
Female	43%	27%
Male	52%	70%
TOTAL	45%	34%
2018		
Female	41%	28%
Male	54%	62%
TOTAL	43%	34%

Source: The personal administrative system, Primula

THIRD-CYCLE STUDIES

Table 2.1. Doctoral students

ADMISSION SUBJECT	GENDER	YEAR OF ADMISSION	STUDY ACTIVITY AUTUMN TERM 2020
Public Health Science	F (I)	2018	50%
Public Health Science	F	2015	100%
Public Health Science	F	2019	80%
Public Health Science	F	2020	8%
Nursing Science	F (I)	2017	52%
Nursing Science	F (I)	2020	33%
Nursing Science	F (I)	2016	80%
Nursing Science	F	2018	80%
Nursing Science	F	2018	80%
Nursing Science	F	2018	77%
Nursing Science	F	2012	41%
Nursing Science	M	2015	48%
Nursing Science	M	2018	63%

Industrial/external doctoral students is marked with (I).

Source: Ladok

Table 2.2. Graduate licentiate and doctoral students separated by gender

DOCTORAL DEGREE	GENDER	2018	2019	2020
Public Health Science	F	2		
Public Health Science	M		1	
Nursing Science	F	2	3	1
Nursing Science	M			1
TOTAL SUM		4	4	2

Source: Ladok

FINANCIAL RESOURCES

Table 3.1 Profit and loss statement for research per year

Amounts in SEK 1 000

	2018	2019	2020
REVENUE			
Direct government funding ¹	9 518	10 259	11 347
External funding ²	7 799	7 071	5 207
Inter-company revenue ³	61	914	2 954
REVENUE TOTAL	17 378	18 244	19 508
EXPENDITURE			
Staffing costs			
Salaries researchers and teachers	-8 561	-9 097	-9 983
Remunerations	-419	-422	-205
Salaries administration and technical staff	-50	-157	-293
Other staff costs	-187	-168	-17
Staffing costs total⁴	-9 217	-9 844	-10 497
Other operating expenses			
Other operation expenses ⁵	-1 219	-1 058	-714
Inter-company costs and expenses			
Inter-company costs and expenses ⁶	-6 215	-6 407	-5 980
EXPENDITURE TOTAL	-16 651	-17 309	-17 191
TRANSFERS			
Funds for financing grants	85	-	923
Grants paid	-85	-	-923
Transfers Total	-	-	-
SUBTOTAL	727	936	2 317

Source: Raintance

¹ Funding directly allocated to the university by the Swedish government.

² Includes revenue from fees, other reimbursements and funding. Funding which can include grants from Councils, other public research funding agencies, municipalities, regions and research foundations.

³ Inter-company transactions includes, for example, grants and/or compensations from other parts of the university or from the relevant audit unit as well.

⁴ Staffing costs mainly refer to costs for personel who receive salary from the relevant audit unit.

⁵ Other operation expenses can include, materials, costs for hired expertise, other consultats, travel costs, costs for premises of campus, depreciation, etc.

⁶ Includes, for example, inter-company staff costs, internal room rent for lecture halls, laboratories, offices and other intercompany expenses such as indirect costs for the faculty and university levels, printing and copying costs etc.

Table 3.2. Research funding sources separated by amounts granted per funder and year(SEK 1000)

