RESEARCH EVALUATION FOR DEVELOPMENT 2019
EXPERT PANEL REPORT

Institute of Medicine

Introductory Remarks

This evaluation of the Institute of Medicine (IoM) is based on the self-evaluation and other background material provided to the panel. It is also based on the site visit at the institute on the 2nd and 3rd of April 2019. The quality of the provided material and the organisation of the site visit were excellent and the panel feels that we have been provided with all information and feedback needed to perform the evaluation. However, we recognise that there still are many things of which we do not have the complete picture and some of our conclusions and recommendations may therefore not be justified. The panel is grateful for the opportunity to review the Institute of Medicine. We hope that our recommendations will be helpful in the future development of the institute and we would like to acknowledge that the work has been a valuable learning experience also for the panel members.

Summary

The review panel was impressed by the high scientific quality of the research carried out at the Institute of Medicine. Much of the work is at the absolute international frontline and is not only published in high-ranking journals, but is also already being translated to clinical practice. The panel was very impressed by the quality and visions of the leadership of the institute. We were also impressed by the reforms made to improve the academic environment of the institute and to provide a better support to staff and PhD students in the short time that the institute has existed. We were happy to see that the institute realises that this development has only started and that there still are many challenges to address. We have identified a number of areas to which we suggest the institute should give special attention.

1. *Institute of Medicine and its academic environment* – the institute should continue to strengthen the efforts to develop thematic programmes across the different departments of the institute and to encourage the engagement of departments outside the institute in these programmes. This will increase the societal impact of the research and also increase possibilities for funding for example from the European Union. Special emphasis should be put on a better integration of the future School of Public Health in the scientific programmes of the institute. There is an imbalance in external funding between the departments that may have a negative impact on the academic environment. The institute also needs to further develop its engagement in the PhD programme to ensure that all PhD students at the institute receive the same level of high-quality training and are able to establish networks with other master's and PhD students as well as junior researchers. PhD students should be encouraged to develop international contacts and have an opportunity to do part of their work abroad. The institute should ensure that the teaching opportunities and duties are shared equally and fairly. There is also a need for further development of grant support particularly for grants at the EU level.

2. *Research facilities* – The fragmented and limited availability of research facilities represents a major threat to the future of the institute. It restricts collaboration, decreases the possibilities for successful external recruitments and represents a risk that groups with increasing funding and expanding activity will accept offers to leave for other universities. The faculty and university leaderships must take an active part in resolving this problem. The new "*Sahlgrenska Life*" building is one attractive solution to this problem. However, this project

will not be ready in the near future and funding for its completion remains to be secured. The problem is acute and short-term solutions need to be established.

3. *Academic research within the health care* – The challenges of performing academic research within a clinical environment are well known. It is the impression of the review panel that the collaboration between Sahlgrenska Academy, the Sahlgrenska Hospital and other healthcare providers within the Västra Götaland region is well established and characterised by mutual trust and understanding of the needs of the respective parties. In spite of this, it is clear that the needs of the daily healthcare service often take priority over research. As one clinical faculty stated "problems in healthcare become problems of the university". This can only be changed by establishing a more academic culture within the entire university healthcare system and by engaging healthcare staff in research aimed at promoting the quality of care provided by their own clinical departments. This will require significant changes in healthcare management beyond the responsibilities of the university. However, we recommend the faculty to engage in discussions with the Västra Götaland region on how this can be achieved. Ideas of how this can be implemented can be found in "*Kunskapslösningen*" that have been put forward by the Swedish Academy of Science of the Swedish Society of Physicians and that can be downloaded at https://www.sls.se/globalassets/sls/dokument/kunskapslosningen-2018.pdf.

4. *Recruitments and career development* – the institute should put more emphasis on international recruitments at all academic levels. For professorships, active recruitment using search committees and help from international scientific advisory boards is encouraged. The institute should also take more responsibility for ensuring the quality of the PhD programme, with a particular focus on the situation of clinical PhDs. The institute should also assist in establishing networks and joint activities for PhD and postdocs. More developed and individualised career development programmes should be established for junior staff. The availability of the university and Västra Götaland region core facilities provide excellent opportunities for young investigators to develop scientific independence and renew the research environment at the institute. The institute should ensure that young scientists are well informed about these facilities and assist in making them available for young scientists with more restricted budgets. The institute should also stimulate the mobility of young scientists, for example by helping them to find postdoctoral positions in high-quality research groups outside Sweden. However, we recognise that changes in society and lifestyle have made mobility in its traditional sense more difficult and we encourage the institute, as well as the university, to find novel ways of mobility that vitalise science, for example via a postdoctoral fellowship in a different faculty or a different research field.

5. *Collaboration and impact on society* – enhancement of implementation research as a way to get research into practice will be of great value for the faculty. There is likely to be an increasing demand for research on implementation in the years to come and this will most likely also lead to new funding possibilities. It is also an excellent area for collaboration with healthcare and more widely with society at large. As part of this work, it will also be important to increase the involvement of outside stakeholders, such as patients and their relatives plus civil society in general. The support structure for innovation and technology transfer at the university level is fragmented and should be reorganised into a more user-

friendly “one door” approach. The institute and faculty should work to influence the university management in this direction.

6. *Open science* – based on an EU directive the Swedish government has decided that open science should be implemented in Sweden by 2025. Open science includes a number of different but overlapping areas such as open access to scientific information, which includes both publications and research data; open educational resources; open source code; alternative ways to measure scientific influence; open peer review; and citizen science. The institute and the faculty need to start working on a strategy for this transition.

Report: Observations and Analysis

Section A – Background and Research Standing

A1. Background

The Institute of Medicine is the largest department at the University of Gothenburg (UGOT) with a faculty size of 142. The activity of the institute is closely related to the Sahlgrenska University Hospital as well as the Västra Götaland region. The institute includes four departments: Molecular and Clinical Medicine, Internal Medicine and Clinical Nutrition, Rheumatology and Inflammation Research, Public Health and Community Medicine. Three out of the four departments include groups that perform research in closely related topics. The Department of Internal Medicine and Clinical Nutrition includes a number of research groups representing a wide variety of disciplines, including translational osteoporosis research, clinical endocrinology, allergy, irritable bowel syndrome. This structure did not evolve organically and thus may provide a challenge to establish close collaboration and interaction especially when they are located at separate sites (please see below).

The panel has observed that the Department of Molecular and Clinical Medicine, Department of Inflammation and Rheumatology as well as the Department of Public Health and Community do have a united physical space and this allows synergy among the groups, interaction between PhD students and postdoctoral scientists, as well as the ability to create an academic environment. However, this is not the case for the Department of Internal Medicine and Clinical Nutrition, which suffers from the physical fragmentation of its groups. Also, the panel observed that several groups are not able to expand and recruit additional PIs due to space limitation and in spite of their success in attracting funding for expansion. The panel thinks that there is a need for providing a physical platform that would allow more interaction between the groups and that would also allow successful groups to expand. For the Department of Internal Medicine and Nutrition, there is an acute need to establish a translational research laboratory/unit/centre along the line of the Wallenberg laboratory which has been an extremely successful platform to enhance metabolic research. The panel thinks that improvement in the physical space is very much needed to secure the future success of the institute. The plans to establish the new physical infrastructure: *Sahlgrenska Life*, are very impressive and will provide an excellent translational research environment. However, the expected date for establishing

this physical infrastructure is around 2027 which means that a temporary solution to the "physical" limitation is needed.

