Norwegian Arthroplasty Register

The Norwegian Hip Fracture Register

Norwegian Knee Ligament Register

Norwegian Paediatric hip register

NASJONAL KOMPETANSETJENESTE
for leddproteser og hoftebrudd

REPORT
2022

Norwegian National Advisory Unit on Arthroplasty and Hip Fractures

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NORWEGIAN NATIONAL ADVISORY UNIT ON ARTHROPLASTY AND HIP FRACTURES: ANNUAL REPORT 2022

This annual report presents results and descriptive statistics of operations up to and including 2021 from our four registers. The COVID-19 pandemic has affected orthopaedic patients differently; this may be seen in the figures in the reports from the individual registers, where the numbers of operations in each month in 2020 and 2021 are compared with the figures for 2019. Hip, knee and shoulder arthroplasty in March, April and May 2020 showed a considerable decrease; 11.6% fewer operations were performed in 2020 than in 2019. In 2021 there were apparently a more normal number of arthroplasties, but the figures from Cruciate Ligament Register show a 25% reduction in 2021 compared with 2019.

Please also consult the introductions to the reports of the individual registers.

Results aimed at the general public are published on 20 June each year on the website of the National Service Centre for Medical Quality Registers www.kvalitetsregistre.no. Some of these results are included in this annual report.

This report is sent electronically to all orthopaedic surgeons in Norway. Paper copies can be obtained by contacting the Norwegian Arthroplasty Register. We now have a new website (http://www.helse-bergen.no/nrl), which contains all our annual reports and references to our scientific papers and presentations. Most of the papers are also available electronically from this website. We publish most of our findings on implants and surgical methods in scientific journals. Here, we can account for materials and methods and discuss strengths and weaknesses and the significance of our findings. Please see the reference lists at the end of this report.

We would like to remind you about our ongoing registry-based randomised controlled trials (RRCTs). In these trials, after a patient is included and undergoes surgery, the register takes over the follow-up work, which means there is no additional work for the patient or clinician. The ALBA trial (Antibiotic-Loaded Bone Cement in Prevention of Periprosthetic Joint Infections in Primary Total Knee Arthroplasty) started to include patients in January 2021 and by 18 May, 1002 patients had been included. Our aim is to include 9172 knees, and we would like all hospitals to start including patients. The Cruciate Ligament Register has an ongoing RRCT where patients are randomised between early surgery and active rehabilitation. All the major hospitals in Norway are involved in this. We have also planned to start a new RRCT when this one has been completed. Participation in the RRCT requires online registration in the medical registration system (MRS). We have created a randomisation solution in the MRS using HEMIT (Helse Midt-Norge IT). This is an important infrastructure for new studies and will be of interest to everyone involved in Norwegian orthopaedics. Following our efforts, we now hope that all Norwegian hospitals will take part.

The Paediatric Hip Register has started a quality improvement project to identify where the delay occurs in diagnosing patients with Calvé-Legg Perthes' disease and epiphysiolysis of the hip. The large hospitals in each health region are reviewing their data to determine if there is a time lag before patients see a doctor, or if it takes too long for patients to be referred from primary healthcare, or if hospitals take a long time to assess referrals and then to refer patients for assessment. Preliminary data show that the delay takes place before patients are referred to hospitals. The future challenge for this project will be how to communicate the findings to primary healthcare services and to parents.

The Norwegian Arthroplasty Register and the Norwegian Hip Fracture Register have collaborated on two national quality improvement projects. The goal was for women >75 years receiving THA and patients over 70 receiving arthroplasty for a hip fracture to have a cemented femoral component. Eighteen hospitals took part in the project and the proportion of women over 75 receiving THA with a cemented femoral stem increased from 66.1% in 2017 to 87.6% in 2021. Cemented hemiarthroplasty for hip fractures has increased from 86.6% to 96.7% in 2021. Many thanks to everyone involved for your great efforts!

Hospital-based annual reports, with data from each hospital, will as before be sent electronically to our contact persons at the hospitals and to the director of each health trust in October. We encourage our contacts to pass on the reports to the hospital administration and to their colleagues, and to check that the number of operations registered and the data are correct. The reports should be used for local improvement work. Please contact us if you find any errors in the hospital reports.

A coverage analysis is published for each of the registers every second year. This year we present figures for 2019 and 2020. Hospitals with low reporting rates need to review their reporting procedures. Some hospitals have low reporting of revisions.

The Cruciate Ligament Register has developed electronic (web-based) registration of the surgery form in the MRS. This is now being used in many hospitals, and almost 70% of surgeries are reported to the MRS. A bar code scanner is used to read information on implants. A corresponding system has now been developed for the Arthroplasty Register and we have started reporting shoulder, knee and hip arthroplasty. We would like hospitals to start using this solution. Electronic registration of patient-reported outcome measures (PROMs) for hip, knee and shoulder arthroplasty is now fully operative in 29 hospitals, while six hospitals have their own solution for exporting data to us. We now have a consultant responsible for teaching staff at the hospitals how to use the system. We would ask hospitals to prepare for collection of PROM data from patients undergoing hip, knee or shoulder arthroplasty. Our goal is for patients at all hospitals to complete the PROM form before surgery and one, six and ten years after surgery. The instructions are available on our website. We are working on solutions for PROMs and surgeons' reports for patients receiving implants in other joints. In the Paediatric Hip Register, all patient data are recorded electronically by the surgeons. Please remember that adult hip surgery (osteotomy and arthroscopic surgery) must also be entered in the Paediatric Hip Register. The electronic form for the Hip Fracture Register is now being used at Haukeland University Hospital and we hope that the other hospitals will be able to start to record data electronically this year. We will provide further information about this when other hospitals can start using this system.

We would like to remind surgeons who work at more than one hospital to request access to multiple hospitals when they create a user account. This will enable the surgery form to be registered at the hospital where the operation was performed.

Please remember that the Norwegian Data Protection Authority requires statements of consent to be signed by patients before operations are reported to the registers, and the statements must be stored in a secure archiving system. From 2021, the Hip Fracture Register has been approved as a register that is based on the right to refuse to consent; patients therefore do not sign a written consent form. Hospitals must ensure that patients have a real right to refuse. See also the introduction to the Annual Report of the Hip Fracture Register.

The National Advisory Unit has its own Facebook page, which we hope you will visit and follow. Please see https://www.facebook.com/leddregisteret/ or use the QR code on the back of this year's report. This page will contain information on published studies and other important information from the Arthroplasty Register.

We would like to thank all orthopaedic surgeons in Norway for good reporting to the registers. We are also grateful for good cooperation with the contact persons for the various registers at all the hospitals, the reference group and the advisory committees, the Norwegian Orthopaedic Association, Helse Bergen, Helse Vest, the Centre for Clinical Documentation and Evaluation (SKDE) and the knowledge centres of Helse Vest, Helse Midt-Norge IT (HEMIT) and Helse Vest IKT via the National Service Centre for Medical Quality Registers, the equipment suppliers, the University of Bergen, the Norwegian Patient Register, the Norwegian Institute of Public Health, the Office of the Auditor General, the Norwegian Medicines Agency, the Directorate of Health and the Ministry of Health and Care Services.

Bergen, June 2022

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Norwegian Arthroplasty Register

Total Hip Arthroplasty (THA)

HIP ARTHROPLASTY REGISTER: ANNUAL REPORT 2022

In 2021, 9396 primary hip arthroplasties and 1172 revisions were recorded. This is an increase on the previous year, but still fewer than before COVID-19 in 2019. In addition, there were 112 revisions without replacement or removal of prosthetic components. This figure includes 90 cases of osteosynthesis of periprosthetic fractures. There is probably underreporting of these, and we would like to point out that *all* periprosthetic fractures must be reported, even those where there is no change to the prosthesis.

We are pleased to note a continued improvement in the quality of primary arthroplasty; in 2015, 14% of surgeries were revisions, but only 11% in 2021. This is probably because Norwegian hospitals and surgeons have made good choices in the past 10-15 years. Prostheses that had poorer results than expected (most recently the Spectron/Reflection and the Titan stem) were discontinued more than 10 years ago, and most of the patients who received these prostheses and developed problems (early loosening and/or wear) have now undergone revision surgery. We conduct an annual review of the results of all implants used in Norway, and have not identified any new implants with poor results. In 2021, 97% of patients in Norway received hip prostheses that we consider to be well-documented (prosthesis survival >95% after ten years), and we believe that this benefits patients. At the same time, we encourage surgeons to innovate by developing and testing new methods, but this should be under strict control, such as through research or quality improvement projects, to enable results to be closely monitored and to prevent the new method from being tested on a high number of patients before the results are known.

Hip arthroplasty shows good results. Ten-year prosthesis survival for patients operated on since 2008 is 95.4% (Fig A.28). The differences between hospitals are quite small and decreasing, and no hospital has results below the 99.8 percentile (Fig A.29). This year, first revision survival rate is also presented, which is about 80% at 10 years (Fig A21/22). This is significantly poorer than after primary THA, which demonstrates the importance of optimal performance of the original surgery.

As before, many results are presented both in this report and on the interactive website of SKDE. This applies to hospital results for prosthetic survival, results of different prosthetic combinations, reporting rates for primary and revision operations, and the extent to which hospitals meet the quality indicators.

There are no notable changes in surgical trends:

- *Surgical approach.* In 72% of patients, the posterior approach is used, while the figure is 23% for the direct anterior or anterolateral approaches combined. The direct lateral approach was used in 191 patients (2%). The posterior approach dominates even more in revisions.
- *Head size.* 32mm is standard, while 36mm is increasing to some extent and is now close to 20%. Larger heads than these are not used in practice.
- *Fixation.* We see increased use of uncemented cups, mainly because of an increase in classical hybrid fixation with a cemented stem and an uncemented cup (about 20% in 2021). Uncemented stems are used in about 25% of patients over 75 years, but only 12% of women over 75. The latter group should normally have a cemented stem.
- *Dual mobility articulations.* These are being increasingly used in primary arthroplasty, with a particular increase in the use of a modular DM cup (Trident MDM). Modular dual mobility is a new concept; it is not very well documented, and caution is therefore advised. Otherwise,

conventional DM cups show equally good results as conventional articulations in NARA studies with medium/long follow-up.

PROM registration: There are still many hospitals that have not started PROM registration. We hope that this will improve and would like to remind hospitals that they only need to help us with the preoperative PROM. Postoperative PROMs are sent directly to patients via Helsenorge.no, provided that we have received the preoperative PROM. For assistance with PROM registration, please see the instructions on our website and/or contact our consultant Mikal Solberg on 90583174 or the register administration on 55973742/43).

Electronic registration of hip arthroplasty has commenced, and we encourage everyone to start to use this. Electronic registration means that the surgical nurse scans implants in the operating room, while the surgeon completes an electronic registration form that replaces the green paper form. All those involved in electronic registration of surgery must create a user account in Falk (https://falk.nhn.no/). The website of the register contains instructions on how to register as a new user and how to scan and use electronic registration. Most of those who have already started have given positive feedback on the system. The electronic form mostly collects the same information as the current paper form, but with some differences:

1. ALL reoperations related to the prosthesis must be reported, including those where the implant is not replaced or removed. This also applies to *closed reduction of prosthesis dislocations*; here only a much simplified registration form needs to be completed.
2. We now ask for information about joint space in mm, skin closure method and use of a drain.
3. We are planning to record the use of screws in uncemented cups (only yes/no options and the number of screws, there is no need to scan the screws) and the use of a cement restrictor for cemented stems (here the implant must be scanned). These changes will be in the next version of the registration form.

We have found some errors in the transfer of data from the MRS to the database of the register, but these have now been corrected. We hope there are no more errors, but please let us know if something that seems wrong is discovered at the hospital.

PUBLICATIONS 2021-2022

Benson TE et al. studied the effect of the type of thrombosis prophylaxis on the risk of revision due to infection, aseptic loosening or all causes in a collaborative study between Denmark and Norway. They found small differences (absolute differences of 0.2-1%) between a group that received low molecular weight heparin and a group that received NOAC, and conclude that the differences are probably not clinically relevant.

Brüggemann H et al. studied the incidence of perioperative periprosthetic femoral fractures, and factors associated with the risk of this complication. They found that the incidence was 1%, and that these fractures were associated with female gender, uncemented stem fixation, a non-osteoarthritis diagnosis, a direct lateral approach and previous hip surgery.

Lie SA et al. evaluated different statistical methods for survival analysis in our register data. There is no consensus on the importance of competing risk analysis. This study revealed that the most suitable methods for studying time to revision of joint arthroplasty are the classical Kaplan-Meier and Cox regression analyses.

Melbye SM, Haug SCD et al. studied long-term results of the Corail stem, and compared the different stem variants used. The Corail stem has good long-term results (88% survival after 30 years), and the standard collared stem had a lower revision risk than the collarless variant. The smallest sizes had an increased risk of revision, especially in male patients.

Silman AJ et al. compared the distribution of ASA classes in hip arthroplasty patients using registers in seven countries, and measured one-year mortality in relation to ASA class. They found significant differences between the countries, e.g. 39% of patients in Finland were ASA 3 or 4, compared to 14% in the Netherlands. One-year mortality increased from 0.2% for ASA 1 to 8.9% for ASA 4, but here there were only moderate differences between the countries.

Aae TF et al. compared data from the NPE (Norwegian Patient Injury Compensation) and the Arthroplasty Register for the period 2008-2018, and found that the NPE had received claims following about 1.9% of hip arthroplasties (both primary and revision surgery). Forty-four percent of the claims were granted (0.9% of primary and 0.5% of revision surgery), and infection was the most common cause followed by poor positioning of prosthetic components. Low-volume hospitals (<93 procedures per year) were overrepresented in claims to the NPE.

Dale H et al. studied risk of revision for infection after primary hip replacement surgery in three-year periods from 2005 to 2019. They found that 1.3% had been revised due to infection, and that there was an increase until 2015 followed by a levelling off. The increase was generally due to early infections, which may have been because of changes in the management of patients.

Pedersen AB et al. compared 14-, 30- and 90-day mortality following hip arthroplasty with cemented and uncemented fixation, using NARA data. At 90 days, mortality was 0.41% after cemented and 0.26% after uncemented fixation, but after adjusting for comorbidity, gender and age, the mortality risk did not differ between the two fixation methods.

Van Steenbergen LN et al. compared patient demographics, procedural characteristics and short-term results of hip arthroplasty in NARA and the Dutch Arthroplasty Register (LROI). Fewer patients under the age of 55 and fewer with diagnoses other than primary osteoarthritis were found in the Netherlands. The Netherlands was most similar to Denmark in terms of procedural characteristics, and had similar short-term results to the Nordic countries.

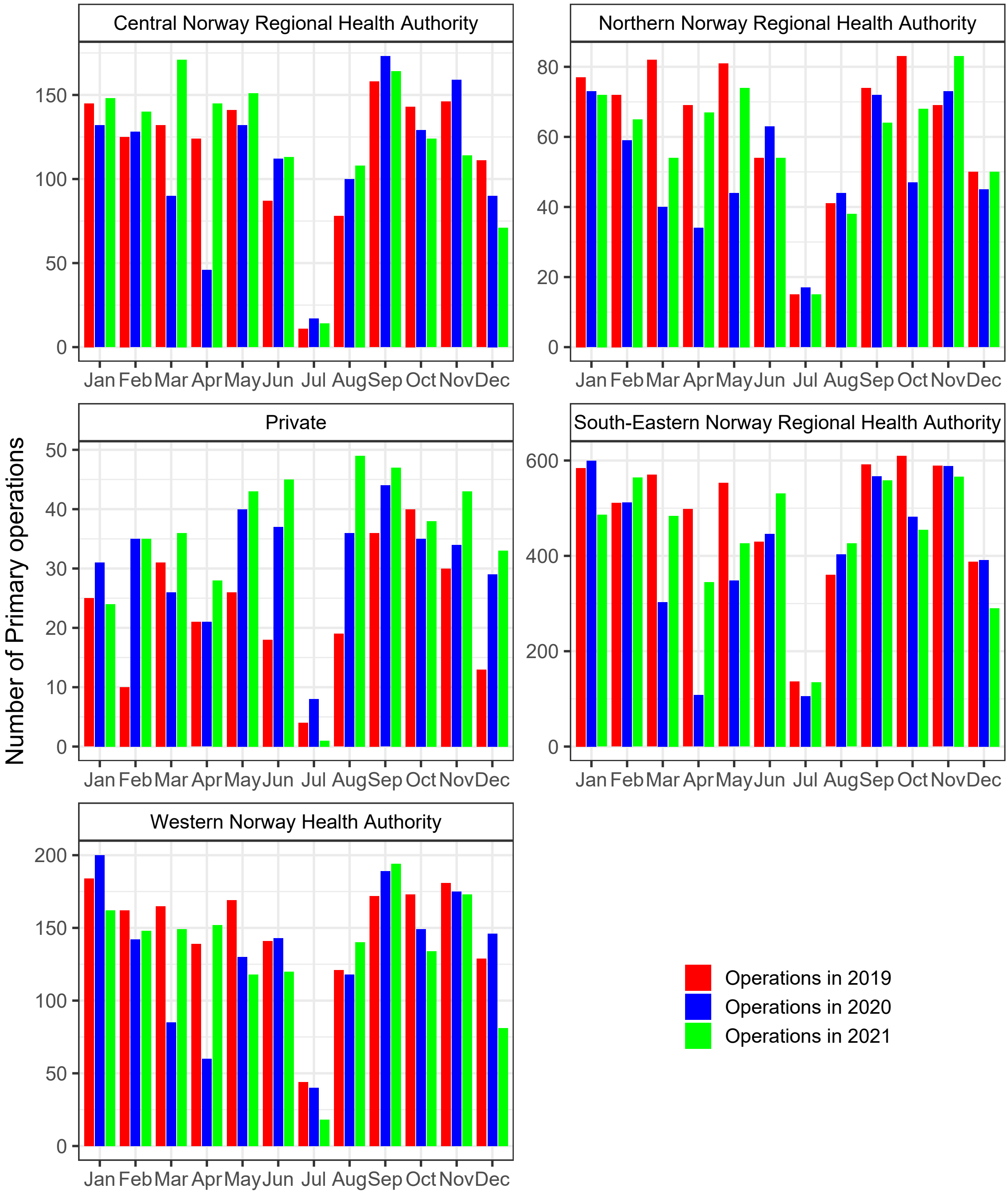
Congratulations to Knut Erik Mjaaland for brilliantly defending his dissertation at the University of Oslo on 5 November 2021: *The anterior approach in total hip arthroplasty. Assessment of the approach and comparison to other approaches [dissertation]. 2021 University of Oslo; Oslo, Norway.* One of the sub-studies in his PhD was a register study on prosthetic survival with different surgical approaches, where the main finding was that survival was not associated with surgical approach, but that there were some minor differences in reasons for revision.

Bergen, June 2022

Geir Hallan Chief Physician/Professor Hip Arthroplasty	Anne Marie Fenstad Biostatistician/researcher Deputy Head of National Advisory Unit	Merete Husøy Consultant
Irina A. Kvinnesland IT consultant	Sigurd Stenvik Biostatistician/researcher	Kalyana Srujana Mulpuri IT consultant

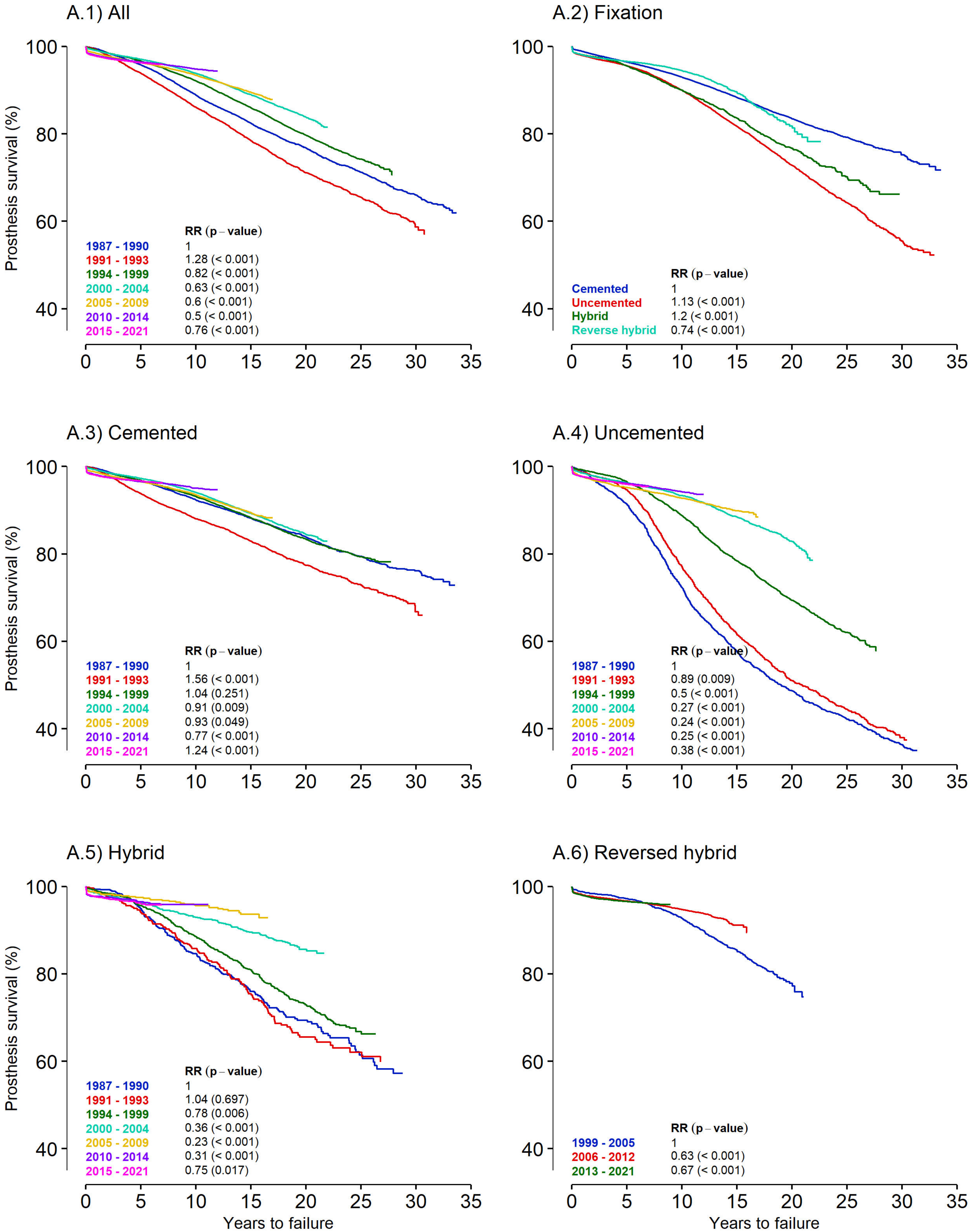
COVID-19

The number of hip prothesis operations for each Health Trust and month for 2019-2021



Survival of total hip prosthesis 1987-2021

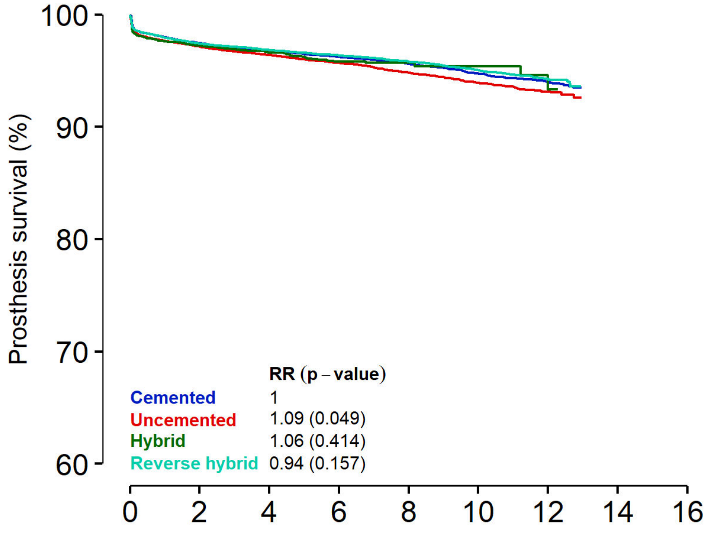
Norwegian Arthroplasty Register



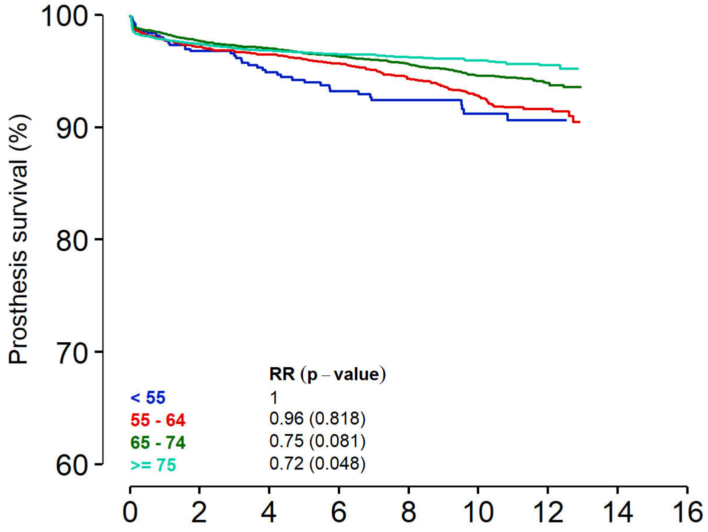
Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses are at risk.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival of total hip prosthesis
2009-2021

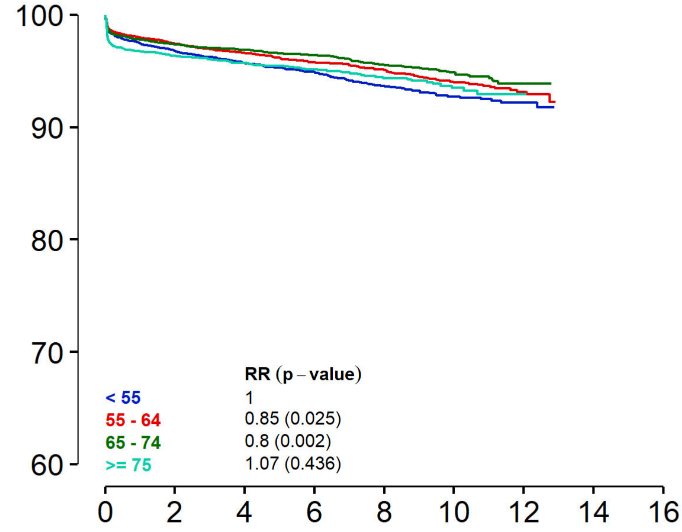
A.7) Fixation



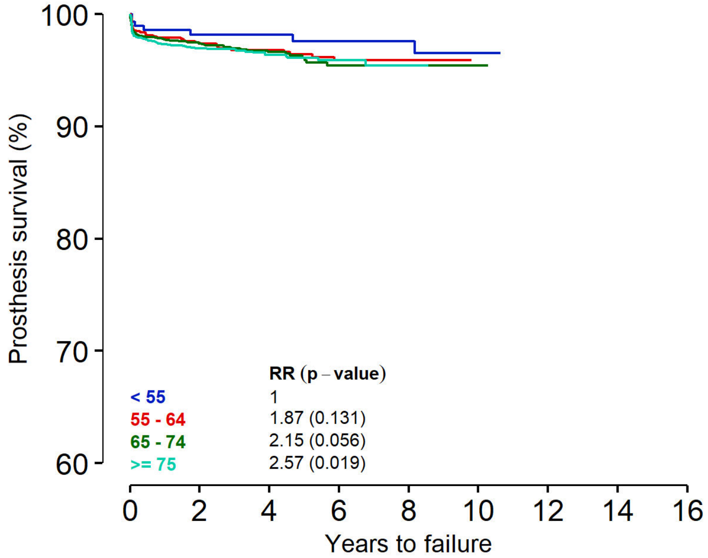
A.8) Cemented



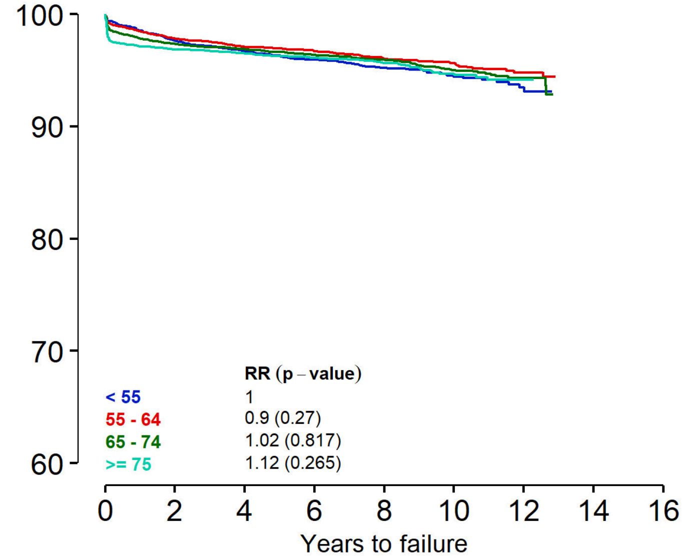
A.9) Uncemented



A.10) Hybrid



A.11) Reversed hybrid



Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
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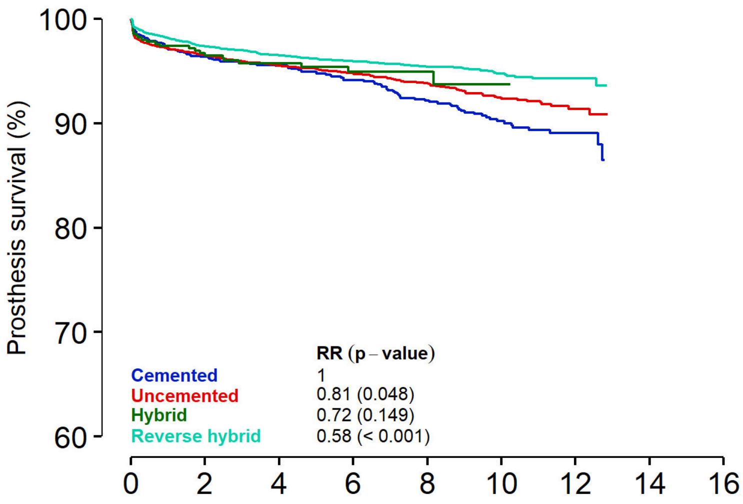
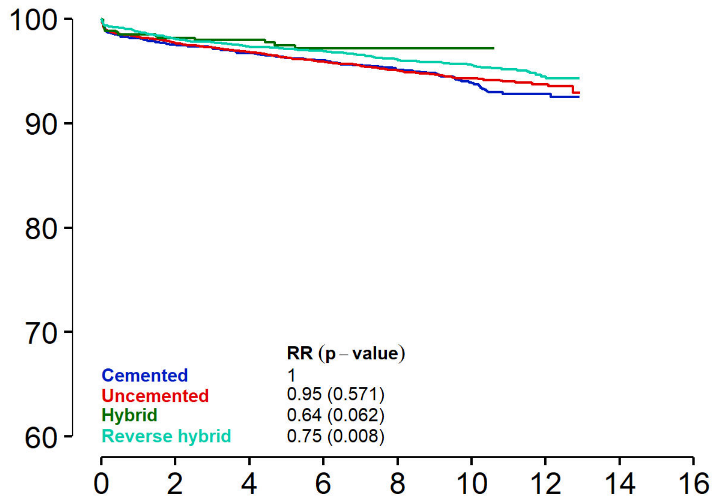
Survival of total hip prosthesis 2009-2021

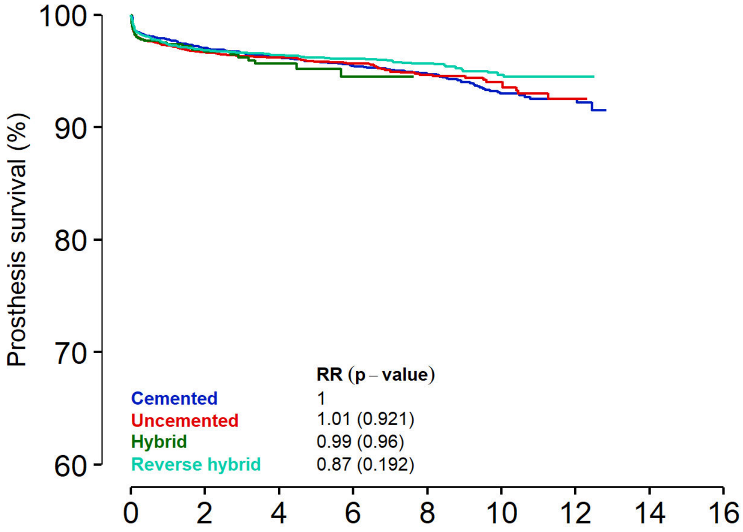
A.12) Different fixations men
Under 65 years



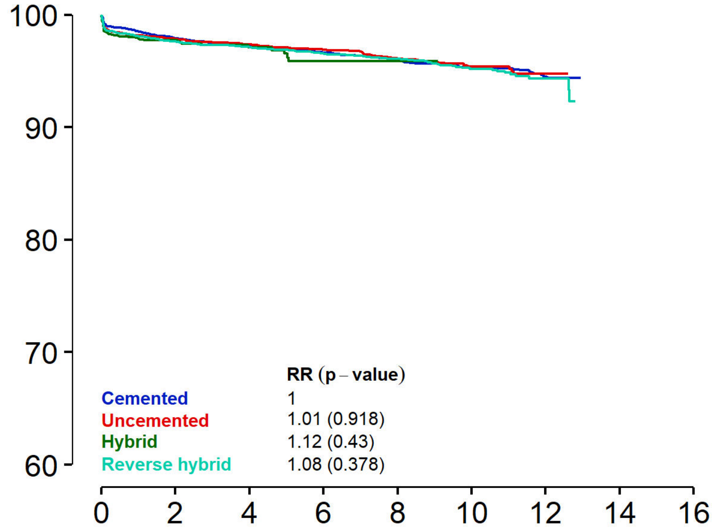
A.13) Different fixations women
Under 65 years