FUNDER	2016	2017	2018	2019	2020	2021	2022	TOTAL AMOUNT GRANTED
Research Councils ¹	-	-	3 000	3 000	3 000	3 000	-	12 000
Vinnova - Sweden's innovation agency ²	-	-	-	200	200	200	-	600
County Administrative Board Örebro ³	-	-	-	-	360	-	-	360
Swedish Agency for Health and Care Services Analysis ⁴	-	-	560	-	-	-	-	560
Foundations ⁵	-	-	-	100	-	-	-	100
Other NP organisations ⁶	-	350	350	350	-	-	-	1 050
Other NP organisations ⁷	-	-	751	140	-	-	-	891
Other NP organisations ⁸	-	-	100	-	-	-	-	100
Region Örebro ⁹	-	-	-	-	30	-	-	30
Region Värmland ¹⁰	-	64	448	-	-	-	-	511
Region Värmland ¹¹	-	-	-	219	381	300	-	900
Region Värmland ¹²	525	525	525	-	-	-	-	1 575
Region Värmland ¹³	525	525	525	525	525	-	-	2 625
Region Värmland ¹⁴	600	1 000	650	-	-	-	-	2 250
Region Värmland ¹⁵	-	-	585	-	-	-	-	585
Region Värmland ¹⁶	-	-	510	-	-	-	-	510
Region Värmland ¹⁷	-	-	617	-	-	-	-	617
Region Värmland ¹⁸	-	-	669	-	-	-	-	669
Region Värmland ¹⁹	-	-	401	-	-	-	-	401
Region Värmland ²⁰	-	-	-	-	149	-	-	149
Region Värmland ²¹	-	-	-	-	492	38	-	530
Swedish companies ²²	-	-	-	-	100	-	-	100
Foreign NP organisations ²³	25	25	25	-	-	-	-	75
Foreign NP organisations ²⁴	70	70	70	70	-	-	-	280
Foreign NP organisations ²⁵	-	70	70	70	70	-	-	280
Foreign NP organisations ²⁶	-	-	-	225	-	-	-	225
Foreign NP organisations ²⁷	-	-	-	-	394	394	394	1 182
EU ²⁸	-	-	25	-	-	-	-	25
EU Framework Programme ²⁹	-	-	-	200	200	200	200	800
EU Framework Programme ³⁰	-	-	-	85	90	90	95	360
TOTAL AMOUNT GRANTED /YEAR			9 882	5 184	5 991			

Source: Raindance

Projects

¹ Rachmix

² DWA Vinnväxt-OMV

³ Översikt föräldrastöd i skolan

⁴ Barn och ungdomsvård

⁵ Almäna Barnhuset elevhälsa

⁶ Flowspport

⁷ Riksidrottsförbundet nyanlända

⁸ Can sociala relationer

⁹ I Rystedt Region Örebro

¹⁰ Digitalwell del 1 omv

¹¹ Digitalwell fas 2 omv

¹² Liv- doktorand omvårdnad

¹³ Liv-doktorand omvårdnad 2016

¹⁴ Livprofessorstöd omvårdnad

¹⁵ Livssymtomkluster cancerpat.

¹⁶ Livklinisk interventionstudie

¹⁷ Liv-doktorand Young Rural People17

¹⁸ Liv-doktorand Selmastudie

¹⁹ Livprofessorsrekr. Omv

²⁰ ID 934197 Maria Larsson

²¹ RV Kau K Ängeby 940228

²² LF uppdrag via Malmö univ

²³ Dok. Anette Kleppang

²⁴ Dok. Marie Dahlen

²⁵ Dok. Toril M Nysäter

²⁶ Prime

²⁷ PCORI

²⁸ Nätverk nord 2018

²⁹ Endpoints

³⁰ Athena

APPLICATION STATISTICS

Table 4.1. Applications statistics for the number of applications, amounts applied for and granted, and approval rate, separated by year

YEAR	NUMBER OF APPLICATIONS	AMOUNT APPLIED (SEK 1000)	AMOUNT GRANTED (SEK 1000)	SUCCESS RATE %
2018	22	62400	7500	12%
2019	14	77000	1400	0,02%
2020	16	38000	4500	12%

Source: Data of submitted applications are collected from the University's internal Form for external funding and later merged with data of granted applications.

RESEARCH PRODUCTION (BIBLIOMETRIC DATA)