The panel also thinks that the process started by the Institute of Medicine to establish new thematic research clusters is highly relevant and will enhance interaction between groups and may provide a temporary solution for the physical fragmentations of the departments. Among the attractive research themes is the initiative led by the Department of Rheumatology and Inflammation to establish a "Centre for Multi-Disciplinary Translational Research on Inflammatory Disease" that can bring several groups together e.g. allergy/asthma/exosomes, chronic obstructive pulmonary disorder, sleep disorder. The panel thinks that such a constellation will allow more efficient use of resources and provide a platform for interaction. The panel also suggests the use of other incentive instruments to enhance collaboration within the institute e.g. establishing a joint PhD student programme, joint postdoctoral scientist or junior faculty positions to be shared between the groups. Such initiatives can be initiated at the levels of institute leadership.

The new leadership of the Institute of Medicine has started up a process of integrating the four departments. A common administration has been established. At the level of the Department for Community Medicine and Public Health (DCPH), a plan for a School of Public Health has been launched, but not finally decided. Furthermore, the Unit of Innovation and Implementation has been merged into the DCPH.

A2. Research standing

The Institute of Medicine includes a number of research groups that produce outstanding science and several of the groups are very well known for their excellent science, both at national and international levels. Specifically, the research groups have excellent publication performance, they are able to attract external funding, are very well represented in national and international research and clinical bodies, and are able to attract excellent students nationally and internationally. However, the panel has also observed differences in impact and success among the groups, which may be related to a variation in teaching burden and the absence of protected time for research for some of the groups. Also, clinicians with joint appointments at the hospital are under pressure to be loyal to their clinical departments and thus their research time is used in clinical practice.

The vision for the future is realistic and sustainable. The institute leadership has a clear idea of how to materialise this vision. However, there are critical challenges in relation to the limitation of the space need for expansion and recruitment. The panel experienced that the groups are highly variable in their ability to have a shared vision with the clinical departments and the hospital research strategy. The Department of Inflammation and Rheumatology Research is an excellent example of integration between clinical practice and research, and the panel thinks that experiences from this department can serve as a model for other groups to be inspired by. The panel thinks that a common vision between group leaders, the leaders of clinical departments, and the head of research at the hospital is of vital importance. The panel thinks that there is huge and sometimes not very well utilised potential for attracting clinicians with combined positions (clinic/research), creating tenure-track positions for non-MD scientists, and utilising core-facilities at the hospital and Sahlgrenska Academy.

The Department for Community Medicine and Public Health (DCPH) has strong research groups and a long-standing record in Occupational and Environmental Health and Life Course epidemiological studies. DCPH research is clearly above average. The department is currently putting up a more comprehensive programme in Global Health and wants to integrate general public health issues with basic clinical science. The department has recruited two new professors for Global Health. It seems as

if the department would benefit from including behavioural science, such as Occupational Psychology, more in their curriculum. This would seem important for studying implantation and utilisation of research fromm the department's different themes.

The research strategy is based on developing high-quality epidemiological and clinical research with a national and international impact, and they have an overall aim to be one of the top 10 European departments in Community Medicine and Public Health in 10 years. This fits well with the aforementioned plan for a School of Public Health and the ambition seems congruent. In addition, the emphasis on Global Health is highly relevant in the strategy and can probably be fulfilled.

In general, the panel thinks that the strategies and plans of the whole institute and its different departments are convincing and achievable.

Section B – Leadership

B1. Leadership

B1.2 Faculty/University level leadership

Strengths

- The university is well organised at several levels of leadership.
- A Research Board has been established to provide information to University Management and to strengthen strategic discussion around research issues.
- University and faculty leadership have adopted many procedures supporting research and teaching at the lower organisational levels, e.g. the faculty co-finances strategic activities and positions.

Weaknesses

- The university organisation, including the Institute of Medicine and Sahlgrenska Academy, is complex and hierarchical, with several organisational and decision-making levels. In a large university, this is a challenge for leadership.
- The new Research Board for strategic discussions is somewhat bureaucratic.
- The hierarchy and distance between the organisational levels and academic positions may cause difficulties in information flow and contacts, and these may equally affect the integration and motivation of the faculty and staff.

Recommendations

- The faculty, as well as university leadership, should actively take part in finding solutions to fragmented and limited availability of research facilities.
- The university is an expert organisation based on knowledge resulting from scientific research. This should be considered in leadership and organisation. Even in a large university, the organisation should be as simple and flat as possible.

- The hierarchy, and thus unnecessary bureaucracy, should be reduced where possible.
- The Research Board might have more general tasks in the university community. The strategic discussions and debates could be as open as possible and include the whole university and its faculty and staff.

B2. Recruitment

Strengths

- Overall, recruitment is given a strong emphasis. That is important, as recruitment is a basis for successful research and teaching.
- It is further recognised that recruitment is both multidisciplinary and multinational. International recruitment is encouraged and all faculty positions are announced internationally.
- Tailor-made positions are not used and candidates from within the department and units are not favoured against newcomers.
- Younger talented and promising scholars are sought among scholars who have received funding for their work.

Weaknesses

- At the institutional level, structured and strategic recruitment plans are missing.
- A fair coverage of recruitments to all established departmental research areas, as well as areas that are novel or more marginal, is challenging in a multidisciplinary environment.
- As recruitment is very critical for departments, units, centres and teams, even more emphasis can be given to it. Single recruitments following the department guidelines may be successful but a broader perspective to recruitment and recruitment policies should be in place.
- The lack of space is raised as a major hindrance for development. Insufficient space and fragmented locations restrict collaboration, integration and synergy, decrease the possibilities for successful external recruitments, and represent a risk that groups with increasing funding and expanding activity will accept offers to leave for other universities.

Recommendations

- The institute should continue the good work it has done in the recruitment of researchers.
- All open positions in all faculty levels should continue to be announced internationally.
- Recruitment should be more structured and the application of official recruitment groups would be helpful. Career plans and career development policies are needed.
- In recruitment, collaboration with healthcare (needs of healthcare system) should also be taken into consideration.
- Working in many places and lack of space is a problem that may even complicate new recruitments and challenge the quality of research. Urgent solutions for both a shorter- and long-term are needed. This is an issue for the whole university as well as SA, IoM and DPH.

B3. Career structure

Strengths

- International postdoctoral training is encouraged among the younger faculty. The measures taken strengthen the institute's research area and support research-based teaching. They also provide ingredients for a broader career strategy for the institute.
- International postdoc training is encouraged. This is good, and shorter and longer training in foreign universities and departments is recommendable, in general, and in top universities and departments, in particular.
- For public health researchers, the career development includes contacts with national and regional stakeholders like healthcare, social security, and local public and private bodies.
- The link between research and teaching is emphasised, and all faculty should participate in both research and teaching. It is an inherent idea of university that teaching is based on research.
- Researcher-clinician careers, including young clinicians in primary health, are supported by special arrangements. This is justified and supports teaching given in primary health.
- The above arrangements are beneficial for adding the integration of DCPH to the Institute of Medicine and support the plan for a School of Public Health that has been launched.