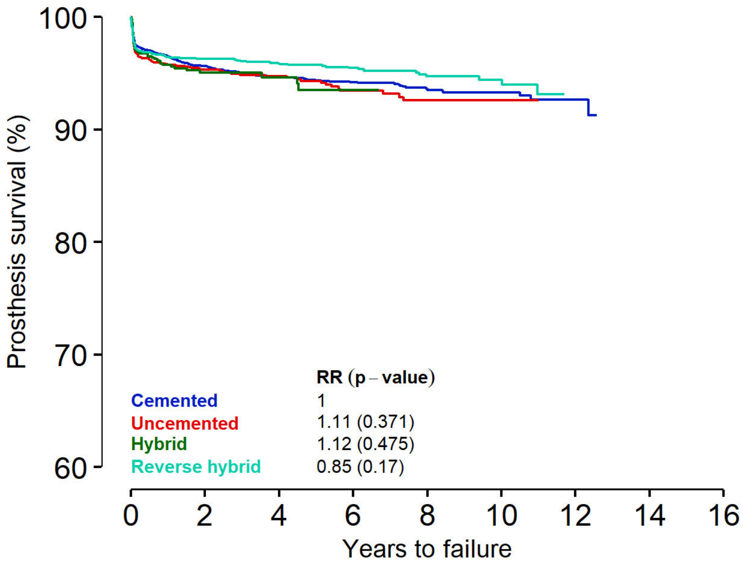
A.14) 65 - 74 years



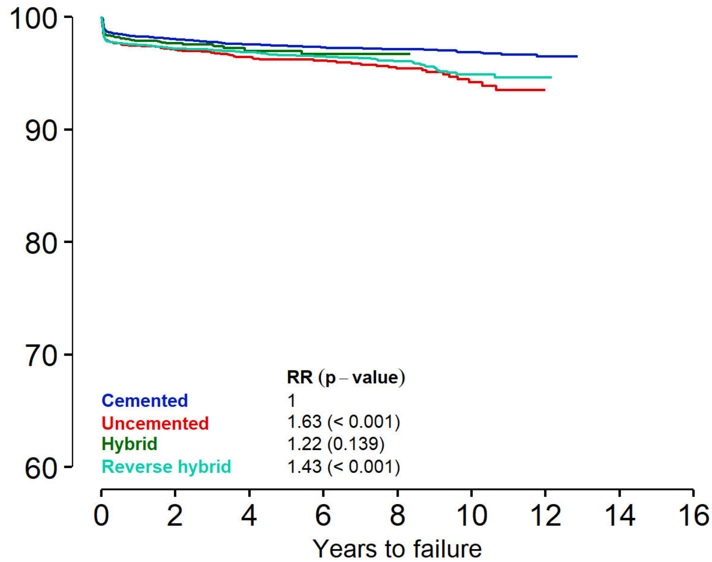
A.15) 65 - 74 years



A.16) Over 75 years



A.17) Over 75 years



Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for diagnosis.
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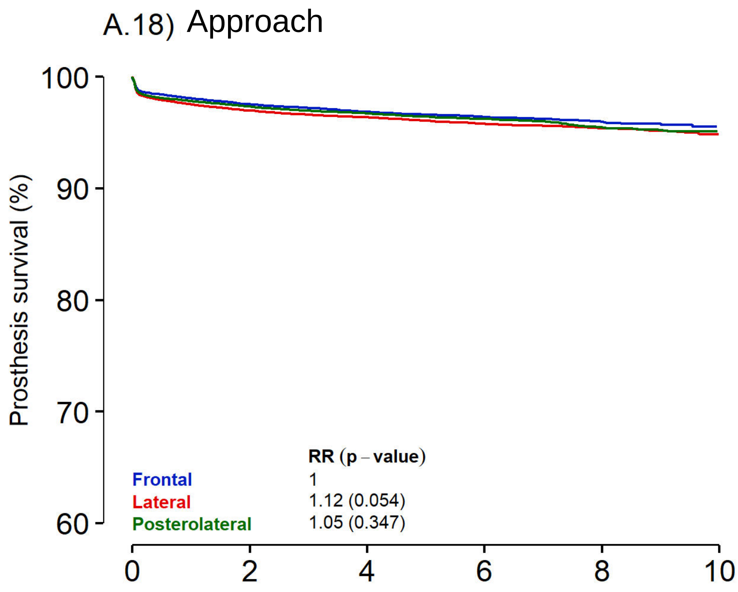
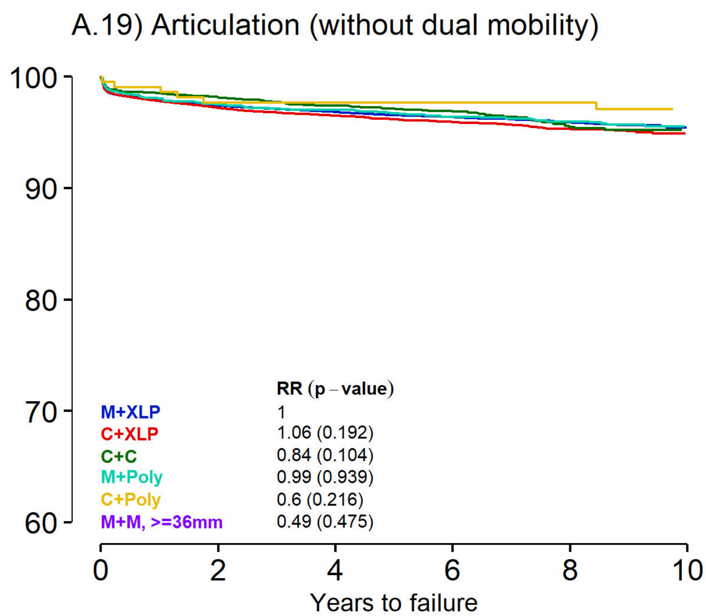
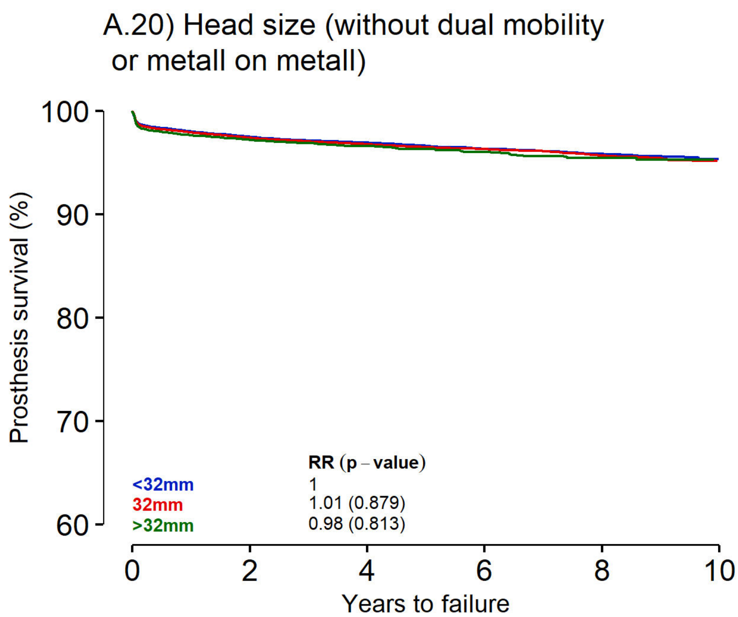
Survival of total hip prosthesis
2011-2021







Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
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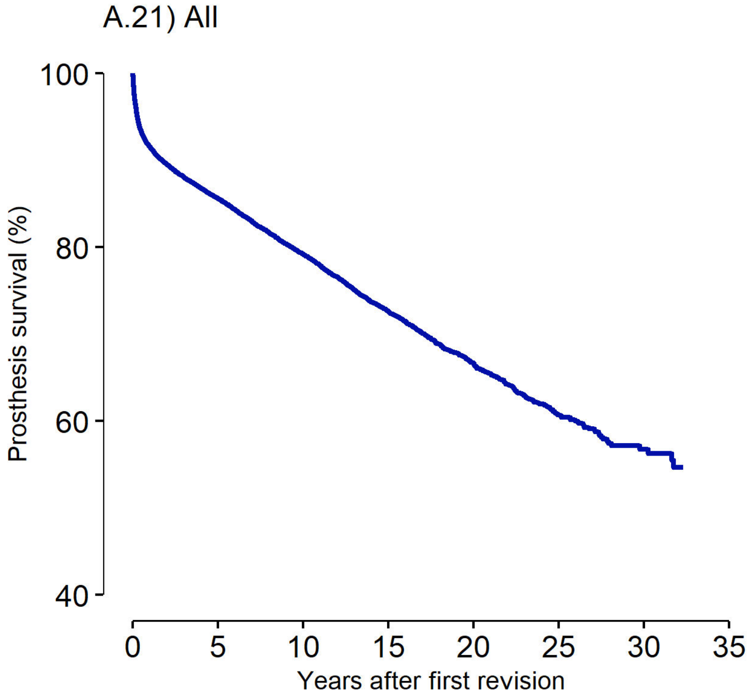
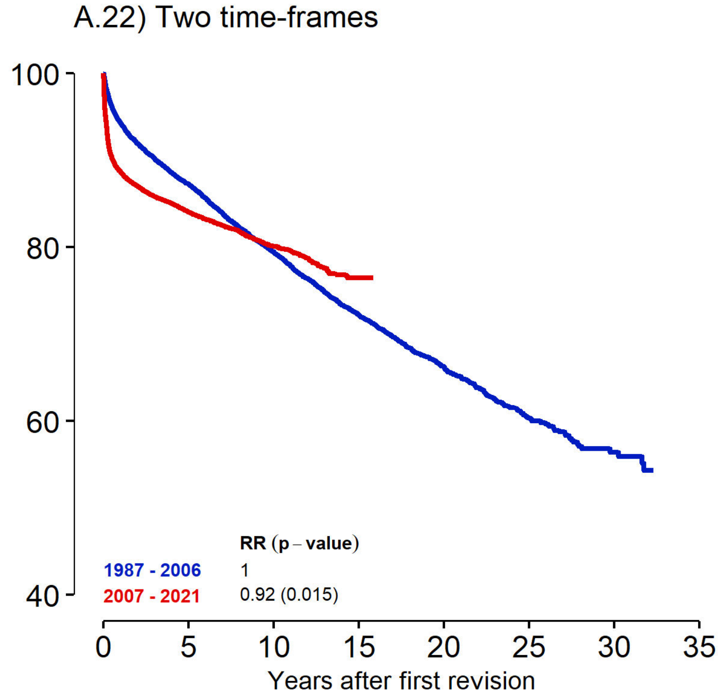
Survival curves for revision of hip prosthesis
1987 - 2021





Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
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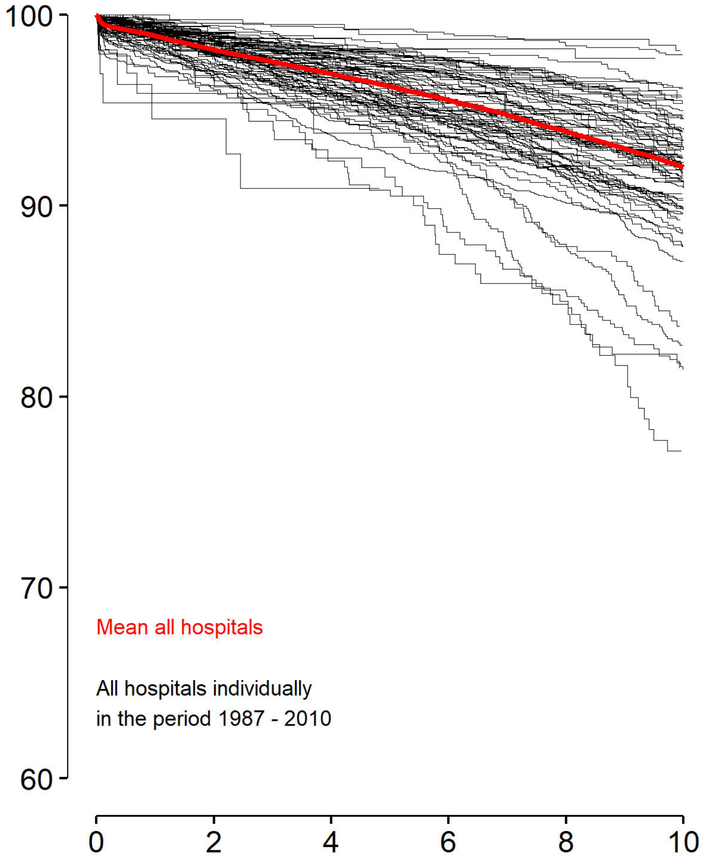
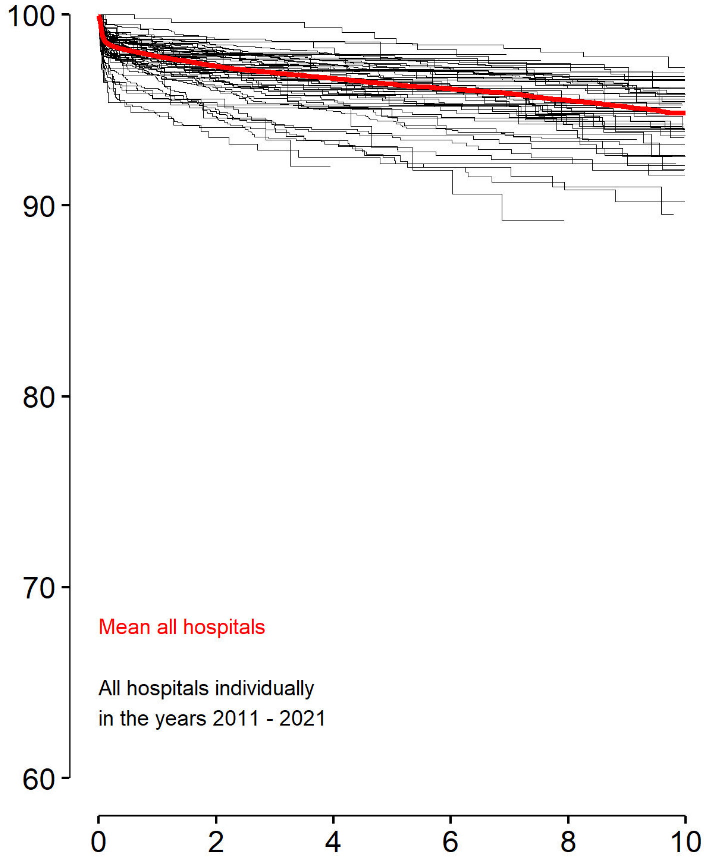
Survival curves for all hospitals individually

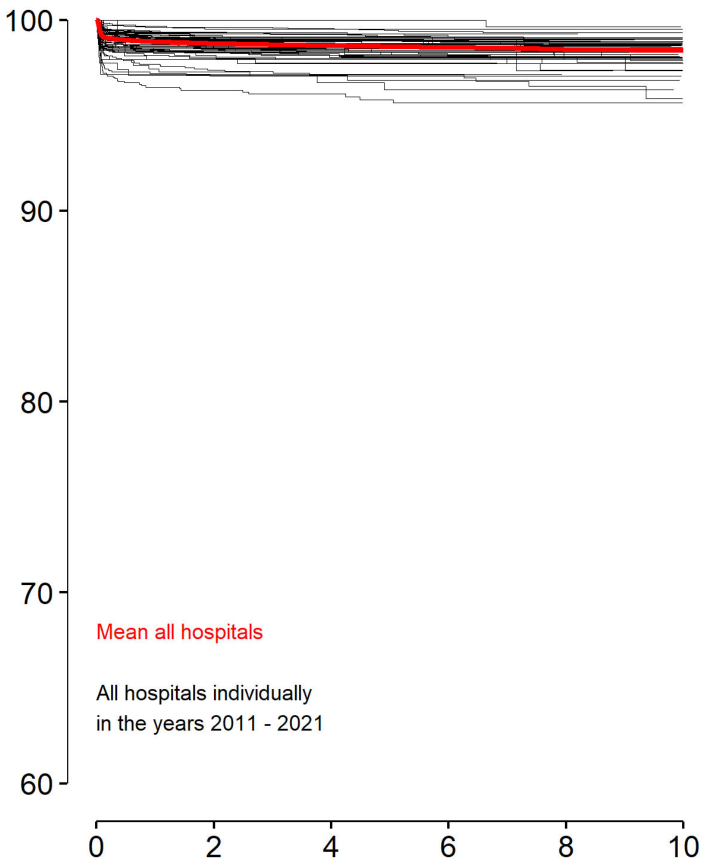
A.21) All hospitals in the years 1987 - 2010



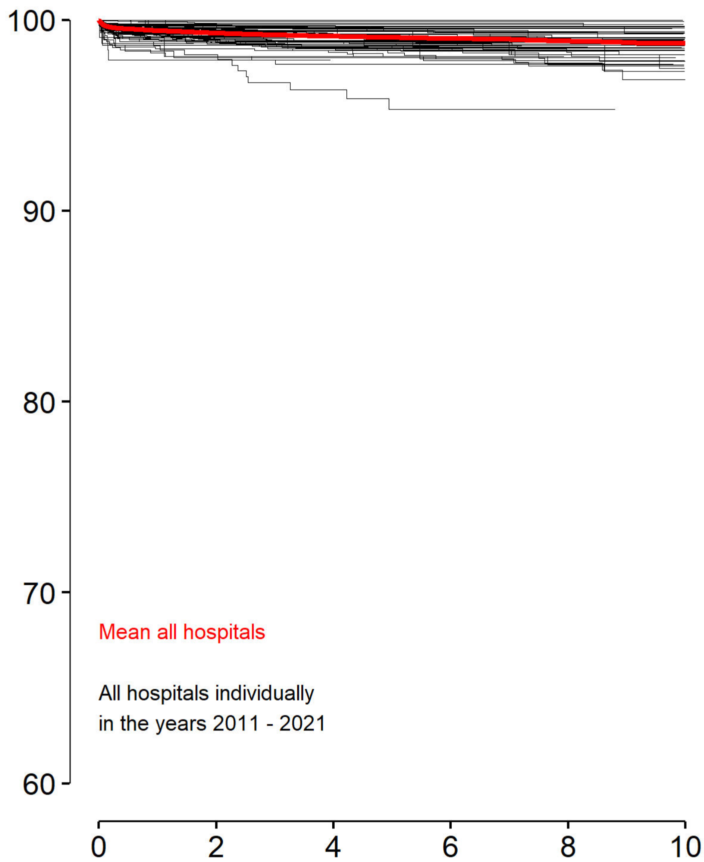
A.22) All hospitals in the years 2011 - 2021



A.23) Endpoint revision due to infection, 2011 - 2021



A.24) Endpoint revision due to dislocation, 2011 - 2021



One stage bilateral hip prosthesis operations

Year	1987-2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Sum:
Number of patients	255	26	23	22	28	32	47	72	70	100	95	770

A one stage bilateral operation is an operation where the patient is operated on both hips during the same operation or on the same day. Only primary operations are included.

FIGURE A.25: Fixation for women over 75 years, 1987 to 2021

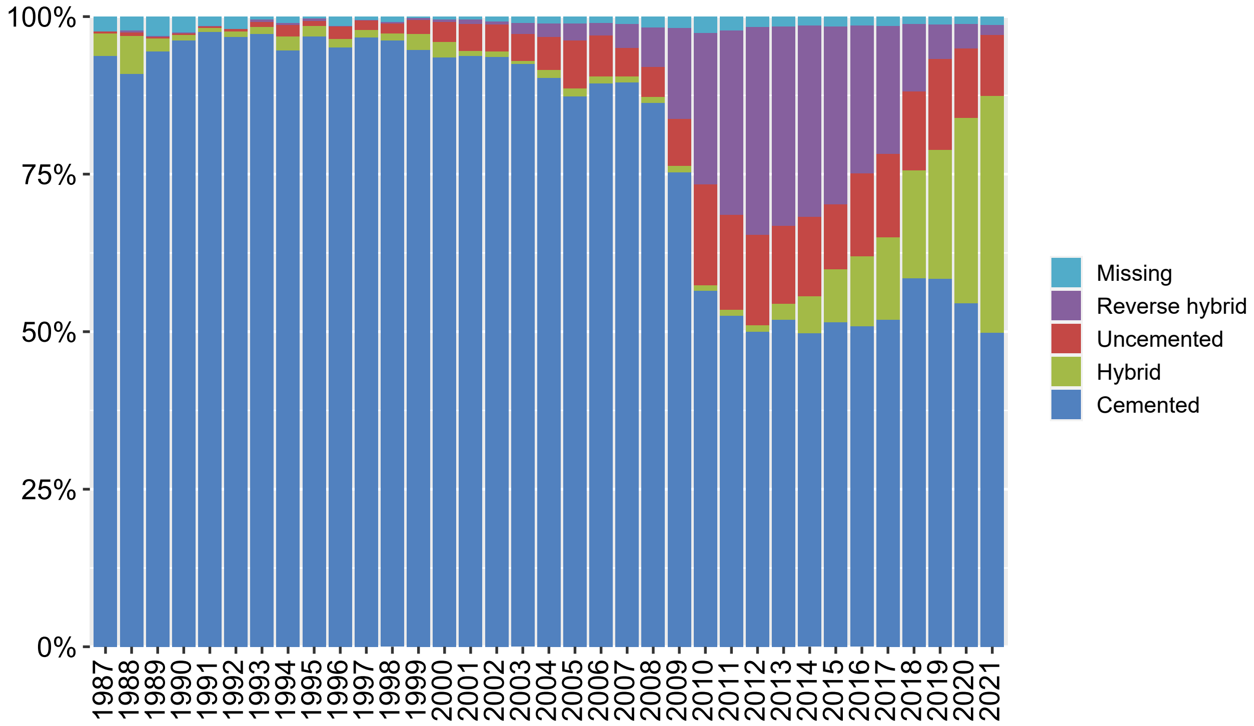


Figure A.26: Number of primary THA operations, 2021

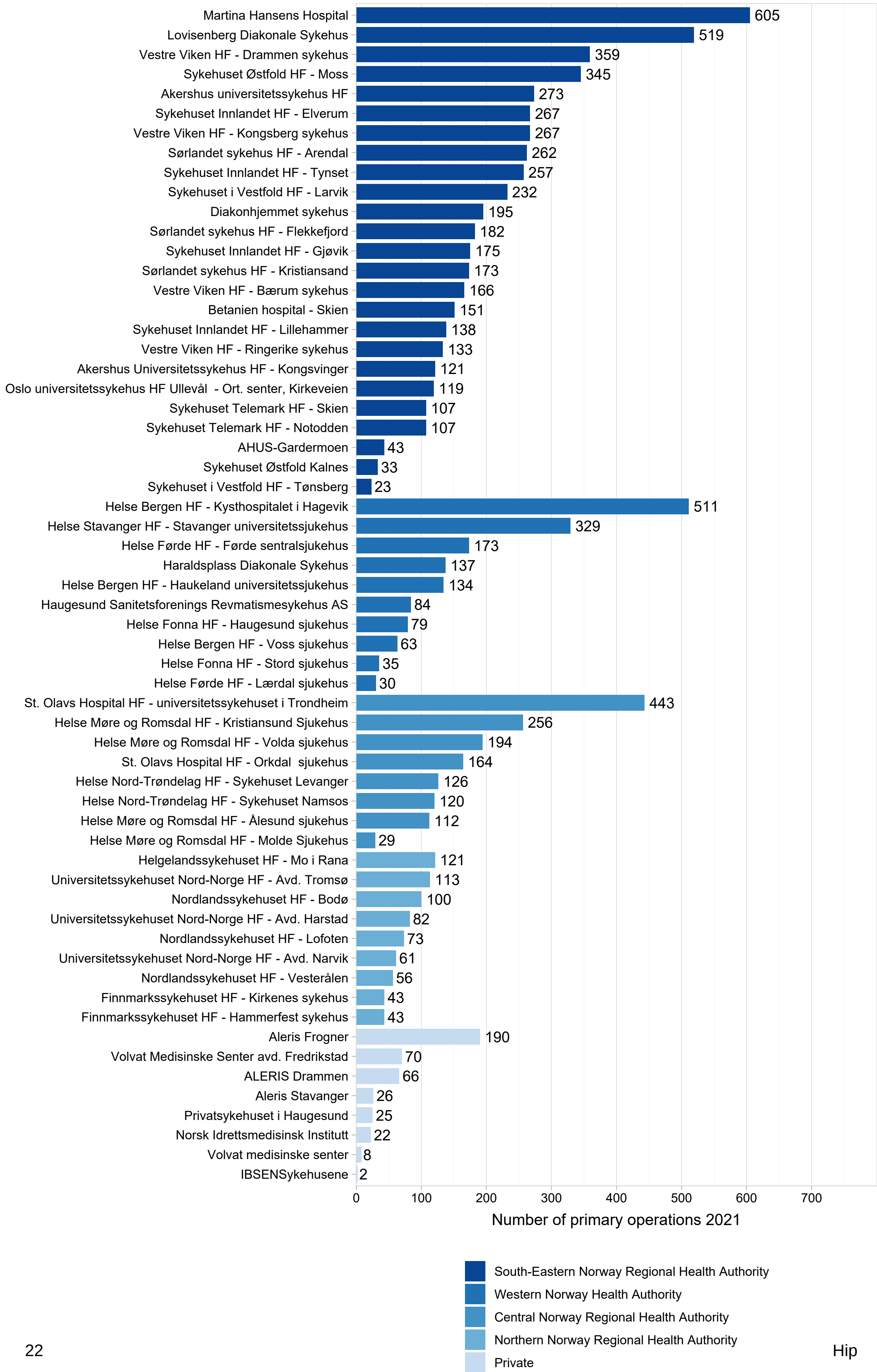
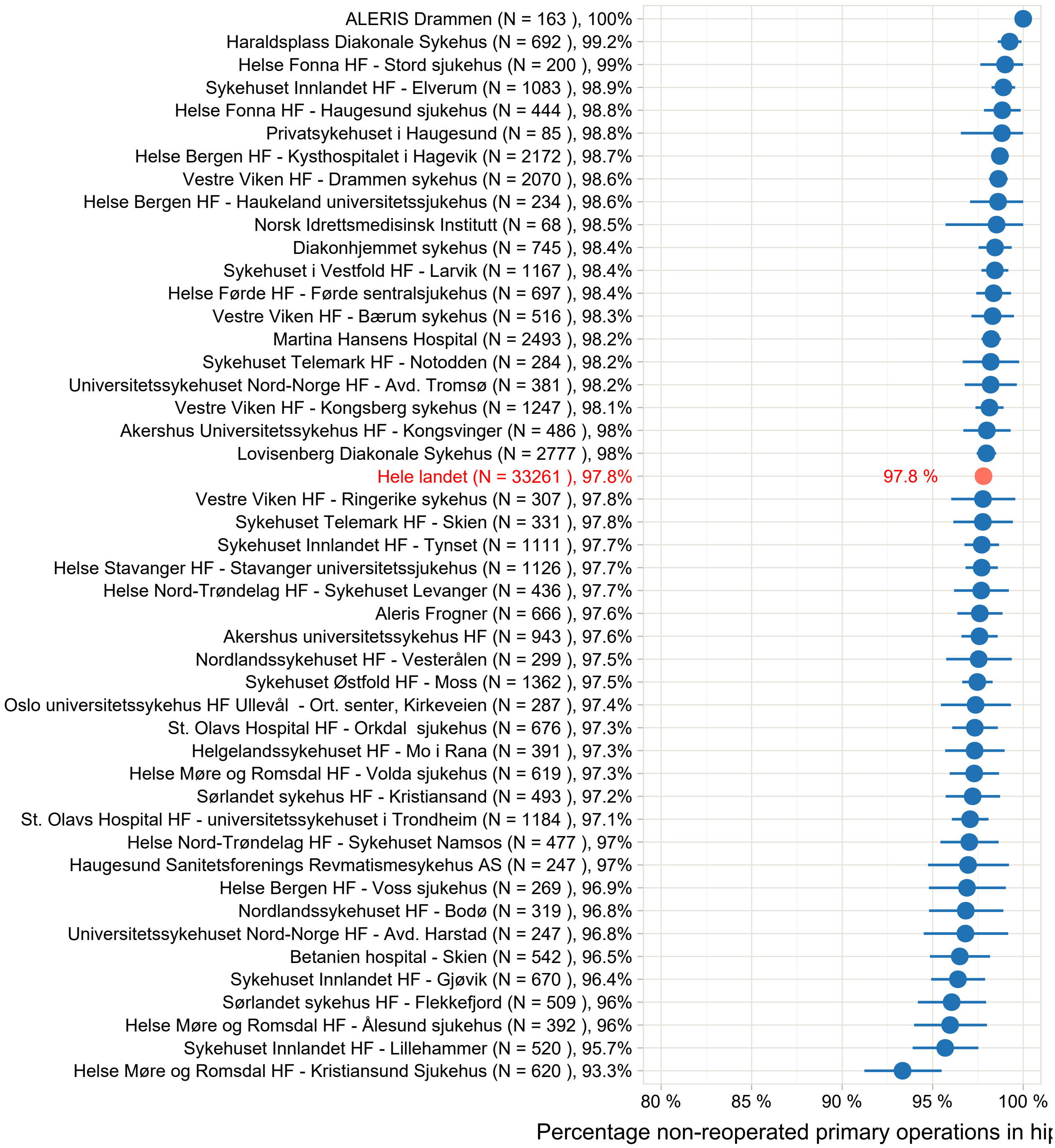


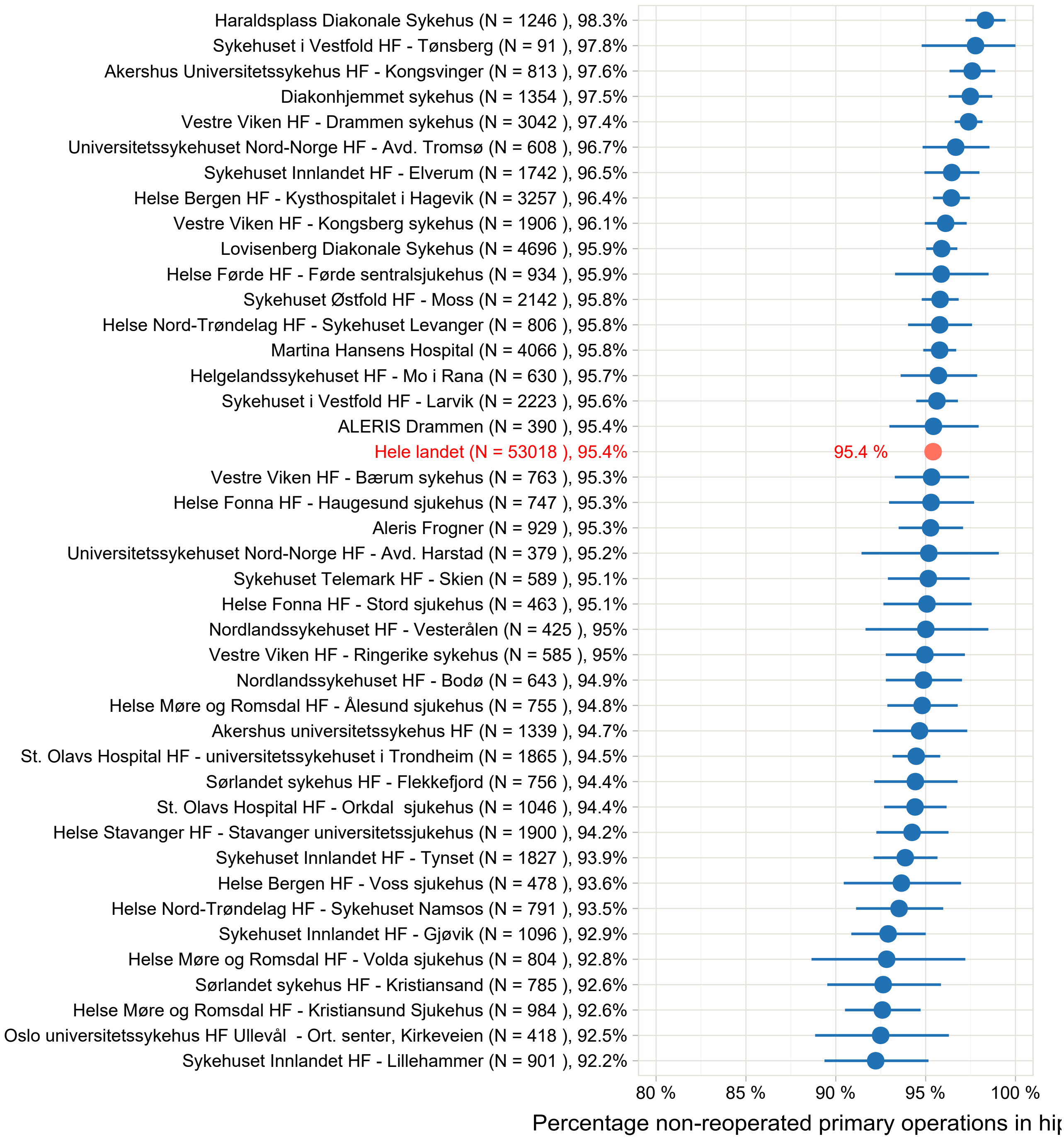
FIGURE A.27: Percentage non-revised standard patients two years after operations in 2015-2021



Kaplan-Meier estimates of percentage non-revised standard patients after two years with 95 % confidence interval. Endpoint is all revisions. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2 and with primary osteoarthritis at primary operation. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2015 to 2021. Only hospitals with operations in 2021 and with more than 50 operations from 2015 to 2021 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than two years. Only hospitals with coverage of at least 80 % for revisions from 2015 to 2020 are included.

See section «How to interpret the hospital-based results:».

Figure A.28: Percentage non-revised standard patients ten years after operations in 2010-2021



Kaplan-Meier estimates of percentage non-revised standard patients after ten years with 95 % confidence interval. Endpoint is all revisions. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2 and with primary osteoarthritis at primary operation. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2010 to 2021. Only hospitals with operations in 2021 and with more than 50 operations from 2010 to 2021 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than ten years. Only hospitals with coverage of at least 80 % for revisions from 2010 to 2020 are included.
See section «How to interpret the hospital-based results:».

How to interpret the hospital-based results:

When hospitals are ranked by percentage of revisions, results must be interpreted with caution, as there may be many reasons for different revision percentages:

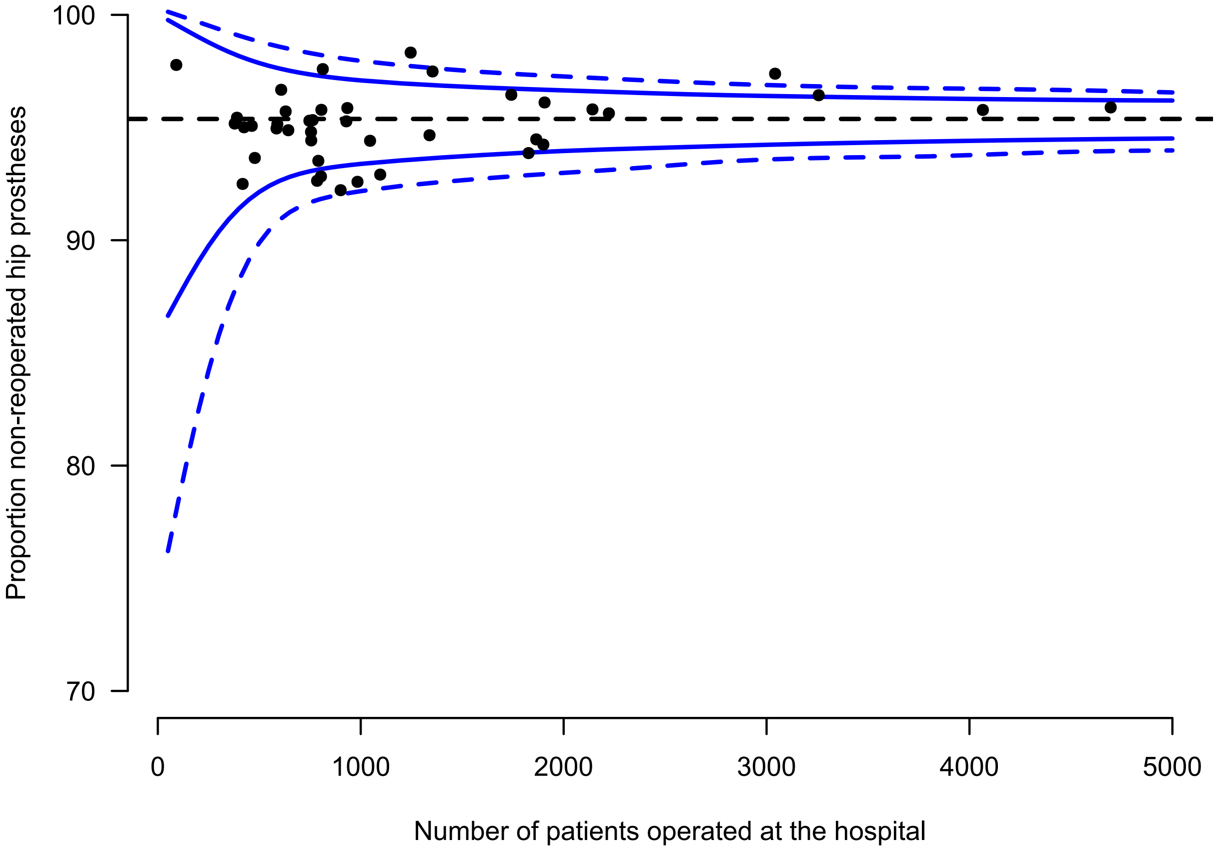
1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analyses.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications, this could lead to unfortunate results despite the fact that this hospital in reality is doing a better job than other hospitals.
3. If the waiting time for reoperations is longer in some hospitals than others, the longer wait could erroneously lead to better results than those of hospitals with a short waiting time.
4. If the surgeons at one hospital have a higher threshold for recommending reoperation than at other hospitals and thus prolong patients' problems, this will also give skewed results in the statistics.
5. Poor hospital results from an earlier period will remain with the hospital, even though the hospital may have acted upon previous problems by switching to better prostheses and improving procedures and surgical skills.

There is also a statistical uncertainty in the ranking lists because the data from the NRL are poorly suited for such calculations. The NRL was designed to compare the results of implants and surgical procedures nationwide. To compare quality in hospitals is a complex matter, because some hospitals operate on more patients with poor prognosis than other hospitals, and because many hospitals, especially the small ones, have so few reoperations that the statistics are too weak, and are further weakened by the fact that the hospitals' coverage (reporting rate) of reoperations varies from 0,0 % to 100,0 %. This issue is explained in detail in the following articles: Ranstam J, Wagner P, Robertsson O, Lidgren L. "Health-care quality register outcome-orientated ranking of hospitals is unreliable." J Bone Joint Surg Br. 2008 and Ranstam J, Wagner P, Robertsson O, Lidgren L. "Ranking in health care results in wrong conclusions". Läkartidningen. 2008 Aug 27-Sep 2;105(35):2313-4.