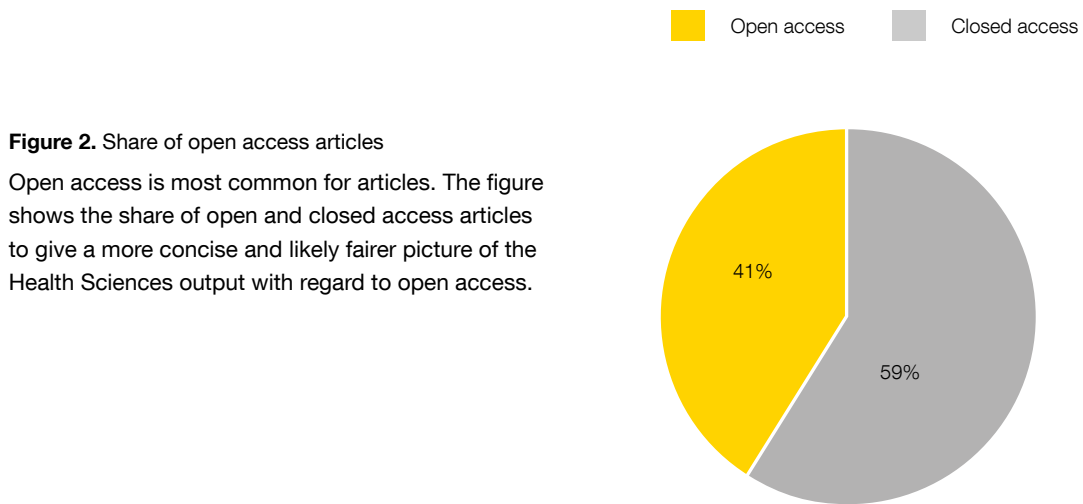
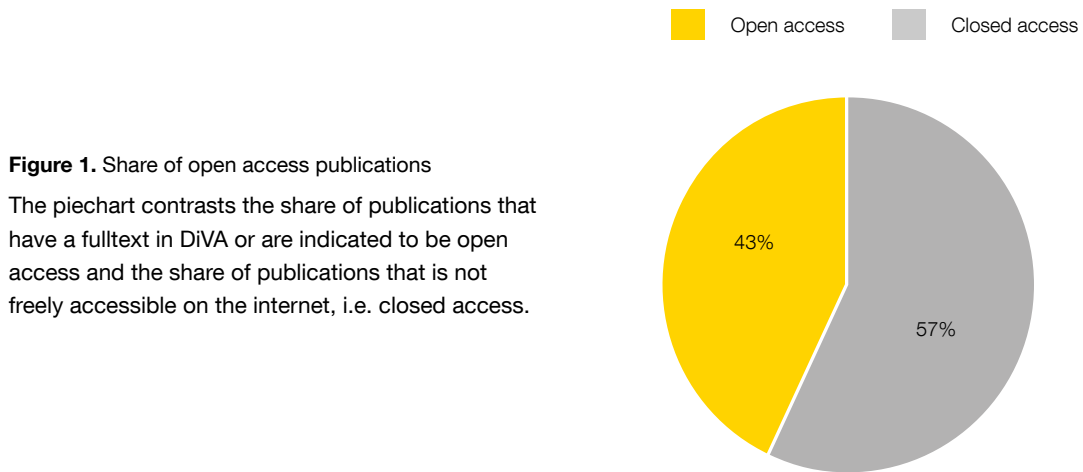
Table 5.1. Publications in DiVA per type of publication and type of content

	PEER-REVIEWED	OTHER ACADEMIC	OTHER (POPULAR SCIENCE, DISCUSSION, ETC.)	TOTAL
Article in journal	127	3		130
Article, review/survey	1			1
Article, book review	1			1
Doctoral thesis, comprehensive summary		5		5
Chapter in book	1	1	1	3
Conference paper	2			2
Report		1		1
Other	1			1
TOTAL	133	10	1	144

The data was obtained from Karlstad Universities repository DiVA (Digital Scientific Archive) by means of a search for all publications from Health Sciences during the years 2018 - 2020. Publication subtypes editorial, abstract and presentation were removed from the analysis.

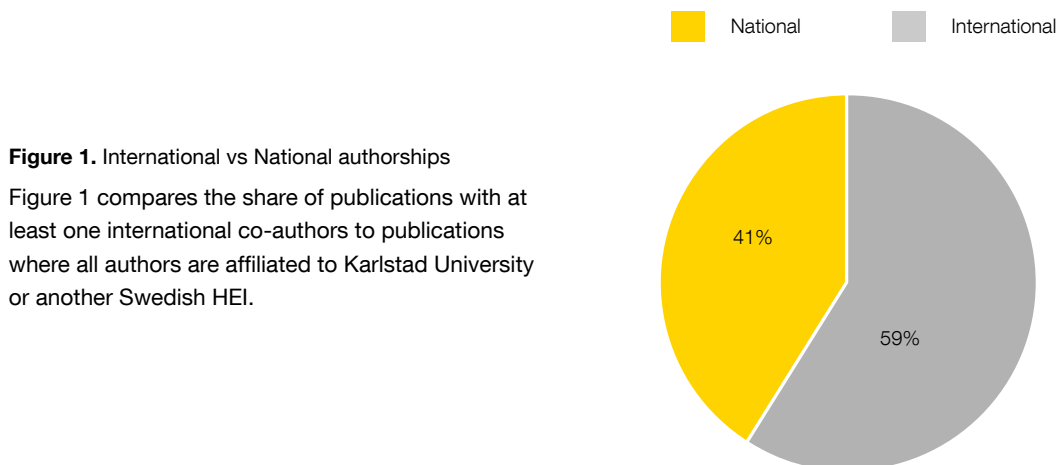
Source: DiVA

Table 5.2. Share of publications published with open access in DiVA



INTERNATIONALISATION

Table 6.1. Co-publications with international researchers.