Weaknesses

- There is a need to increase international PhD training and PhD students should be encouraged and supported to do part of their work in foreign universities and institutes.
- As for postdocs, personalised career-track development support should also be provided for PhD students. Although the institute's measures cover a range of important career issues, they do not yet constitute a full strategy for career structure.
- Young scholars are in need of special supervision in their career promotion.
- On the other hand, young talented scholars are natural supporters of their peers in research training as well as career development. This needs recognition and promotion.
- In addition to the clinician-researcher career and collaboration with local stakeholders, broader career developments should be considered. Scholars within public health and community medicine should seek expert careers also within local, regional and government positions, administration, international positions and global health.

Recommendations

- Departments can develop mentoring, arrange courses, seminars and visits that support young scholars' careers.
- Departments can be instrumental in developing peer supervision and support as well as career development among junior scholars.
- Arrangements to support junior scholars' expert careers within local, regional and government positions, administration, international positions and global health should be considered.
- The tenure-track route to promotion has proven a successful career instrument and needs to be continued and further developed. The institute has done good work in strengthening its career structure and this should be continued.
- PhD students' international training should be increasingly encouraged and supported as well as expanded. Personalised track development should cover all staff and faculty.

- For a good career structure, the institute needs to consider equally those who are on the professor track and those who are not. The career structure measures taken so far cover several important issues and could be developed into a full career strategy in the future.

B4. Funding

Strengths

- The institute has been successful in acquiring external funding, which has increased substantially. This is a major support for research and academic work. In addition, internal funding such as ALF is important and provides opportunities for research and teaching. The success in funding translates into success in research, publications and academic development.
- The institute administration is being centralised; this will help department heads to focus better on funding strategies and increasing funding. External funding is a most important resource for successful research.
- The university and IoM safeguard salaries, but all other costs have to be covered by external funding. This is well recognised.
- IoM has seen a strong increase in external funding, of which the Department of Molecular and Clinical Medicine accounts for 70%.
- A substantial part of DPH funding, and its increase, is due to regional funding sources (Region Västra Götaland). This is successful and opens future opportunities. Regional projects also allow practical applications of public health research in the community around the university.
- DPH has also benefitted from ALF funding (medical education and research in healthcare).
- Support is given for the preparation of funding applications and research advisors and a professional editor have been hired by IoM and SA to increase the quality of applications and their chances for acceptance.

Weaknesses

- Despite the success in funding, there are underused funding sources, which could be better used. These include EU funding in general, Marie Curie fellowships and Horizon 2020 funding.
- Within the institute, the funding received is unequally distributed. One department has been particularly successful and accounts for a large part of the funding and its increase, whereas other departments have maintained their funding at a lower level.
- ALF funding is stably low for DPH compared to the Departments of Molecular and Clinical Medicine and Internal Medicine.
- Moving all financial management to IoM may also be taken as a sign of centralisation, which potentially affects collegiality and independence of teams negatively. In any case, the change is followed by new leadership challenges.
- Teams tend to save external funds, which should be used for research purposes.

Recommendations

- The funding success needs to be sustained and further strengthened to enable and increase high-quality research. Support for funding across all departments would lead to a more equal

distribution of resources and a balanced development within the whole institute. Such development would provide opportunities to further the level of external funding.
- Important and underused funding sources such as EU funding should be better considered in the future. The institute should make the most of the reorganisation of the administration to support department heads and seniors in focusing on increasing external funding.
- It is important to support departments and units with lower levels of research funding, such as DPH, in order to safeguard a balanced development of departments and the research and teaching within them.
- Departments and units can learn from each other. The stronger ones are in a key position to support and guide those with weaker external funding resources.
- Teams often save external funds for continuity and job security purposes. However, use of funds for research should be efficient and team leaders may need to learn better financial management. Professionals and experienced seniors can be helpful in teaching younger team leaders. Courses for project management are likely useful.
- More concretely, research advisors and editors are useful in the preparation of applications.
- Grant applications among women need special measures to be able to increase gender balance in funding.
- ALF funding is also at a low level in DPH and needs support to avoid the imbalance.
- The university, SA and IoM should strive to extend local and regional funding. This has been important for DPH, and regional funding should be strengthened further. Other departments may equally benefit from public and private regional funding sources.
- National research funding should be extended to cover better international funding from Nordic, EU and other multilateral sources.
- National and international collaboration between teams, including broader networking, is instrumental for cutting-edge research and international funding opportunities.

B5. Feedback and evaluation

Strengths

- The recruitment of a professional communicator has been an important step in improving the academic environment of the institute. It provides the institute leadership with excellent opportunities to inform staff of ongoing research and educational activities, possibilities for funding as well as any other matters of importance.
- The institute has implemented a system of annual development interviews to discuss individual development and support needs for staff.
- The significance of assessment, feedback and evaluation of research environments and outcomes is recognised.
- Feedback and evaluation are mainly provided by heads of department, who give direct feedback to individual scholars for their research and teaching.
- Feedback is also given in annual development interviews.

Weaknesses

- There is a tendency that feedback in staff assessment focuses only on the positive side and what is working well. Although this may be good for the self-confidence of staff, it may not always be optimal for individual career development or for the academic performance of the institute. This issue was brought up as a general problem for the university at the feedback session with the Vice-Chancellor during the site visit.
- Head of Department-employee feedback is important, but remains only individual. Feedback and evaluation are needed at all levels: individuals, teams, centres, units and departments.
- Feedback and evaluation are not one-dimensional processes, but go from management to staff and from staff to management.
- Topics of feedback and evaluation should be clear and have a broad coverage, including research outcomes, environments, leadership, recruitment, funding and staff satisfaction.
- Systematic procedures for feedback include both predefined topics and open topics as well as follow up.
- Feedback is not only a formal procedure, but also part of the academic culture and can be given informally in everyday occasions.

Recommendations

- The institute should continue developing the information platforms. There is still a lack of knowledge among staff of funding opportunities, availability of core facilities, possibilities for career development and many other matters.
- Much focus should be put on establishing web-based platforms where such information is easily available. Daily newsletters providing links to news articles related to the institute, important scientific publications and research policy is something that many large departments have and is much appreciated by staff.
- The institute should also review its routines for staff quality assessment and quality improvement to ensure that these are of international standard. Recognise that feedback and evaluation are important to the staff and faculty and, if successful, strengthen research, improve research environments, and contribute to the quality of research.
- Develop feedback and evaluation at all levels within the department, not just for individuals.
- Feedback and evaluation should not only concern individual employees and junior staff, but also seniors and the management.
- Feedback is a two-way process from top to down and down to top.
- In addition to face-to-face feedback and evaluation, electronic sites can be used as well as meetings and boards.

Section C – Complete Academic Environment

C1. Collaboration

C1.1 Collaboration and networks within the University of Gothenburg, with other Swedish universities, and internationally

There are a number of collaborations and networks within the University of Gothenburg (i), with other Swedish universities (ii), and internationally (iii):

- (i) GOthenburg CArdiovascular RegisTry Studies (GOCARTs) is part of the VR-financed Swedish Initiative for Research on Microdata in the Social and Medical Sciences (SIMSAM), initiated at SA in 2014, and capitalises on the strong tradition of collaboration between clinical research and cardiovascular epidemiology in Gothenburg, including GUCH (Grown-Up Congenital Heart disease), heart failure, cardiomyopathies, atrial fibrillation, hypertension, diabetes, obesity, and several more. To date over 100 papers from this constellation have been published, many in high-profile journals.
- The Centre for Intellectual Property is an interdisciplinary development centre focused on knowledge-based business that provides a platform for the promotion of research, education and collaboration based on the strategic management of intellectual assets, and is jointly governed by Chalmers University of Technology, the University of Gothenburg, and the Norwegian University of Science and Technology. Its mission is to transform knowledge into wealth and welfare.