Moreover, it is a well-known phenomenon in quality assurance that if those who report their complications and errors the most accurately receive a lower ranking because of this, the reporting may eventually deteriorate.

If league tables of hospitals are publicised, there is thus a danger that hospitals' reporting of revisions may become poorer, leading to inferior quality of the registers. In order to achieve complete reporting of reoperations (revisions), reporting to the Register should be linked to performance-based financing, reporting should be made mandatory, and the requirement for the patient's written consent to reporting of the operation to the Register should be waived and replaced by presumed consent.

Figure A.29: Funnel plot, percentage non-revised standard patients ten years after operations in 2010-2021



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2010 to 2021 at Norwegian hospitals. Some hospitals are excluded. This can be due to low completeness of reporting of revisions (<80 % from 2010 to 2020), that less than 50 hip prostheses have been operated in the period, that fewer than 10 patients have been followed up for more than 10 years, or that the hospital don't have any operations in 2021. The solid blue lines show the interval where 95 % of the Norwegian patients will be. The dotted blue lines show the interval where 99.8 % of the patients will be. Points to the right represents hospitals with many operations (see the x-axis). Points above or below the dotted lines are regarded as outliers with exceptionally good or exceptionally bad results respectively.

All of the points in the funnel plot correspond to a hospital in figure A.28. By choosing any point, and using the corresponding values for "Number of patients" and "Proportion non-reoperated" on the x and y axis respectively, the hospital belonging to the point can be found in figure A.28.

FIGURE A.30: Durability of THA 2010-2021.

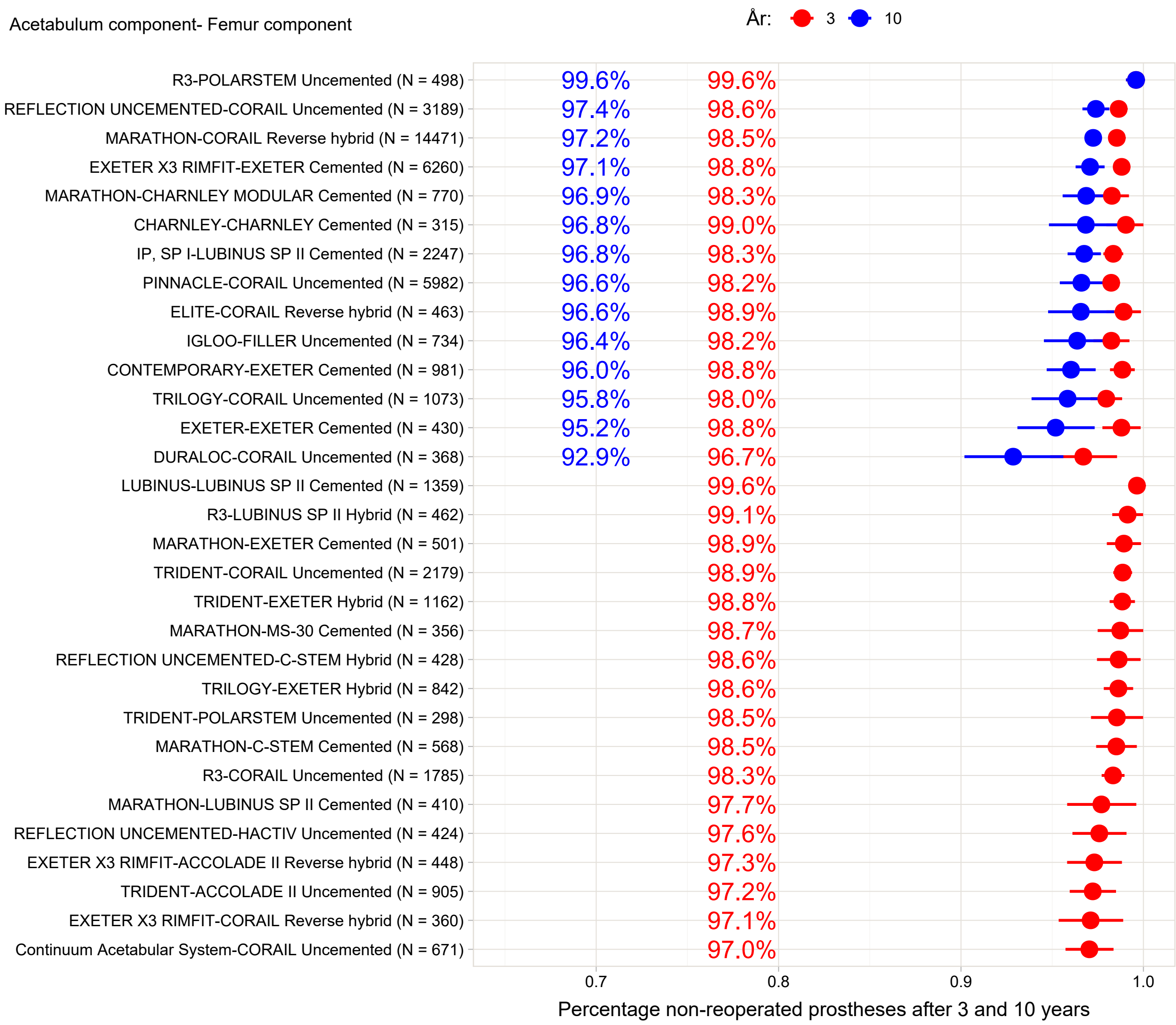


Figure A.30 shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of hip prostheses. We have only included combinations used in 500 or more operations in 2010-2021. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2010 to 2021 have been included, and the number of prostheses will therefore be below 500 in some cases. A standard patient is aged 55-85 years, has ASA class 1 or 2 and was diagnosed with primary osteoarthritis at primary surgery. Using standard patients provides a more homogenous group of patients, and we believe that this makes the results more comparable.

Endpoint is all revision operations, except infections and reoperations without insertion, removal or replacement of the prosthesis. As recommended in Report No. 6/2002 from the Norwegian Centre for Health Technology Assessment (SMM), "Choice of Implants in Primary Total Arthroplasty in Norway", most health trusts will require ten-year documentation on the prosthesis. The results in this report must be compared with results in our publications, where we can account for materials and methods and discuss strengths and weaknesses and the significance of the findings.

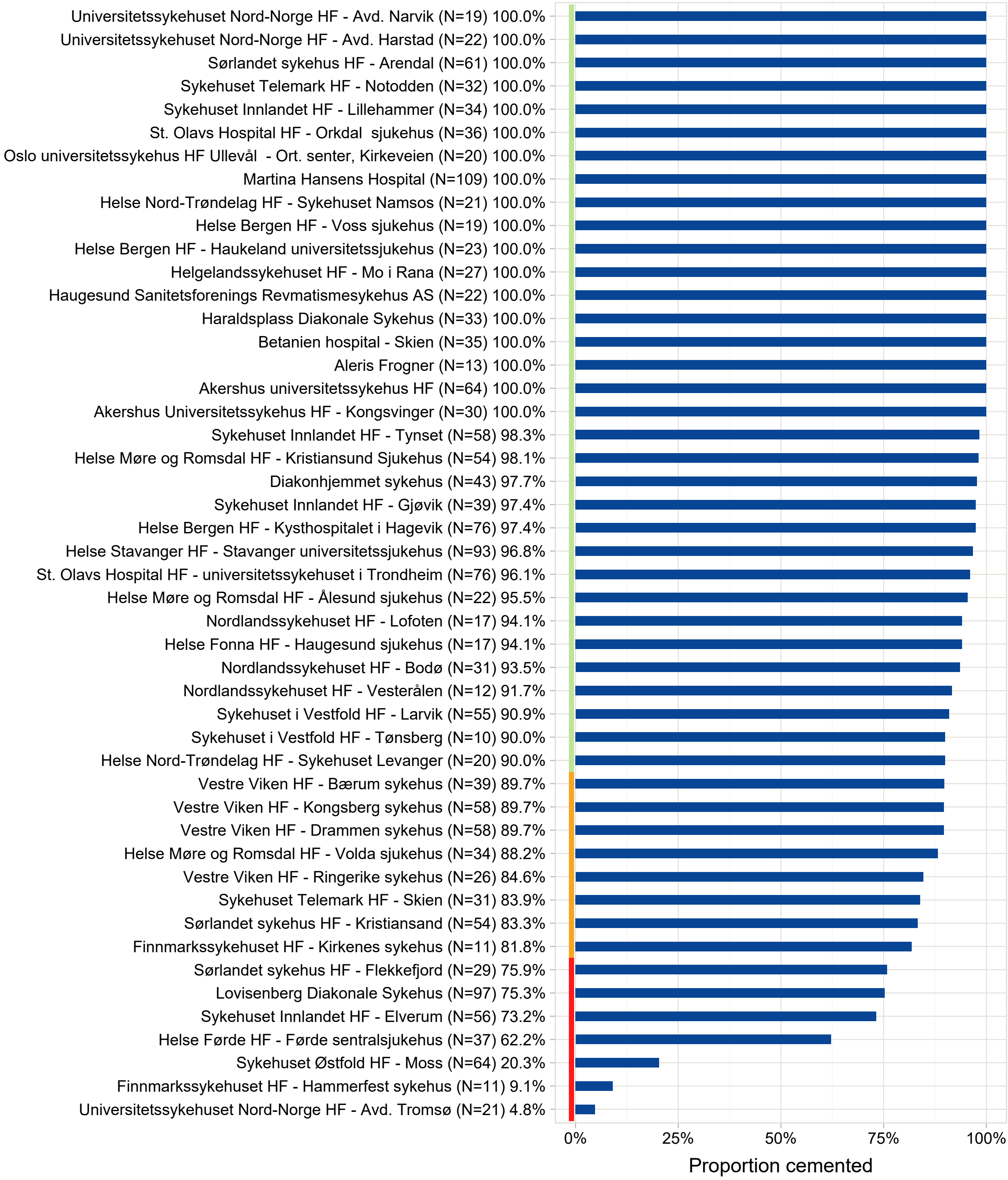
How to interpret the prosthesis results:
When prostheses are ranked by percentage of revisions, results must be interpreted with caution, as there may be many reasons for different revision percentages. We mainly publish prosthesis results in scientific journals and presentations where we account for materials and methods and discuss strengths and weaknesses and the significance of the findings (see the reference list on our website https://helse-bergen.no/nrl).

In general, we can state the following:

1. A poor result for a particular prosthesis may be caused by a learning curve for its use, which means that some patients will be revised due to the lack of experience with the particular implant.
2. In our papers, we adjust for differences in patient groups such as age, gender, diagnosis, joint surface material and fixation. Some prostheses and materials tend to be used in younger and more active patients. Such patients may wear out the prosthesis faster. A prosthesis used in many such patients may have poorer results than a prosthesis used in older and less active patients. The degree of activity has not been recorded in the register until recently; we now collect activity data through the PROMs.
3. If a prosthesis is used in a large number of patients (>3000) and in several hospitals (>5), we consider the results more reliable.
4. Scientific papers discuss the reason for revision of the prosthesis. If there is a natural biological or mechanical reason, we have more faith in the results, i.e. we consider a high revision rate to be due to qualities of the prosthesis rather than the surgeon.
5. National registers are observational studies and cannot normally explain the reasons for the results of a particular group of prostheses. The results must be compared with those of experimental studies and randomised controlled trials. Furthermore, the results must be reproduced in other studies and registers before being considered valid.

Results of hip and knee arthroplasty in Norway are generally good and comparable to results in the other Nordic countries (Mäkelä K 2014, Junnila M 2016 and Robertsson O 2010), see the reference list in our annual report. The two hip prostheses with poorest ten-year results (Titan/Titan and Reflection cemented/Spectron EF) have been discontinued in Norway on the basis of results in our earlier publications (Espehaug B 2010, Hallan 2012 and Kadar T 2011). This also applies to the Duracon knee prosthesis (Gøthesen 2013).

FIGURE A.31: Proportion of women over 75 years with cemented stem in 2021.



The figure shows that some hospitals use cemented femoral stems in all women over 75 years, others differentiate and some choose uncemented femoral stems for all these patients. The Register recommends using a cemented stem for this patient group. On a national level, 88,9 % of femoral stems were cemented in women over 75 years of age.

Figure A.32: Proportion of patients with strong cup materials (cross-linked polyethylene/ceramic) in 2021.

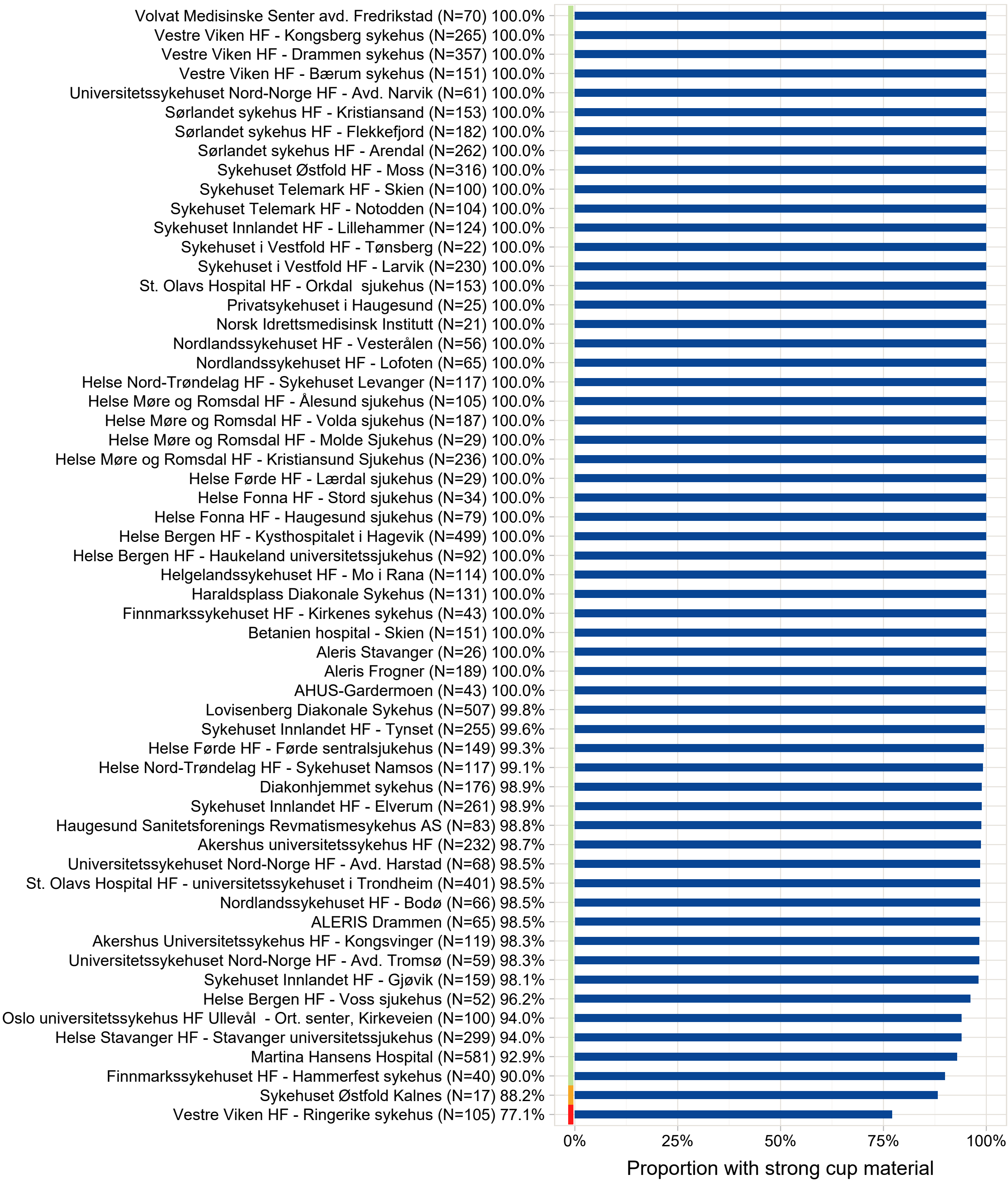
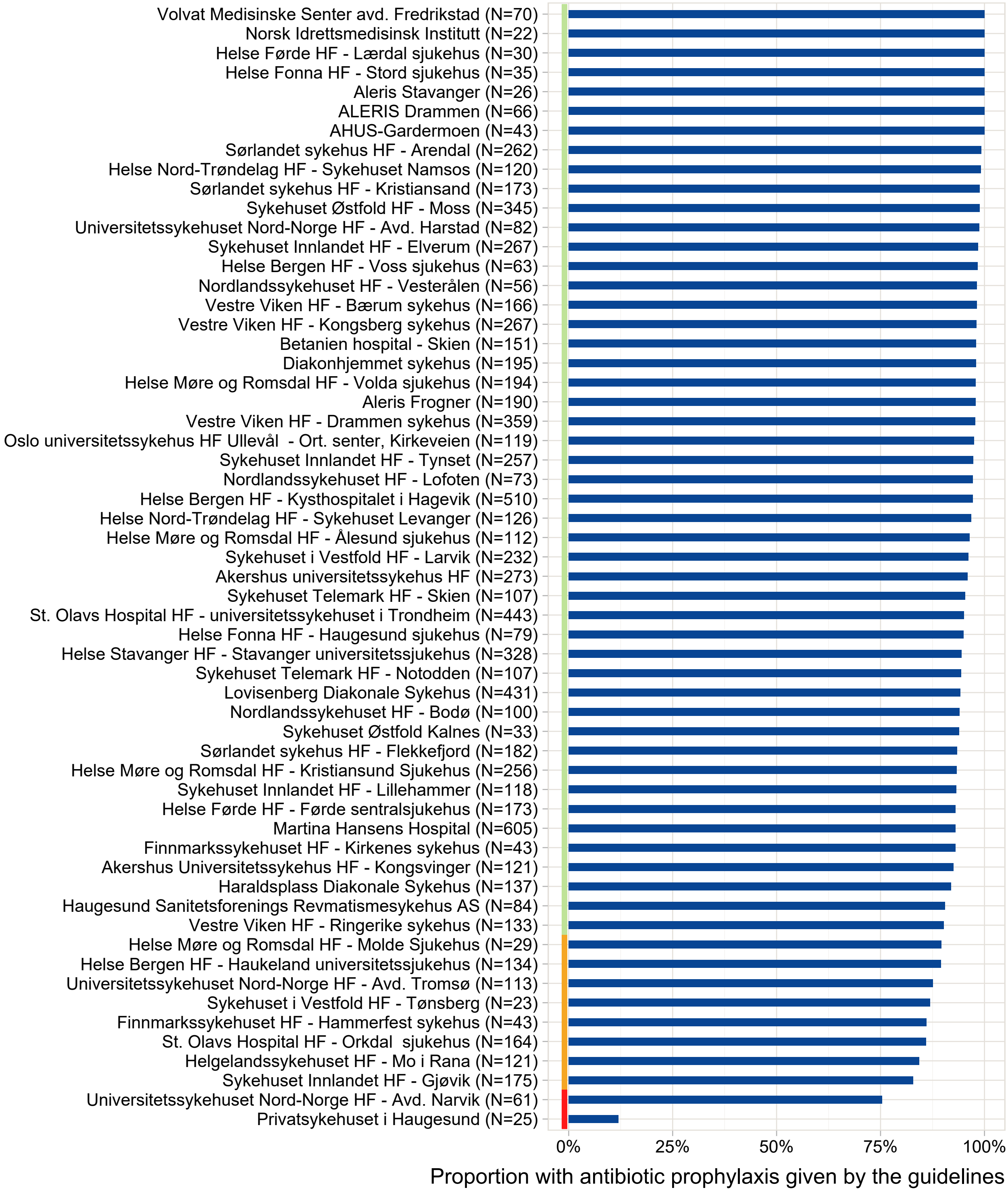


Figure A.32 shows that most patients at all hospitals receive hip prostheses with wear-resistant joint surfaces (Nationally: 98,6 %). The use of ordinary polyethylene is justified in certain patients who do not need a prosthesis lasting longer than 10-15 years.

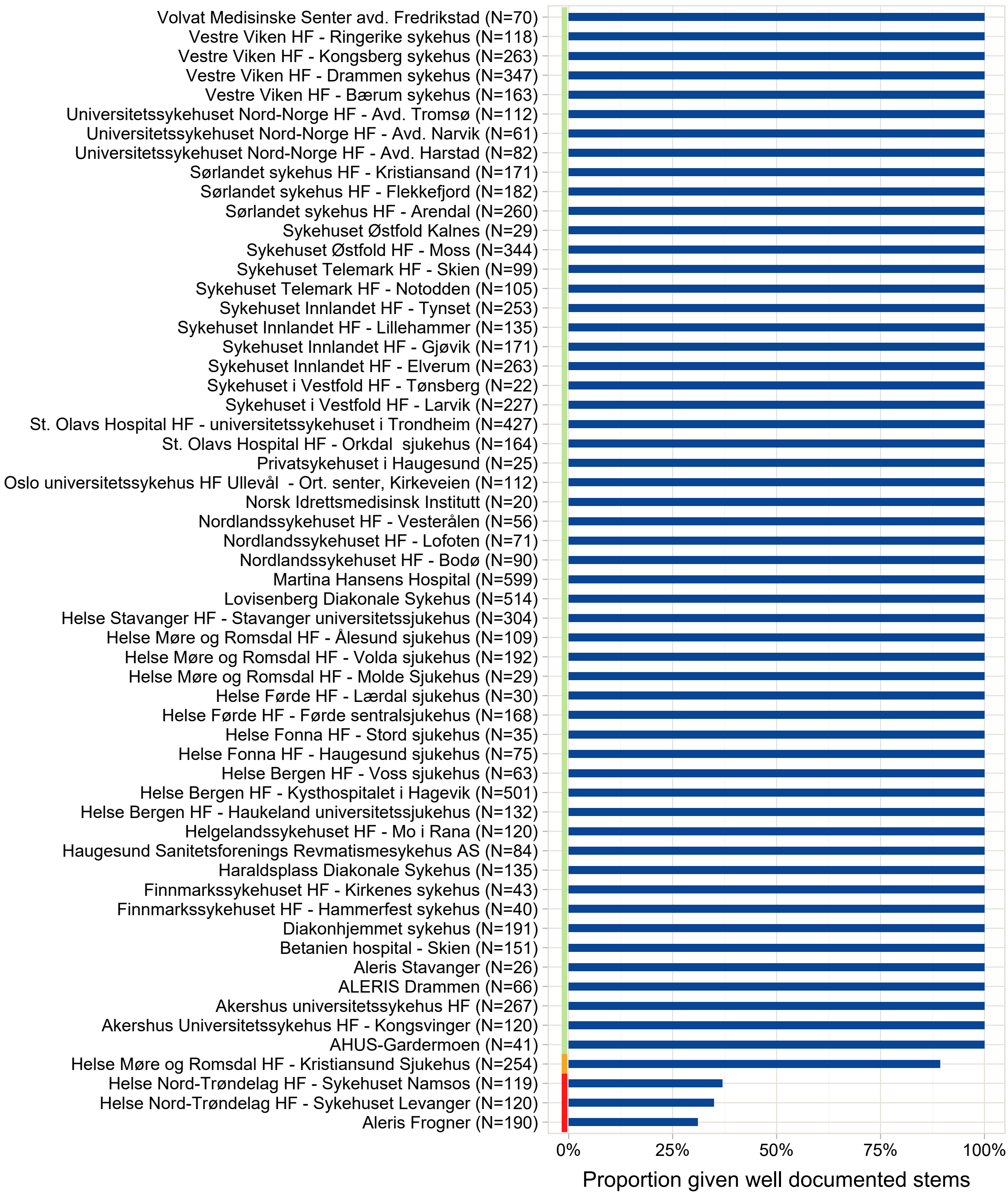
A special type of cups (Dual Mobility (DM) cups) are still delivered with conventional polyethylene. The hospitals in the lower part of the figure uses these cups. It is not clear form literature that it is necessary to use cross-linked polyethylene in DM cups.

FIGURE A.33: Proportion of patients with antibiotic prophylaxis as given by the guidelines in 2021.



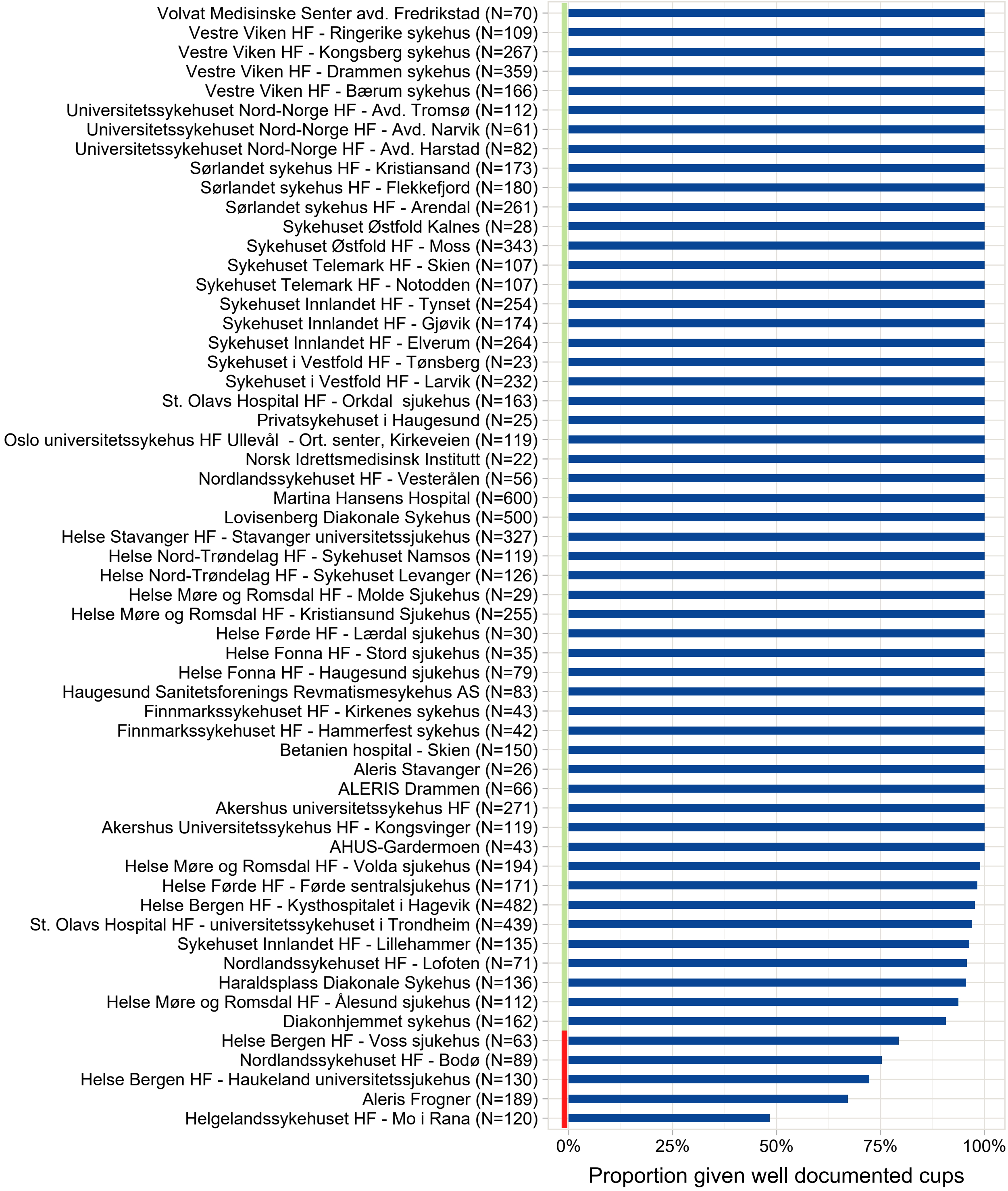
Antibiotica prophylaxis was administered according to the guidelines in 96,6 % of all operations. A low score (at the bottom of the figure) does not mean that patients have not received antibiotics; it generally means that they were given antibiotics in a manner contrary to the guidelines. Some hospitals have several cases of inaccurate reporting, which means the hospitals will perform poorly in the figure, even if they do administer antibiotic prophylaxis according to guidelines. When reporting electronically this inaccuracy will be strongly reduced.

FIGURE A.34: Proportion of patients recieving well documented hip stem in 2021.



The overwhelming majority of all inserted hip stems are well documented. On a national level, 96,6 % of all hip prostheses use well documented hip stems. A few hospitals fall short of satisfying the requirements. For some hospitals, this is due to ongoing clinical trials on new implants. Others have elected to use implants where the long-term results have yet to be documented. All hospitals have been asked to report these prostheses to the registry so that they could be excluded from the above presentation.

FIGURE A.35: Proportion of patients recieving well documented hip cups in 2021.



On a national level, 97,2 % of all hip prostheses use well documented hip cups. Some hospitals fall short of satisfying the requirements. This is partly due to hospitals use of newer cups in ongoing clinical trials. All hospitals have been asked to report these prostheses to the registry so that they could be excluded from the above presentation.

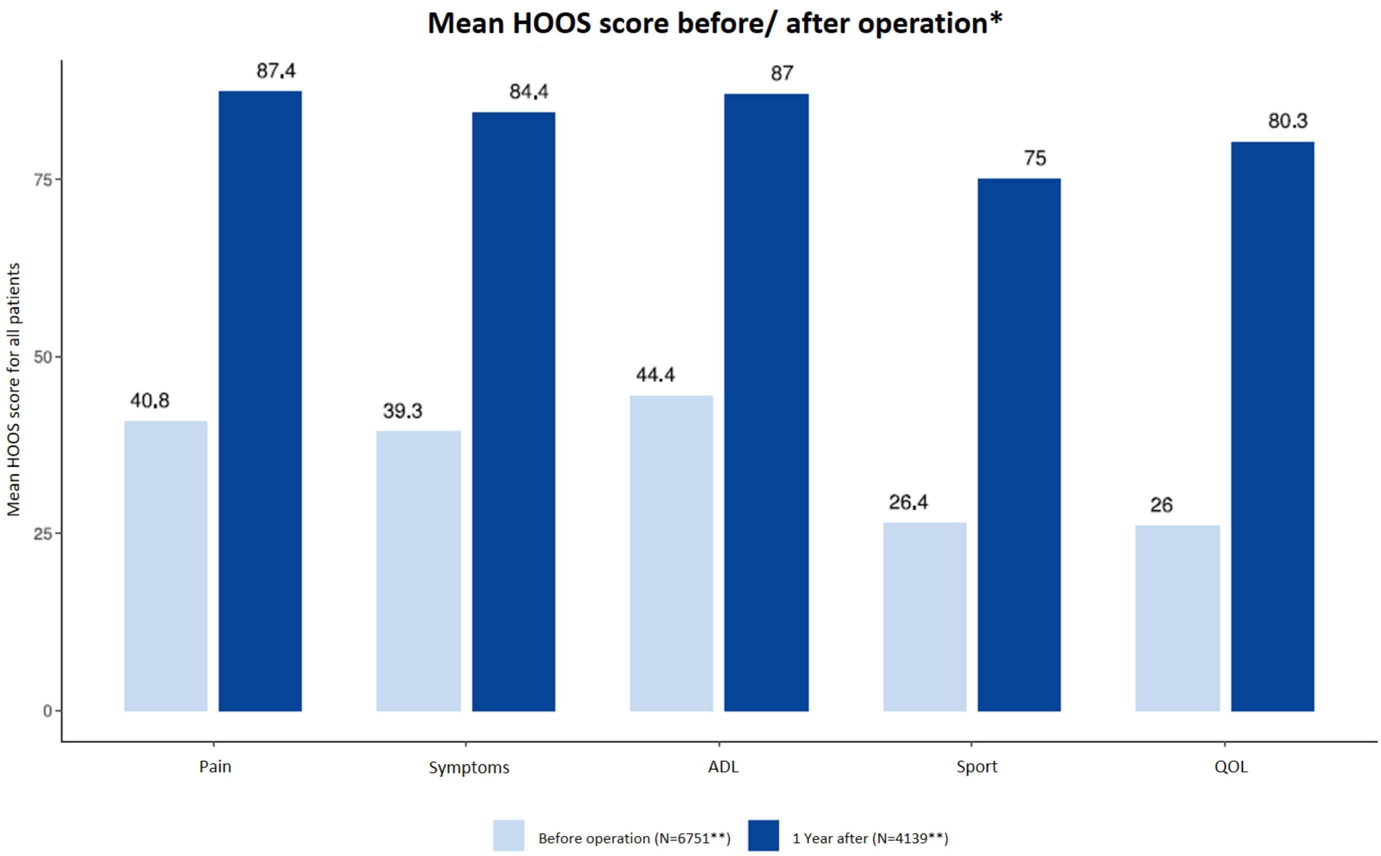
PROM, Hip Arthroplasty Register

The Hip Arthroplasty Register started electronic collection of PROM data in 2017. We wish to focus more on patients' perceived quality of life and joint function before and after surgery. Patients complete an electronic questionnaire before surgery and 1,6 and 10 years after surgery. We will compare the data we collect from patients with the data reported by surgeons for the same patient group. This will allow us to focus on function and quality of life in addition to a possible revision of the prosthesis.

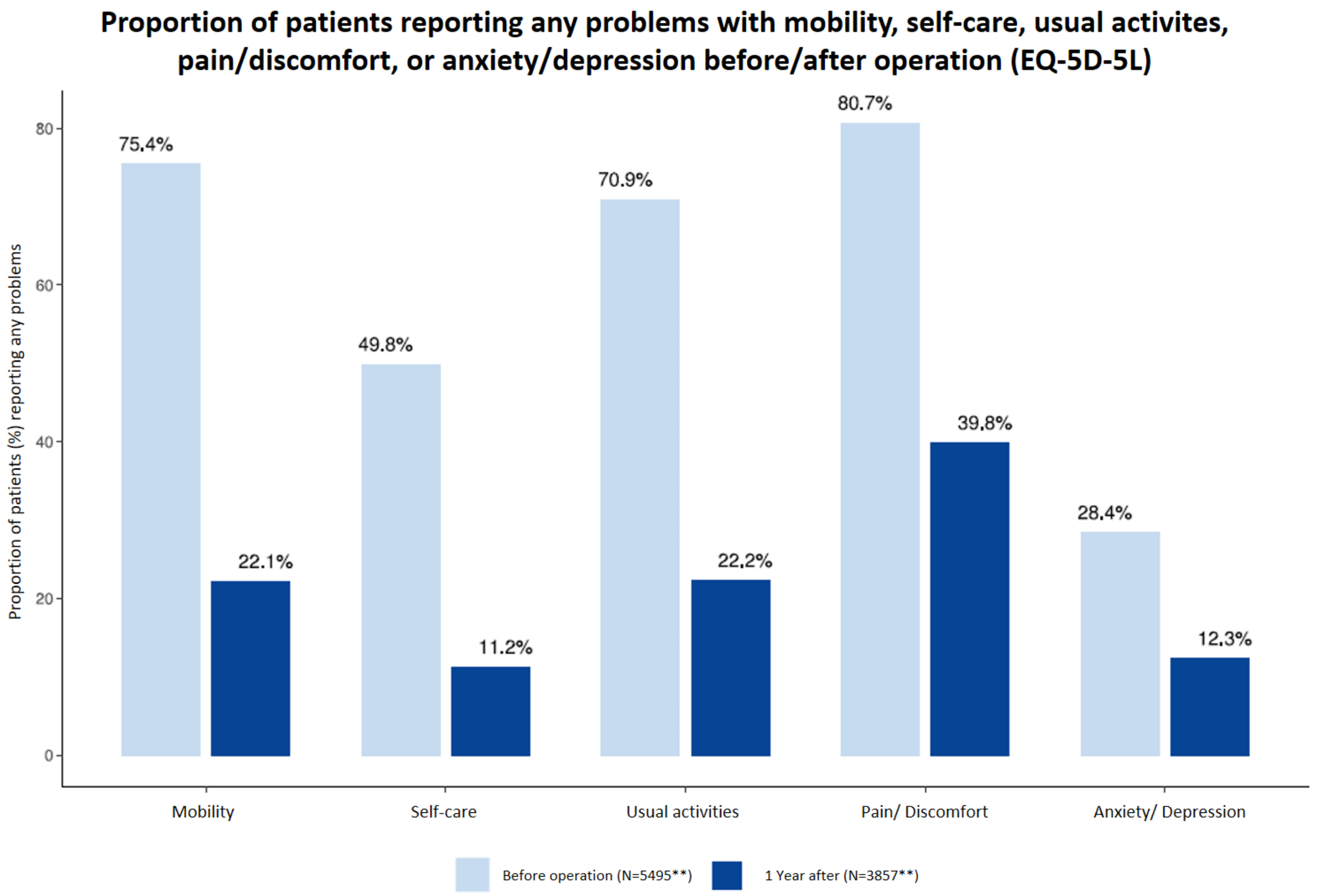
So far, 5495 pre-operative PROM forms and 3857 one year follow-up forms have been reported to the register. Up until this point 35 hospitals have begun collecting and reporting PROMS. Due to a major bug in the MRS system, patients have been unable to fill out the questions regarding HOOS in the 1 year follow-up forms in 2020. We also received 463 paper forms from 13 hospitals. All hospitals will recieve reports containing analyses of their own results. Any questions regarding collection and reporting of PROMs should be sent to our consultant Mikal Solberg mikal.solberg@helse-bergen.no.