COLLABORATION AND APPLICATION OF RESEARCH FINDINGS

Table 7.1. The number of partners in ongoing research projects divided into private organisations and public organisations.

There are no collective records of partners in ongoing projects for the evaluation unit for the period of 2018-2020. The design of the software system and routines for register the data is currently under development.

Table 7.2. Number of evaluated innovative ideas per employee. Number of innovative ideas that have received funding. Number of registered intangible assets (patent, trademark, design)

There are no records of innovative ideas being evaluated or receiving funding for the evaluation unit for the period 2018-2020.

Note: The origin of data are based on the annual operations of the Innovation Office Fyrklöver. Innovative ideas could be a product, a method or a service that can be useful in the wider society in the form of start-up companies, licensing, etc.

Information on research collaboration is also partly reported in Table 2.1 (number of industry/external doctoral students in third-cycle studies), and in the Self-reflection.

The Background data report is produced by the Periodic research review's administrative Support group; Sofia Andersson, Charlotte Månsson, Karin Brattfjord, Lotta Utterberg, Nadja Neumann och Patrik Bångerijs.

December 2021

Assessment Report

Department of Health Sciences Periodic Research Review

Summary

This review is based on limited background data, Department Self- Evaluation, and presentations during a virtual visit on 10th and 11th February 2022.

We formed the impression that the Department is committed to producing high quality research, which varied between the three disciplines. Research Council income or similar is limited and a grant application success rate of eight percent is lower than expected. International collaboration is impressive, and advantage has been taken of European Union funding streams, which is to be commended. In terms of publications the bibliometric data that we received was limited to number and type of publication. The department reported thirteen full time equivalent (FTE) research active staff, which suggests an average publication rate of three publications per FTE, which is a reasonable output.

In terms of recruitment and research capacity building there are challenges. There are no post-doctoral positions, and it is difficult to recruit quality research active staff, given as far as we know teaching is in Swedish, which may limit international applications. There are thirteen doctoral candidates, nine in Nursing, six of whom are members of teaching staff registered part-time. We formed the impression that staff especially in Nursing Sciences thought that they had a high teaching load and could not always dedicate the required time to research. It was not clear to us how the allocated research time that varied between members of staff from 20-50 percent was evaluated.

In conclusion we would like to thank colleagues at the Department of Health Sciences for their honest and open approach during this periodic research review.

1. Research and scientific development

The department of Health Sciences is comprised of three different subjects/disciplines namely: Nursing Sciences, Public Health Sciences and Oral Health Science. The disciplines are at different stages of development. The department follows the university's strategic plan and is committed to producing high quality research, which is differentially reflected in the three disciplines depending on their level of development, with public health being the most established programme as exemplified by the internationally renowned SELMA programme.

New professorial appointments in nursing have acted as a catalyst for the review of its research areas, this is currently in progress and in some senses, this periodic review was somewhat premature for the subject, the focus on clinical research is a positive. Oral Health is the youngest discipline and has made a solid start in setting up collaborative research with the region and other universities both in Sweden and Internationally. It was noteworthy that despite synergies between Public Health and Nursing in terms of health promotion and prevention of ill health we did not learn of any collaboration or joint research between these disciplines.

As was mentioned in the strategic goals for 2019-2023 of particular importance is collaboration with the community of Värmland, both within healthcare and healthcare product development and services. We were told that there are links with Region Värmland, however, clinical professionals are absent from the department research staff (see under 4 below); the same appears to be true for the Digitalwell. These collaborations may provide a necessary infrastructure, which is helpful for the conduct of clinical research as well as other research resources such as health economics, development and evaluation of risk stratification models and support tools etc..