- (ii) An important national collaboration is the observational cohort study SCAPIS, which aims to increase understanding of cardiovascular epidemiology in middle-aged people by combining detailed imaging with functional analyses of the cardiovascular and pulmonary systems of 30,000 people. This collaboration has hitherto generated 15 papers since 2015 and many more are planned.
- The prospective Swedish Obese Subjects (SOS) study of health outcomes after bariatric surgery has generated a large number of papers in top journals. The findings have contributed to guidelines and treatment recommendations for obesity and type 2 diabetes, both nationally and internationally.

- (iii) An example of the development of international quality research is the PURE (Prospective Urban and Rural Epidemiological) study in collaboration with the Population Health Research Institute, McMaster´s University, Hamilton, Canada. This collaboration on the incidence and clinical presentation of cardiovascular disease over time and geographical location has generated 40 papers since 2011, many in top journals such as *NEJM*.
- Several of the faculty have excellent tracks as national lead investigators for numerous large-scale international clinical trials. For example, several publications in high-ranking journals have resulted from the APPROACH-network, a global consortium of centres involved in research on adult congenital heart disease. This network involves close collaboration both internationally and locally with the Institute of Health and Care Sciences.
- The Transatlantic Networks of Excellence "*Gut Microbiome as a Target for the Treatment of Cardiometabolic Diseases*", funded by the Leducq Foundation. The aim of the project is to understand how microbes in the gut contribute to the development of cardiovascular disease. Subsequently, as a major goal of the network, they aim to develop therapeutic small molecules that might inhibit specific gut microbiome enzymes linked to human metabolic and cardiovascular disease.
- The large multinational Rome IV Global Epidemiology project will carefully characterise gastrointestinal symptom burden across the globe and assess factors of importance for these

symptoms. This will be achieved through a population-based survey in 33 countries across all continents including data from 80,000 subjects.

- Scientists at the institute are, and have been, involved in numerous EU-funded projects including: RESOLVE; EMIF-Metabolic; Drug the Bug; Novel Mechanisms of Site-Specific Regulation of Bone Strength; PROMISS; Interreg-EnviSuM (Environmental Impact of Low Emission Shipping: Measurements and Modelling Strategies of the Interreg Baltic Sea Region); Metagenome and Bariatric Surgery: New Avenues to Treat Metabolic Disease; Mucus and Metabolism; HILYSENS II; NeuroGut: European Training in Neural Regulation of Intestinal Function; HealthPort; and Health 2 Market.
- The Department of Public Health and Community Medicine collaborates with several international partners and research networks, which have helped to produce a reasonably large number of publications, including high-level papers in top journals.

Weaknesses

- Overall, interdisciplinary and multi-disciplinary collaboration across departments has not yet reached its full potential. Groups and departments seem not to share many cross-cutting themes or research strategies; this leaves groups working in parallel or in separate silos. Especially clinical and medically-oriented research and more social science and human-oriented research seldom seem to be combined to solve practical or societal challenges and problems in creative ways.
- Informal collaboration with non-academic actors as well as co-creation with other societal actors seems to be in its early stages and mostly limited to some groups only. The new unit for Innovation and Entrepreneurship still seems to lack links and collaboration with the different departments and levels of the university; the concept of innovation from basic to clinical research to implementation and utilisation and further, via evaluative studies back to science, has not been operationalised yet.
- Further, co-creation or co-development activities related to health and wellbeing with special interest organisations such as industry, NGOs, and the public sector, is in its early phase.
- The rather limited scale of international collaboration is also reflected in the around 20% share of publications being co-authored with international partners.

Recommendations

- Initiate and support transdisciplinary collaborations and networks, such as between basic scientists and clinicians, and increase multidisciplinary collaborations.
- Further develop recent activities in the direction of increased co-creation with non-academic actors, NGOs, and potentially private sector actors.
- Continue to develop international collaborations, in particular, to increase research partnership, international research funding (e.g. EU and NIH) and co-authorship of publications.
- Continue to develop the unit for Innovation and Entrepreneurship. This has been awarded a dedicated grant directly from the Swedish government to broaden and increase knowledge in innovation, entrepreneurship and utilisation.
- Continue to develop both national and international collaborations, although the bibliometric data show good figures for this (70% of the institute’s publications are co-authored with an

external organisation, and approximately 20% are co-authored with international organisations).
- Support transdisciplinary collaborations and networks, such as between basic scientists and clinicians. Increase multidisciplinary collaborations.
- The department could further develop its recent activities in the direction of more co-creation with non-academic actors, NGOs, and potentially private sector actors. In addition, one may ask if 20% of publications with international collaborations is enough. It is not clear how much interdepartmental collaboration there is in the institute.

C1.2 Collaboration with external stakeholders

Strengths

The institute's research focus on human health is implemented by collaborating with external stakeholders to make new medical discoveries, diagnostic tools and treatment, with an aim of developing new preventive medicine. This is achieved through a close interaction and collaboration with healthcare, industry and small biotech, and relevant stakeholders in society.

Collaboration with health care and registries

- The institute has close and extensive collaborations with Sahlgrenska University Hospital and primary healthcare in Region Västra Götaland. It has 18 adjunct professors and 10 adjunct senior lecturers, most of whom have their main positions within healthcare.
- The institute also has a long-term collaboration with the Centre of Registers Västra Götaland, which supports the development of around 25 national quality registers that are used to improve healthcare. One example, the National Diabetes Register, is an important infrastructure for clinical research in diabetes at the institute.
- The Head of Department for Public Health and Community Medicine is concomitantly manager of Swedish National Data Service (SND), which is a national resource that facilitates access to new and existing Swedish research data within and outside of Sweden. SND also provides support to researchers in Sweden throughout the data management process.
- Several of the faculty are members of steering groups at the hospital, and the co-head of the institute is a member of the Management Board of Sahlgrenska University Hospital.

Collaboration in global health

- In global health, the institute has established a successful collaboration with the National University of Rwanda. This has resulted in three PhDs for students from Rwanda (two are medical doctors). Even if these studies are not at the scientific front line, they are very important for promoting academic research in low-income countries.

Collaboration with industry and private sector

- Active collaborations exist with AstraZeneca within cardiovascular disease and obesity, and within asthma and chronic obstructive pulmonary disease, among others. The institute strongly encourages close collaboration with AstraZeneca, as well as with other pharmaceutical companies.

- The institute in general, and the section at "*Östra Sjukhuset*" in particular, has over the years seen several physicians – who received their clinical, scientific and leadership training at the university hospital and the institute – leave for distinguished positions and careers at AstraZeneca. This illustrates and enhances close interactions with industry. There are several adjunct professors and adjunct senior lecturers from AstraZeneca.
- Several groups have successfully established smaller companies for taking innovations in improving health for patients with acute and chronic disorders to market. These companies are actively involved in several clinical trials.
- Close collaborations and funding and/or research grants from BioGaia and Metabogen regarding probiotics studies.
- The Unit for Innovation and Entrepreneurship runs a large number of research- and company-based projects that serve as study material for research in utilisation. These have implications for future research at the department in general as expertise, methods and tools for utilisation are established.

Weaknesses

- One questions the independence of research when collaboration builds largely on working closely with only one private company. In addition, although collaboration with private sector and start-up initiatives are welcome in principle, one would expect an explanation of the structures, principles, and safeguards in place to protect independent research and publishing.