Patient demografic	Before operation	1 Year after
Number of forms (n)	5495	3857
Men (%)	30.1	26.6
Median age (min-max)	67 (17-96)	66 (18-94)
Body-Mass Index mean (SD)	28 (8.9)	28 (9.4)
Uses alcohol n (%)	2889 (66.1)	1059 (41.2)
Smokes n (%)	421 (7.7)	230 (6)
High school education or higher n (%)	2363 (43)	1499 (38.9)
Lives alone n (%)	1128 (20.5)	607 (15.7)
UCLA activity* mean (SD)	4.6 (1.9)	5.9 (2)
Health** (VAS) mean (SD)	58.7 (19.9)	75.6 (18.4)

*Best possible score is 10, **100 is the best possible health



*100 is best possible score, **only 6751 forms have adequate completeness of the questions tied to HOOS before the operation, and 4139 forms 1 year after



Health Trust	Reporting hospitals	No Before operation	No 1 year after
Central Norway Regional Health Authority	5/8	334	215
Northern Norway Regional Health Authority	4/9	80	44
Private	5/8	938	341
South-Eastern Norway Regional Health Authority	17/24	1654	1246
Western Norway Regional Health Authority	7/10	2489	2011

Figure A.36 Proportion of primary hip operations where pre-operative PROMS have been reported in 2020-2021

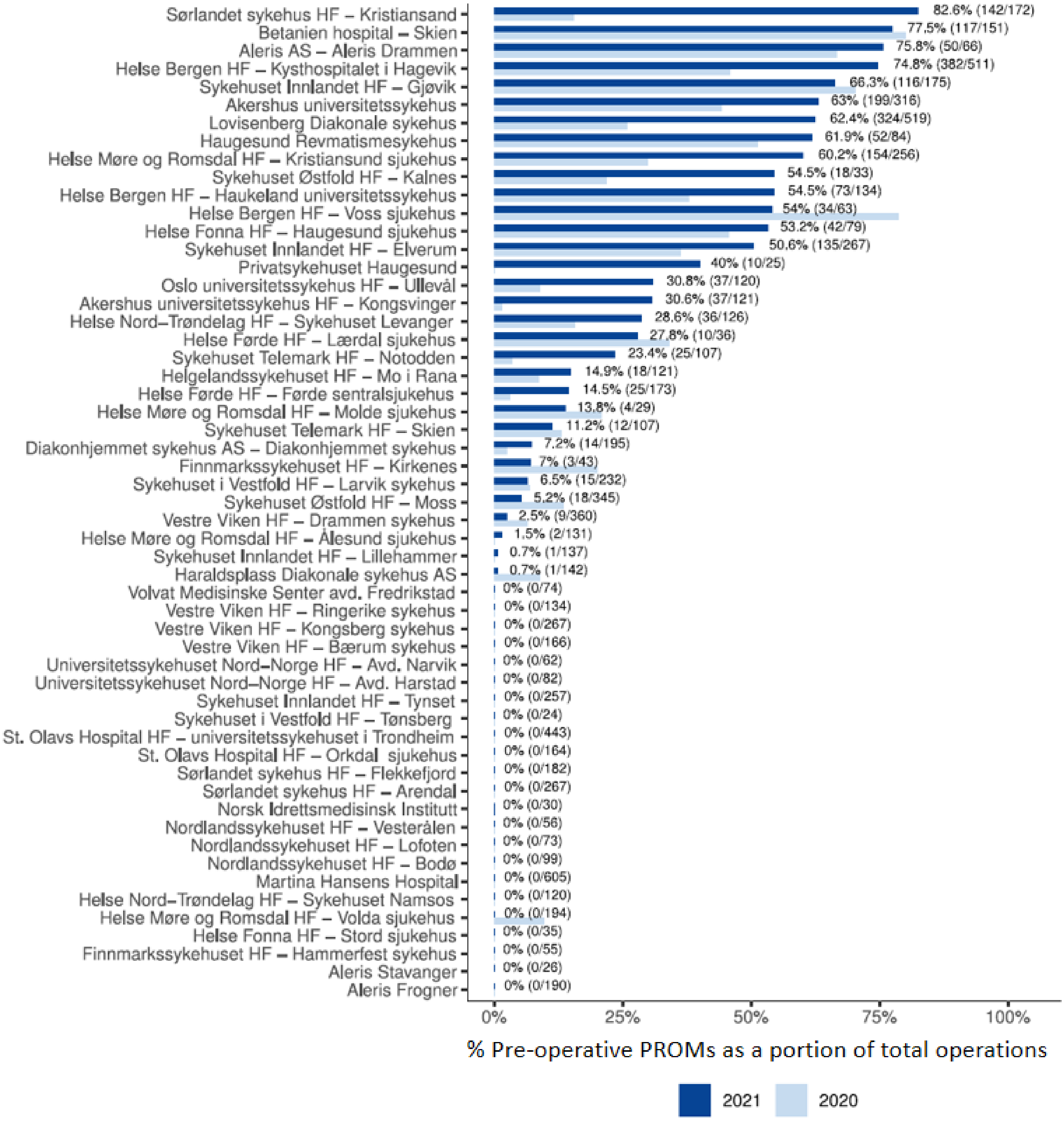


Figure A.36 presents pre-operative PROMs reported via paper or the online web solution MRS, as a portion of total number of hip operations reported in 2021 (dark blue line) and in 2020 (light blue line). The level is still low, but some hospitals seem to have taken steps to improve PROM reporting. We wish to remind the reader that any questions regarding registering and reporting of PROMs should be directed to the registry.

TOTAL HIP ARTHROPLASTY

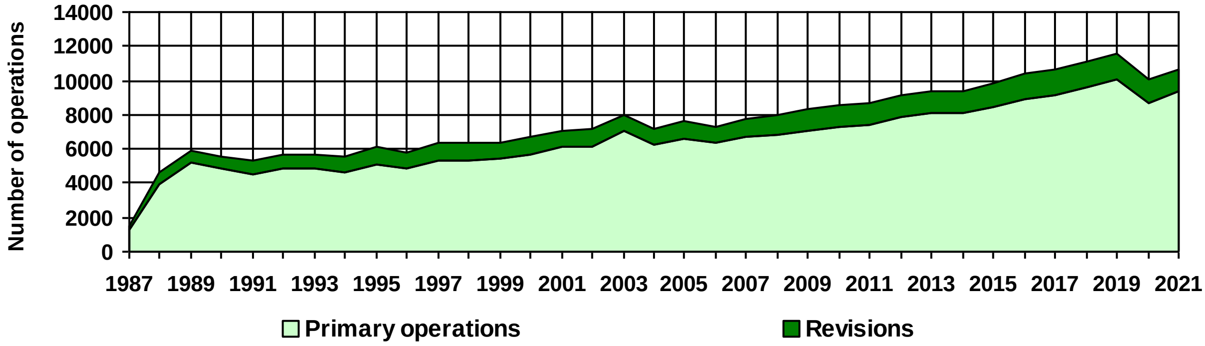
Table 1: Annual numbers of operations

Year	Primary operations *		Reoperations **		Revisions		Total
2021	9 396	(88,0%)	112	(1,0%)	1 172	(11,0%)	10 680
2020	8 721	(86,4%)	101	(1,0%)	1 276	(12,6%)	10 098
2019	10 042	(86,8%)	106	(0,9%)	1 415	(12,2%)	11 563
2018	9 610	(86,0%)	120	(1,1%)	1 442	(12,9%)	11 172
2017	9 176	(85,9%)	110	(1,0%)	1 393	(13,0%)	10 679
2016	8 954	(85,7%)	82	(0,8%)	1 416	(13,5%)	10 452
2015	8 450	(85,7%)	33	(0,3%)	1 377	(14,0%)	9 860
2014	8 138	(86,3%)	32	(0,3%)	1 262	(13,4%)	9 432
1987-13	155 606	(85,7%)	84	(0,0%)	25 937	(14,3%)	181 627
Total	**228 093**	**(85,9%)**	**780**	**(0,3%)**	**36 690**	**(13,8%)**	**265 563**

* In addition, there were reports 180 primary hemi prostheses done for other reasons than hip fractures.

** Reoperations where prosthetic parts are not changed or removed (soft tissue debridements for infected prosthesis, soft tissue procedures for gluteal insufficiency etc.).

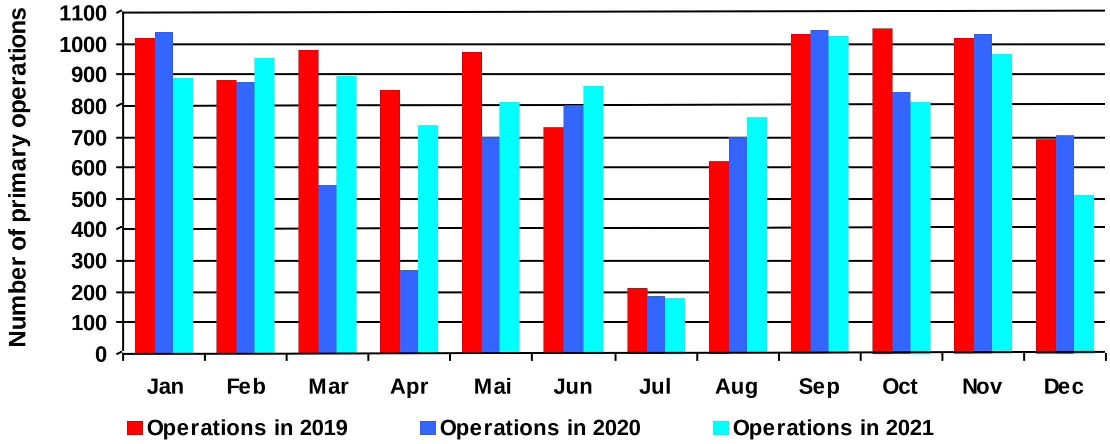
Figure 1a: Annual numbers of operations



54,7 % of all operations were performed on the right side. 66,2 % performed in women.
Mean age at primary surgery was 68,8 years, 69,7 years for women and 67 years for men.

COVID-19

Figure 1b: Monthly primary operations in 2019 - 2021



Incidence

Figure 2a: Incidence of primary hip prostheses

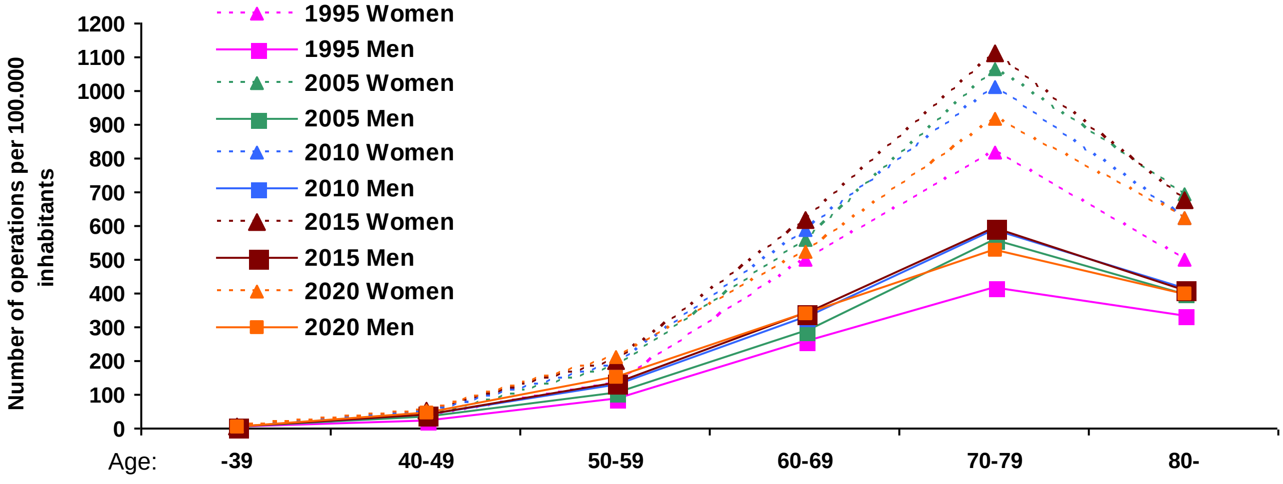


Figure 2b: Annual incidence of all primary hip prostheses

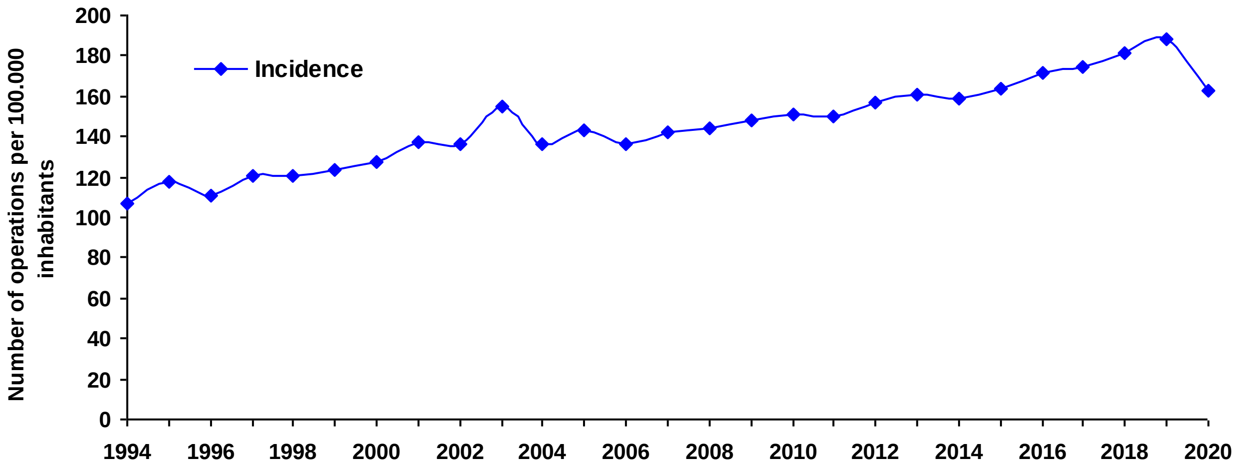
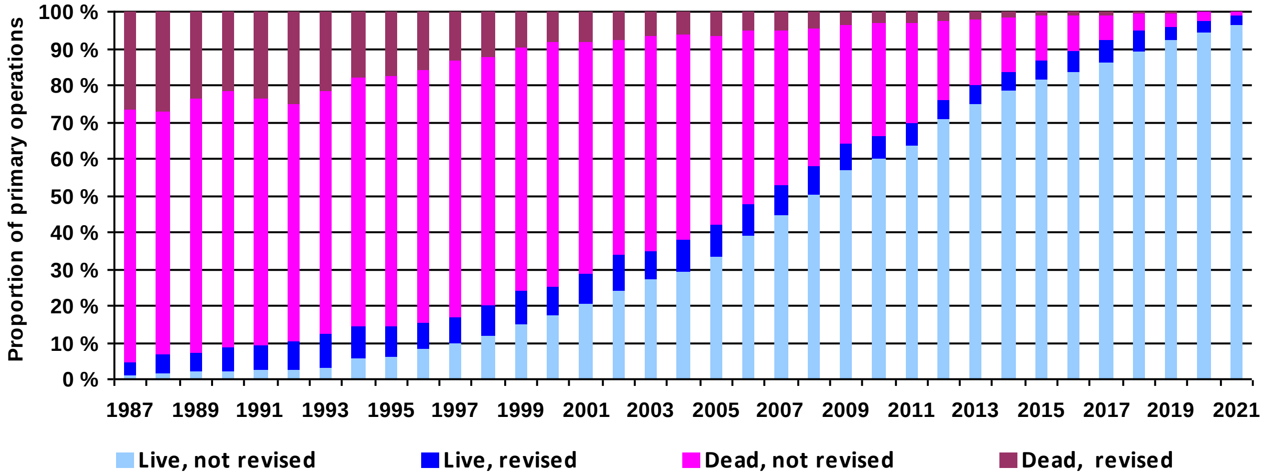


Figure 2c: Status of THA surgery in the period 1987-2021 per 31.12.2021



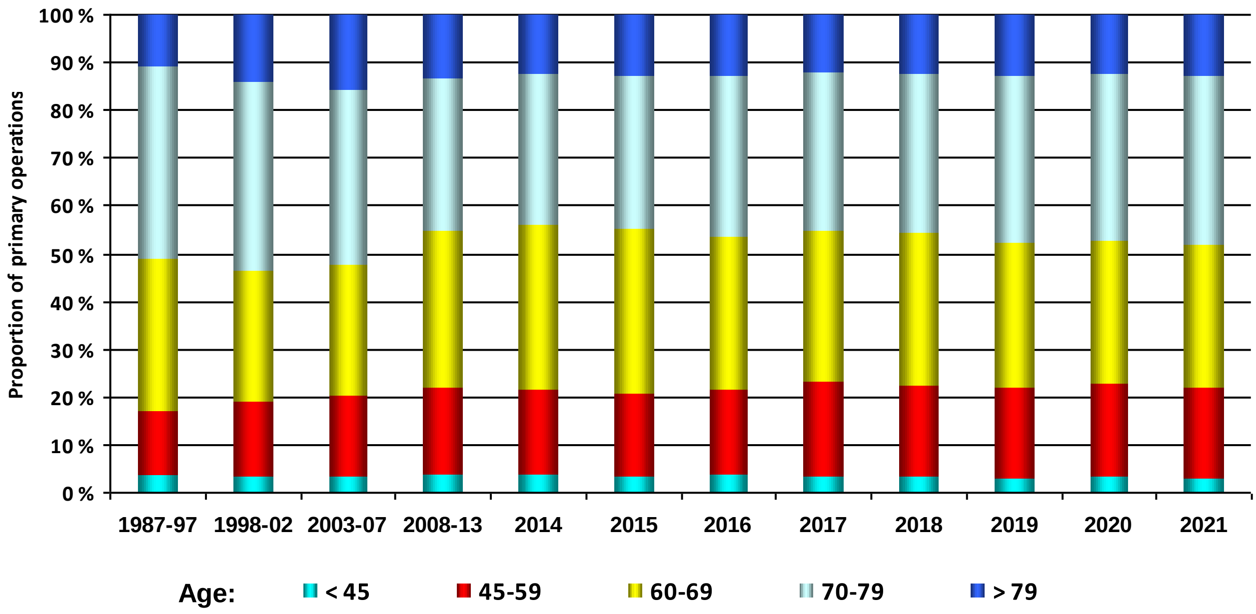
Reasons for primary operations

Table 2:

Year	Primary osteoarthritis	Rheumatoid arthritis	Sequelae after hip fracture	Congenital dysplasia	Cong. dysplasia with dislocation	Epiphysiol./Perthes' disease	Spondyloarthropathy	Acute fracture of the femoral neck	Avascular necrosis of the femoral head	Sequelae after acetabular fracture	Other	Missing information
2021	7 652	90	238	596	15	82	9	505	241	16	277	17
2020	6 900	102	270	615	6	74	18	525	222	25	236	25
2019	7 937	88	312	664	17	94	20	619	300	30	299	22
2018	7 628	97	298	653	24	113	21	574	266	23	283	9
2017	7 301	108	299	679	19	105	26	404	272	34	282	13
2016	7 109	137	355	685	11	107	19	342	229	33	247	9
2015	6 796	108	332	587	11	106	21	321	181	26	200	19
2014	6 413	116	354	648	18	86	28	287	250	22	175	19
2008-13	35 033	816	2 275	3 453	133	618	165	1 137	967	112	1 080	162
2003-07	25 068	771	2 630	2 263	110	404	113	578	642	81	504	56
1998-02	24 699	1 045	3 563	2 385	172	462	165	279	396	68	613	307
1987-97	30 040	1 650	5 763	3 485	597	576	201	130	197	154	852	369
Total	**172 576**	**5 128**	**16 689**	**16 713**	**1 133**	**2 827**	**806**	**5 701**	**4 163**	**624**	**5 048**	**1 027**

Diseases are not mutually exclusive. More than one reason for operation is possible

Figure 3: Age by year of operation



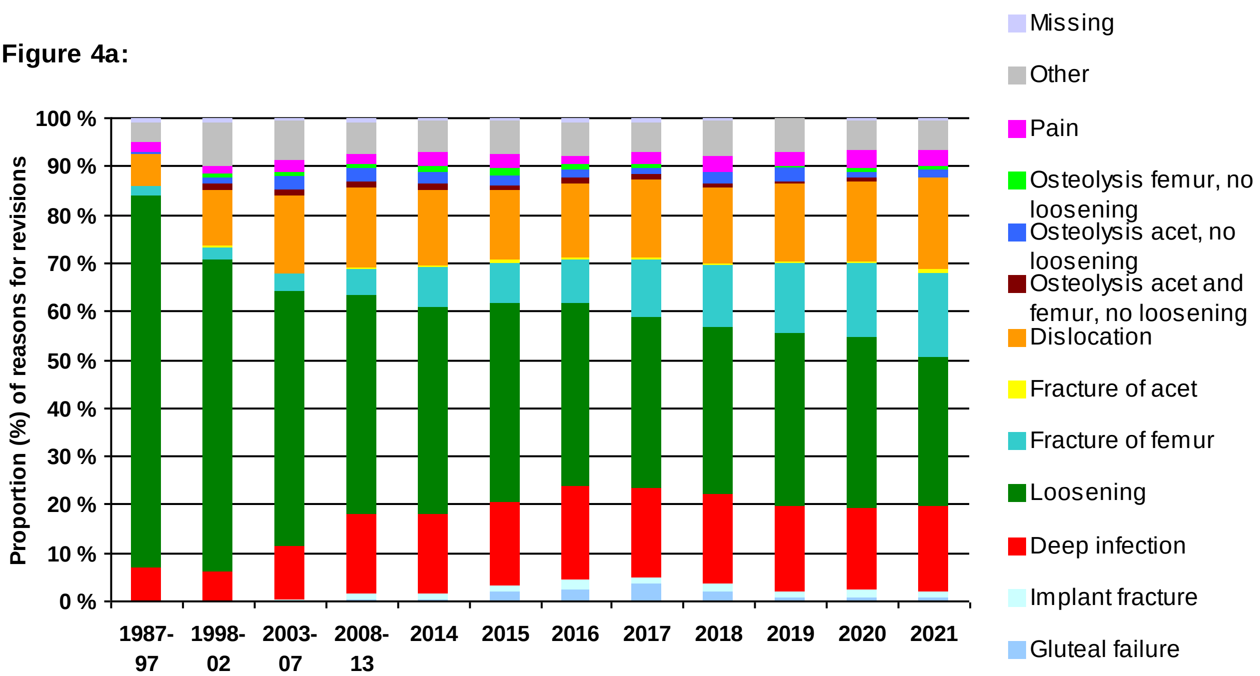
Reasons for revisions

Table 3a:

Year of revision	Loosening of acetabular component	Loosening of femoral component	Dislocation	Deep infection	Periprostethic fracture	Pain	Osteolysis acet.,no loosening	Osteolysis femur, no loosening	Polyethylene wear	Previous Girdlestone	Implant fracture	Gluteal failure	Other	Missing information
2021	247	150	179	145	184	122	23	20	25	1	17	8	47	3
2020	315	163	184	158	190	138	30	22	33	1	22	11	59	3
2019	318	204	189	175	189	138	35	16	35	3	25	12	63	2
2018	329	214	187	188	176	153	45	24	37	2	34	28	67	5
2017	331	207	193	196	163	149	39	37	35	3	26	43	64	7
2016	371	227	178	181	135	116	43	33	28	2	37	34	60	8
2015	347	241	165	159	132	175	41	43	42	1	25	25	65	3
2014	347	229	150	139	118	112	44	26	38	2	17	6	53	5
2008-13	2 078	1 605	921	814	519	699	292	232	329	47	81	33	185	30
2003-07	1 612	1 310	586	360	262	418	173	186	288	50	13	2	166	14
1998-02	1 710	1 824	425	182	216	282	122	165	334	50	18	0	286	22
1987-97	4 001	4 633	425	375	315	672	29	60	85	91	78	0	216	46
Total	**12 006**	**11 007**	**3 782**	**3 072**	**2 599**	**3 174**	**916**	**864**	**1 309**	**253**	**393**	**202**	**1 331**	**148**

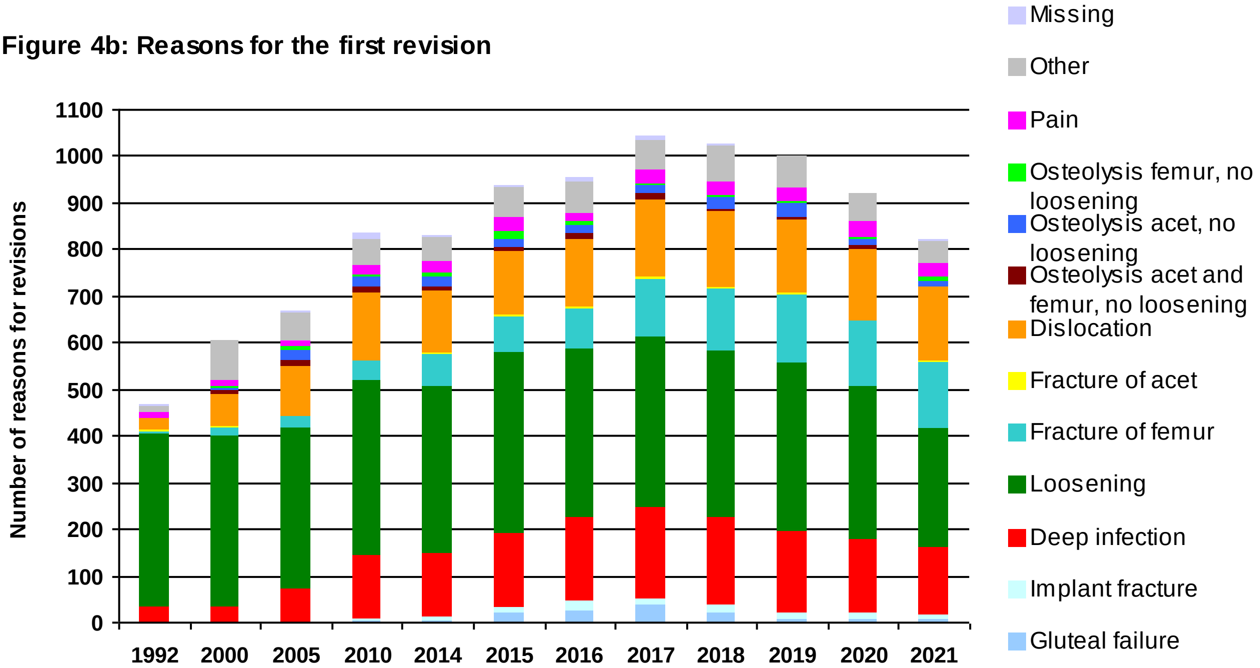
Revision causes are not mutually exclusive. More than one reason of revision is possible. Only the first reoperation is counted.

Figure 4a:



The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted. Only the first reoperation is counted.

Figure 4b: Reasons for the first revision



The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted. Only the first reoperation is counted.

Reasons for revisions

Table 3b: Implant Fracture

Year of revision	Femoral stem	Femoral head	Acetabular cup	Liner	Other	Tota
2021	4	2	2	9	0	17
2020	7	4	1	10	0	22
2019	11	2	1	11	0	25
2018	8	4	2	18	2	34
2017	5	6	1	14	0	26
2016	6	9	7	13	2	37
2015	3	5	4	10	3	25
2014	1	2	2	10	2	17
2008-13	14	27	13	23	4	81
2003-07	4	6	3	0	0	13
1998-02	14	2	2	0	0	18
1987-97	60	1	17	0	0	78
Total	**137**	**70**	**55**	**118**	**13**	**393**

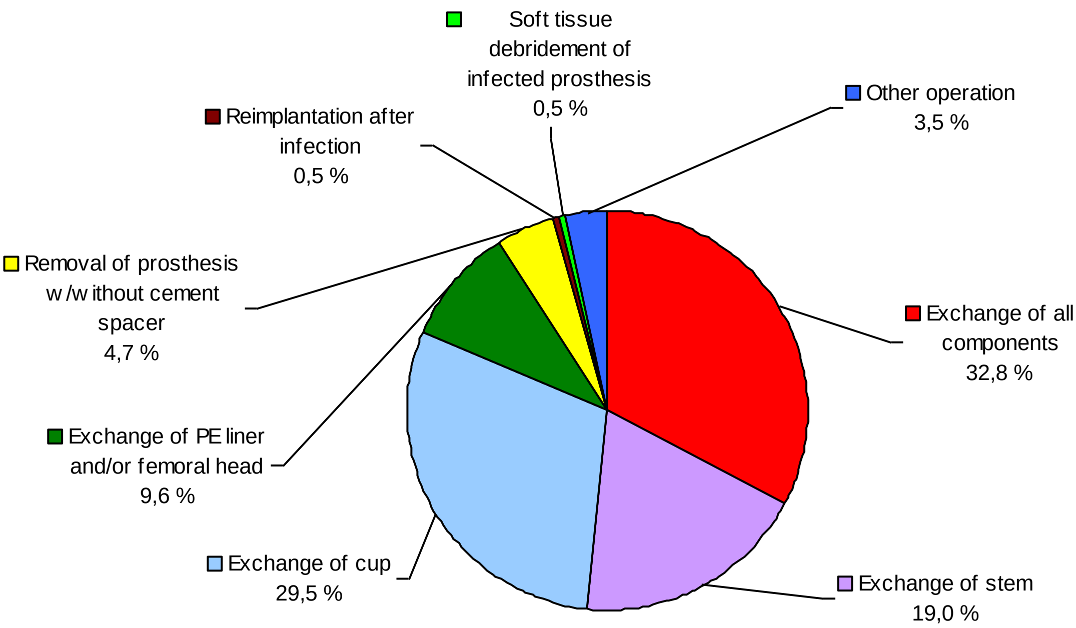
Type of revision

Table 4:

Type of revision	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Exchange of femoral stem and head	3 805	133	135	118	142	104	144	147	131	121	91	**5 071**
Exchange of stem, PE liner, head	188	10	12	24	16	16	28	28	35	19	23	**399**
Exchange of acetabular cup	2 596	150	118	157	155	122	160	143	185	200	142	**4 128**
Exchange of femoral head	591	90	79	79	92	98	96	94	79	67	54	**1 419**
Exchange of femoral head and acetabular cup	2 490	179	205	189	216	238	203	214	172	152	119	**4 377**
Exchange of all components	7 253	240	254	216	226	248	229	205	200	188	195	**9 454**
Exchange of PE liner only	67	4	3	3	7	1	3	8	7	8	8	**119**
Exchange of PE liner and femoral head	590	47	47	46	60	59	74	76	87	65	75	**1 226**
Removal of prosthesis or cement spacer	830	23	14	20	22	8	11	13	5	6	4	**956**
Removal of prosthesis and insertion of cement spacer	11	35	34	34	38	46	39	43	40	36	37	**393**
Insertion of new prosthesis (after Girdlestone)	136	1	2			1			1		1	**142**
Soft tissue debridement of infected prosthesis	12	18	10	18	9	13	16	13	13	7	5	**134**
Muscle resonance and re-insertion		1	8	1	15	19	35	18	5	8	4	**114**
Osteosynthesis for fracture				1		31	36	46	63	66	78	**321**
Other operation	50	13	20	25	26	51	43	55	50	41	46	**420**
Missing information	101	6	6	4	3	4	4	4	2	4	6	**144**
Total	**18 720**	**950**	**947**	**935**	**1 027**	**1 059**	**1 121**	**1 107**	**1 075**	**988**	**888**	**28 817**

Only the first reoperation is counted

Figure 5:



More than one cause of reoperation is possible. Only the first reoperation is counted.

Bone transplantation in revisions

Table 5: Acetabular cup

Year	Yes		No		Bone impaction[1]		Missing		Total
2021	44	(3,6 %)	859	(70 %)	39	(3,2 %)	286	(23,3 %)	**1 228**
2020	41	(3,1 %)	914	(69 %)	52	(3,9 %)	318	(24 %)	**1 325**
2019	61	(4,2 %)	952	(65 %)	70	(4,8 %)	381	(26 %)	**1 464**
2018	50	(3,3 %)	966	(63,5 %)	76	(5 %)	430	(28,3 %)	**1 522**
2017	66	(4,5 %)	961	(65,4 %)	83	(5,6 %)	360	(24,5 %)	**1 470**
2016	72	(4,9 %)	942	(63,9 %)	96	(6,5 %)	364	(24,7 %)	**1 474**
2015	102	(7,3 %)	971	(69,2 %)	92	(6,6 %)	238	(17 %)	**1 403**
2014	112	(8,7 %)	856	(66,2 %)	94	(7,3 %)	232	(17,9 %)	**1 294**
2008-13	658	(8,8 %)	4 663	(62,2 %)	1100	(14,7 %)	1 076	(14,4 %)	**7 497**
2003-07	731	(14,5 %)	2 896	(57,5 %)	933	(18,5 %)	475	(9,4 %)	**5 035**
1998-02	1 244	(21,3 %)	3 670	(62,9 %)	789	(13,5 %)	132	(2,3 %)	**5 835**
1987-97	2 146	(28,2 %)	5 203	(68,5 %)	86	(1,1 %)	162	(2,1 %)	**7 597**
Total	**5 327**	**(14,3 %)**	**23 853**	**(64,2 %)**	**3 510**	**(9,4 %)**	**4 454**	**(12 %)**	**37 144**

Table 6: Femoral stem

Year	Yes		No		Bone impaction[1]		Missing		Total
2021	19	(1,6 %)	884	(73,8 %)	4	(0,3 %)	291	(24,3 %)	**1 198**
2020	32	(2,6 %)	891	(71,2 %)	4	(0,3 %)	325	(26 %)	**1 252**
2019	33	(2,4 %)	951	(68,8 %)	5	(0,4 %)	394	(28,5 %)	**1 383**
2018	26	(1,8 %)	957	(66,8 %)	4	(0,3 %)	445	(31,1 %)	**1 432**
2017	45	(3,2 %)	957	(69 %)	7	(0,5 %)	377	(27,2 %)	**1 386**
2016	43	(3,1 %)	964	(68,4 %)	3	(0,2 %)	399	(28,3 %)	**1 409**
2015	70	(5 %)	982	(70,4 %)	11	(0,8 %)	331	(23,7 %)	**1 394**
2014	63	(4,9 %)	880	(68 %)	3	(0,2 %)	348	(26,9 %)	**1 294**
2008-13	673	(9 %)	4 769	(64,1 %)	216	(2,9 %)	1 780	(23,9 %)	**7 438**
2003-07	713	(14,2 %)	3 143	(62,4 %)	453	(9 %)	726	(14,4 %)	**5 035**
1998-02	1 188	(20,3 %)	3 518	(60,2 %)	997	(17,1 %)	139	(2,4 %)	**5 842**
1987-97	1 704	(22,4 %)	5 602	(73,7 %)	129	(1,7 %)	162	(2,1 %)	**7 597**
Total	**4 609**	**(12,6 %)**	**24 498**	**(66,8 %)**	**1 836**	**(5 %)**	**5 717**	**(15,6 %)**	**36 660**

1 Registration of "Bone impaction" started in 1996.

Bone loss in revisions

Table 7: Acetabular cup

Year	Type I	Type IIA	Type IIB	Type IIC	Type IIIA	Type IIIB	Missing	Total
2021	226	176	67	46	37	23	196	**771**
2020	279	164	98	41	42	24	220	**868**
2019	234	198	110	54	62	19	250	**927**
2018	310	173	93	48	49	20	264	**957**
2017	311	166	99	62	55	9	256	**958**
2016	267	219	103	82	55	29	231	**986**
2015	241	180	108	51	59	20	266	**925**
2014	197	171	93	70	41	31	281	**884**
2008-13	1 332	1 129	590	504	405	137	1 254	**5 351**
2003-07	635	415	253	212	173	77	627	**2 392**

Bone loss in revision - acetabulum (Paprosky Classification):

Type I: Hemispheric acetabulum without edge defects. Intact posterior and anterior column. Defects in anchoring holes that do not destroy the subchondral bone plate.
Type IIA: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with small metaphyseal fractures again.
Type IIB: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with small metaphyseal fractures again and some lack of support superiort.
Type IIC: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with defect in medial wall.
Type IIIA: Significant component migration, osteolysis and bone loss. Bone loss from 10 o'clock until 2.
Type IIIB: Significant component migration, osteolysis and bone loss. Bone loss from 9 o'clock until 5.