There are 13 current PhD students in the Department, the majority are in Nursing (N=9) and are part-time research students, six are also members of the teaching staff. Given the difficulty in appointing staff with PhD's investing in current staff is to be commended and time will tell if the investment pays off. Another alternative is to establish attractive career support system with possible incentives such as assistant lectureships with a time limited starting grants (biträdande lektorat för postdoktor/docent mentoring with an accompanying well-thought-out transparent promotion process. Other career support activities for teaching and research staff could include mentorship and coaching.

The department has a generous allocation of time for research between 20-50 percent. One often cited obstacle, however, concerned time (hrs) set aside for research versus teaching. Staff, especially in Nursing Sciences, thought that they had a high teaching load and could not always dedicate the required time to research. It was also not clear to us if and how the research time is evaluated. The relationship between research and teaching is important (see Section 6)

In terms of publications, the bibliometric data we received were limited to type of publication, there were 130 journal articles over a three-year period between 2018-2020. The department

has a total of 13 research active FTE's which gives an average publication rate per FTE of approximately 3 publications per year which is a reasonable output.

External grant income has fallen in 2020 and there is approximately an 8 percent success rate in receiving research grants. Decreases like these may, however, be temporary having to do with previously receiving grants and not being as active in applying during the covid pandemic. It is, however, important to consider ways of increasing submissions (the number of grant submissions in 2020 was only five) and improve the quality of grant applications if research is to remain buoyant in the department. There has been success in funding via the EU funding streams this has been achieved through networking which is positive in terms of developing an international profile.

2. Unit's composition and academic qualification

The unit is comprised of three disciplines as already stated. On the face of it the disciplines do not necessarily have a good cognate fit. Nursing being the largest with a strong emphasis on teaching over research (33 Lecturers, 12 Senior Lecturers and three Professors) and Public Health with a strong emphasis on research over teaching (15 Senior Lecturers and one Professor). Oral Health, is the smallest discipline with five lecturers and two senior lecturers. In addition, as mentioned previously there seems to be no collaboration or joint research between these disciplines. However, there is the potential for the identification of common ground. This has occurred in the context of post-graduate teaching where there is one training programme for all three disciplines.

In terms of staffing, numbers have increased slightly between 2018 and 2020 from 10-research FTE equivalent to 13 and recently additional professors have been appointed which will strengthen the composition of the Department.

The department has a predominance of lecturers who are not research active, but the inclusive culture means that if time is available, they can participate in seminars and other development. There seems to be difficulties in recruiting PhD-students, especially in Oral Health. There might be various reasons for this, the most obvious being that Oral Health is a very small discipline within Health Sciences. In addition, most of the PhD-positions at the department include a substantial part teaching which limits the time available for research. There is also difficulties in recruiting staff with PhD's, as far as we could tell there were no post-doctoral positions, which in the long term may be problematic.

Health Sciences is the smallest research area (Medicine and Health) at Karlstad University, and it accounts for only five percent of the total working time spent on research. It is noteworthy that the social sciences area accounts for over eight times more working hours. There seems to be an ongoing discussion in the Health Science department whether this is an optimal size and structure of the department. Another related issue has to do with the fact that Health Sciences are split into two faculties at Karlstad University: psychology, social work, risk, and environmental studies are in one faculty while the Department of Health is in another faculty.

There seems to be a lack of a natural bridge between graduates and later PhD positions. A research aspirant program based for example on scholarships could be a possible solution. The research aspirants may, for example, participate in practical research work, literature studies, method development and - above all - may establish contacts with researchers at the faculty. A joint program in the faculty could also give the added benefit of promoting collaboration bridges at different levels between the research groups.

3. Organisation, leadership, and management

The university infrastructure has its origins in education and the faculty and department structures mirror this. The focus on teaching in contrast to research has various ramifications among them the uncertainty about who manages and monitors the research being done in the department. We were unable to find any person or position on the faculty level or the departmental level who is specifically in charge of such research issues.

Instead, the infrastructure to support research is mainly located in the Research Support Office, which is not as well used as it might be by the department. The Head of Department has an onerous workload since she is responsible for the running of the department and for research. As far as we could tell teaching was the priority although this is in transition and an internal review of research areas is underway.

The organization of research in the department seems, sub-optimal and maybe somewhat confusing to its members. Some features are out of members direct control, and some can be changed. Externally researchers are hampered by the lack of management information, unclear or broken incentive structures, and a dominance of teaching considerations in wider management decisions (e.g., recruitment). Some factors are under local control and should be considered, including creating wider networking, mentoring to enhance publication practice to be more ambitious and focussed.

