Knowledge for the health services in the future

Expectations for health and care services are increasing while resources are under great pressure. An aging population, increasing antimicrobial resistance (AMR) and expensive medical technology will require health services to develop and become increasingly efficient, without compromising the requirements for quality and patient safety. The Norwegian Institute of Public Health (FHI) has long contributed to summarizing and disseminating health service research, and to produce new knowledge about and for the health services. This plan does not give a complete picture of research at the institute, neither now nor in the future, but it points to some areas where we particularly will strengthen health service research in the coming years.

With a vision of good healthcare for all, the aim of the institute's healthcare research is to strengthen the knowledge base for decisions at all levels in the Norwegian health services. We will particularly focus on strengthening our applied, quantitative, and empirical health services research. This will require close contact with the health care services and patient groups to address questions that are important for the design of tomorrow's services. To be able to deliver high-quality research, we must build on the expertise in quantitative methods and big data that already exists at FHI. This will take advantage of the unique combination of health and health service expertise at the institute and sets us up to even better see health analyzes and health service analyzes in context.

Overall, we will place particular emphasis on expanding

• Research that is useful for the municipal health and care services, including implementation

• Research that studies how conditions in primary care are affected by or affect patient treatment in specialist services

• Research into how conditions outside the health sector (the labor market, the education sector, etc.) is affected by or affects the health services

• Research into how health services should be designed to meet the needs of people with

- early life and children
- mental disorders,
- elderly with multiple chronic diseases
- different immigrant groups

NIPHs role in Norwegian health service research

A lot of health service research is already being carried out in Norway, and NIPHs role lies at the intersection between academia and public administration. In academia, you are free to choose your own research questions, and success is measured by publication in scientific journals. This is not the case for NIPH. Our task is to answer central questions in the services, and publication in scientific journals is a means of ensuring quality and confidence in our research, not an end in its own right. For us, obtaining information is a central part of our tasks when questions regarding the services are concerned with and need to be elucidated. Our work is not over when an article is published in an international journal - it is even more important that the analyses and the international research is brought out into the services and implemented in a way that makes the health services better. Research regarding effective implementation of new knowledge, and primarily as an integral part of the service's daily routine work, is therefore central to us. Our success criterion is better or more efficient healthcare services.

At the same time, it falls outside NIPHs focus on health service research to follow how the services carry out their daily work or whether they operate in line with overall guidelines or goals. Responsibility for having routines and statistics to monitor the work in the services is up to the services themselves, or the health authorities.

The institute's strengthening of health services research will focus on issues where Norwegian decision-makers cannot base their measures on research from other countries, because such research does not exist or because the issues or the context are peculiar to the Norwegian services. The extensive work which NIPH has already developed within evidence synthesis is thus a necessary foundation for this venture. Indirectly, the investment will also strengthen our evidence synthesis through even better competence to assess the method quality and the contextual relevance of the studies being summarized. Health service research in the form of underlying methodological research for national functions stands already strong in NIPH (user experiences, quality measurements, evidence synthesis, method assessments, health economics, infection control, vaccination, etc.), and will remain a foundation for the institute's work going forward.

It is crucial that we do not build up health service research in fields where there is already such capacity in Norway, and it is a goal for FHI to collaborate with academia, the institute sector, administration and services in order to strengthen the overall knowledge base for decisions in the Norwegian health services. We have therefore regular meetings between the top management at FHI and most universities, where we inform each other about our research and search for possible strategic collaboration constellations. To succeed with strengthening health service research, we must increase cooperation with the major universities within this field, through collaboration on applications and implementation of large research projects. We also need to step up our participation in international research forums, particularly associated with the leading universities in Europe and North America.

Our frequent contact with the central health authorities, in particular the Directorate of Health and the Ministry of Health and Care, but also the Directorate for e-health, the Norwegian Medicines Agency, the RHFs and the HFs, as well as KS, is crucial for our research to be relevant. Likewise, we have regular contact with the institute sector and other services, particularly frequently with the municipalities and hospitals in the learning networks for good patient pathways. Overall, we make particular clarifications through participation in the Faculty Council in a national network for health services research, RHF's strategy group for research and we want to join the Municipalities strategic research body.