Table 8: Femoral stem

Year	Type I	Type II	Type IIIA	Type IIIB	Type IV	Missisng	Total
2021	243	92	45	14	8	195	**597**
2020	232	111	52	11	5	216	**627**
2019	256	133	59	10	7	236	**701**
2018	296	123	59	15	10	247	**750**
2017	275	140	51	13	8	219	**706**
2016	253	153	70	24	4	214	**718**
2015	200	134	87	17	10	249	**697**
2014	162	149	67	13	3	237	**631**
2008-13	1 124	977	433	112	44	1 283	**3 973**
2003-07	521	432	190	63	25	508	**1 739**

Bone loss in revision - femoral stem (Paprosky Classification):

Type I: Minimal loss of metaphyseal bone and intact diaphysis.
Type II: Major loss of metaphyseal bone, but intact diaphysis.
Type IIIA: Significant loss of metaphyseal bone without possibility of proximal mechanical support. Over 4 cm of intact corticalis in the isthmus area.
Type IIIB: Significant loss of metaphyseal bone without possibility of proximal mechanical support. Below 4 cm of intact corticalis in the isthmus area.
Type IV: Significant loss of metaphyseal bone without possibility of proximal mechanical support. Wide isthmus with little possibility of cortical support.

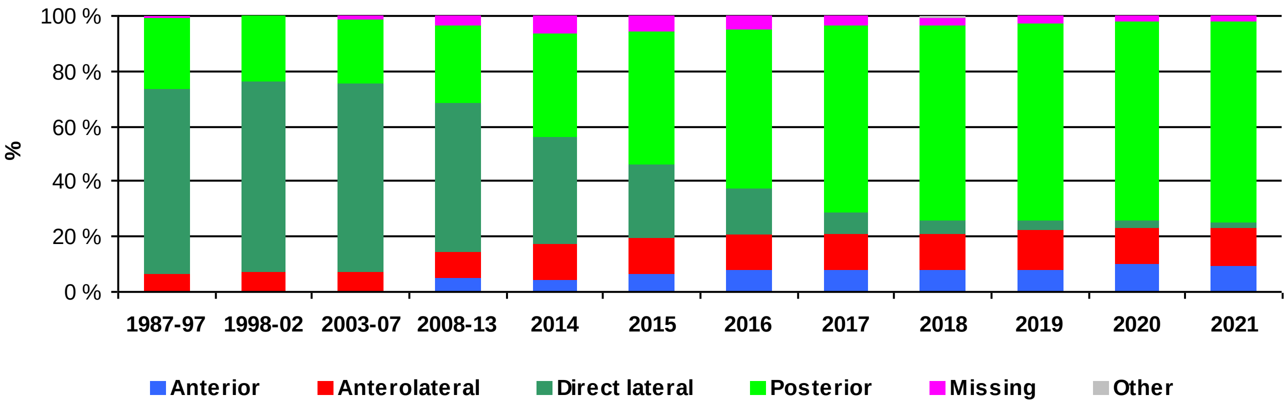
Registration of bone loss started in 2005

Surgical approach

Table 9: In primary operations *

Year	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing information		Total
2021	904	(9,6 %)	1 292	(13,7 %)	191	(2 %)	6 798	(72,3 %)	1	(0 %)	211	(2,2 %)	**9 397**
2020	862	(9,9 %)	1 171	(13,4 %)	237	(2,7 %)	6 254	(71,6 %)	11	(0,1 %)	197	(2,3 %)	**8 732**
2019	793	(7,9 %)	1 423	(14,1 %)	414	(4,1 %)	7 109	(70,6 %)	23	(0,2 %)	303	(3 %)	**10 065**
2018	771	(8 %)	1 249	(12,9 %)	465	(4,8 %)	6 801	(70,5 %)	43	(0,4 %)	324	(3,4 %)	**9 653**
2017	713	(7,8 %)	1 170	(12,7 %)	753	(8,2 %)	6 177	(67,3 %)	4	(0 %)	363	(4 %)	**9 180**
2016	718	(8 %)	1 165	(13 %)	1 437	(16 %)	5 170	(57,7 %)	5	(0,1 %)	464	(5,2 %)	**8 959**
2015	521	(6,2 %)	1 147	(13,6 %)	2 235	(26,4 %)	4 087	(48,3 %)	3	(0 %)	460	(5,4 %)	**8 453**
2014	337	(4,1 %)	1 059	(13 %)	3 175	(38,9 %)	3 021	(37 %)	16	(0,2 %)	546	(6,7 %)	**8 154**
2008-13	2 230	(5 %)	4 049	(9,1 %)	4 075	(53,8 %)	2 789	(28,6 %)	133	(0,3 %)	1 454	(3,3 %)	**44 730**
2003-07	43	(0,1 %)	2 430	(7,4 %)	2 237	(67,7 %)	7 725	(23,5 %)	26	(0,1 %)	401	(1,2 %)	**32 862**
1998-02	56	(0,2 %)	2 487	(7,3 %)	3 473	(68,6 %)	7 986	(23,4 %)	35	(0,1 %)	157	(0,5 %)	**34 194**
1987-97	121	(0,3 %)	2 720	(6,2 %)	9 354	(66,6 %)	1 501	(26,1 %)	38	(0,1 %)	318	(0,7 %)	**44 052**
Total	**8 069**	**(3,5 %)**	**21 362**	**(9,4 %)**	**08 046**	**(47,3 %)**	**85 418**	**(37,4 %)**	**338**	**(0,1 %)**	**5 198**	**(2,3 %)**	**228 431**

Figure 6: In primary operations *

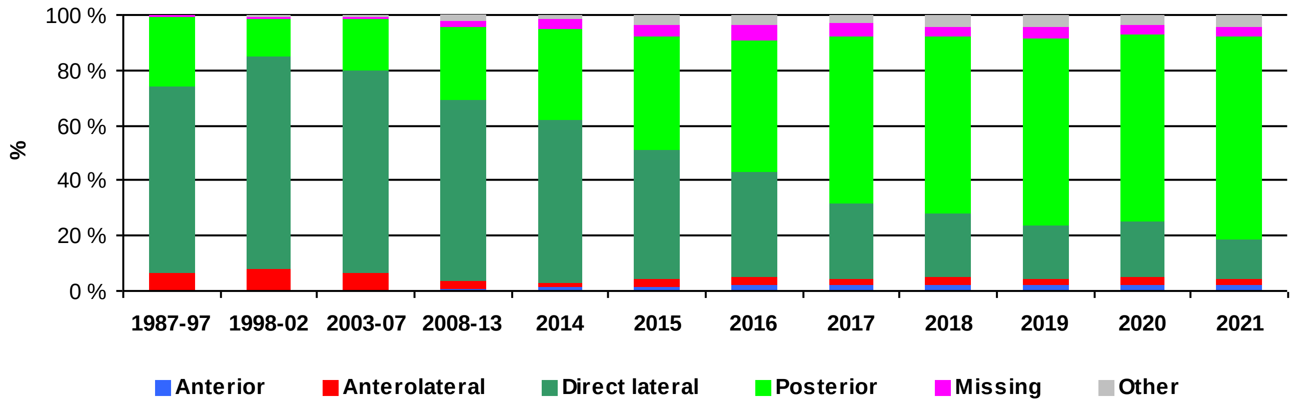


* Anterior: Operative approach between sartorius and tensor
Anterolateral: Operative approach between glut. medius and tensor
Direct lateral: Operative approach transgluteal
Posterior: Operative approach behind gluteus medius

Table 10: In revisions *

Year	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing information		Total
2021	26	(2 %)	26	(2 %)	183	(13,7 %)	899	(67,4 %)	49	(3,7 %)	150	(11,3 %)	**1 333**
2020	33	(2,3 %)	36	(2,5 %)	272	(19 %)	899	(62,9 %)	52	(3,6 %)	137	(9,6 %)	**1 429**
2019	27	(1,7 %)	35	(2,2 %)	285	(18 %)	1 009	(63,8 %)	60	(3,8 %)	165	(10,4 %)	**1 581**
2018	34	(2,1 %)	47	(2,9 %)	344	(21,2 %)	975	(60 %)	63	(3,9 %)	162	(10 %)	**1 625**
2017	29	(1,9 %)	35	(2,3 %)	409	(26,5 %)	900	(58,3 %)	41	(2,7 %)	130	(8,4 %)	**1 544**
2016	27	(1,7 %)	45	(2,9 %)	570	(36,7 %)	714	(46 %)	54	(3,5 %)	142	(9,1 %)	**1 552**
2015	24	(1,6 %)	35	(2,4 %)	662	(45,3 %)	573	(39,2 %)	50	(3,4 %)	116	(7,9 %)	**1 460**
2014	16	(1,2 %)	25	(1,9 %)	762	(57,9 %)	427	(32,4 %)	23	(1,7 %)	64	(4,9 %)	**1 317**
2008-13	68	(0,9 %)	203	(2,6 %)	4 902	(63,9 %)	2 007	(26,2 %)	151	(2 %)	339	(4,4 %)	**7 670**
2003-07	8	(0,2 %)	297	(5,9 %)	3 664	(72,2 %)	950	(18,7 %)	26	(0,5 %)	128	(2,5 %)	**5 073**
1998-02	17	(0,3 %)	451	(7,6 %)	4 468	(75,7 %)	815	(13,8 %)	44	(0,7 %)	105	(1,8 %)	**5 900**
1987-97	18	(0,2 %)	463	(6,1 %)	5 146	(67,5 %)	1 906	(25 %)	22	(0,3 %)	66	(0,9 %)	**7 621**
Total	**327**	**(0,9 %)**	**1 698**	**(4,5 %)**	**21 667**	**(56,9 %)**	**12 074**	**(31,7 %)**	**635**	**(1,7 %)**	**1 704**	**(4,5 %)**	**38 105**

Figure 7: In revisions *



* Anterior: Operative approach between sartorius and tensor
Anterolateral: Operative approach between glut. medius and tensor
Direct lateral: Operative approach transgluteal
Posterior: Operative approach behind gluteus medius

Trochanteric osteotomy

Table 11:

	Primary operations						Revisions						
Year	**No**		**Yes**		**Missing**		**No**		**Yes**		**Missing**		**Total**
2021	8 686	(92,4 %)	9	(0,1 %)	701	(7,5 %)	1 088	(84,7 %)	48	(3,7 %)	148	(11,5 %)	**10 680**
2020	8 334	(95,6 %)	18	(0,2 %)	369	(4,2 %)	1 203	(87,4 %)	74	(5,4 %)	100	(7,3 %)	**10 098**
2019	9 555	(95,2 %)	20	(0,2 %)	467	(4,7 %)	1 328	(87,3 %)	65	(4,3 %)	128	(8,4 %)	**11 563**
2018	9 027	(93,9 %)	27	(0,3 %)	556	(5,8 %)	1 338	(85,7 %)	94	(6 %)	130	(8,3 %)	**11 172**
2017	8 576	(93,5 %)	20	(0,2 %)	580	(6,3 %)	1 306	(86,9 %)	69	(4,6 %)	128	(8,5 %)	**10 679**
2016	8 458	(94,5 %)	25	(0,3 %)	471	(5,3 %)	1 307	(87,2 %)	91	(6,1 %)	100	(6,7 %)	**10 452**
2015	7 608	(90 %)	29	(0,3 %)	813	(9,6 %)	1 203	(85,3 %)	96	(6,8 %)	111	(7,9 %)	**9 860**
2014	7 400	(90,9 %)	21	(0,3 %)	717	(8,8 %)	1 112	(85,9 %)	66	(5,1 %)	116	(9 %)	**9 432**
2008-13	40 416	(90,6 %)	280	(0,6 %)	3 901	(8,7 %)	6 333	(84,2 %)	633	(8,4 %)	553	(7,4 %)	**52 116**
2003-07	30 515	(92,9 %)	616	(1,9 %)	1 705	(5,2 %)	4 237	(84 %)	514	(10,2 %)	296	(5,9 %)	**37 883**
1998-02	32 598	(95,4 %)	1 232	(3,6 %)	329	(1 %)	5 038	(86 %)	708	(12,1 %)	110	(1,9 %)	**40 015**
1987-97	36 682	(83,3 %)	6 876	(15,6 %)	456	(1 %)	6 147	(80,9 %)	1 358	(17,9 %)	94	(1,2 %)	**51 613**
Total	**207 855**	**(91,1 %)**	**9 173**	**(4 %)**	**11 065**	**(4,9 %)**	**31 640**	**(84,4 %)**	**3 816**	**(10,2 %)**	**2 014**	**(5,4 %)**	**265 563**

Fixation in primary operations

Figure 8a: All patients

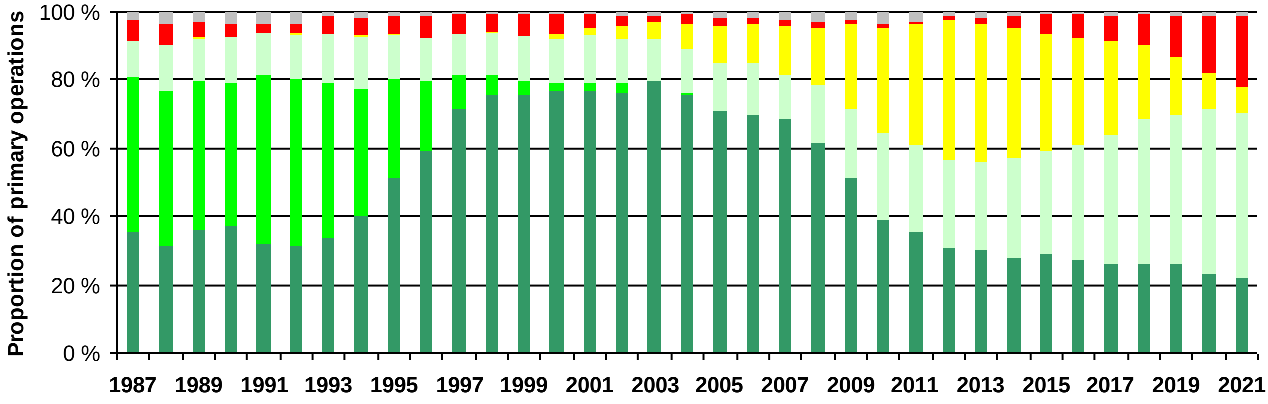
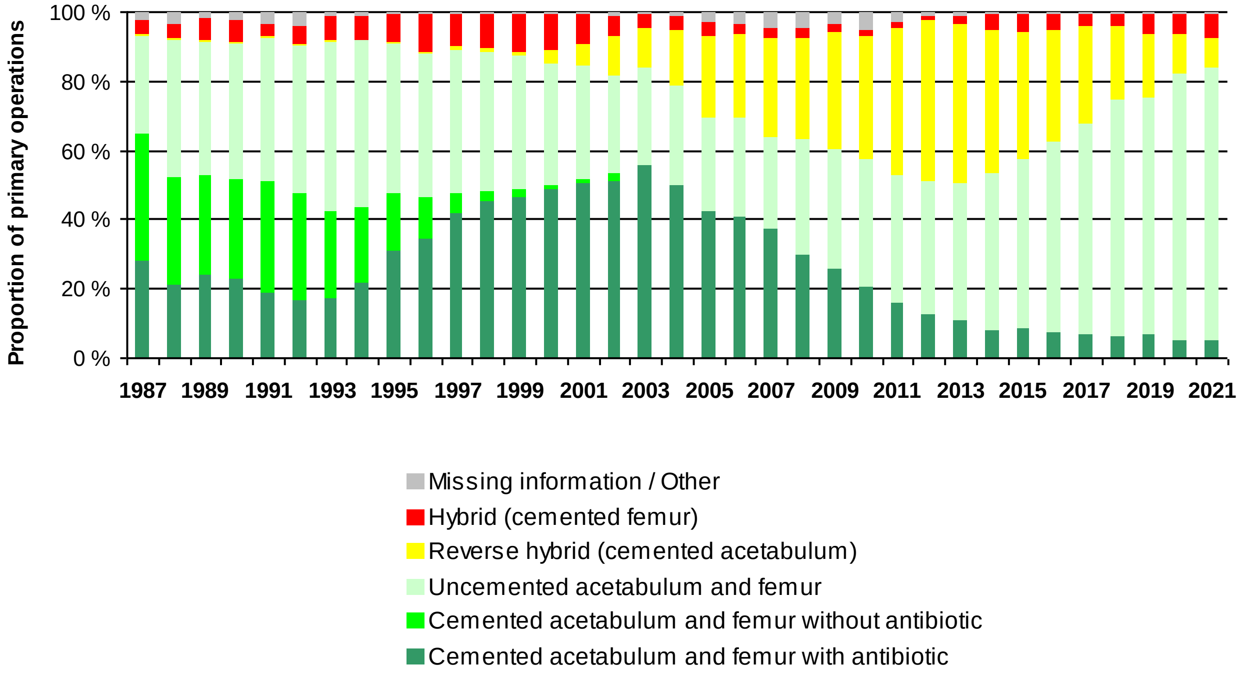


Figure 8b: Patients under 65 years old



Fixation in primary operations (cont.)

Figure 8c: Patients between 65 years and 75 years old

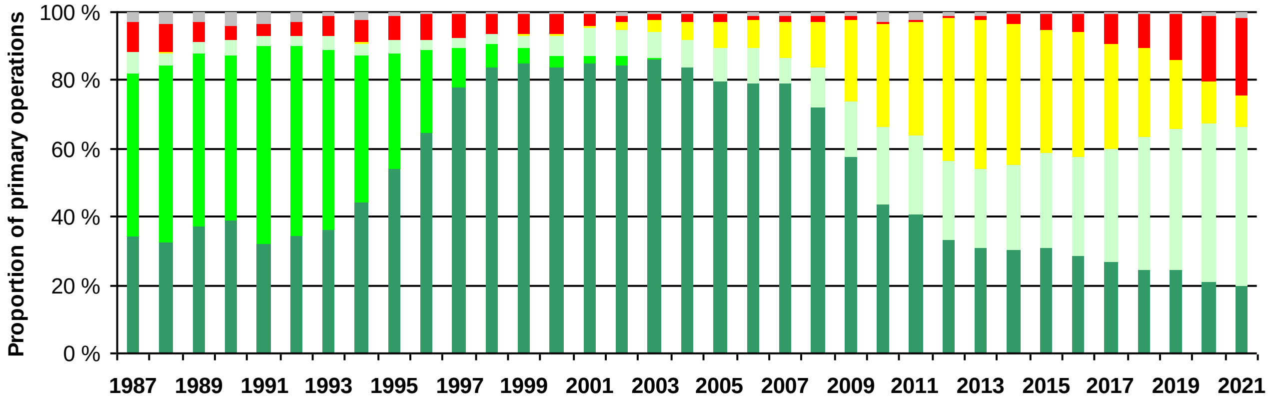
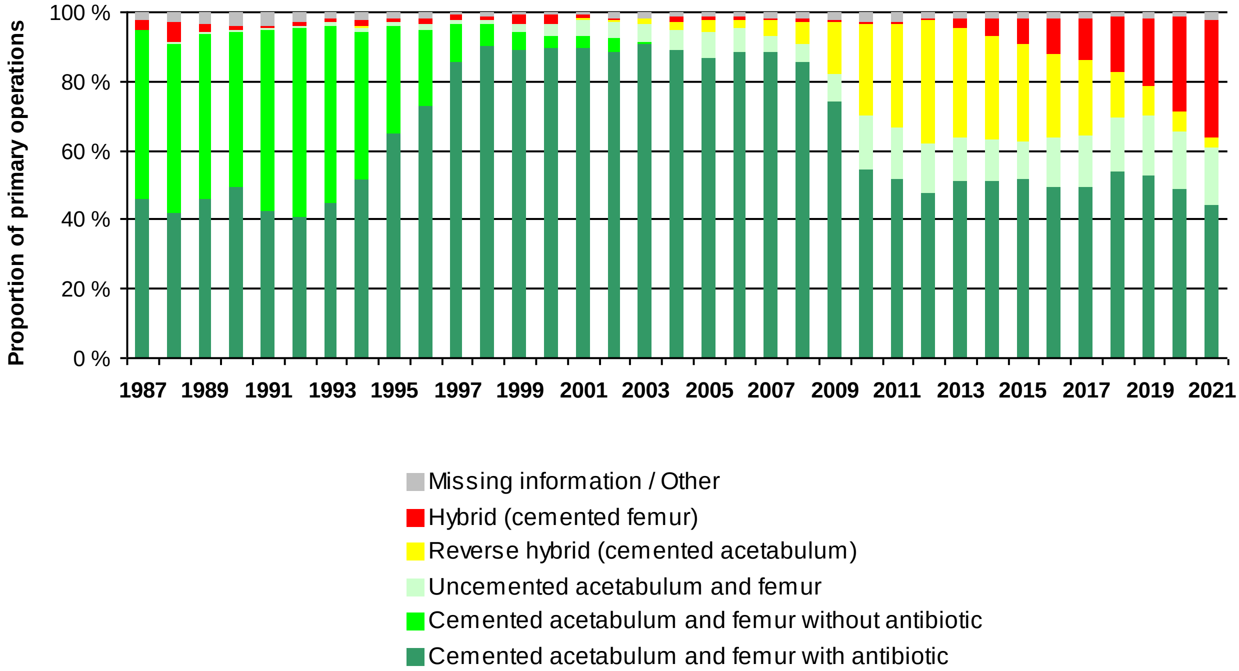


Figure 8d: Patients over 75 years old



Fixation in revisions

Figure 9: Acetabular cup - All patients

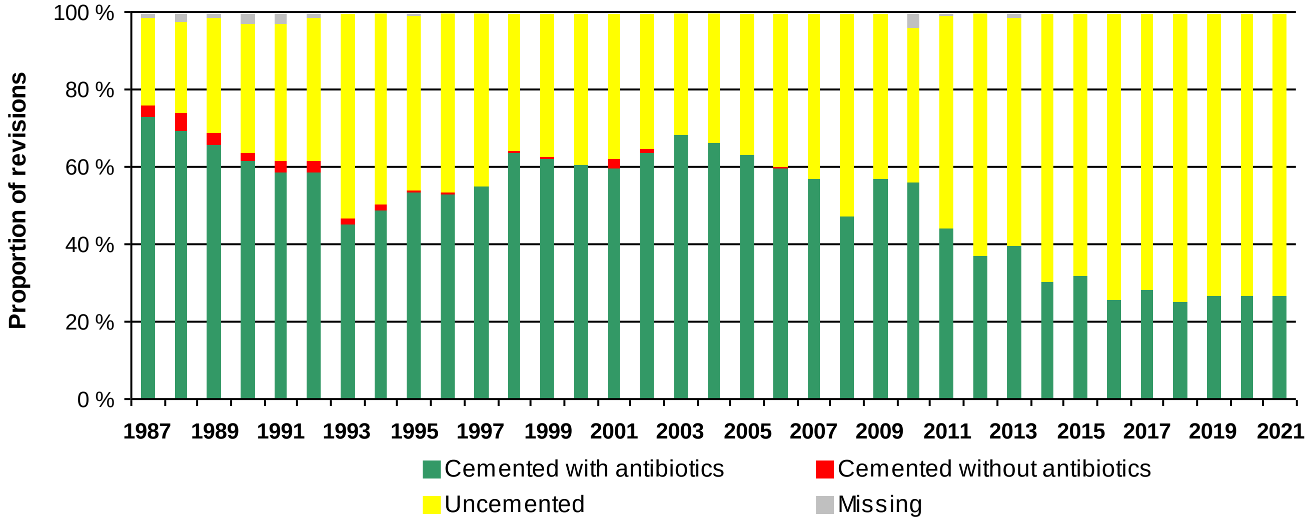
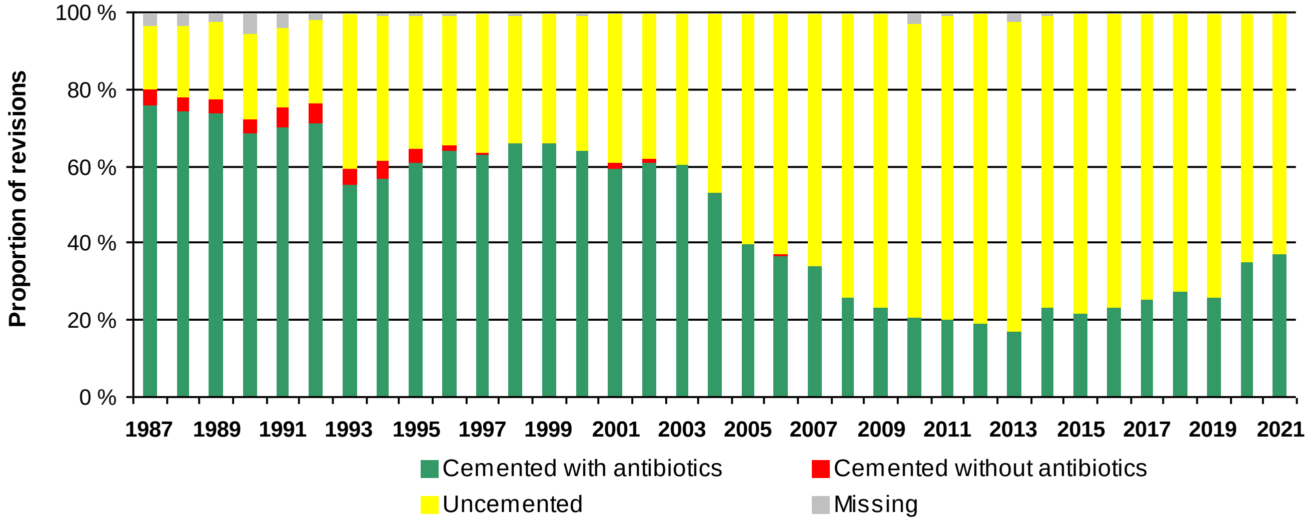


Figure 10: Femoral stem - All patients



Type of fixation and bone transplantation in revisions

Table 12: Acetabular cup

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2021	8%	6%	74%	11%	207	4%	5%	72%	19%	565
2020	9%	2%	73%	17%	230	5%	5%	71%	19%	631
2019	11%	5%	68%	15%	252	6%	7%	65%	22%	684
2018	12%	5%	61%	22%	237	7%	5%	65%	23%	697
2017	16%	7%	56%	20%	258	5%	7%	73%	15%	655
2016	16%	7%	57%	20%	235	6%	8%	70%	17%	699
2015	21%	9%	63%	7%	301	5%	12%	69%	15%	638
2014	26%	10%	56%	8%	260	4%	14%	67%	14%	593
2008-13	40%	8%	45%	7%	2 337	6%	17%	68%	10%	2 608
2003-07	39%	13%	44%	4%	2 159	5%	31%	58%	6%	1 275
1998-02	28%	22%	49%	0%	2 363	8%	45%	46%	1%	1 467
1987-97	2%	26%	71%	1%	3 133	1%	62%	35%	2%	2 082
Total	**23%**	**16%**	**56%**	**5%**	**11 972**	**5%**	**25%**	**59%**	**10%**	**12 594**

Table 13: Femoral stem

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2021	2%	1%	83%	14%	171	0%	4%	76%	20%	290
2020	1%	2%	81%	16%	168	0%	5%	72%	22%	316
2019	1%	1%	78%	19%	143	0%	4%	72%	24%	401
2018	1%	0%	73%	26%	149	0%	4%	72%	24%	408
2017	3%	3%	76%	18%	130	0%	7%	74%	19%	395
2016	0%	1%	77%	22%	126	1%	7%	75%	17%	412
2015	2%	4%	82%	12%	118	2%	9%	76%	14%	428
2014	3%	3%	63%	32%	114	0%	13%	74%	14%	376
2008-13	24%	4%	55%	17%	642	2%	21%	66%	11%	2 422
2003-07	34%	9%	53%	4%	1 049	4%	37%	54%	5%	1 269
1998-02	35%	15%	50%	1%	2 246	16%	52%	31%	1%	1 255
1987-97	2%	15%	81%	2%	4 072	2%	65%	32%	1%	1 625
Total	**15%**	**12%**	**68%**	**5%**	**9 128**	**3%**	**30%**	**57%**	**10%**	**9 597**

Registration of "Bone impaction" started in 1996

Cements used in the acetabulum and femur

Table 14: In primary- and revision surgeries

Cements	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
Boneloc	1 353	0	0	0	0	0	0	0	0	**1 353**
Cemex System Genta FAST	1 378	116	84	0	0	0	1	0	0	**1 579**
Cemex system genta ID green	0	0	0	18	197	204	139	3	0	**561**
Cemex w/gentamicin	457	128	150	234	0	0	1	3	0	**973**
CMW I	5 110	0	0	0	0	0	0	0	0	**5 110**
CMW I w/gentamicin	3 340	0	0	1	0	0	0	0	0	**3 341**
CMW II	15	0	0	0	0	0	0	0	0	**15**
CMW III	1 956	0	0	0	0	0	0	0	0	**1 956**
CMW III w/gentamicin	189	0	0	0	0	0	0	0	0	**189**
Copal G+ V	4	7	13	11	25	32	93	86	88	**359**
Copal w/gentamicin+clindamycin	16	3	9	3	13	23	41	42	29	**179**
Optipac Refobacin Bonecement R	8 021	2 108	2 464	2 207	1 633	1 180	88	0	1	**17 702**
Optipac Refobacin Bonecement R-3	0	0	0	0	0	0	131	120	135	**386**
Optipac Refobacin Revision	29	8	21	17	13	1	0	0	0	**89**
Palacos	6 989	0	1	0	0	0	0	0	0	**6 990**
Palacos E-Flow (low viscosity)	99	0	0	0	0	0	0	0	0	**99**
Palacos R + G	23 578	2 462	2 504	2 335	1 666	1 541	1 018	529	498	**36 131**
Palacos R+G pro	1	2	1	59	790	2 081	3 751	3 554	3 897	**14 136**
Palacos w/gentamicin	62 764	0	1	0	0	1	0	0	0	**62 766**
Palamed G (gentamicin)	13	0	0	0	0	0	0	0	0	**13**
Refobacin Bone Cement R	9 741	694	384	632	913	59	1	0	0	**12 424**
Refobacin Revision	313	38	36	24	70	24	5	0	0	**510**
Refobacin Revision-3	0	0	0	0	0	35	38	30	35	**138**
Refobacin-Palacos	2 386	0	0	0	0	0	0	0	0	**2 386**
Simplex	7 147	0	0	0	0	0	0	0	0	**7 147**
Simplex unknown	826	1	0	0	0	0	0	0	0	**827**
Simplex w/erythr.+colistin	2 598	0	0	0	0	0	0	0	0	**2 598**
Simplex w/Tobramycin	6 469	511	527	534	488	503	491	333	390	**10 246**
SmartSet GHV	159	0	0	0	0	0	0	0	0	**159**
SmartSet GHV Genta. Smartmix	186	2	26	156	179	99	117	33	1	**799**
SmartSet HV	15	0	0	0	0	0	0	0	0	**15**
Vancogenx	5	2	2	1	5	4	10	6	7	**42**
Annet (n<10)	18	1	1	0	1	0	0	1	4	**26**
Missing information	433	33	32	55	66	60	108	89	17	**893**

Cemented primary prostheses

Table 15: (The 45 most common combinations of cup and stem)

Cup	Stem	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
CHARNLEY	CHARNLEY	40 327	39								**40 366**
EXETER	EXETER	12 986	1								**12 987**
EXETER X3 RIMFIT	EXETER	2 847	1 167	1 360	1 321	992	1 044	1 009	632	526	**10 898**
REFLECTION CEM. ALL POLY	SPECTRON-EF	9 739	1								**9 740**
TITAN	TITAN	6 986									**6 986**
IP	LUBINUS SP II	4 987	281	307	262	217	203	222	156	178	**6 813**
CONTEMPORARY	EXETER	4 682	57	15	3	1		3	4		**4 765**
SPECTRON	ITH	2 405									**2 405**
LUBINUS	LUBINUS SP II	138	169	252	213	214	201	228	227	266	**1 908**
MARATHON	CHARNLEY MODULAR	1 207	228	137	46	26		2	13		**1 659**
KRONOS	TITAN	1 496									**1 496**
MARATHON	EXETER	215	92	122	187	197	244	241	95	58	**1 451**
ELITE	TITAN	1 237									**1 237**
MARATHON	C-STEM	34		42	129	118	180	249	250	231	**1 233**
ELITE	CHARNLEY	932									**932**
REFLECTION CEM. ALL POLY	ITH	927									**927**
REFLECTION CEM. ALL POLY	BIO-FIT	905									**905**
MARATHON	LUBINUS SP II	61	46	69	111	40	41	110	184	211	**873**
WEBER ALLO PRO	MS-30	813									**813**
MARATHON	MS-30			15	19	72	115	167	197	220	**805**
ELITE	EXETER	778									**778**
ZCA	CPT	756									**756**
CHARNLEY	CHARNLEY MODULAR	671	1								**672**
AVANTAGE	EXETER	209	62	38	40	32	65	71	74	72	**663**
IP	LUBINUS	587									**587**
ELITE	ELITE	579									**579**
CHARNLEY	EXETER	571									**571**
TITAN	FJORD	523									**523**
ELITE	CHARNLEY MODULAR	499	22								**521**
SPECTRON	SP I	432									**432**
MODULAR HIP SYSTEM	BIO-FIT	430									**430**
SPECTRON	TITAN	414									**414**
MARATHON	CORAIL	142	55	51	61	28	25	14	5	13	**394**
CHARNLEY	C-STEM	378									**378**
CHARNLEY	ELITE	375									**375**
EXCEED ABT CEMENTED SYS	MS-30					65	97	97	38	73	**370**
OPERA	SPECTRON-EF	356									**356**
ELITE	MS-30	339									**339**
POLARCUP	LUBINUS SP II	44	10	9	15	25	16	45	55	76	**295**
PEARL	TITAN	285									**285**
EXCEED ABT CEMENTED SYS	CPT					106	113	64			**283**
MODULAR HIP SYSTEM	ITH	277									**277**
SPECTRON	BIO-FIT	226									**226**
IP	SP I	214									**214**
LMT	LMT	191									**191**
Other	Other	2 867	65	47	46	254	170	141	106	148	**3 844**

Uncemented primary prostheses

Table 16: (The 45 most common combinations of cup and stem)

Cup	Stem	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
PINNACLE	CORAIL	1 605	321	385	491	1 241	1 674	1 739	1 632	1 748	**10 836**
REFLECTION UNCEMENTED	CORAIL	3 181	823	543	170	219	427	182	277	188	**6 010**
TRIDENT	CORAIL	90	74	113	270	240	303	659	1 066	1 299	**4 114**
IGLOO	FILLER	2 901	173	124	165	108	121	136	73	39	**3 840**
TRILOGY	CORAIL	1 885	271	248	331	270	199	329	148	57	**3 738**
R3	CORAIL	2		120	493	568	519	463	334	353	**2 852**
TROPIC	CORAIL	2 674									**2 674**
TRIDENT	ACCOLADE II	42	75	174	127	116	174	233	216	248	**1 405**
ATOLL	CORAIL	1 282									**1 282**
Continuum Acetabular System	CORAIL		190	302	332	88	41	48	78	83	**1 162**
DURALOC	CORAIL	1 071									**1 071**
REFLECTION UNCEMENTED	HACTIV	11	3	117	185	187	184	95			**782**
R3	POLARSTEM	234	51	50	74	50	14	25	108	155	**761**
BICON-PLUS	ZWEYMÜLLER	586									**586**
TRIDENT	POLARSTEM		43	58	21	60	59	121	93	74	**529**
REFLECTION UNCEMENTED	SECURFIT	518									**518**
TRILOGY	SCP/UNIQUE	509									**509**
R3	FILLER		31	89	90	114	96	44			**464**
TRILOGY	HACTIV	449						8			**457**
GEMINI	PROFILE	407									**407**
BICON-PLUS	HACTIV	386									**386**
DURALOC	PROFILE	332									**332**
REFLECTION UNCEMENTED	OMNIFIT	305									**305**
DURALOC	SCP/UNIQUE	267									**267**
TRILOGY	FILLER	259		2							**261**
REFLECTION UNCEMENTED	SCP/UNIQUE	198	25	13	10	2					**248**
ENDLER	ZWEYMÜLLER	247									**247**
EUROPEAN CUP SYSTEM	TAPERLOC	240									**240**
PLASMACUP	BICONTACT	232									**232**
TRABECULAR METAL	CORAIL	22	19	21	36	26	26	35	28	16	**229**
LMT	TAPERLOC	227									**227**
TRIDENT	ABG II	109	81	22							**212**
AVANTAGE	CORAIL	90	1	2	29	10	12	25	14	14	**197**
TI-FIT	BIO-FIT	175									**175**
REFLECTION UNCEMENTED	SL-PLUS MIA	173									**173**
SECURFIT	OMNIFIT	166									**166**
ABG I	ABG I	165									**165**
HARRIS/GALANTE	HARRIS/GALANTE	158									**158**
ABG II	ABG II	155									**155**
COXA	FEMORA	155									**155**
PARHOFER	PARHOFER	152									**152**
BICON-PLUS	CORAIL	148	1	1							**150**
REFLECTION UNCEMENTED	PROFEMUR GLADIATOR	142	1								**143**
TRIDENT	HACTIV		3	18	65	44	6				**136**
TRILOGY	OMNIFIT	134									**134**
Other	Other	2 981	152	157	147	145	253	242	168	281	**4 526**