Recommendations

- Apply and engage in mobility programmes between the institute and pharmaceutical industry.
- Clarify the activities or plans related to potential mobility programmes, as well as the safeguards for guaranteeing independent research and research integrity in collaborations with private sector actors, especially when concentrating collaboration largely on one private sector company.
- Continue development of platforms to facilitate clinical research in other diseases, with the Clinical Rheumatology Research Centre as a model.
- Expand epidemiological studies on population-based registries and cohorts to the Nordic countries but also internationally.
- Explore the funding opportunities in EU Innovative Medicines Initiative (IMI), a public-private partnership aiming to facilitate partnership funding for health research and innovation.
- Promote innovation and establishment of (small) business enterprises/bio-tech companies.

C2. Relevance and impact on society

C2.1 Management and support

Strengths

- Centralisation of the administrative staff for more efficiency and higher quality of issues related to e.g. economy, HR activities, as well as provision of appropriate resources to the leadership/chair of the institute, is a major advancement.

- Within the Department of Public Health and Community Medicine, intra-departmental management seems to function very well. New support structures, such as the Health Metrics Unit, have good potential to support research.
- The scientific editor recently hired is an asset in article and, potentially, grant-writing.
- The institute established the "Unit for Innovation and Entrepreneurship". Recruitment of a highly merited and experienced adjunct professor to the unit is strategically a very important step for utilisation of research.
- The Department of Public Health and Community Medicine plays an active role in governmental work in investigations and commission.
- The institute supports the utilisation and practical application of research-based knowledge by the action-based education of students at the *Sahlgrenska School of Innovation and Entrepreneurship (SSIE).* In a two-year course, theory is mixed with practical experience working with projects based on research from the university, but also from the public health sector and the private business sector. The second year consists mainly of practical innovation work on the projects.
- Since 2008, SSIE has driven over 125 projects and created an interdisciplinary learning environment via collaborations with multiple actors, including the regional innovation platform, Sahlgrenska University Hospital, Sahlgrenska Science Park, AstraZeneca BioVenture Hub, UGOT's Grants and Innovation Office, Chalmers Ventures, Chalmers School of Innovation, UGOT's School of Business, Economics and Law, UGOT's Centre for Intellectual Property, and several big companies such as Philips, Nestlé, Parc, Novartis, Volvo and Ericsson.

Weaknesses

- Centralised support in grant acquisition, grant-writing (e.g. EU grants) and helping to form research teams across departments for multi-disciplinary grant proposals, does not seem to be in place or fully developed. It seems e.g. that the Health Metrics Unit does not have resources to serve the need for methodological consultancy on a daily basis. Further, there is a need for more work across groups and departments to exchange and share expertise, advice and support e.g. in research methods. Still, inter-generational transfer of skills could be strengthened to avoid gaps in knowledge.
- Many researchers may not be aware of the free opportunity, offered by the Unit for Innovation and Entrepreneurship within the institute, to test utilisation of their research. Strategies, policies, and rewarding mechanisms for utilisation of research-based knowledge could also be strengthened.

Recommendations

- Provide structures and internal policies for the availability of expertise throughout the institute, especially in the areas of methods expertise availability (including methods for qualitative research), grant-writing support, support for innovation development, implementation and utilisation, plus for evaluating the usefulness, acceptance and cost-effectiveness and impact of innovations.
- Promote a systematic approach to stimulate research utilisation. Ensure that utilisation is integrated in the culture of the institute.

C2.2 Research relevance and impact on society

Strengths

- In general, translational research is strongly emphasised and visible in the institute; this is especially true for the translation from laboratory to clinic. Further, initiatives such as the Unit for Innovation and Entrepreneurship at the Department of Public Health and the Sahlgrenska School of Innovation and Entrepreneurship (SSIE) offer very promising structures and channels for knowledge co-creation beyond the clinic, to wider society and stakeholders beyond academia and healthcare. The Department of Public Health and Community Medicine does highly relevant research and development work globally. This is also true for the Department of Internal Medicine and Clinical Nutrition, as well as the Department of Rheumatology and Inflammation Research.
- In addition, collaboration with the regional innovation platform, Sahlgrenska University Hospital, Sahlgrenska Science Park, AstraZeneca BioVenture Hub, UGOT's Grants and Innovation Office, Chalmers Ventures, Chalmers School of Innovation, UGOT's School of Business, Economics and Law, UGOT's Centre for Intellectual Property and several big companies show active interest in knowledge translation. Moreover, several small spin-off biotech companies have been successfully created by members of the institute (for example, Metabogen).
- There is an impressive activity at the institute, with participation in writing and defining national and international guidelines, and participation in consensus groups for the treatment and monitoring of diseases within the areas of faculty expertise.
- Several RRCTs have been performed within the SWEDEHEART platform; VALIDATE-SWEDEHEART, iFR-SWEDEHEART, DETOX-SWEDEHEART, COMPARE-ACUTE. These studies have had an immediate impact on developing international clinical guidelines (ESC/ACC/AHA) and as such, have improved healthcare outcomes in patients with ischemic heart disease. Faculty from the institute have been involved in steering committees, generation of research hypotheses, proposing and prioritising RRCTs, and the inclusion of patients and analysis of clinical trial data.
- Within the Department of Public Health and Community Medicine, some of the UN's Sustainable Developmental Goals have high relevance in the research, including global health. Also, research in occupational health is of relevance to the UN goals. In addition, the department has developed a collaboration with the National University of Rwanda, with a mutual exchange of knowledge and research to encourage well-educated professionals in Rwanda to remain in their national healthcare and university system.
- Examples of practical applications based on academic research at the Department of Internal Medicine and Clinical Nutrition are: the Neurogastroenterology Research Group are aiming to establish infrastructure to facilitate collaboration with primary care facilities; the Clinical Nutrition Group has a strong national reputation in clinical nutrition and as well as very popular teaching programme for dieticians; the Clinical Endocrinology Group has a translational profile and broad portfolio of projects with priority for healthcare; the Clinical Allergy/Asthma Group are aiming to merge clinical epidemiological and registry date to expand current knowledge involving pharmaceutical industry; the Exosomes Group presents successful examples of clinical translation of basic science to the establishment of two companies related to respiratory disease and cancer; the Clinical Osteoporosis Group presents

RCTs investigating the effect of probiotics on bone and its metabolism, identifies predictors for fall injuries and factures, and by using multiple large and combined registries to study treatment outcomes with diabetes and osteoporosis medication; the Translational Osteoporosis Group have described genetic determinants for fracture risk, novel markers of fracture risk, novel fracture targets as well exploration of a novel field "Osteomicrobiology"; the Clinical Respiratory Medicine Group have a focus on sleep disordered breathing and COPD, with new pharmacological treatments in sleep apnea and cardiovascular monitoring.

- Examples of practical applications based on academic research at the Department of Rheumatology and Inflammation Research are: outcomes of disease and treatments in population-based registers for axial-SPA, RA and gout; biomarkers as risks for axial-SPA RA and gout; genetic risk scores and imaging by MRI as predictor of structural lesions in axial-SPA.
- The Department of Public Health and Community Medicine aims to improve public health at individual, institutional and community levels by translating research and new findings into policies and practice through close collaboration with society and stakeholders. Examples of practical applications based on academic research at the Department of Public Health and Community Medicine are: research on health effects of air pollution, noise, and heavy metals; this is instrumental for decision-makers at national, European and global levels. In addition, brief interventions in alcohol consumption and mental health areas, as well as small spin-off companies which have been created, are good examples of applied research.