Within the institute sector or similar institutions in administration or services, it is important to us strengthened commitment to health service research that we particularly clarify the boundaries and explore possibilities for cooperation with the following institutions:

• National center for e-health research (NSE). Their expertise in digitization and e-health will be important for strengthening FHI's work with health service research. We will therefore enter into a cooperation agreement with NSE, and we have already started a good collaboration on concrete projects.

• Health Southeast Center of Excellence for Health Services Research (HØKH). HØKH has long engaged in health service research, both qualitative and quantitative. We are in close contact with HØKH, and we will assess cooperation on concrete projects going forward.

• Center for clinical documentation and evaluation (SKDE). SKDE has, among other things, responsibility for analyzes of geographical variation in the use of specialist healthcare services, and

they also work with research into the causes of such variation. Until we have jointly described the interface between us or found good forms of cooperation, we do not plan to prioritize new tasks in this field.

• Statistics Norway (SSB). Statistics Norway has worked to a small extent on health service research, but the agency has models that project aggregates for costs in the services, as well as access to and the need for healthcare personnel. Until we have jointly described the interface between us or found good forms of cooperation, we do not plan to prioritize new tasks in this field.

In addition, we have established contact with environments that have some health services research, such as for example Simula, Sintef and DnV-GL. We will also explore opportunities for collaboration with the surrounding business community regarding research funding etc.

The overall responsibility for surveying national research needs and initiating new research rests with them the Ministry and the Research Council. In such contexts, FHI contributes with evidence synthesis to strengthen the decision-making basis of the research council or the ministry, but beyond this we have no national role in initiating health service research. Our strengthened commitment to health service research will mainly be financed by assignments from the services themselves, calls for proposals in the Research Council, the EU etc.

Academic foundation for our strengthened investment

FHI has a long tradition of research within and related to the health services, with solid medical and health professional anchoring. Systematic summaries of knowledge are one of the most important foundations for relevant research. We have carried out several evidence synthesis of health service research recent years, and this work must be continued in order for the investment to be relevant for decision-makers. Going forward, we see a particular need for better and more systematic knowledge support for use by the municipal authorities the health and care services, for example a form of New methods for the municipalities, as well as the subsequent monitoring and evaluation using register data when specific measures are introduced in the services. We also have experience in analyzing future trends, for example developments in the burden of disease in the population.

We have long worked with quality indicators, both based on patient experiences, register data and within infection prevention. In this work, we have also carried out analyzes of the reasons for variation in the quality indicators, and how the variation affects patient safety. Our work with quality indicators and patient safety provides a good starting point for more research into how we can ensure quality and patient safety in future health services.

Much of FHI's research on health and public health has dealt with socio-economic differences and prevention. This research has followed patient groups or the population over time, and such expertise in follow-up methods and handling of large data sets is an important basis for the venture. This is also closely related to secondary prevention, which will be an important part of the work in the health services going forward. The quality of the service in the coming years will also be linked to the personnel's competence and the new opportunities provided by development in technology.

FHI has a long tradition of contributing to the implementation of new knowledge in the services. Mediation has taken place in various ways, including systematic work with learning networks for good patient outcomes, training and guidance of healthcare personnel within the infection control area and courses for healthcare personnel who meet users with low health skills. We have also worked to investigate whether measures work, through traditional controlled randomized trials and more quasi-experimental methods. We have a separate center for the evaluation of public health

measures. Our expertise in this field enables us to provide the services pragmatic advice on how they should implement their measures in such a way that they can learn what that works.

Our systematic work to obtain and process data to have a good basis for improvement work is a valuable source of knowledge about future healthcare services. This competence will be decisive for being able to use new data sources in analyzes that lay the foundation for the design of the future healthcare.

3+2 ventures within healthcare research

Based on the NIPHs academic foundation, and the need for knowledge for the planning of the health services of the future, we have gathered our strengthened investment in health services research under five main points, where the three the first indicates important research topics and the last two point to how we can support the services by building method and data skills that the services can benefit from in their work.