Hybrid primary prostheses

Table 17: Hybrid primary prostheses. (The 20 most common)

Cup (uncemented)	Stem (cemented)	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
TRIDENT	EXETER	91	10	22	31	12	174	451	556	635	**1 982**
TRILOGY	EXETER	545	207	239	245	258	170	60	32	26	**1 782**
TROPIC	TITAN	894									**894**
REFLECTION UNCEMENTED	C-STEM		1	26	64	108	124	146	198	143	**810**
R3	LUBINUS SP II			44	159	142	145	95	80	109	**774**
MORSCHER	MS-30	699									**699**
TRIDENT	LUBINUS SP II	1		3	7	20	13	64	214	281	**603**
PINNACLE	C-STEM				3	2	25	94	121	232	**477**
TRILOGY	CHARNLEY	382									**382**
ENDLER	TITAN	346									**346**
PINNACLE	LUBINUS SP II	1		2	4	5	28	36	105	150	**331**
REFLECTION UNCEMENTED	LUBINUS SP II	48	68	83	1		22	9	4		**235**
TRIDENT	MS-30				1	1	4	39	67	117	**229**
AVANTAGE	EXETER	28	9	15	32	26	24	19	12	12	**177**
DURALOC	CHARNLEY	153									**153**
REFLECTION UNCEMENTED	BIO-FIT	145									**145**
TRILOGY	CPT	93				46	2	1			**142**
REFLECTION UNCEMENTED	SPECTRON-EF	135					1				**136**
TRIDENT	C-STEM				1			4	24	104	**133**
ATOLL	TITAN	126									**126**
Other	Other	1 346	29	40	34	105	155	242	90	149	**2 190**

Table 18: Reverse hybrid primary prostheses. (The 20 most common)

Cup (cemented)	Stem (uncemened)	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
MARATHON	CORAIL	8 902	2 729	2 564	2 350	2 187	1 818	1 496	796	629	**23 471**
ELITE	CORAIL	2 602	71	3	2						**2 678**
REFLECTION CEM. ALL POLY	CORAIL	1 224	22	30	29	31	7	2	7	2	**1 354**
TITAN	CORAIL	986									**986**
EXETER X3 RIMFIT	ACCOLADE II	68	60	123	157	121	116	62	1	1	**709**
CONTEMPORARY	CORAIL	682	1								**683**
KRONOS	CORAIL	640									**640**
EXETER X3 RIMFIT	CORAIL	172	88	46	129	54	24	21	11	5	**550**
REFLECTION CEM. ALL POLY	HACTIV	475	1								**476**
REFLECTION CEM. ALL POLY	FILLER	240	20	1		2					**263**
IP	CORAIL	201	3	2	5	1	3	4			**219**
AVANTAGE	CORAIL	85	19	12	12	14	20	10	7	12	**191**
EXETER	CORAIL	174									**174**
EXETER	ABG II	172									**172**
REFLECTION CEM. ALL POLY	TAPERLOC	162									**162**
EXETER X3 RIMFIT	ABG II	148									**148**
EXETER X3 RIMFIT	FILLER	26	44	35	25	7		2			**139**
CHARNLEY	CORAIL	118									**118**
ELITE	SCP/UNIQUE	97	1	1							**99**
MARATHON	ACCOLADE II			15	51	28	1	1	1	1	**98**
Other	Other	1 113	67	69	67	66	58	71	58	48	**1 617**

Acetabular cups in primary operations

Table 19: (The 45 most common)

Cup	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
CHARNLEY	42 989	114	66	40								**43 209**
MARATHON	4 391	3 090	3 319	3 193	3 045	3 000	2 762	2 495	2 331	1 555	1 377	**30 558**
REFLECTION CEM. ALL POLY	13 689	234	108	53	36	33	34	8	17	15	8	**14 235**
EXETER	13 408	84	26	1								**13 519**
EXETER X3 RIMFIT	816	1 103	1 370	1 363	1 571	1 635	1 178	1 185	1 099	647	536	**12 503**
PINNACLE	871	468	388	331	398	519	1 286	1 810	1 948	1 903	2 215	**12 137**
REFLECTION UNCEMENTED	3 715	848	933	968	798	435	520	834	452	495	345	**10 343**
TRIDENT	232	53	161	347	441	548	546	783	1 626	2 301	2 911	**9 949**
TITAN	8 815	1										**8 816**
TRILOGY	4 300	292	351	509	517	582	576	374	468	196	86	**8 251**
IP	5 314	482	440	286	315	267	220	211	228	159	178	**8 100**
ELITE	7 375	261	118	95	5	2						**7 856**
CONTEMPORARY	5 137	195	111	58	15	3	1		3	4		**5 527**
R3	97	57	82	84	308	829	885	808	692	523	658	**5 023**
IGLOO	2 665	249	211	175	124	169	110	121	136	74	57	**4 091**
TROPIC	3 823											**3 823**
SPECTRON	3 652											**3 652**
KRONOS	2 193											**2 193**
AVANTAGE	550	119	103	119	98	158	190	182	222	191	221	**2 153**
DURALOC	1 849	72	62									**1 983**
LUBINUS	31	1	125	169	253	213	215	205	230	230	274	**1 946**
ATOLL	1 491											**1 491**
Continuum Acetabular System				194	320	348	98	50	60	83	88	**1 241**
BICON-PLUS	1 211			1	1							**1 213**
POLARCUP	56	58	79	66	64	49	91	99	183	185	187	**1 117**
ZCA	1 063											**1 063**
EXCEED ABT CEMENTED SYS	7	8	13	19	32	23	206	274	179	42	75	**878**
MODULAR HIP SYSTEM	878											**878**
MORSCHER	843											**843**
WEBER ALLO PRO	830											**830**
ENDLER	662											**662**
BIRMINGHAM HIP RESURFACI	499	21	2									**522**
GEMINI	510											**510**
OPERA	457											**457**
TRABECULAR METAL	12	14	17	33	35	54	41	44	57	34	34	**375**
EUROPEAN CUP SYSTEM	332											**332**
TI-FIT	312											**312**
PEARL	287											**287**
PLASMACUP	283											**283**
LMT (Uncemented)	275											**275**
HARRIS/GALANTE	252											**252**
PE-PLUS	247											**247**
MÜLLER TYPE	242											**242**
ABG II	236											**236**
COXA	220											**220**
Other	2 284	6	7	26	65	81	204	121	106	76	141	**3 117**

Acetabular cups in revisions

Table 20: (The 45 most common)

Cup	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
CHARNLEY	2 856	5	3				1					**2 865**
AVANTAGE	1 012	114	99	85	86	76	90	97	92	118	86	**1 955**
TROPIC	1 885											**1 885**
TRABECULAR METAL	207	118	161	214	160	204	158	153	155	111	84	**1 725**
TRILOGY	1 227	50	51	56	65	59	46	42	24	29	21	**1 670**
ELITE	1 563	19	12	6								**1 600**
PINNACLE	484	97	82	117	97	111	115	134	114	118	85	**1 554**
TRIDENT	74	38	41	44	94	88	111	169	228	268	257	**1 412**
POLARCUP	102	84	119	113	132	118	129	111	123	89	94	**1 214**
MARATHON	336	164	138	66	94	66	60	46	45	35	24	**1 074**
EXETER	940	3						1				**944**
REFLECTION CEM. ALL POLY	895	7	4	3	4	2				1		**916**
REFLECTION UNCEMENTED	227	78	94	83	74	35	41	28	26	20	23	**729**
IGLOO	432	24	18	15	15	25	18	17	20	4		**588**
TITAN	527											**527**
ATOLL	396											**396**
R3		7	6	6	20	61	79	67	31	27	33	**337**
IP	241	10	4	3	5	3	4	1	1	1	2	**275**
Continuum Acetabular System				13	51	66	37	37	38	15	7	**264**
CONTEMPORARY	228	9	3									**240**
KRONOS	225											**225**
EXETER X3 RIMFIT	25	24	30	25	29	29	9	5	11	6	6	**199**
CHRISTIANSEN	196											**196**
SPECTRON	189											**189**
DURALOC	110	10	5	11	9	2	6	5	7	6	6	**177**
OPERA	101											**101**
HARRIS/GALANTE	99											**99**
ZCA	96											**96**
MODULAR HIP SYSTEM	95											**95**
CAPTIV	71					7						**78**
BICON-PLUS	49	2	3		2	1	5	4	5	4		**75**
EUROPEAN CUP SYSTEM	73											**73**
LMT (Uncemented)	67											**67**
ENDLER	66											**66**
HG II	53											**53**
MORSCHER	51											**51**
GEMINI	47											**47**
SECURFIT	45											**45**
REGENEREX RINGLOC	31	7	2							1		**41**
OCTOPUS	40											**40**
TI-FIT	36											**36**
PARHOFER	35											**35**
PCA	33	1										**34**
G7										3	28	**31**
S-ROM	27											**27**
Other	365	2	3	5	4	7	18	19	19	14	22	**478**

Femoral stems in primary operations

Table 21: (The 45 most common)

Stem	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
CORAIL	19 715	4 495	4 637	4 712	4 459	4 759	5 031	5 171	5 080	4 432	4 503	**66 994**
CHARNLEY	42 304	116	67	44								**42 531**
EXETER	20 294	1 461	1 570	1 651	1 850	1 894	1 553	1 838	1 928	1 474	1 422	**36 935**
LUBINUS SP II	4 445	514	622	589	780	786	670	682	895	1 069	1 435	**12 487**
TITAN	12 188											**12 188**
SPECTRON-EF	10 516	92	37	10	3	1	2	6	6	10	4	**10 687**
FILLER	2 964	321	374	328	262	287	245	235	196	94	70	**5 376**
ITH	3 723											**3 723**
C-STEM	540		1	2	76	203	250	360	585	643	759	**3 419**
MS-30	1 876				17	21	144	227	320	329	460	**3 394**
CHARNLEY MODULAR	1 945	258	237	261	154	46	28		2	13		**2 944**
HACTIV	1 279	108	38	9	150	281	242	204	134			**2 445**
ACCOLADE II			110	137	314	342	266	305	325	262	312	**2 373**
CPT	1 113		1	2	1	2	440	262	175	1		**1 997**
BIO-FIT	1 993											**1 993**
POLARSTEM	124	83	108	103	110	97	111	112	169	219	246	**1 482**
SCP/UNIQUE	1 286	15	33	36	28	35	11		1	1	3	**1 449**
ZWEYMÜLLER	1 102											**1 102**
ELITE	1 026	3	1									**1 030**
OMNIFIT	884	6										**890**
PROFILE	890											**890**
ABG II	573	94	78	81	23							**849**
TAPERLOC	787											**787**
SP I	780											**780**
FJORD	652											**652**
LUBINUS	624											**624**
SECURFIT	432	94	32									**558**
CPS-PLUS	496											**496**
BICONTACT	443											**443**
KAR/Corail Revision	150	20	32	21	29	42	39	24	37	21	17	**432**
LMT (Cemented)	417											**417**
ABG I	304											**304**
PROFEMUR GLADIATOR	58	71	38	4				33	20	11		**235**
TI-FIT	221											**221**
MÜLLER TYPE	213											**213**
FURLONG EVOLUTION				4	19	19	36	32	32	25	41	**208**
FEMORA	182											**182**
BI-METRIC	145	5	2	3	7	16	1					**179**
SL-PLUS MIA	177											**177**
HARRIS/GALANTE	169											**169**
PARHOFER	159											**159**
KAREY	136											**136**
FURLONG				41	16	19	23	18	15			**132**
MÜLLER TYPE V	132											**132**
RESTORATION	26	7	11	9	8	9	2	6	20	18	16	**132**
Other	1 252	18	24	52	102	47	22	47	48	42	42	**1 696**

Femoral stems in revisions

Table 22: (The 45 most common)

Stem	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
KAR/Corail Revision	2 254	138	147	120	138	103	99	90	106	76	66	**3 337**
CHARNLEY	2 978	1	1	2	1			1				**2 984**
EXETER	1 701	72	62	63	77	78	68	84	84	91	93	**2 473**
CORAIL	1 340	62	65	40	51	66	57	50	45	40	42	**1 858**
RESTORATION	219	57	67	63	70	55	36	73	51	62	50	**803**
CPT	474	7	2	5	7	6	23	18	9	1	8	**560**
TITAN	538											**538**
FJORD	476											**476**
FILLER	318	15	17	16	10	19	19	16	19	6	10	**465**
TTHR	169	71	53	37	21	24	24	16	19	6	8	**448**
SPECTRON-EF	355	4	8	3	3	2	1		2	3		**381**
LUBINUS SP II	166	9	8	30	16	9	17	30	28	34	33	**380**
ELITE	351		1									**352**
REEF	320	5	2									**327**
ARCOS	1	3	12	17	27	32	42	41	26	51	54	**306**
REVITAN	7	7	27	20	36	31	38	33	34	15	14	**262**
MP RECONSTRUCTION	69	24	26	18	17	12	14	14	10	10	6	**220**
ANATOMIC BR	192											**192**
ITH	192											**192**
Securus			7	15	11	19	20	21	39	34	20	**186**
BIO-FIT	167											**167**
REACTIV	51	3	6	19	13	27	14	9	13	2	3	**160**
HACTIV	102	4	4		13	9	10	8	7			**157**
BI-METRIC	102	16	16	1		2	2					**139**
C-STEM	13			1	3	12	11	14	19	26	24	**123**
TAPERLOC	115											**115**
PRIUS				2	11	17	8	22	9	6	9	**84**
ZWEYMÜLLER	83											**83**
RECLAIM		1	13	9	12	12	6	10	5	10	2	**80**
Profemur	47	11	14	5								**77**
ECHELON	68											**68**
MS-30	34					2	4	4	4	9	9	**66**
SP I	66											**66**
SCAN HIP	59											**59**
LUBINUS	51											**51**
HARRIS/GALANTE	44											**44**
CHARNLEY MODULAR	25	3	3	3	3	5	1					**43**
FEMORA	43											**43**
PARHOFER	43											**43**
MRP-TITAN							6	18	12	2	1	**39**
PROFEMUR GLADIATOR	7	20	9	3								**39**
AURA	38											**38**
LANDOS (Reconstruction)	33											**33**
MÜLLER TYPE	32											**32**
OMNIFIT	32											**32**
Other	316	4	3	2	12	6	10	2	8	9	14	**386**

The 7 most common primary prostheses in last 5 years

Table 23a: Acetabular cup

2017	2018	2019	2020	2021
MARATHON (2 762)	MARATHON (2 495)	MARATHON (2 331)	TRIDENT (2 301)	TRIDENT (2 911)
PINNACLE (1 286)	PINNACLE (1 810)	PINNACLE (1 948)	PINNACLE (1 903)	PINNACLE (2 215)
EXETER X3 RIMFIT (1 178)	EXETER X3 RIMFIT (1 185)	TRIDENT (1 626)	MARATHON (1 555)	MARATHON (1 377)
R3 (885)	REFLECTION * (834)	EXETER X3 RIMFIT (1 099)	EXETER X3 RIMFIT (647)	R3 (658)
TRILOGY (576)	R3 (808)	R3 (692)	R3 (523)	EXETER X3 RIMFIT (536)
TRIDENT (546)	TRIDENT (783)	TRILOGY (468)	REFLECTION * (495)	REFLECTION * (345)
REFLECTION * (520)	TRILOGY (374)	REFLECTION * (452)	LUBINUS (230)	LUBINUS (274)

Table 23b: Femoral stem

2017	2018	2019	2020	2021
CORAIL (5 031)	CORAIL (5 171)	CORAIL (5 080)	CORAIL (4 432)	CORAIL (4 503)
EXETER (1 553)	EXETER (1 838)	EXETER (1 928)	EXETER (1 474)	LUBINUS SP II (1 435)
LUBINUS SP II (670)	LUBINUS SP II (682)	LUBINUS SP II (895)	LUBINUS SP II (1 069)	EXETER (1 422)
CPT (440)	C-STEM (360)	C-STEM (585)	C-STEM (643)	C-STEM (759)
ACCOLADE II (266)	ACCOLADE II (305)	ACCOLADE II (325)	MS-30 (329)	MS-30 (460)
C-STEM (250)	CPT (262)	MS-30 (320)	ACCOLADE II (262)	ACCOLADE II (312)
FILLER (245)	FILLER (235)	FILLER (196)	POLARSTEM (219)	POLARSTEM (246)

Table 23c: Combinations of cup and stem

2017	2018	2019	2020	2021
MARATHON + CORAIL (2 215)	MARATHON + CORAIL (1 844)	PINNACLE + CORAIL (1 742)	PINNACLE + CORAIL (1 634)	PINNACLE + CORAIL (1 751)
PINNACLE + CORAIL (1 241)	PINNACLE + CORAIL (1 676)	MARATHON + CORAIL (1 511)	TRIDENT + CORAIL (1 068)	TRIDENT + CORAIL (1 299)
EXETER X3 RIMFIT + EXETER (992)	EXETER X3 RIMFIT + EXETER (1 044)	EXETER X3 RIMFIT + EXETER (1 009)	MARATHON + CORAIL (801)	TRIDENT + EXETER (653)
R3 + CORAIL (568)	R3 + CORAIL (519)	TRIDENT + CORAIL (660)	EXETER X3 RIMFIT + EXETER (632)	MARATHON + CORAIL (643)
TRILOGY + CORAIL (270)	REFLECTION * + CORAIL (427)	R3 + CORAIL (464)	TRIDENT + EXETER (558)	EXETER X3 RIMFIT + EXETER (527)
TRILOGY + EXETER (259)	TRIDENT + CORAIL (303)	TRIDENT + EXETER (460)	R3 + CORAIL (334)	R3 + CORAIL (354)
TRIDENT + CORAIL (242)	MARATHON + EXETER (244)	TRILOGY + CORAIL (329)	REFLECTION * + CORAIL (277)	TRIDENT + LUBINUS SP II (308)

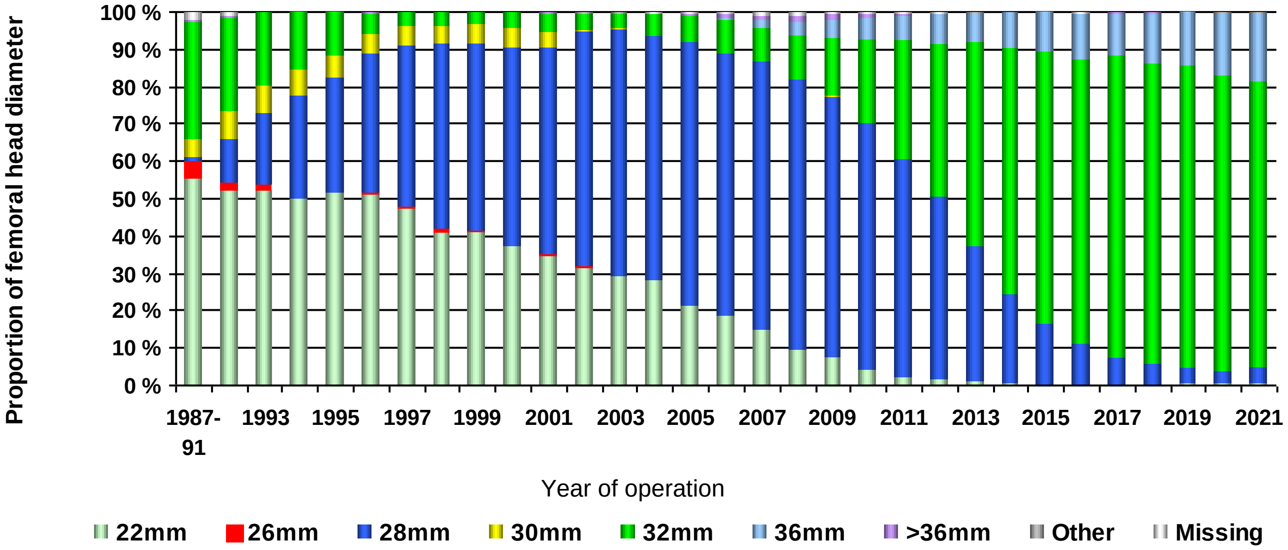
* UNCEMENTED
**' MODULAR

Femoral head diameter (Dual mobility THA excluded).

Table 24: In primary operations and revisions

Year	22 mm	26 mm	28 mm	30 mm	32 mm	36 mm	>36 mm	Other	Missing	Total
2021	25		401		7 226	1 704	3	10	20	**9 389**
2020	26		308		7 037	1 487	7	14	21	**8 900**
2019	28		462	2	8 445	1 469	12		10	**10 428**
2018	14		592		8 219	1 361	6	4	19	**10 215**
2017	7		720		7 871	1 136	9	2	21	**9 766**
2016	9		1 082	1	7 366	1 186	1	2	27	**9 674**
2015	22		1 507		6 747	948	5	2	10	**9 241**
2014	57		2 094	1	5 863	807	4	3	15	**8 844**
2013	83	2	3 222	1	4 850	677	3	5	22	**8 865**
2012	148		4 213	3	3 503	671	25	4	25	**8 592**
2011	158		4 783		2 607	522	53	1	24	**8 148**
2010	348		5 340	3	1 827	490	82	1	40	**8 131**
2009	598	2	5 529	4	1 241	386	115	1	48	**7 924**
2008	732	2	5 494	2	880	279	136	3	64	**7 592**
2007	1 081		5 316	2	665	148	112	2	62	**7 388**
2006	1 287	6	4 908	3	639	58	60	5	33	**6 999**
2005	1 563	9	5 170		522	4	41	2	25	**7 336**
2004	1 931	26	4 505	7	393		4	3	27	**6 896**
2003	2 256	24	5 117	13	309		3	12	15	**7 749**
2002	2 173	16	4 315	62	274		2	24	14	**6 880**
2001	2 385	18	3 809	317	342		1	3	15	**6 890**
2000	2 392	6	3 425	347	269			3	8	**6 450**
1999	2 546	26	3 104	337	198			2	7	**6 220**
1998	2 505	66	3 037	305	224			1	5	**6 143**
1997	2 860	24	2 627	297	226		6	1	7	**6 048**
1996	2 862	7	2 102	287	306	1	15		5	**5 585**
1995	3 014	4	1 821	342	673		7		5	**5 866**
1994	2 639	13	1 474	359	806		5		7	**5 303**
1993	2 811	70	1 042	390	1 045		2		11	**5 371**
1992	2 775	124	605	404	1 332		8		70	**5 318**
1987-91	11 373	919	308	930	6 492	1	76		423	**20 522**
Total	**50 708**	**1 364**	**88 432**	**4 419**	**88 397**	**13 335**	**803**	**110**	**1 105**	**248 673**

Figure 11: In primary operations and revisions



Femoral head prostheses

Table 25: In primary operations and revisions (The 50 most common)

Prosthesis	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
CORAIL	6 484	2 710	2 894	3 125	3 457	3 582	4 161	3 763	3 673	**33 849**
EXETER	23 517	653	793	744	563	568	571	382	440	**28 231**
CERAMTEC	10 514	2 449	2 218	2 211	2 109	2 177	1 447	1 055	1 048	**25 228**
LANDOS	21 728	15								**21 743**
UNIVERSAL	17 028	50	39	35	63	59	102	87	63	**17 526**
LFIT ANATOMIC	3 117	1 434	1 646	1 719	1 469	1 839	1 861	1 493	1 396	**15 974**
SP II	6 015	647	826	835	734	772	977	1 170	1 534	**13 510**
FJORD	11 767	2	3		2					**11 774**
PINNACLE	1 081	249	161	286	358	374	729	777	960	**4 975**
ELITE	3 814	184	136	62	35	8	8	21	4	**4 272**
IGLOO	2 823	213	170	229	207	224	201	81	52	**4 200**
PROTEK	1 984				381	332	285	102	133	**3 217**
SCANOS	1 695	30	211	347	289	267	178	17	23	**3 057**
PLUS ENDO	1 586	30	14	16	15	14	6	4	5	**1 690**
CPT	1 634	2	1	4	3	2	1	1	1	**1 649**
VERSYS	188	29	80	81	141	164	227	270	366	**1 546**
OXINIUM	951	47	5	10	6	8	26	173	216	**1 442**
PROFILE	1 429									**1 429**
MALLORY-HEAD	799	65	107	93	64	61	46	83	82	**1 400**
HIPBALL PREMIUM	702	166	137	116	66	54	28	19	26	**1 314**
TAPERLOC	1 088									**1 088**
BIOTECHNI	1 050	5	2	1						**1 058**
HARRIS/GALANTE	876		6	5		1	5	1		**894**
OMNIFIT	844	1	2	2	3	3	2	3		**860**
" OSTEONICS Hoder" , C-taper head	815									**815**
ZIRCONIA	763									**763**
FURLONG	8	73	80	91	108	84	97	81	76	**698**
STRYKER HODER	105	24	41	48	19	26	106	134	156	**659**
BIOBALL	210	62	61	59	63	60	49	39	42	**645**
BICONTACT	490	6	2	2	2	2	1	5	1	**511**
BIRMINGHAM HIP RESURFACING	467					1				**468**
ABG I	399	7	6	3	3	2	3	2	1	**426**
SURGIVAL	372									**372**
Zimmer Hoder		1			162	83	76	14	23	**359**
ZWEYMÜLLER	342									**342**
CERAMIC OSTEO	220									**220**
FEMORA	213									**213**
PARHOFER	184					1				**185**
TI-FIT	141									**141**
SMITH & NEPHEW KERAMIKKHODE	136									**136**
CHRISTIANSEN	126									**126**
BIOLOX DELTA	61	5	3	1	6	17	17	11	3	**124**
PCA	108		2		1	1				**112**
BIRMINGHAM HIP MODULÆR	58									**58**
MUTARS	16	2	10	8	6	3	4	5	4	**58**
ABG II	48									**48**
ASR MODULÆR	45									**45**
LINK Rippensystem	38									**38**
A-ACUTA						8	7	8	9	**32**
AURA II	29				1					**30**
Other	319	1	1	3	7	20	10	6	7	**374**

Dual Mobility articulation

Table 26 In primary operation

Prosthesis	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
AVANTAGE	773	118	98	158	190	175	208	182	187	**2 089**
POLARCUP	193	66	64	49	91	95	172	171	153	**1 054**
TRIDENT MDM	25	12	16	22	35	50	96	176	264	**696**
CAPTIV				19						**19**
Restoration Anatomic Cup	4	1		5	4	1	4			**19**
Other (n<5)	2									**2**
Total	**997**	**197**	**178**	**253**	**320**	**321**	**480**	**529**	**604**	**3 879**

Table 27 In revisions

Prosthesis	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
AVANTAGE	1 266	95	93	92	121	108	108	136	100	**2 119**
POLARCUP	318	125	144	129	141	123	129	100	99	**1 308**
TRIDENT MDM	22	23	48	33	44	90	137	195	202	**794**
Restoration Anatomic Cup	19	6	12	17	28	11	4			**97**
CAPTIV				10						**10**
GYROS	10									**10**
Other (n<5)					1	1				**2**
Total	**1 635**	**249**	**297**	**281**	**335**	**333**	**378**	**431**	**401**	**4 340**

ASA classification

Figure 12: Primary operations

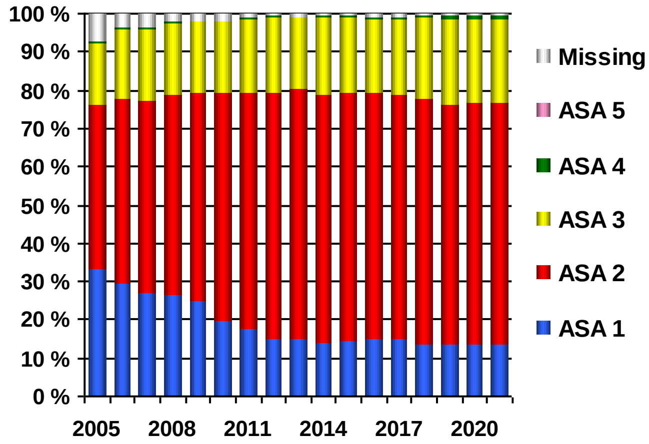
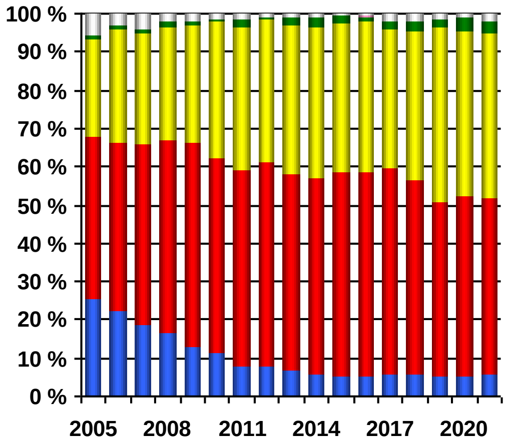


Figure 13: Revisions



ASA 1 = Healthy patients who smoke less than 5 cigarettes a day.
ASA 2 = Patients with an asymptomatic condition who are kept under medical control (f.ex. hypertension), or with diet (f. ex. diabetes mellitus type 2), and otherwise healthy patients who smoke five cigarettes or more daily.
ASA 3 = Patients having a condition that can cause symptoms. However, patients are kept under medical control (f. ex. moderate angina pectoris and mild asthma).
ASA 4 = Patients with a condition that is out of control (f. ex. heart failure and asthma).
ASA 5 = A moribund patient who is not expected to survive the operation.

Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 28: Primary operations *

År	1		2		3		4		Missing		Total
2021	319	(3%)	8 064	(86%)	855	(9%)	116	(1%)	42	(0%)	**9 396**
2020	395	(5%)	7 416	(85%)	751	(9%)	130	(1%)	29	(0%)	**8 721**
2019	465	(5%)	8 510	(85%)	879	(9%)	150	(1%)	38	(0%)	**10 042**
2018	581	(6%)	7 790	(81%)	1 103	(11%)	91	(1%)	45	(0%)	**9 610**
2017	627	(7%)	7 458	(81%)	985	(11%)	65	(1%)	41	(0%)	**9 176**
2016	800	(9%)	7 055	(79%)	975	(11%)	72	(1%)	52	(1%)	**8 954**
2015	1 068	(13%)	6 277	(74%)	959	(11%)	57	(1%)	89	(1%)	**8 450**
2014	1 115	(14%)	5 950	(73%)	967	(12%)	31	(0%)	75	(1%)	**8 138**
2013	1 345	(17%)	5 638	(70%)	1 049	(13%)	10	(0%)	62	(1%)	**8 104**
2012	1 579	(20%)	4 853	(62%)	1 320	(17%)	9	(0%)	82	(1%)	**7 843**
2011	2 221	(30%)	4 304	(58%)	793	(11%)	3	(0%)	38	(1%)	**7 359**
2005-10	19 970	(49%)	15 882	(39%)	4 064	(10%)	45	(0%)	907	(2%)	**40 868**

Table 29: Revisions *

År	1		2		3		4		Missing		Total
2021	158	(12%)	927	(72%)	97	(8%)	63	(5%)	39	(3%)	**1 284**
2020	172	(12%)	1 006	(73%)	125	(9%)	47	(3%)	27	(2%)	**1 377**
2019	193	(13%)	1 088	(72%)	146	(10%)	67	(4%)	27	(2%)	**1 521**
2018	202	(13%)	1 124	(72%)	146	(9%)	66	(4%)	24	(2%)	**1 562**
2017	207	(14%)	1 105	(74%)	139	(9%)	24	(2%)	28	(2%)	**1 503**
2016	205	(14%)	1 077	(72%)	162	(11%)	27	(2%)	27	(2%)	**1 498**
2015	222	(16%)	1 019	(72%)	133	(9%)	12	(1%)	24	(2%)	**1 410**
2014	225	(17%)	921	(71%)	118	(9%)	10	(1%)	20	(2%)	**1 294**
2013	226	(17%)	916	(69%)	153	(12%)	6	(0%)	26	(2%)	**1 327**
2012	240	(18%)	823	(63%)	216	(16%)	10	(1%)	26	(2%)	**1 315**
2011	318	(25%)	758	(59%)	184	(14%)	8	(1%)	19	(1%)	**1 287**
2005-10	3 131	(47%)	2 666	(40%)	734	(11%)	21	(0%)	153	(2%)	**6 705**

Figure 14: Primary operations

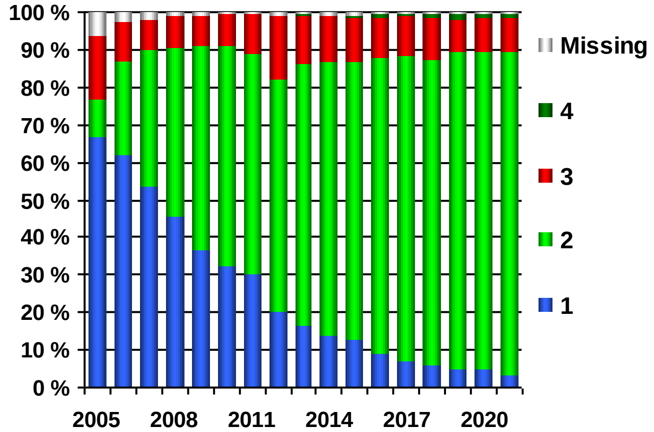
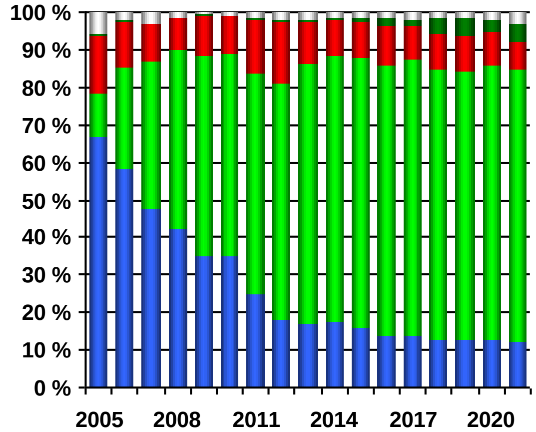


Figure 15: Revisions



*

1 = Yes - Medication started preoperatively
2 = Yes - Medication started postoperatively
3 = Yes - Missing information on medication start
4 = No

Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 30: All operations

Drugs	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)		0,1 %	0,4 %	0,6 %	0,8 %	0,8 %	1,0 %	1,1 %	1,1 %	1,1 %
Apiksaban (Eliquis)		1,2 %	1,5 %	1,5 %	1,5 %	1,6 %	1,4 %	1,3 %	1,8 %	1,9 %
Dabigatranetixalat (Re-Novate, Pradaxa)	0,4 %		0,1 %	0,1 %						
Dalteparin (Fragmin)	56,9 %	56,1 %	51,6 %	58,4 %	61,6 %	64,1 %	64,9 %	53,7 %	50,1 %	50,9 %
Dekstran (Macrodex, Dextran)	0,1 %	0,1 %	0,1 %							
Enoksaparin (Klexane)	35,6 %	27,9 %	31,4 %	24,1 %	22,0 %	19,6 %	17,6 %	26,8 %	29,7 %	30,2 %
Rivaroksaban (Xarelto)	0,7 %	2,3 %	2,2 %	1,5 %	1,5 %	1,1 %	1,1 %	1,0 %	0,9 %	0,9 %
Warfarin (Marevan)	0,1 %			0,1 %						
Ximelagatran (Exanta, Malagatran)	0,3 %									
Other			0,1 %						0,1 %	0,1 %
Combination of 2 drugs	3,3 %	10,8 %	10,6 %	11,5 %	10,0 %	10,2 %	10,9 %	12,5 %	13,0 %	11,4 %
Clinical study	0,5 %									
No drugs										
Missing/Unknown	2,0 %	1,4 %	2,0 %	2,2 %	2,6 %	2,5 %	2,9 %	3,4 %	3,3 %	3,4 %
Total	**65 408**	**9 467**	**9 455**	**9 878**	**10 467**	**10 690**	**11 184**	**11 568**	**10 114**	**10 693**