Weaknesses

- In general, the concept applied to translational research seems to end when the research knowledge has been delivered to healthcare. The full circle of knowledge management, from research to implementation, evaluation and feeding back to research, is not present in the institute programmes. Especially, active involvement of stakeholders: citizens and their sub-groups such as minorities, seems to be rare if not non-existing, except maybe in occupational health interventions.
- Active evaluation of the developed and produced guidelines in terms of adherence to the guidelines, their impact and cost effectiveness of changing practice and health outcomes, seems to be lacking.
- Communication about science with societal stakeholders seems to be a challenge. Research outcomes that are most important for generating a direct and indirect impact in society, such as reports, non-academic publications, disseminations and outreach items, instruments, infrastructure, datasets, software tools and designs, need further development. There are some examples of non-scientific publications such as "*Arbete och Hälsa*" and related highly-relevant lay language reports, but in general it seems that the institute relies on science/ scientific communication mainly.
- There is no mention of a follow-up of the adherence or impact of the guidelines produced based on conducted research. Non-academic publications, outreach actions or dissemination activities (with the exception of systematic reviews being distributed in *Arbete och Hälsa*) are not described in this section.

Recommendations

- The independence of strong research groups should be maintained. The most successful groups should be prioritised for additional support over less productive groups. The groups demonstrating high-impact research activity should be provided with the means to strengthen other missions of the university. Thematic areas of scientific opportunity that are consistent with the expertise of the institute's faculty could be prioritised for strategic investments and development. Expand outreach to society e.g. by finding out how the produced guidelines have been adhered to and implemented in healthcare and what kind of impact they have had beyond healthcare in society, e.g. in improving health status, reducing costs, improving equal access to care etc. Increase the institution's role in using research knowledge to advise decision-makers.
- Dissemination of non-academic research products could be enhanced. Then, maybe involvement of societal stakeholders such as lay people, communities, NGOs etc in the research needs mapping, planning and evaluation of research impact on society, could be considered. Cross-disciplinarily and sectorial collaborations should be strengthened to implement (translate) research results not only in the clinic but also in society. Existing projects should be further extended into research and health-promoting projects.
- Promote a systematic approach to stimulatu research utilisation. Ensure that utilisation is integrated in the culture throughout the institute (one door principle). Inclusion of utilisation in research, teaching, and on the management agenda, can change the culture and have impact in society. This requires an active effort and investment, as well as active support by the university. It is complementary that a new national knowledge organisation is now being formed for all disease areas and clinical specialties. The institute should encourage clinical researchers to actively engage in this work.
- The Department of Public Health and Community Medicine also has competence in human rights and health, which should be further developed to boost national and international research in areas of relevance for public health and reduced inequalities.
- A growing interest in migrant health should be further developed through collaboration with Angered Hospital and other stakeholders working with migrant public health.
- The workplace is a source of stress-related factors such as sleep disturbances, nutrition, physical activity, noise, job strain to mention a few. Existing projects should be further extended into research and health-promoting projects.
- Inclusion of utilisation in research, teaching, and on the management agenda, will in the long run change the culture, and impact will be a natural effect of all activities. This requires an active effort and investment, as well as active support by the university.
- The two positions of professor in global health that are under appointment should be given special attention.

C3. Research-teaching linkages

C3.1 Undergraduate and master's education

Strengths

- Most teachers of undergraduate studies have a PhD and are active in research projects. In some courses, PhD students are also involved in teaching. Teaching in clinical courses is also

done by clinicians at Sahlgrenska University Hospital without academic positions at the university. Most of these clinicians have a PhD and many are active in research, but to different extents.
- Senior members of the institute (senior lecturers and professors) take care of the management of education, including the development and improvement of educational programmes and courses.

Weaknesses

- There seems to be an imbalance between faculty members in the amount of teaching they perform; for some the teaching load hampers research tasks. Some high-profile teachers are not involved in undergraduate teaching. Further, clinical teachers not employed by the institute do not have access to pedagogical development.

Recommendations

- Distribute teaching assignments more evenly between academic staff and encourage all staff to engage actively in research. All professors should, on a regular basis, engage in some way in undergraduate teaching. It is important for undergraduate students to meet highly merited academic role models.
- Find support for clinical teachers for their career pathways, including pedagogical training/ courses. Regular meetings for professors, which are planned to discuss e.g. this issue, might help; however, it is recommended to include different levels of staff in the planning of researcher-teacher work balance and career development.
- Further link research and educational activities for complete academic environments and better link research and education/teaching.
- Create opportunities in undergraduate clinical courses for high-profile research leaders and other non-clinical researchers to contribute to teaching.
- The link between research and teaching (=research-based teaching) needs higher profiling.

C3.2 Doctoral education

Strengths

- The institute has a rather large number of doctoral students; the majority of them at the Departments of Molecular and Clinical Medicine, Internal Medicine and Nutrition, and Rheumatology and Inflammation. Some are employed at the department, others outside academia and at the hospital, indicating fruitful research collaboration with healthcare.
- Most PhD students are part of larger research groups and in an active research environment. Here, research groups have regular meetings and journal clubs for the discussion of research results and methods. Some of the PhD students are also involved in national research schools, such as the National Research School of General Practice.

Weaknesses

- Clinical PhD students (majority of PhD students) may sometimes be distanced from the academic environment as they work mostly in the clinic under the supervision of one or two

clinicians. Their education may be weaker in academic culture, methodology and critical thinking.
- There seems to be a need for more networking, club activity, writing clubs, mentor functions and in general, exchange and communication among/to the doctoral students. There seems also to be rather little mobility and exchange options and/or activities for doctoral students to learn from different environments, cultures and sectors.
- It is not clear how active the journal club is and other PhD student activities, especially when it is known how dispersed the research groups are geographically.

Recommendations

- Link doctoral students who are health professionals working in the clinical environment (in hospital or general practice) closer to the university academic environments by contacts within translational research centres.
- Encourage clinicians to perform part of their PhD studies in the translational centres, including engaging in laboratory-based work.
- Potentially joint PhD programmes could be built between academia and industry, public sector etc.
- Increase the meeting points and possibilities e.g. institute gatherings, workshops on selected themes and skills, e.g. PhD days, junior scientist lunches etc.
- Develop and build mobility opportunities for doctoral students outside the home departments, home institute, home country. In particular, PhD students should be encouraged to interact with and visit institutions abroad.
- Encourage PhD students to develop career plans early in the training period to be discussed with their superiors/mentors at the annual performance interview.
- Develop and encourage an early possibility for research training/exposure to science in the curricula for medical and other professional students. By this, recruitment of professionals to academia will increase. The system will also take advantage of the high motivation, energy and passion younger trainees often express.
- Develop a strong and comprehensive mentoring programme for PhD students and junior faculty. Such a programme could include training in preparation of research grant applications and enhanced communication skills.
- For Clinician PhDs a co-supervisor from the university should be part of the supervisor team to strengthen the academic influence. To encourage a tighter collaboration between academia-clinic a suggestion is to establish a Medical Students Research Programme with a PhD on top (medical faculties in Norway have established this with huge success).