Under each of the five main points, we will place particular emphasis on strengthening

• Research that is useful for the municipal health and care services, including implementation

• Research that looks at how conditions in primary care are affected by or affect patient care in the specialist services

• Research into how conditions outside the health sector (the labor market, the education sector, etc.) is affected by or affects the health services

• Research into how health services should be designed to meet the needs of people with mental disorders, elderly with multiple chronic diseases and different immigrant groups

1. Quality

The aging population and increasingly high expectations for the services present the health and care services with new requirements for efficiency, and then it is crucial that we ensure high quality and patient safety. We must have current and well-suited aims regarding quality, and we will focus on understanding variation in use and quality between groups and institutions with a particular focus on mechanisms that can lead to a two-part health system.

The patient's needs will be at the center of tomorrow's services, and sufficient health skills are a prerequisite to be able to answer "what is important to you?".

Questions we are interest in include:

- Who receives too few or low-quality services?
- Why are there quality differences between the providers?

More precisely, in the coming years we particularly want to contribute to

• analyze quality in mental health care (BUP, DPS, etc.) and TSB, municipal health services (GPs, nursing homes, care services) and patient safety (NPE, MSIS, NPR, Prescription Register, NOIS), with an emphasis on analyzes of possible causes for quality differences. We will strive to use international data in our analyzes (e.g., OECD's Patient-Reported Indicator Survey (PaRIS)).

• analyze strengths and weaknesses with quality indicators based on various sources (patient-reported data, NPE, NPR, KPR, MSIS, NOIS, legelisten.no, working environment surveys, etc.) and

correlations with outcomes outside the sector (NAV, employment, education, correctional services, etc.)

• document and understand the background for socio-economic differences in quality, with a focus on immigrants, elderly people with multiple chronic diseases and people with mental disorders

2. Patient history

The proportion of patients with chronic and complex conditions is growing, and it is becoming increasingly important for the patient, the quality of the treatment and the use of resources that the various parts of the services interact well and are adapted to the patient's needs. The services' ability for primary and secondary prevention will be of great importance for the patients and for the capacity of the services. We will particularly focus on following the patient throughout the course to understand what promotes and hinders quality and efficiency.

Questions we will be concerned with include:

• Which patient groups are or are at risk of becoming heavy users of healthcare services, and how can different parts of the welfare state interact to prevent it?

• How does contact with one part of the services affect contact with other parts of the services?

More precisely, in the coming years we particularly want to contribute to

• analyzing the use of primary and specialist healthcare services for patients in the period before and after hospitalization, incl. emphasis on possible causes of health outcomes (e.g., infections, re-admission, death) and costs

• predict high-risk groups and investigate effects of team with personnel from both municipal and specialized health care services

• understand how changes in work or organization in the primary healthcare service can affect hospital (re)admissions (and so on)

- analyze how private providers (contract specialists) and other organizational moves can affect the flow of and the outcome for patients, with an emphasis on immigrants, the elderly with several chronic diseases and people with mental disorders

3. Personnel

Shortage of competent personnel is one of the big threats to future Norwegian healthcare services, and perhaps particularly in rural areas. At the same time, we know from the last decades that the burden of disease and new medical technology can entail major changes in the skills needed to provide good health services to all. Presumably we will experience shifting tasks and new occupational groups with completely different tasks than those we see today. We will especially study the need for personnel in the event of changes in the disease picture, technology, and measures in the services.

Questions we will be concerned with include:

• How has the need for personnel in Norway changed with development in the disease burden and technology in recent decades?

• How can new technology and task-shifting change personnel need and needs for health services in the future?