Figure 16: Drugs - All operations

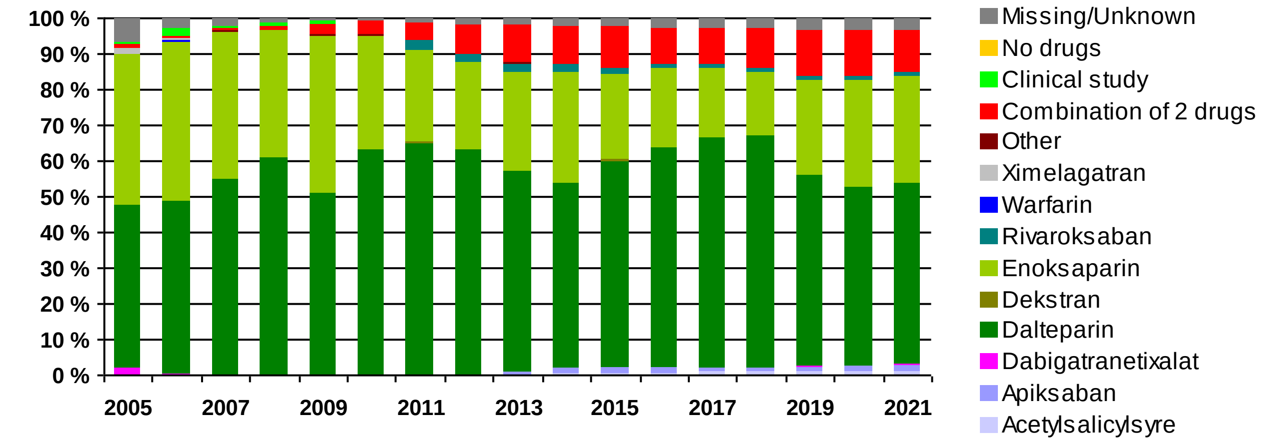


Table 31: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2021	2 553	4 549	782	21	945	15	0	1 828	10 693
2020	2 534	3 996	766	42	1 114	13	1	1 648	10 114
2019	2 658	4 473	919	117	1 410	14	0	1 977	11 568
2018	2 173	4 029	1 026	177	1 860	19	0	1 900	11 184
2017	1 457	3 927	1 003	542	1 911	25	0	1 825	10 690
2016	1 427	3 483	1 114	732	2 046	22	0	1 643	10 467
2015	1 440	2 882	725	943	2 338	26	0	1 524	9 878
2014	1 402	2 277	578	904	2 944	45	0	1 305	9 455
2013	1 432	1 408	598	1 481	3 231	63	0	1 254	9 467
2012	1 163	1 594	702	1 496	3 088	34	0	1 096	9 173
2011	699	1 745	693	1 397	3 197	40	1	885	8 657
2010	758	2 173	636	1 079	3 155	44	2	744	8 591
2009	879	2 406	668	785	2 637	37	6	906	8 324
2008	837	2 479	787	701	2 166	124	5	871	7 970
2005-07	2 862	6 391	3 525	1 027	5 199	386	6	3 297	22 693

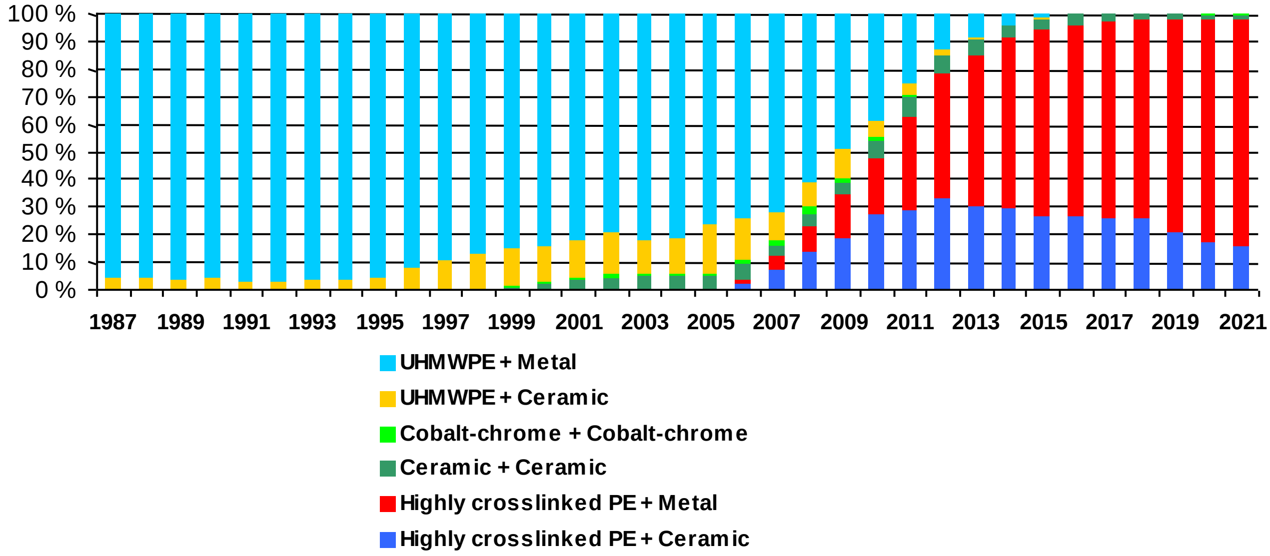
Registration of thrombosis prophylaxis started in 2005

Articulations (except dual mobility)

Table 32: In primary operations - All patients

Cup + Femoral head	1987-13	2014	2015	2016	2017	2018	2019	2020	2021	Total
UHMWPE + Steel	71 234	69	5	0	0	0	0	4	10	71 322
Highly crosslinked PE + Cobalt-chrome	11 226	4 151	4 755	5 229	5 774	6 195	6 852	6 189	6 696	57 067
UHMWPE + Cobalt-chrome	33 345	257	135	25	13	8	21	24	19	33 847
Highly crosslinked PE + Alumina	9 397	1 775	1 529	1 424	860	696	293	149	132	16 255
Highly crosslinked PE + Alumina/Zirconium[1]	2 122	554	630	904	1 423	1 688	1 673	1 207	1 210	11 411
UHMWPE + Alumina	10 904	8	4	2	0	0	0	0	0	10 918
Highly crosslinked PE + Steel	2 379	712	797	682	493	427	422	266	262	6 440
Alumina + Alumina	3 674	109	7	0	1	0	0	0	0	3 791
Alumina/Zirconium + Alumina/Zirconium[1]	992	211	342	372	218	205	193	118	122	2 773
UHMWPE + Titanium	1 907	1	0	0	0	0	0	0	0	1 908
UHMWPE + Zirconium	1 402	0	0	0	0	0	0	0	0	1 402
Highly crosslinked PE + Oxinium	727	39	3	2	2	2	21	161	203	1 160
Cobalt-chrome + Cobalt-chrome	1 045	0	0	0	0	0	0	0	0	1 043
UHMWPE + Alumina/Zirconium[1]	337	4	5	0	0	0	0	0	0	346
Titanium + Alumina	145	2	2	2	1	0	0	0	1	153
Highly crosslinked PE + Titanium	73	10	0	0	0	0	0	0	0	83
UHMWPE + Oxinium	77	0	0	0	0	0	0	0	0	77
Missing	3 369	18	27	44	53	46	23	33	34	3 647
Other (n<50)	176	11	17	7	7	3	8	2	12	243
Total	**154 531**	**7 931**	**8 258**	**8 693**	**8 845**	**9 270**	**9 506**	**8 153**	**8 701**	**223 888**

Figure 17: In primary operations



[1]Alumina/Zirconium = Aluminum oxide and zirconium oxide composite.

Vancouver Classification

Table 33: Vancouver classification for periprosthetic femoral stem fractures operated with or without replacement of the prosthesis

	With replacement of the prosthesis					Without replacement of the prosthesis					
	Type A	Type B1	Type B2	Type B3	Type C	Type A	Type B1	Type B2	Type B3	Type C	Missing
2021	6	5	64	22	5	14	37	16	2	10	31
2020	7	9	62	28	2	14	25	16	7	8	43
2019	12	10	67	39	1	11	31	10	5	11	30
2018	12	7	71	25	4	10	22	14	2	6	44
2017	14	7	48	25	1	8	15	2	3	5	50
2016	17	1	24	23		7	11	6		4	70
2015			1			1					143

Completeness of reporting analysis for the Norwegian Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Norwegian Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Hip Arthroplasty Register

Type	Code	Description
Primary operation	NFB 20	Primary total prosthetic replacement of hip joint not using cement
	NFB 30	Primary total prosthetic replacement of hip joint using hybrid technique
	NFB 40	Primary total prosthetic replacement of hip joint using cement
	NFB 7y	Primary implantation of reconstruction prosthesis
with or without	NFB 99	Other Primary prosthetic replacement in hip joint
Revisjon (level 1)	NFC 2y	Secondary implantation of total prosthesis in hip joint not using cement
	NFC 3y	Secondary implantation of total prosthesis in hip joint using hybrid technique
	NFC 4y	Secondary implantation of total prosthesis in hip joint using cement
	NFC 7y	Secondary implantation of reconstruction prosthesis
	NFC 99	Other secondary prosthetic replacement in hip joint
	NFU 1y	Removal of total prosthesis from hip joint

Formulas for completeness of reporting

$$\text{Completeness rate NRL} = \frac{\text{Only NRL} + \text{begge registre}}{\text{Only NPR} + \text{Only NRL} + \text{both registries}}$$

$$\text{Completeness rate NPR} = \frac{\text{Only NPR} + \text{begge registre}}{\text{Only NPR} + \text{Only NRL} + \text{both registries}}$$

Primary operations. In 2019-2020, 19 190,00 primary hip replacements were reported to one or both of the registers. 97,0 % of these were reported to the NAR while 94,5 % were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the Norwegian Arthroplasty Register, either the form was not sent to the NAR or other interventions than hip arthroplasties were incorrectly coded with NFB 20/30/40.

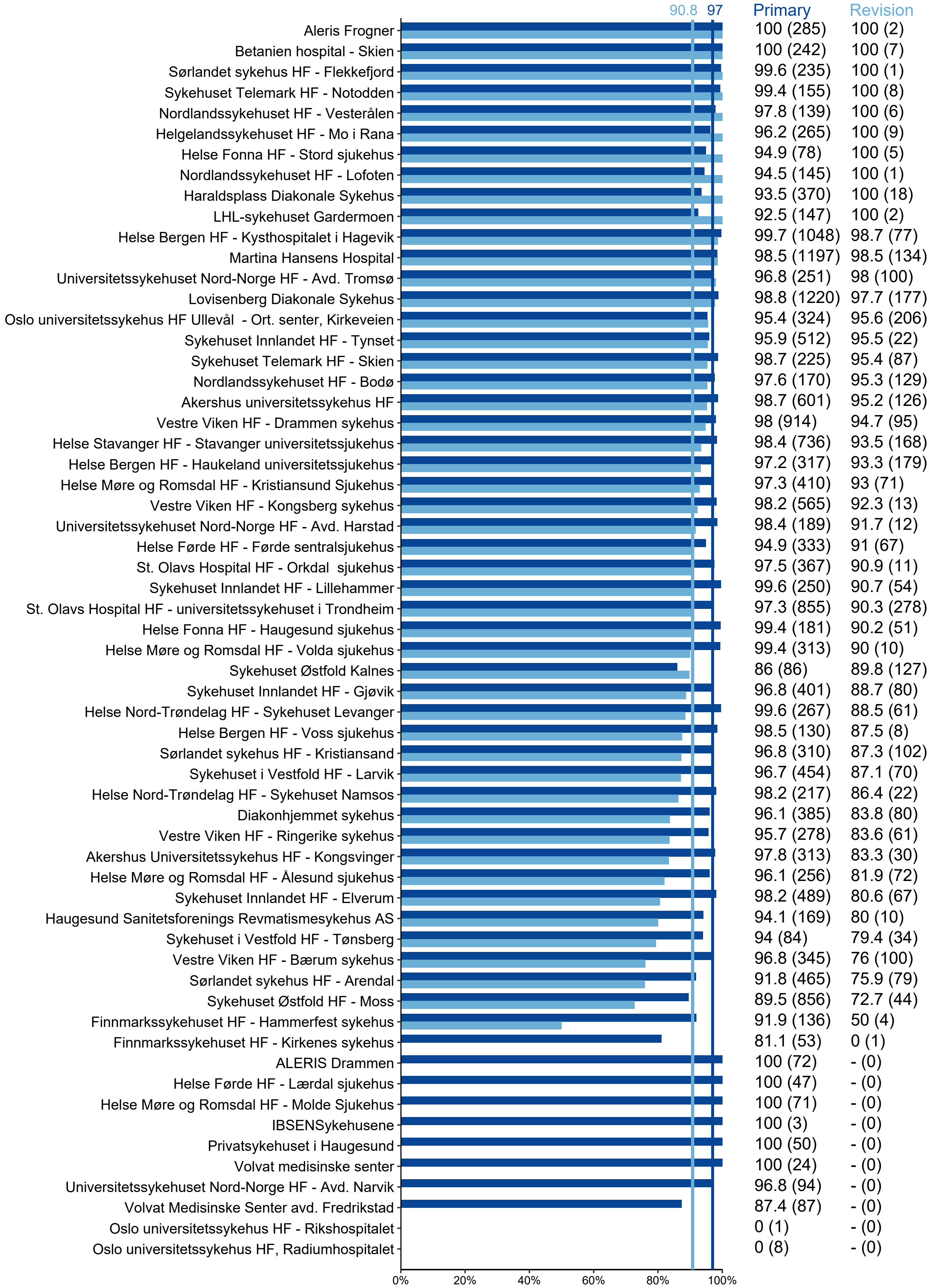
Procedure codes to be used for primary operations: NFB 20 - NFB 30 - NFB 40

Revision operations. In 2019-2020, 3 178,00 revisions were reported to one or both of the registers. 90,8 % of these were reported to the NAR while 73,5 % were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the revision form was not sent to the NAR, or that other interventions than removal, replacement or insertion of a secondary prosthesis were incorrectly coded with NFC 2/3/4/99 or NFU1. The analysis shows that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:
NFC2*- NFC3*- NFC4*- NFC99 - NFU1*

New: From 2012, revisions due to infection, even where parts of the prosthesis are not removed or replaced, are to be reported on the form to the NAR. These must be coded NFS 19 or NFS 49 with the additional code NFW 69.

Completeness of reporting for Norwegian Arthroplasty Register, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

CONTENTS

Knee prostheses

KNEE, SHOULDER AND OTHER JOINTS REGISTER: ANNUAL REPORT 2022

In the period 1994-2021, 120 347 knee replacements, 12 383 shoulder replacements and 11 108 replacements of other joints were recorded. The COVID-19 epidemic has clearly affected arthroplasty, but the number of knee replacements was higher than ever before. In 2021, 7 478 primary knee replacements were performed, which is the highest number ever recorded. The number of revisions was 584, which represents 7.2%; there is a welcome decreasing trend in this figure. The number of shoulder arthroplasties has increased regularly in recent years, and in 2021 there were 980 primary shoulder arthroplasties. The 79 revisions correspond to 7.5%.

ELECTRONIC REPORTING

We have now established electronic reporting of knee and shoulder arthroplasty in the medical registration system (MRS) in the Norwegian Health Network (Norsk helsenett). This registration provides each hospital with access to its own data and reports can be accessed directly from the MRS system. Surgeons must register as users in the Norwegian Arthroplasty Register in the Norwegian Health Network at https://falk.nhn.no. They will then be able to log in to mrs.nhn.no and register patients in the surgery form. Instructions can be found on our website. We have made some changes and simplifications in the form. For knee arthroplasty, we now ask about height and weight, access to the knee joint, closure technique, anaesthesia, degree of osteoarthritis based on the Ahlbäck classification, classification of bone loss during revision and classification of periprosthetic fractures. We also record stems, augments and cones with the product number. The recording of antibiotic prophylaxis, systemic antibiotic prophylaxis and the use of antifibrinolytics is now the same for all joints. Please remember that all periprosthetic fractures must be reported even if the prosthesis is retained and only osteosynthesis is performed.

There is now a separate form for shoulder arthroplasty. Here, we have added variables for e.g. glenoid type, surgical approach, rotator cuff status, and updated causes of surgery/revision and additional procedures. These changes have been made in collaboration with the other Nordic countries, to enable more uniform registration and thus easier comparison of results across the countries.

We use the Procordo scanning software to read the barcodes for the implants: pscan.procordo.com. A scanner must be installed in the operating room. For now, elbow, hand, finger, toe and ankle surgery must be recorded on a paper form, but we are working on an electronic solution for all joints. We have provided instructions on helse-bergen.no/nrl to help you get started. Please contact our consultant Mikal Solberg (mobile no. 90583174) or the National Advisory Unit (phone no. 55973742/43) if you need further assistance.

PROMs

We would ask all hospitals to arrange for patients to complete PROMs before hip, knee and shoulder arthroplasty. Further questions will automatically be sent to patients one year post-surgery via Digipost or Helsenorge.no. as long as the preoperative PROM has been completed or the surgery has been recorded electronically. One-year PROMs are not yet being sent to patients whose surgery was recorded on paper. Results for knee function and pain (KOOS/WOOS), quality of life (EQ-5D) and other variables recorded by patients are presented on pages 96-97. We have also made a summary of the proportion of patients who register the preoperative PROM at each hospital. There are still very few hospitals with over 80% preoperative PROM registration, which is our target, and hospitals need to make a greater effort in this area. Voss Hospital has 100% preoperative PROM registration, which shows what is possible. Hospitals will be able to use this data for their own quality assurance, research and improvement. Instructions on how to get started are available on our website.

THE ALBA TRIAL

We have started the first registry-based randomised controlled trial in Norway through the Arthroplasty Register. The ALBA trial will examine whether antibiotic-loaded bone cement prevents periprosthetic infections in primary TKA. The protocol has been published (Leta T 2021). The web-based registration form, which is the same as that used for electronic registration of knee arthroplasty, has a built-in randomisation function. The study started in January 2021 and 1000 knees had been included by 20 May. We hope that all knee arthroplasty patients will be included in the trial. Please contact us if your hospital has not started. Instructions can be found on our website.

SOME NEW TABLES AND FIGURES FOR KNEE ARTHROPLASTY

Figure 2c shows the status of the patients. Of those who underwent TKA in 1994, about 75% have died without revision, 8% are alive without revision, 4% are alive with revision, while 13% have died with revision.

In Tables 3a and 3b, we have distinguished between segmental prostheses and hinged prostheses. The latter are used in cancer surgery, some revisions with considerable bone loss and in acute fractures. Radiumhospitalet, which uses this type of prosthesis, unfortunately does not report to the Arthroplasty Register, but we hope they will do so in the future since the other hospital that offers cancer surgery reports to us. It is important to investigate the durability of this type of prosthesis.

In Tables 6a-d, we show details of the prosthetic components hospitals have used in TKA in 2015-2021. For some components such as the NexGen femur, over 17 different types of femoral components have been used during the period. This can pose problems and we encourage surgeons and companies not to change prostheses or use too many different ones unless it is strictly necessary.

Table 25b shows combinations of medications used in thrombosis prophylaxis. It shows that low molecular weight heparin combined with direct-acting oral anticoagulants (DOAC) is increasing and now accounts for 17% of thrombosis prophylaxis in TKA.

PERIPROSTHETIC FRACTURES

Reoperations for periprosthetic fractures without replacement of the prosthesis should also be reported for the knee, shoulder and other joints.

CHANGES IN TKA PRACTICE

We have noted a slight increase in the use of all-polyethylene tibial components in TKA. Studies from Sweden have shown that this type of tibial component can yield good results.

The use of cross-linked plastic in TKA has increased in recent years. To date we have not seen better results with cross-linked plastic, but follow-up time is short. Figures from Australia show somewhat better or similar results with over ten-year follow up when using cross-linked plastic, depending on the brand of prosthesis. Consequently, it appears to be safe to use cross-linked plastic in TKA.

The use of mobile bearings in TKA has decreased, which is in line with Norwegian and international register studies that show a somewhat higher revision rate for this type of total prosthesis compared to cruciate retaining prostheses (Paxton E 2011, Gøthesen Ø 2014, Namba R 2014, Gøthesen Ø 2017).

The use of uncemented TKA has increased in recent years. This is not in line with findings from the registers. Two recent Nordic NARA study showed higher rates of revision for uncemented TKA in patients of all ages (Niemeläinen M 2020, Irmola T 2021).

QUALITY OF KNEE ARTHROPLASTY IN NORWAY

Survival curves show a gradual improvement since 1994 in TKA results, when the endpoint is revision surgery. We are pleased to note also improvement in results of unicondylar knee arthroplasty from 2012 to 2020. In a study based on our register data, hospitals that performed more than 100 total knee arthroplasties per year had fewer revisions than hospitals performing a lower number (Badawy M 2013). Unicondylar knee replacements should be concentrated at a smaller number of hospitals (Badawy M 2014) to reduce the risk of revision.

Infection, instability, aseptic loosening of the tibial component, axial deviation including malrotation and pain are still the most frequent *causes of revision of total knee arthroplasty* (Dyrhovden G 2017). Many of these revisions are probably due to poor surgery. Results can be improved with a focus on good patient selection, infection prevention, correct stabilisation of the prosthesis, sound techniques for the alignment of prosthetic components, good balancing and a correct cementation technique (Refsum et al. 2019). If pain is the only indication, revisions should be avoided.

DOCUMENTATION OF KNEE PROSTHESES

We present the proportion of patients who received well-documented knee prostheses at different hospitals (Figure B35). In consultation with the reference group, we have chosen the ODEP (Orthopaedic Data Evaluation Panel UK) classification 10A as the basis for referring to a prosthesis as well-documented. This corresponds to documentation of ≥93% survival of the prosthesis after ten years. The long-term goal is to use 10A*, which is ≥95% survival. We have excluded prostheses used in studies approved by REK and revision prostheses. In 2019, 61% of patients received well-documented prostheses, and in 2021 the figure was 80%. We hope that this is due to increased awareness among surgeons, but it is also because some prostheses such as the cemented and hybrid Legion CR now have ten years of documented good results from the Australian Registry. We see that some hospitals decide to use prostheses that cannot be classified as well-documented. We hope that these hospitals will review their practice in relation to tenders in the health trusts, and ensure that they use the prostheses stated in the tenders. They should also be aware of the attitude of the register to tenders for joint replacement. Documentation is available on our website under “Anbefalinger og retningslinjer (Protesedokumentasjon av hofte og kneproteser)” [Recommendations and guidelines: Documentation of hip and knee prostheses].

We present three- and ten-year durability of the most commonly used knee prostheses in Norway in 2008-2021 (when more than 500 prostheses have been used) (Figures B33 and B34). None of those used today have poor results, but several prosthesis combinations lack ten-year results from Norway and/or abroad. Further details of prosthetic durability is available on our website under “Anbefalinger og retningslinjer (Protesedokumentasjon av hofte og kneproteser)”.

COMPLETENESS ANALYSIS

In this report, we show completeness of reporting for primary operations and revisions for 2019-2020 on hospital level. The national average is good for primary surgery (96.6%), which is a slight decrease on the figure of 97.6% for 2018-2019. For revisions, the reporting rate was 92.9%, which is also a slight decrease on 93.2% in 2018-2019. These are good figures, but it is important to establish good procedures for checking against the surgery protocol with the changeover to electronic reporting. Some hospitals have low reporting of revisions. This may result in too positive prosthesis survival rates at these hospitals. In the figures showing the proportion of non-revisions after two and ten years, we have excluded hospitals with lower than 80% reporting of revisions.

For shoulder arthroplasty, the reporting rate for primary operations is 91.4% and for revisions 84.2%. We would like hospitals with low reporting of revisions to investigate this further.

Please note that ankle, hand, finger, back and toe arthroplasty must also be reported; these operations have a lower reporting rate than the other joints. The next analysis will be conducted in two years, for 2021-2022. We encourage hospitals to review their reporting procedures if their completeness is low.

HOSPITAL RESULTS

We present some hospital results. The proportion of non-revised TKAs after two years (operated in 2015-2021) and ten years for standard patients in 2010-2021. Standard patients are 55-85 years old, ASA class 1 or 2, with primary osteoarthritis. We also present funnel plots for the proportion of standard patients operated in 2009-2020 who were not revised after ten years. The funnel plot takes into account the number of knee arthroplasties performed at the hospital. Hospitals with a risk of revision of more than three standard deviations (99.8%) above the national average must be considered to have an excessively high risk of revision and must review their procedures (Figure B32). We have previously written to four hospitals with a high proportion of revisions to ask them to review their procedures. These hospitals have provided details of their practice, reviewed their internal procedures and initiated improvement measures. We hope that this will yield better results in the long term, but poor results from ten years ago will continue to have an effect for a few more years.

SHOULDER ARTHROPLASTY

The number of shoulder arthroplasties was increasing from 2002 to 2018, there was then a decrease in 2019 and 2020, but the year 2021 saw a record number of primary shoulder arthroplasties (980).

The increase in the number of reverse arthroplasties continues, and 74% of all primary shoulder arthroplasties in Norway are now reverse total arthroplasties. Shoulder hemiarthroplasty is very little used, and in line with recent literature and international trends, only for selected proximal humerus fractures. The survival curves of reverse and anatomic total prostheses have shown a significant improvement in recent periods, and ten-year survival is now over 90% for both anatomic and reverse total replacements. However, for hemiprostheses, the curves show a significant decrease in survival in the most recent period. The explanation for the increased number of revisions of hemiarthroplasty may partly be the new platform systems that simplify revision from hemiarthroplasty to total arthroplasty or reverse arthroplasty, with possibly a lower threshold for revision.

We also see an increasing tendency to use reverse arthroplasty for primary osteoarthritis of the shoulder. Orthopaedists need to be aware of the increased risk of revision of reverse prostheses in men and in the youngest age group (<60 years).

With the help of our NARA collaboration we have shown that reverse shoulder arthroplasty has a greater risk of revision due to infection than anatomic shoulder arthroplasty (Moeini 2019) and anatomic prostheses must still be the preferred choice in patients with an intact rotator cuff. We have also shown that there is a low risk of revision of reverse shoulder arthroplasty for proximal humerus fractures (Lehtimäki 2020), but that instability is still the main reason for revision.

Electronic reporting of shoulder arthroplasty has now commenced and can be used in all hospitals. This form of registration is already being used by several hospitals, which have reported that it is now working well. However, scanning will be difficult in the case of implants that are not recorded in the database. Please record these prostheses manually and contact the register to enable us to register new prostheses and enter these into the system. Electronic registration gives each hospital access to its own data and reports can be accessed directly from the MRS system. We would like all hospitals to start electronic registration and to contact us for help or training if needed. It is important that everyone involved registers as a user in the Norwegian Arthroplasty Register in the Norwegian Health Network at https://falk.nhn.no. Registration of PROMs for shoulder arthroplasty has commenced, and we hope that hospitals will create efficient procedures for collecting preoperative PROM data. One-year PROMs are sent directly to the patient as long as the preoperative PROM has been registered.

ELBOW ARTHROPLASTY

Total elbow arthroplasty had been decreasing in recent years until 2018, but in 2019 and 2020 there was a notable increase compared to 2018, which was the year with the lowest number. In 2021, there were 23 total arthroplasties, but only six in 2018, which is a similar number to the previous years. From 2019, we see an increasing trend towards hemiarthroplasty, with ten in 2021, which is a record number. A hemiprosthesis is used instead of a total prosthesis in supracondylar and intracondylar humerus fractures.

The humeral component was fixed with cement in all total arthroplasties except one, while the ulnar component was fixed with cement in fewer than half. This is a similar picture to the previous year. In the past seven years, Nexel and Latitude EV have been most used, but have a relatively short follow-up time.

The number of revisions of elbow arthroplasty has decreased to some extent. Use of the radial head prosthesis has increased steadily over the past ten years, and a record number of these prostheses was recorded in 2021. This type is predominantly used for acute fractures.

FINGER AND HAND ARTHROPLASTY

The number of finger prostheses inserted is still low compared to previous years, and many of the operations were revisions. Twenty-three primary operations and ten secondary operations using the wrist (radiocarpal) prosthesis were performed in 2021, which is somewhat fewer than some years ago. There has been a decrease in distal radioulnar joint replacements since 2019; in 2021 there were four operations, compared to 15 in 2019. The use of a carpal (CMC I) prosthesis has stabilised in recent years at about ten primary prostheses annually, following the lowest number ever (5) in 2016. In 2020, 12 primary prostheses were inserted, compared to 30 in 2021.

ANKLE ARTHROPLASTY

There has been a decline in primary ankle arthroplasty, and only 29 primary operations were reported in 2021. A large proportion of surgeries are revisions: over 50% of all ankle arthroplasties were reoperations in 2020. Some smaller hospitals that have now discontinued ankle arthroplasty had an unusually large number of such operations. In our opinion, it is difficult to determine whether an arthrodesis or a prosthesis is indicated and operations should therefore be limited to a few hospitals. The American Food and Drug Administration has reported many cases of plastic component breakage in the STAR ankle prosthesis. The STAR has not been used in Norway since 2013. We are conducting a study of ankle prostheses to improve our understanding of the large proportion of revisions.

SUMMARY OF THE MOST IMPORTANT SCIENTIFIC FINDINGS LAST YEAR

Please see the introduction to the report of the Hip Arthroplasty Register for a review of studies including both hip and knee replacement. See also the list of publications in the report.

Irmola T et al., in a Nordic study, showed that cemented knee arthroplasty in patients under 65 must still be considered the gold standard. Hybrid prostheses had similar results to cemented ones, but were used in far fewer patients. Uncemented prostheses showed poorer results than cemented ones. Reverse hybrid prostheses had good results, but were used in very few patients in a small number of hospitals.

Leta T et al. published the protocol for the first registry-based randomised controlled trial in the Arthroplasty Register (the ALBA trial). The research question is: Does the use of antibiotic-loaded bone cement prevent periprosthetic infection in TKA? We need to include 9172 knees, and we therefore hope that all surgeons, hospitals and TKA patients can be included. To date, 11 hospitals and over 1000 patients have been included in the study.

Randsborg PH et al. published a study based on data from the NPE (Norwegian Patient Injury Compensation) and the Arthroplasty Register from 2008 to 2018. 0.9% of all primary TKAs resulted in claims, while in 0.5% of primary TKAs, the claims were granted. Of the successful claims, 28% were due to infection, 26% poorly inserted implants and 13% aseptic loosening (compensation is routinely paid if loosening takes place within three years of primary surgery). Patients operated on in low-volume hospitals (≤57 surgeries annually) were more often successful in their claims.

Hole RM et al. compared the risk of death following shoulder arthroplasty with and without the use of thrombosis prophylaxis. No difference was found in the risk of death in any of the patient or diagnosis groups studied, and the use of thrombosis prophylaxis in shoulder arthroplasty should therefore be assessed on an individual basis.

Perry A et al. published survival analyses for ankle arthroplasty, as part of an international collaboration between four registers. About half of ankle arthroplasties in Norway were revised within 20 years, which is a higher proportion than in Sweden. The other countries involved had a shorter follow-up period. The figures are a cause for concern and we are working on a publication on ankle arthroplasty that will analyse the poor results. We believe that ankle arthroplasty should be limited to a small number of hospitals as it is a demanding form of surgery with many potential complications.

Thank you all for good reporting, but please remember the small joints in the hand, foot and back. It is possible to have a contact person for each of the joints, if hospitals prefer this. We would be pleased to receive suggestions for research projects and we are interested in research collaboration.