Section D – Academic Culture

D1. Academic culture

Strengths

- The academic culture seems to foster and support high academic excellence. The leadership has focus on the individual researcher and aims to coach and support the individual – research and education, to encourage senior well-established faculty to be "good citizens of the institute" and role models, and to encourage faculty to consider how they can contribute to the department/institute/university and not vice versa. The institute cherishes supporting leadership, and a transparent and supporting environment for all; it provides training and seminars, collegial examination of applications and mentoring, multinational staff, integrity of researchers and research.
- The institute aims to stimulate utilisation and translation of results to clinic; it also supports close and trusting interaction with healthcare, including the Sahlgrenska University Hospital and primary healthcare.
- The leadership encourages young talented researchers to establish themselves as independent scientists. In addition, international recruitments are encouraged.
- The leadership nurtures a culture that is conductive to high-quality research and renewal, with regard to stimulating an interactive environment to achieve a collegial culture through seminar series, international guest professors, mentoring of junior researchers, common meeting areas, transparency and a culture of express one's own opinion, and celebrating the individual researcher's success.
- One of the best ways researchers can avoid and resolve ethical dilemmas is to know both what their ethical obligations are and what resources are available to them. The institute promotes an academic culture (at all levels, including decision-making) where results and findings are shared, good records of research activities are maintained, data is reported objectively, conflicts of interests are disclosed, animals and patients are treated with respect, ethical guidelines are adhered to, and contributions from other researchers are respected. The institute will also work closely with the new Ethics Committee at Sahlgrenska Academy.
- Work is underway towards finding a structure to better integrate research and teaching. The institute aims to stimulate utilisation and translation of results back to clinic, and will continue to stimulate a close and trusting interaction with healthcare, including the Sahlgrenska University Hospital and primary healthcare.

Weaknesses

- The institute does not have strong international mobility programmes or support for young researchers – neither for incoming nor outgoing mobility. Integration and balancing of research and teaching is not very strong either.
- Interaction between different disciplines and departments is not very active yet. There is also a lack of common research themes or research strategies, especially strategies to solve societal challenges by combining high-level research with implementation and involvement of societal actors and sectors in research planning and evaluation.
- Comprehensive approach to utilisation and translation of results not only to clinic but also to wider society is not very strong yet.

Recommendations

- Build (international) mobility programmes, balance research and teaching activities and duties, build multi-disciplinary and multi-sectorial research in collaboration with societal actors and stakeholders to solve health and social challenges.

- Support networking of junior and senior academics and provide opportunities for exchange across department borders; provide e.g. research methodology infrastructure and expertise and services so that they are easily available, provide access to necessary infrastructure such as registry and other data also for juniors.
- A better culture and strategies for utilisation and translation of results to clinic but also beyond clinic to wider society; more appreciation of applied science is needed.
- A better structure for integration of research and teaching is needed.

D2. Publication

D2.1 Publication strategy

Strengths

- The strategy is based on excellence and high-quality publications (high-impact journals) are promoted. By a pragmatic approach it is acknowledged that there is a balance and that not all publications can be published in high-impact journals.
- The institute is committed to providing resources to support high-quality publications and has employed a professional scientific editor. A key role is to provide constructive criticism at an early stage of the writing process, and to educate junior and senior scientists in the art of scientific writing and publishing e.g. via writing courses and with the support of a scientific editor.
- One-week courses in scientific writing are organised with three professional scientific editors. The course comprises lectures about the writing process each morning followed by interactive sessions in the afternoons in which the attendees work on their own partially prepared manuscript and receive feedback from the three teachers. The course is informal with maximum interaction (as it is limited to 12 course participants). In the future, the course will be organised for the entire institute.
- 'Open access' aims to make the findings of research freely available. As sharing new knowledge benefits researchers, the education sector, businesses and others; this concept is supported. However, the institute does not finance the open access fee for faculty or staff.

Weaknesses

- The institute does not have a system in place to financially support open access publications and open science principles are not integrated in the institute work.
- It seems that there is no alternative crediting system for publications that are closer to local practices and more applied science, for which high-impact journals are not always relevant publication channels. This kind of knowledge dissemination strategy is not explicit in the institute.

Recommendations

- Find ways to finance open access publishing and to make preparations for the open science future.
- Increase the awareness of PlanS and its potential implementation in 2020.

- Increase awareness (incl. identification policy) of predatory journals.
- A more realistic and comprehensive publication strategy is needed, rather than only targeting high-impact journals. In particular, different kinds of research (from well controlled basic science studies to locally tailored implementation and evaluation studies, including qualitative research when relevant) would be necessary. The latter kinds of studies are important to solve practical problems and so enhance e.g. societal impact of research.
- The publication strategy should consider the whole career path and other work-related duties, such as teaching when enhancing manuscript writing and publishing.

D2.2 Analysis of bibliometric data

Strengths

- The bibliometric data analysis shows that there is both very high-quality but also (increasing) quantity of publications at the institute, even if there is variation between groups and departments; these differences can largely be related to the kinds of research and their salient publication channels – e.g. basic/clinical science vs. applied research.
- The analyses show that all departments have active international collaborations (with co-authorship) and that the publications are highly cited.
- Number of publications have increased from 2013 (around 200) to 2017 (round 280). In 2017, 200 of the publications are published in Level 1 journals, 68% of the publications co-authored with an external organisation and 20% with international organisations. The publications are highly cited (cf. (citations) value is 2.8).

Weaknesses

- About 20% of the publications are with international co-authors. This is a rather low percentage.
- No explicit publication strategy seems to be in place. Thus, it is not clear if there is any agreed policy or credit system (other than based on citations and high-impact journals) along the lines of the institute visions and goals e.g. in answering societal challenges and societal impact, including translational research, implementation and evaluation research, learning from practice etc.

Recommendations

- An important task would be to encourage interdisciplinary and inter-departmental, as well as international collaboration and themes that aim to solve wider societal challenges and generate added-value.
- It is also important to provide additional support e.g. in the comprehensive use of theory-based, research designs and methods, plus writing and communication skills to maximise the potential of high-quality research and ensure it is published in good and relevant publication channels for maximum impact.
- Studies have been published covering a wide area of research topics including basic and translational studies, epidemiology and registrar studies, public health and global health

D3. Facilities and research infrastructure

Strengths

- There are good facilities for research infrastructure such as biobanks, technological platforms, sample banks and registry data for clinical cohorts.
- Further, strong collaborative research networks give the opportunity to preserve, build and access "state-of-the-art" facilities, research infrastructure and biobanks.
- In addition, through the Impact Accelerator, the UGOT Grants and Innovation Office and GU ventures, there is infrastructure to facilitate the utilisation and commercialisation of research results.
- The lipidomics platform is linked to the national infrastructure for biological mass spectrometry (BioMS). The BioMS is hosted by Lund University with support from the Swedish Research Council and co-financing by Gothenburg and Lund Universities, Karolinska Institute, and Chalmers University of Technology.
- The Department of Rheumatology and Inflammation and the Rheumatology Department at Sahlgrenska University Hospital established a joint clinical facility in 2010 for both investigator- and industry-sponsored drug trials.
- Through the Rome IV Global Epidemiology Project there is access to global population-based data on GI symptom patterns in the population (33 countries across all continents, n=80,000) and factors of importance for these symptoms.
- In addition, there is access to a variety of specialised research premises, including a sleep laboratory and a noise laboratory, and strong infrastructures in epidemiology and health economy, a microbiome platform and a gnotobiotic facility.
- Strong external funding makes it possible to invest in new research infrastructure. The "state-of-the art" lipidomic platform is linked to the national infrastructure for biological mass spectrometry (BioMS). This excellent platform is well suited for research collaboration locally, nationally and internationally, as well as for multidisciplinary research and sectorial collaborations (healthcare and industrial).