There is an inclusive culture within the department although the respective disciplines seem to operate in isolation. We were also told that there are organizational barriers for internal cooperation. The department has a few ways of stimulating interdisciplinary working for example regular research faculty meetings where research proposals are reviewed, however attendance is variable.

The research that is produced in the department seems to be both methodological sound and of good quality. There is, however, a need for developing a communication plan that includes greater visibility externally, both nationally and internationally. The world deserves to learn more about the work being done at Karlstad University.

4. Collaboration and application of research findings

Collaboration with the health services in the region is a common feature of health science departments. Hospitals and community locations are necessary for both student placements and for clinical research activities. The department has strong international connections as

exemplified via the SELMA platform of research. European Union funding streams such as Marie Curie and Erasmus permit the linking of both research and education, which nursing sciences has taken advantage of. Oral health has a wide range of links throughout Sweden.

There are areas such as digital health/ wellbeing where there is some collaboration but not all disciplines have explored this opportunity.

In terms of the application of research findings, the SELMA project has provided many opportunities for publications, PhD training and international projects with leading international institutions. There have also been impacts identified from this platform of work namely improved risk assessment and reduced environmentally related human health and development problems. It seems that impact can be confused with general academic outcomes of research and perhaps further exploration of how impact can be captured needs to be thought through.

5. Inclusive culture: internationalisation, gender equality and disciplinary transparency

We were impressed with the inclusive culture in the department there is a wish to engage all members of staff in research activities and in teaching. Despite this, as mentioned above, the disciplines seem to work autonomously. The department is committed to expanding international collaboration and has visiting international staff. Staff are also encouraged to join some of the research centres, but it was not clear from our interviews how many staff were engaged with centres. It was noteworthy that more than half of the department's publications included an international author.

With respect to gender, equality there is not an equal distribution between men and women. Nursing sciences are the largest group, and most nurses are women, hence there is a female bias. There is a better balance in public health where 4 out of 7 staff are male.

Given the difficulties in recruitment there is potential barrier to international recruitment because as far as we could tell students were taught in Swedish hence one needs to be able to speak Swedish to fully participate in academic like at Karlstad University.

6. Connection between education and research

There is a commitment in the department to integrate research into teaching. This is partly achieved by the inclusive culture (see 5 above). In addition, the various curricula are underpinned by research, commonly referred to as evidence-based practice. In addition, in the case of nursing, MSc. Programmes have been developed around pertinent research areas such as palliative care, cancer care etc. Public health historically a research discipline has developed MSc courses based on its research programmes. Oral health in its early stages of development and is committed to introduce an evidence-based model into teaching dental hygiene.

With a few exceptions, however, many employees in the department must combine teaching and research. Consequently, time and resources necessary for research are limited. For example, the nursing programme with a high teacher/student ratio is especially demanding for Senior Lecturers and Professors. A similar situation, but less clear is evident for Public Health and Oral Health. The department may consider various measures allowing members of all three environments to spend more time for research (e.g., issues having to do with recruitment, competency development (kompetensutveckling), introducing new staff, etc).

7. Concluding assessment and recommendations for continued development

This report is based on the materials we received to review prior to our opportunity to meet with the staff on zoom. Unfortunately, the preparatory materials lacked detail and disciplinary breakdown which posed difficulties for our evaluation. We were grateful for the opportunity to speak with the staff although there were time constraints and some presentations whilst interesting did not necessarily provide us with the information we were seeking. We were grateful to the staff at all levels for their open approach to the discussion. What follows we hope will be helpful suggestions for future development:

- Develop strategies for the funding and recruitment of post-doctoral positions.
- Develop a common understanding of what is meant by quality research and impact.
- Diversify research funding, improve grant quality, and seek funding from highly regarded funding sources e.g., Swedish Research Council, FORTE or similar.
- There is a need to think about succession planning especially in Public Health.
- Consider streamlining research themes topics and develop criteria for participation within research groups and between disciplines.
- Reflect on how research time should be accounted for and evaluated within the department.
- Consider various innovative measures allowing members of the department to spend more time for research.
- Renew efforts to recruit joint appointments with the region e.g., hospitals or community services.
- Consider a thorough internal review of publication and grant capture metrics to give clearer management information.

- Consider revising incentives and reward structures for progression (especially for Lecturer, Senior Lecturer and Associate Professor) and making them transparent.

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