More precisely, in the coming years we particularly want to contribute to

• analyze staffing in cities and towns, and how new technology and care in the family can affect the services, with an emphasis on the needs of immigrants, people with several chronic diseases and people with mental disorders

• examine how new technology (New methods) and real-time data can change the need for routine checks and empowering the patient as their own therapist, as well as how it is related with the services need for skills, and centralization

• analyze connections between employee satisfaction, sickness absence, patient safety culture, patient satisfaction, patient injuries, infection control, quality indicators and health outcomes in Norwegian hospitals

4. Effects of interventions

Knowledge about what improves health services and health is not sufficient. The knowledge must also be used. Good quality in tomorrow's services requires that the services know how to implement new knowledge, so that the behavior of healthcare personnel or patients actually changes. This requires research with, not on the services. The services must be educational, so that the implementation and evaluation of new measures are included as an integral part of daily work. Patient-adapted medicine and the introduction of new medical equipment (New methods) can involve savings, but also large costs, and we must measure how such interventions affect the use of resources in the various parts of the services, as well as how the benefits are shared between patient groups. We will invest in developing to become a resource center that the services can consult with when they wonder how to implement new measures in such a way that they can learn about what works and its cost-benefit-profile.

Tasks we will be concerned with include:

• Give the health services advice on how they can implement new measures in such a way that it is possible to learn what works for whom, and what the benefits/costs are. This may include randomization, but normally more pragmatic, quasi-experimental methods that can be more easily integrated into the services' daily operations and which builds on data that is already collected

• Evaluate effects - with particular emphasis on possible costs elsewhere in the services - by using administrative data for monitoring and evaluation when specific measures are introduced in the services (cf. Nye metoder)

• Such evaluation of the effects of measures can also be integrated into methods for targeting measures at specific target patient groups, incl. through statistical prediction models and machine learning

5. New data

The services of the future will to a far greater extent than today be based on new data sources, and real-time monitoring of individual patients' health status through apps will be able to both improve services and put the patient in a better position able to be their own therapist. We will try out and facilitate the use of new data and new combinations of existing data to provide the services faster and better answers, to save resources, to provide more reliable research and to strengthen the patient's control over their own health and treatment.

Tasks we will be concerned with include:

• Projects that connect conventional and existing data sources in new ways and follows the patient both inside and outside the health services over time

• Focused projects that aim to illustrate applications and infrastructure for new data sources, such as

- National lab database: Who takes too few and too many samples? Preach sample requisition patterns of serious health outcomes? How do new samples "contagion" between GPs? Variation in AMR?
- Health center data: Can data from early childhood be used to prevent the need for treatment in BUP and dropping out of school?
- Online data and more textual data sources, for example about user experiences and user experience quality from Facebook, Google, Legelisten.no, surveys etc. We will develop and validate algorithms for machine learning of qualitative comments, which is important for the health services' improvement.
- Patient reporting and data from sensors/apps: Avoid unnecessary routine checks by classifying patients into different groups, socio-economic differences in the use of sensors, the meaning for further healthcare use.
- Curve data and real-time data: Manage patients between hospitals according to capacity, prediction models to supports the doctors in their work to assess admissions and treatment of patients, real-time measurements of the patients' experience of the services (PREMs, PROMs, etc.)

Measures to succeed with our strengthened investment in health service research

In order to achieve the goal of becoming a leading health service research environment that is useful for the Norwegian health and care services, the following measures will be necessary.

• We must be closer to the municipal and state services to ensure that we meet their knowledge needs. Overall, this is ensured through participation in the Municipalities' strategic research body and RHF's strategy group for research, as well as regular contact with the Ministry of Health and Care,

The Directorate of Health, the Directorate for e-Health and KS. Furthermore, we will seek strategic cooperation with municipalities that can provide us with information about which research questions are important to them, and we will apply for innovation funds in collaboration with services or patient groups.

• We will compete for research funding for applied issues to ensure relevance and quality

• We will participate actively in the international research environment to ensure the quality of and trust in our research, and to ensure that we are up-to-date on professional developments in the world. This requires that our researchers regularly publish in recognized scientific journals.

• We will participate in strategic collaboration with other research environments in Norway and internationally to strengthen our position and maintain high professional quality

• Internally in FHI, we will strengthen the coordination of health service research, send applications for funding with participation from several areas at the institute, have strategic recruitment and skills development and have a coordinated strategy for handling tomorrow's data