Weaknesses

- Lack of space for translational and clinical research; many facilities are too old and non-functional for modern research, and lack of space prevents recruitment and expansion.
- The institute is located in a large number of places. This fragmentation prevents collaboration and synergies between research groups and between departments locally, but also in a multidisciplinary way.
- Centralised competence for bioinformatics and Big Data-handling seems to be lacking.

Recommendations

- Temporary solutions need to be developed until the more permanent buildings are ready. One such solution would be to establish a Centre for Multidisciplinary, Translational Research on Inflammatory Diseases encompassing rheumatology, clinical immunology, gastroenterology, dermatology, asthma/allergy, chronic obstructive pulmonary disease etc.
- Establish a centralised core facility for bioinformatics and Big Data-handling.

- Consider establishing other centralised Core Facilities involving expensive instrumentations and advanced technical staff (could potentially be a faculty issue). Open and easily available core facilities are an important asset, making an institution attractive in connection with e.g. recruitment of academic staff.

D4. Transverse perspectives

D4.1 Equal opportunities and gender equality

Strengths

- The institute tries hard to keep equal opportunities and gender equality on the agenda. Since women are less likely than men to ascend to positions of power, a long-term objective is to give younger men and women the same chances to become the leaders of the future. Therefore, both men and women receive tasks and trust assignments. The institute tries to avoid overloading the (women) staff with too many assignments, which would be harmful to their research. When recruiting, a serious attempt is made to identify both successful women and men applicants.
- The institute adheres to the recommendation of the Science Europe Working Group on Gender and Diversity and it supports career planning for both genders.
- Career planning support for both genders seems to be in place; this should improve e.g. leadership opportunities for women.

Weaknesses

- The institute has a challenge since there is a tendency to lose excellent senior women.
- Women are less likely than men to ascend to positions of power. In total, the institute currently has more men than women as faculty members.
- Career development counselling and support for all juniors seems not to be explicitly announced.

Recommendations

- A more explicit strategy and good practice could be put in place to enhance and maintain gender balance and diversity.
- An explicit strategy and programme for career development strategy and counselling is needed for junior staff.

D4.2 Internationalisation

Strengths

- The institute encourages international recruitment and all positions are announced internationally and are open for free competition.
- International exchange is encouraged, by promoting international postdoctoral training and international Guest Professors.

- Several seminar series regularly invite international speakers.
- Involvement in EU projects and other international networks stimulates international exchange.

Weaknesses

- International exchange and mobility strategy and programmes are not very visible and strong.
- Only one fifth of the publications in the institute include international co-authorship.

Recommendations

- More international mobility programmes could be built, strengthened and financially supported for all academic levels from juniors to seniors, and both for incoming and outgoing mobility.
- Try to engage more in international research projects, e.g. EU-funded projects. Also, it is recommended to register as expert evaluator positions for EC research programmes; these tasks are excellent opportunities for learning and further motivating applications for international funding.
- The EU Marie Skłodowska-Curie actions should be fully explored for increased internationalisation and mobility of young researchers to strengthen their academic careers.
- Promote international exposure and experience for PhD students incl. financial support.

Section E – Support

E1. Internal research support

Strengths

- It was the impression of the review panel that the institute takes this task very seriously and that it is actively working to develop internal research support. Several important steps have already been taken, including the organisation of courses on writing scientific manuscripts and grant applications, internal advisory boards, collegial review of applications from junior staff and running of a seminar programme at the highest international level. There are also plans to hire an additional scientific editor and a research advisor at the faculty level to provide support in the preparation of more strategic grants.
- Internal support is important to the faculty and the staff. Courses in writing, support for grant applications and mentoring, as well as a professional editor at the institute, are all helpful for the faculty.
- Departmental seminars with international participation form a part of general career support for research work.
- An emphasis on gender issues is justified to avoid male bias in various aspects of research work and environments.

- There is an awareness that the full potential of international research has not yet been reached.

Weaknesses

- Support for working on applications to EU framework programmes, ERC and the new European Innovation Council, could be improved; as could the support for handling the administration of approved EU grants.
- Particular measures and even programmes to support younger scholars, PhD students and postdocs, are important and helpful for their research work and career development.
- Aiming at gender balance in research environments needs support and continuous consideration.
- Department administration is a shared resource, and research staff and faculty should participate in administration as well. A balanced division of labour in administrative tasks is needed.

Recommendations

- The institute should work with the faculty leadership to improve the support structure for international grants, primarily those from the EU and NIH.
- A basic course package for new and junior scholars could be developed. Such a package could include research skills, like writing, article publishing and conference performance, but also methodological and technical skills, data management, as well as issues like starting and leading research teams, and ethics.
- Measures to address gender balance and supporting women in research environments should be continuously monitored and women's research careers promoted. Support for grant applications and funding is important, but also broader areas should be covered, such as recruitment, skill and career development, including publishing and establishing teams.
- To add staff participation in administration, clear and even written policies would help avoid imbalance and the risk of conflicts. Participation in administration also supports the flow of information and this should be considered in departmental policies.

E2. Faculty and University-wide support

Strengths

- There is a variety of faculty- and university-level support for researchers, teams and departments provided by special bodies in the faculty and university administration. In addition, research advisors and administrators have been hired for these purposes. The support aims to enhance the international competitiveness of research.
- The faculty and university provide access to several core facilities of very high quality.
- Grant-writing, as well as applying and managing funding from international sources, such as EU and NIH, is supported. For example, SA and the university provide support for financing indirect costs for international projects. This helps project management and lowers financial risks after funding is granted.
- Legal and contractual advice is provided for international projects and is available for applicants.

- The university library is supportive and arranges, for example, popular seminars for students and researchers.
- Communication and new media have become part of knowledge utilisation and need to be considered within academia. Research can also be communicated to wider audiences by providing news, using press releases, debate articles, public debates and various digital media channels. Support for such communication is available, although this is a novel and quickly changing arena.

Weaknesses

- Information on support for research may not reach scholars and teams. The university and SA are very large, and the complex and multilevel organisation sets further challenges.
- Wider communication and digital media use are novel in the university environment and support is needed. This is particularly important since there are also problems and even risks for academic work. For example, the "news logic" may be problematic as only part of research leads to "big results" and "breakthroughs" to be easily communicated. Similarly, aiming at "branding" and "brands" follow a logic that may fit business, but not necessarily universities and research.

Recommendations

- Develop faculty- and university-level support, such as the Grants and Innovation Office and research advisors and administrators, to better reach the department and unit level.
- Support should be given to junior staff to stimulate their use of available core facilities.

Section F – Other Matters

F1. RED10 evaluation

The panel thinks that the department has responded adequately to several issues raised in RED10 and has developed areas that were pointed out. The organisation was assessed as requiring major development, and the panel thinks that the current new leadership of the Institute of Medicine is working along several lines that adequately deal with the issues raised in RED10. The full scale of organisational changes cannot be fully accessed now. The plans are very ambitious, but sound reasonable and realistic.

F2. Other matters

The panel thinks that a strategy regarding improving academic culture and supporting innovation should be included in the overall strategy of the Institute of Medicine, and these considerations have been pointed out in other sections of the report.

Concluding Recommendations

Please see summary on page 2.