Bergen, June 2022

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Knee Surgery

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Biostatistician/researcher

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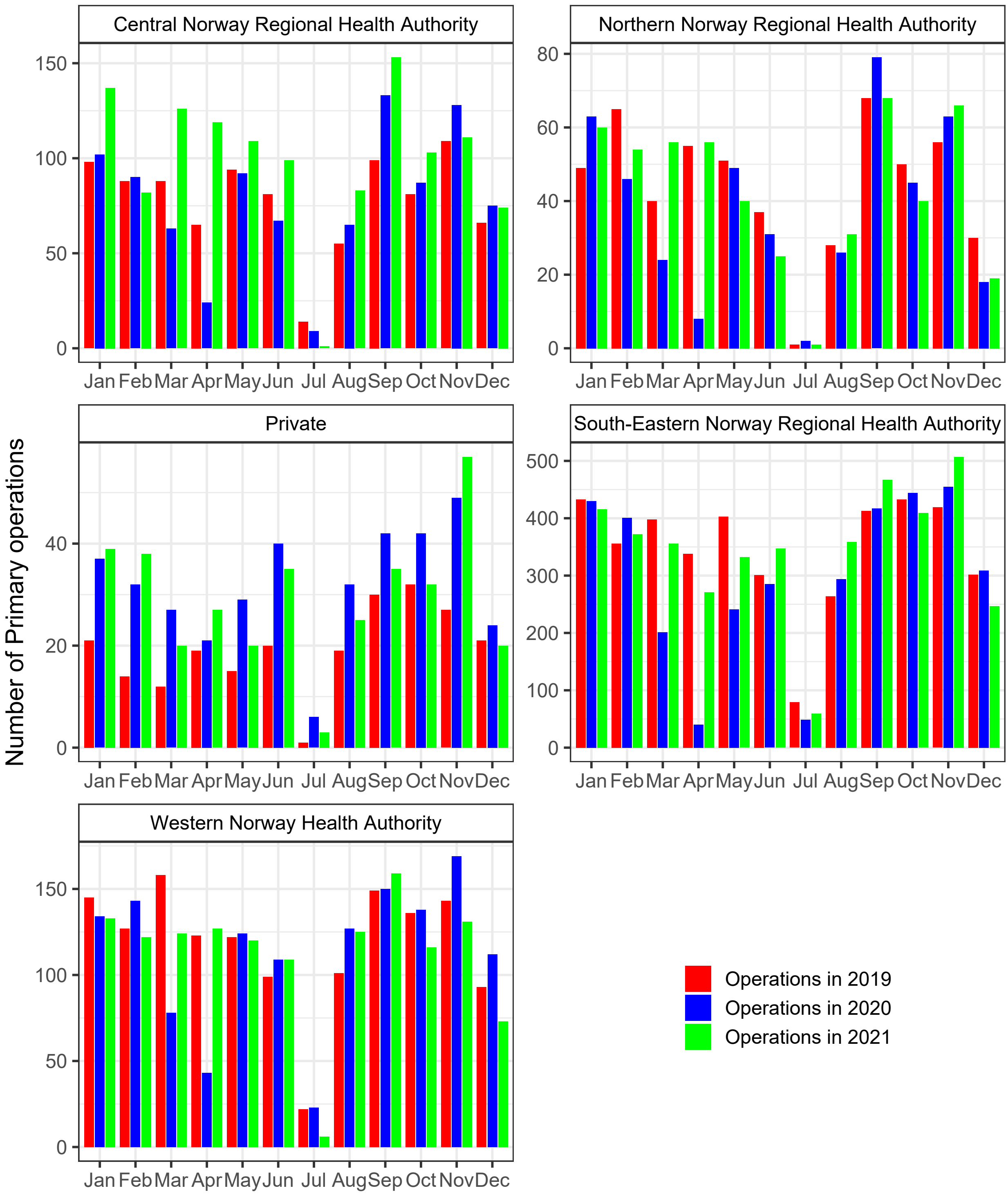
IT Consultant

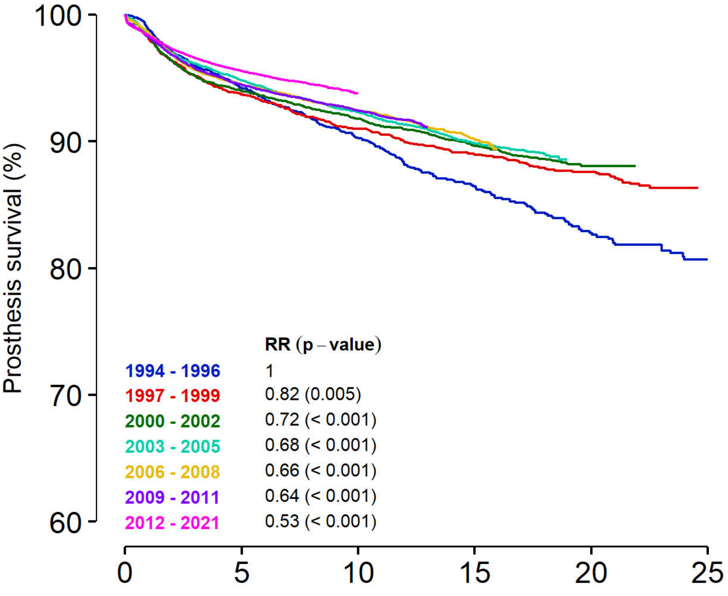
COVID-19

The number of knee prothesis operations for each Health Trust and month for 2019-2021

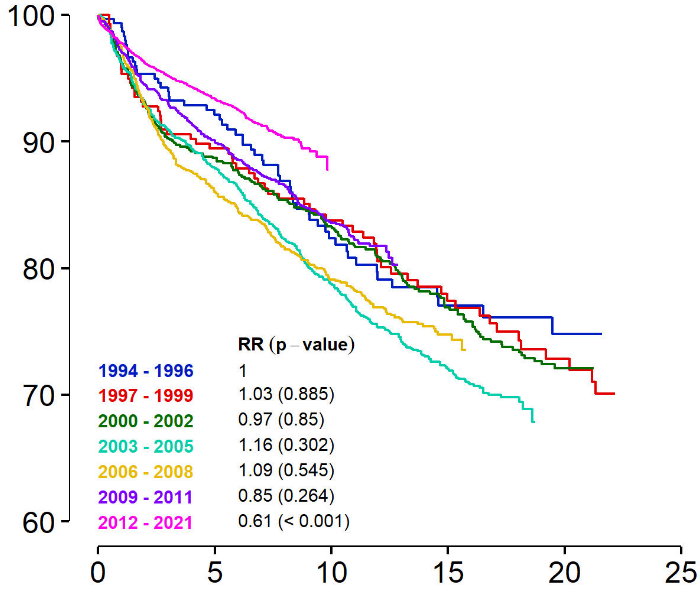


Survival curves for knee prosthesis
1994-2021

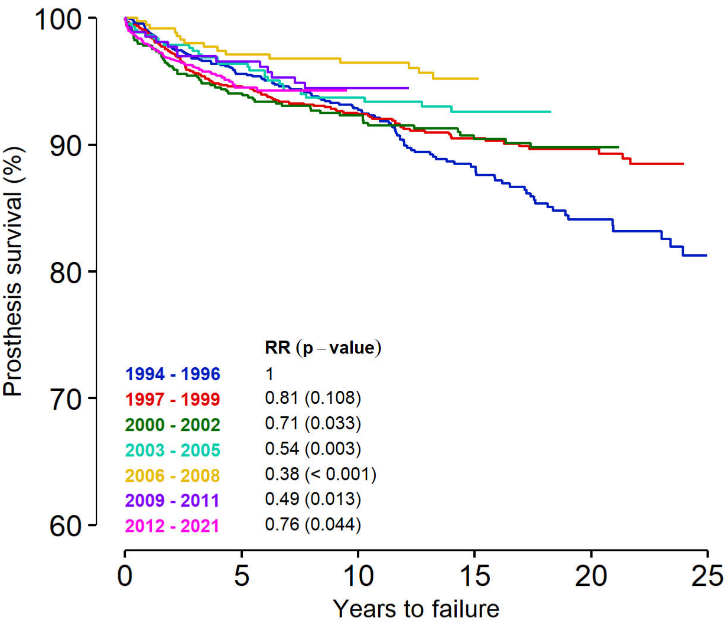
B.1) All



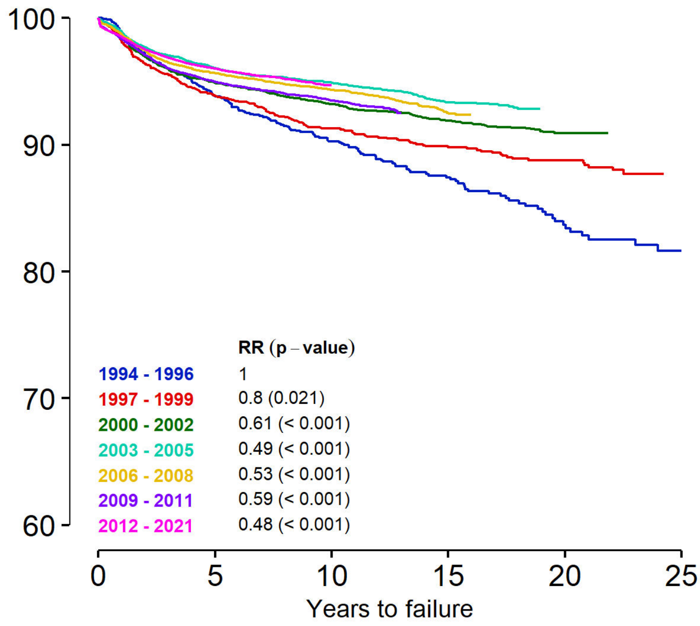
B.2) Unicondylar



B.3) Total with patella



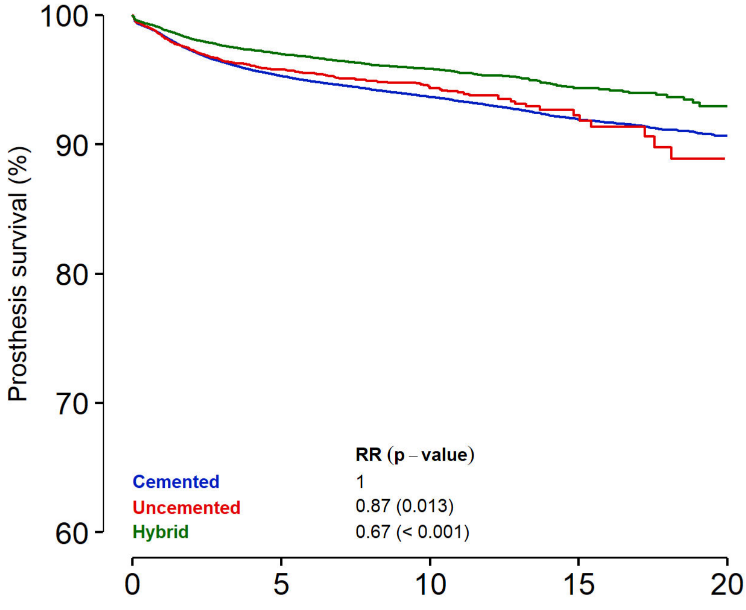
B.4) Total without patella



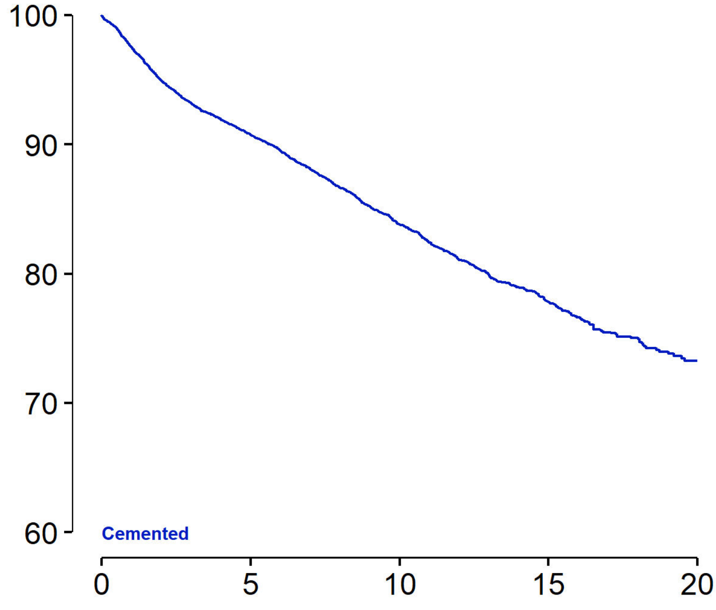
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for knee prosthesis - Fixation
1994 - 2021

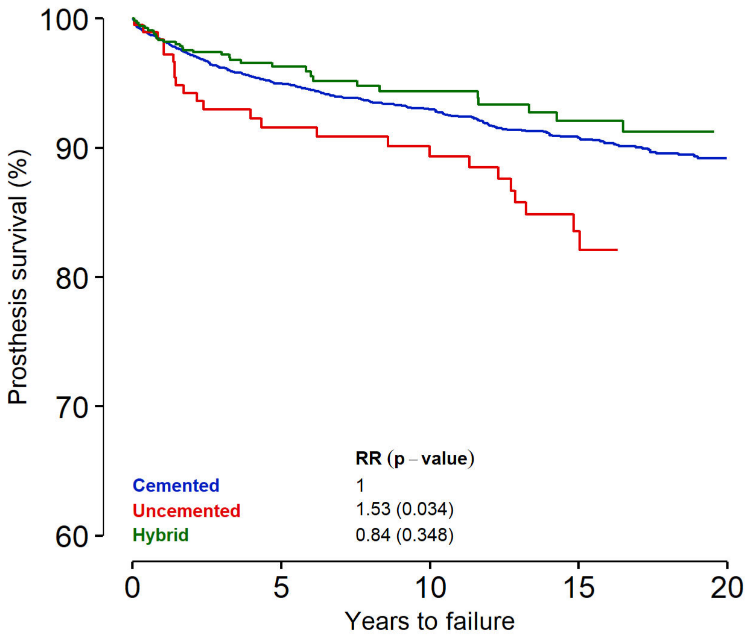
B.5) Total prosthesis



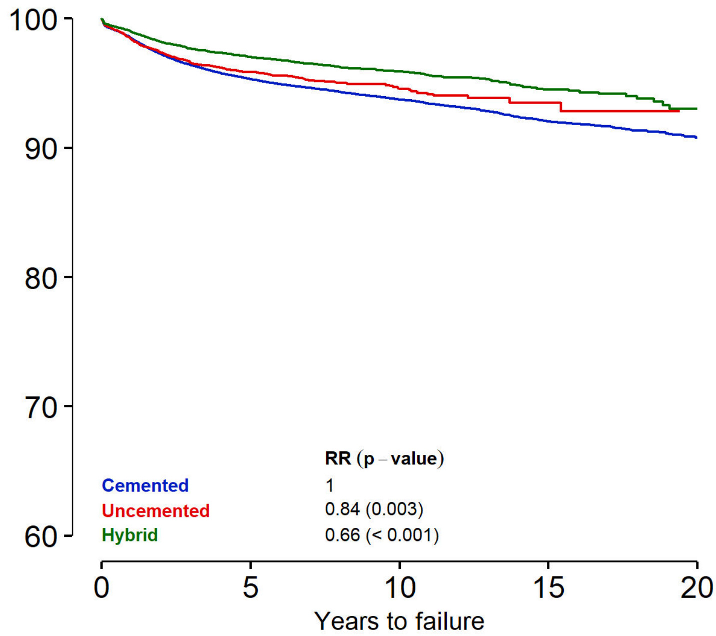
B.6) Unicondylar



B.7) Total with patella



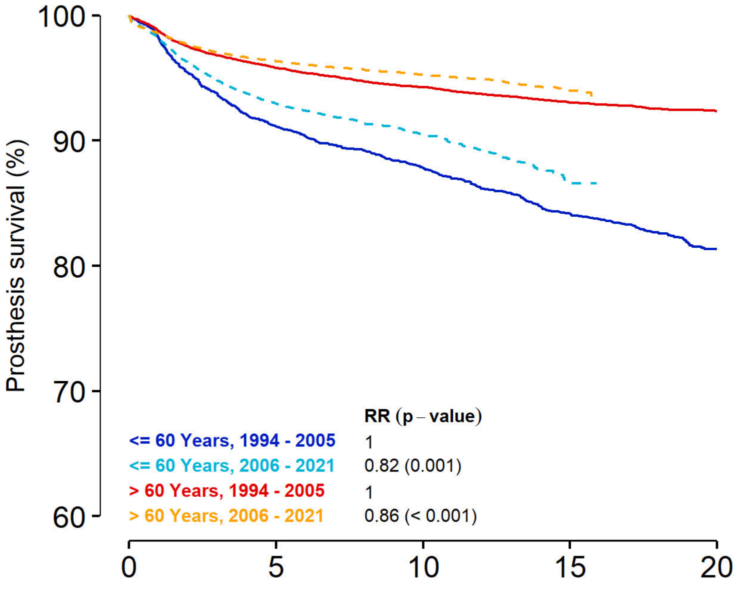
B.8) Total without patella



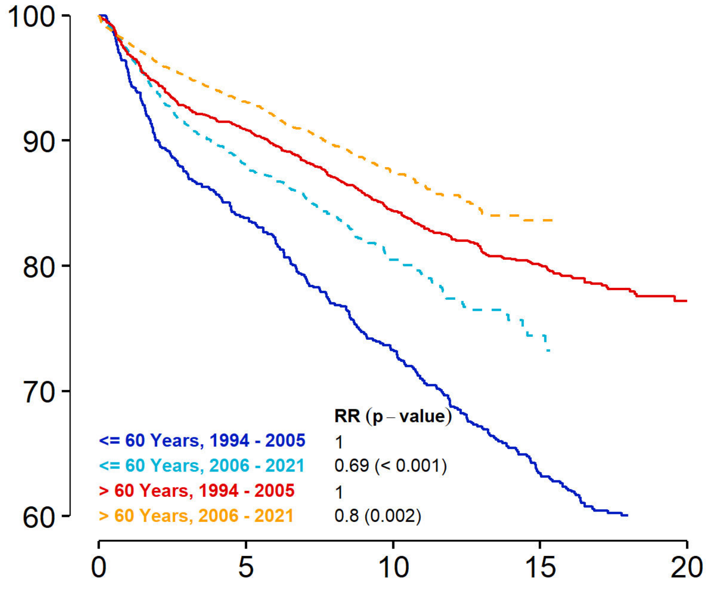
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for knee prosthesis - Age
1994 - 2021

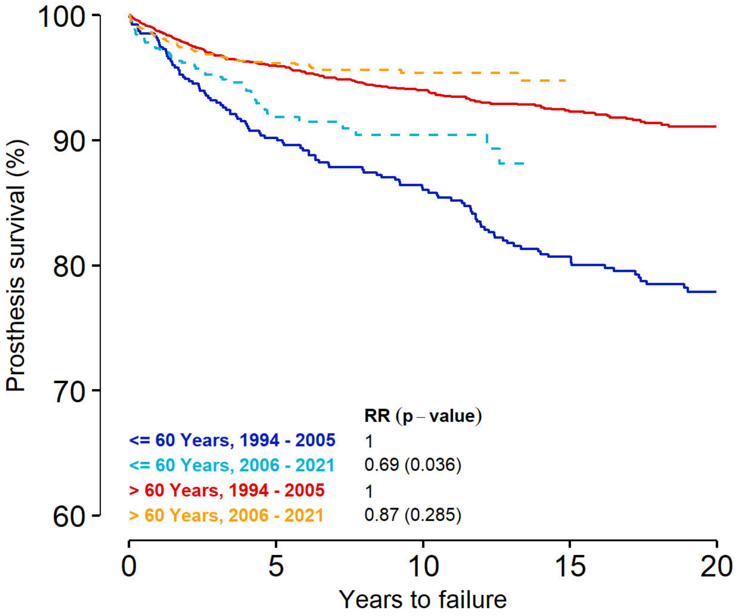
B.9) Total prosthesis



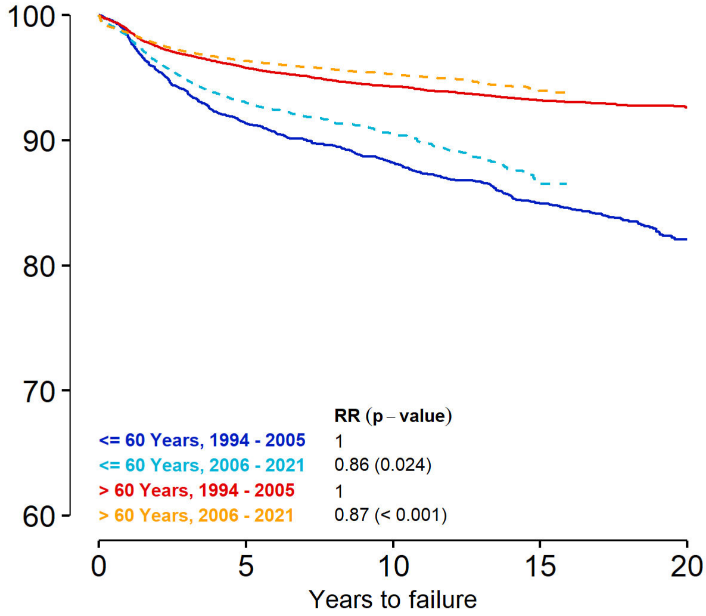
B.10) Unicondylar



B.11) Total with patella



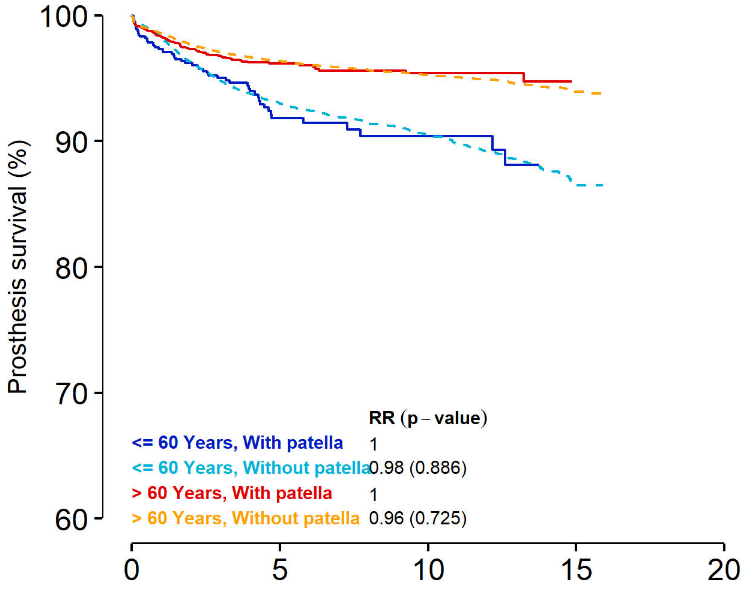
B.12) Total without patella



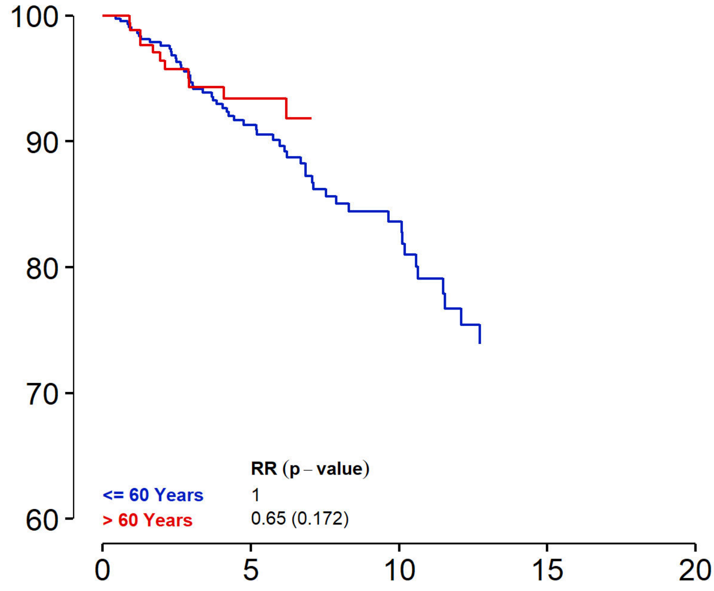
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
For figures B.9-12 two Cox-regressions have been fit; one for each age group. the years 1994-2005 is used as reference in both models.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for knee prostheses
1994 - 2021

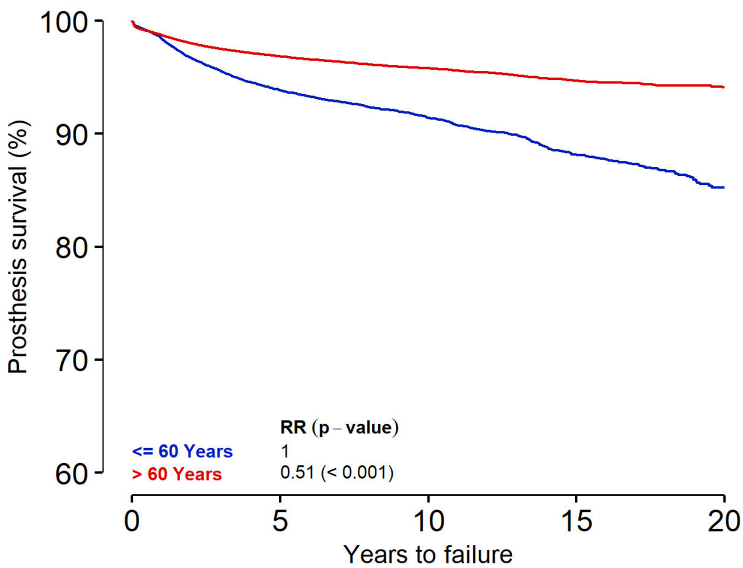
B.13) Total, 2006 - 21



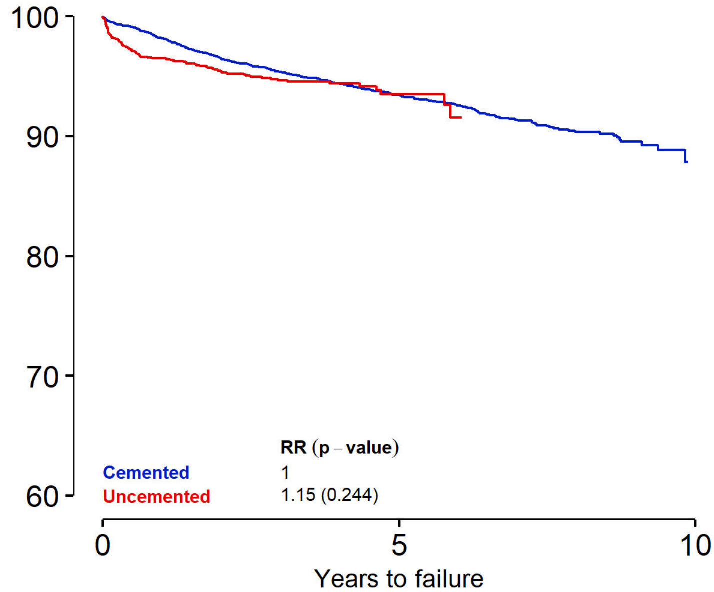
B.14) Patellofemoral



B.15) Total prostheses without patella where insertion of patella doesn't count as a revision



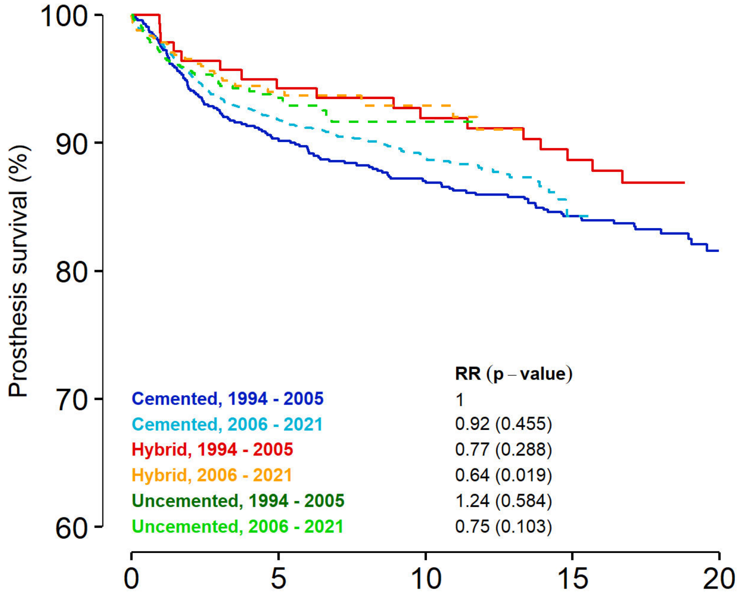
B.16) Unikcondylar prostheses cemented | uncemented



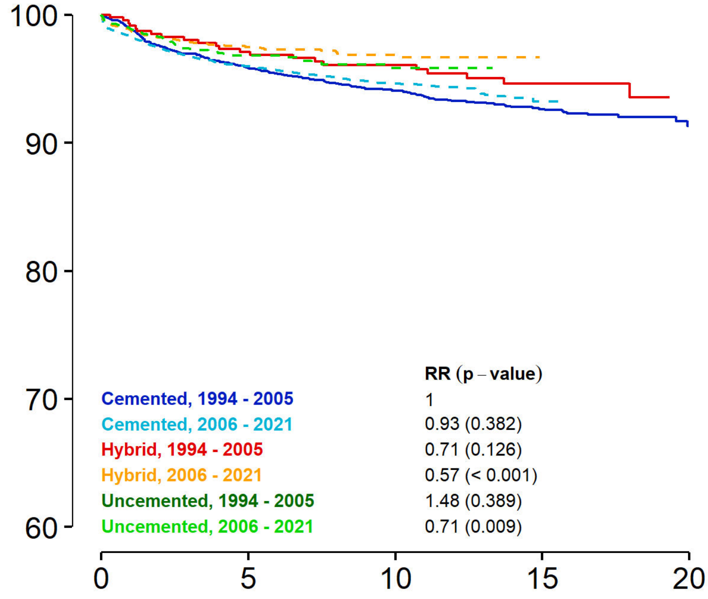
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
For figure B.13 two Cox-regressions have been fit; one for each age group. the years 1994-2005 is used as reference in both models.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for total prostheses in knee without patella
1994 - 2021

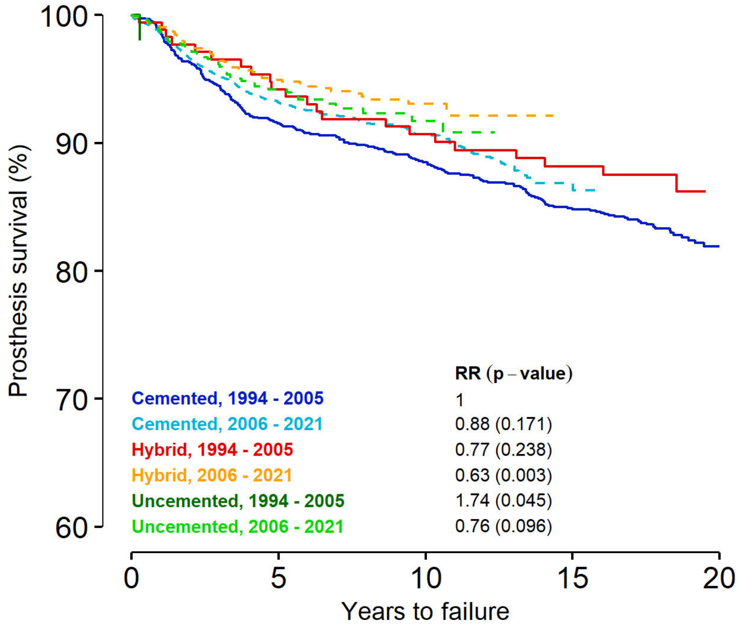
B.17) Men, under 60 years



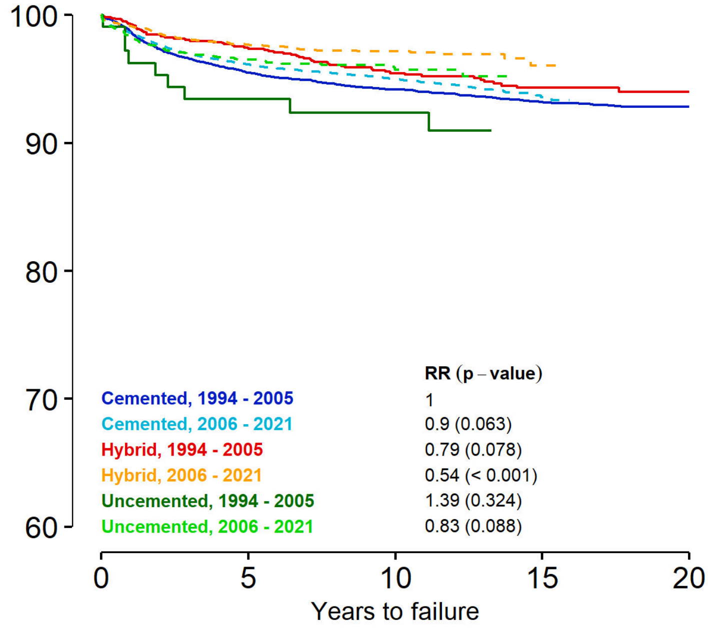
B.18) Men, over 60 years



B.19) Women, under 60 years

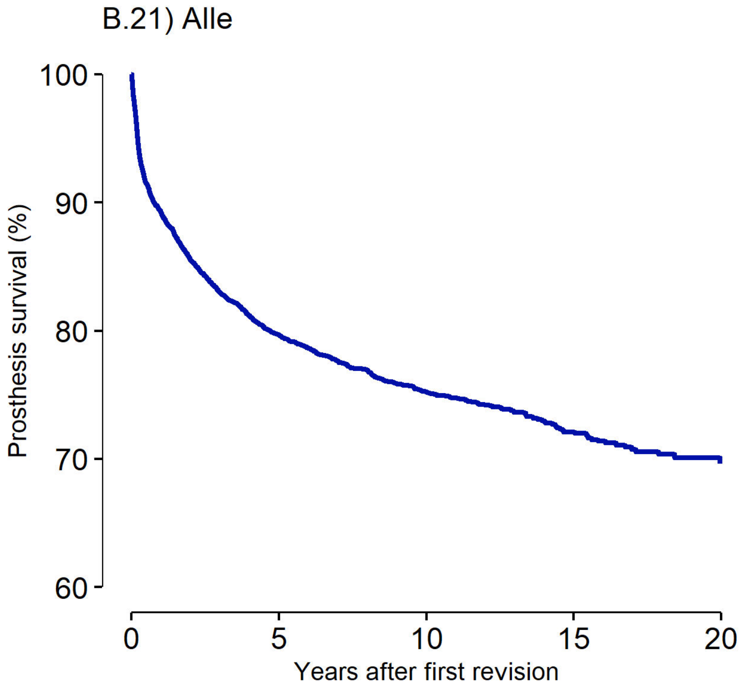


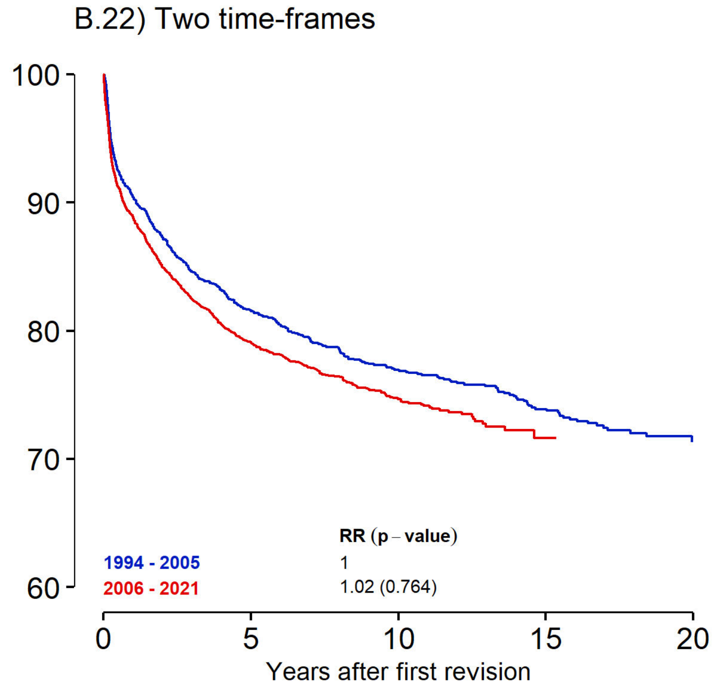
B.20) Women, over 60 years



Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for revisions of knee prostheses
1994 - 2021

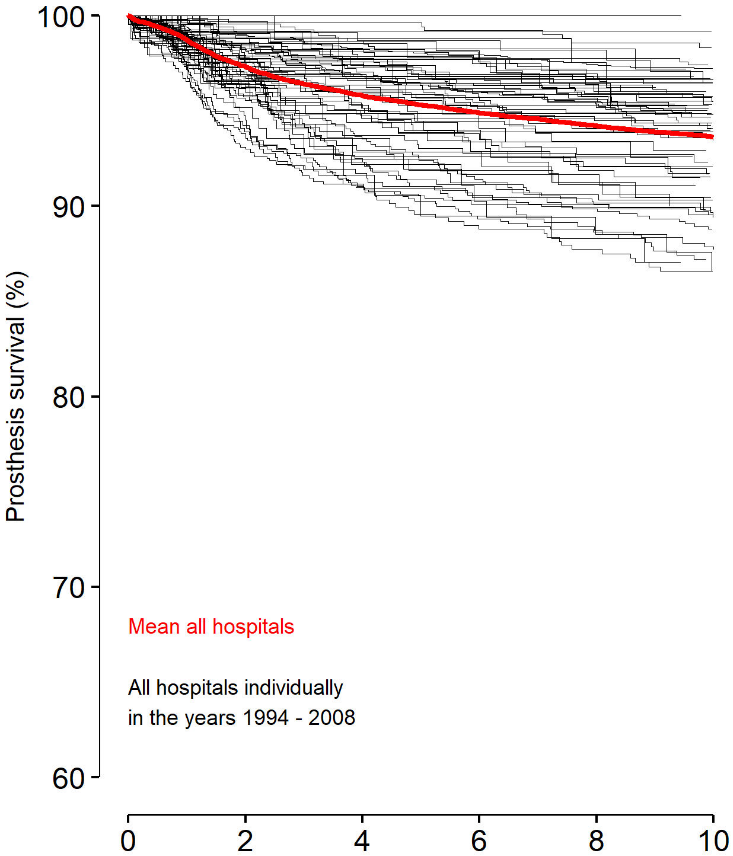




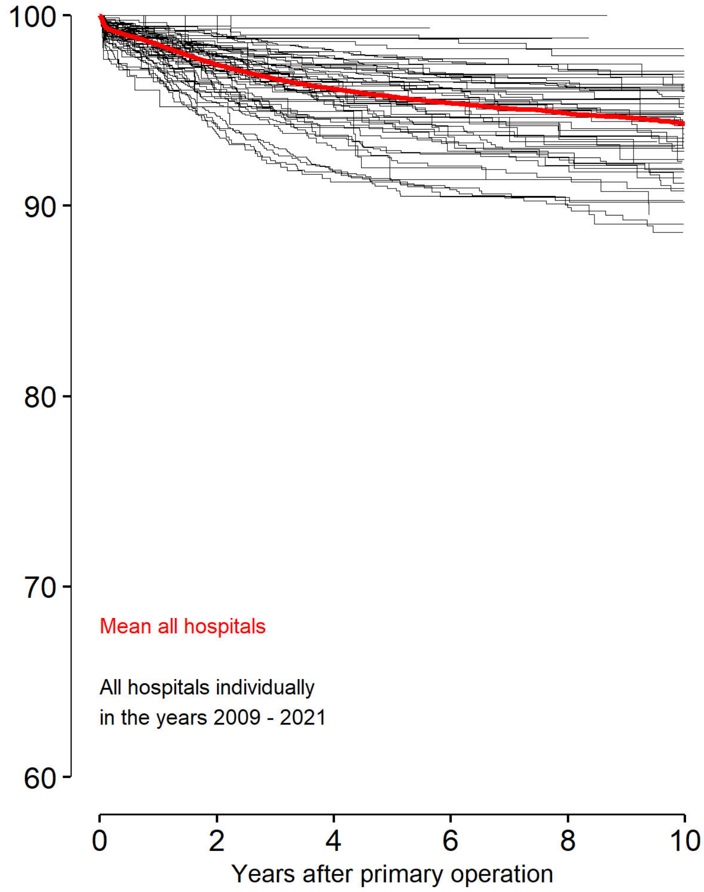
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for total kneeprostheses

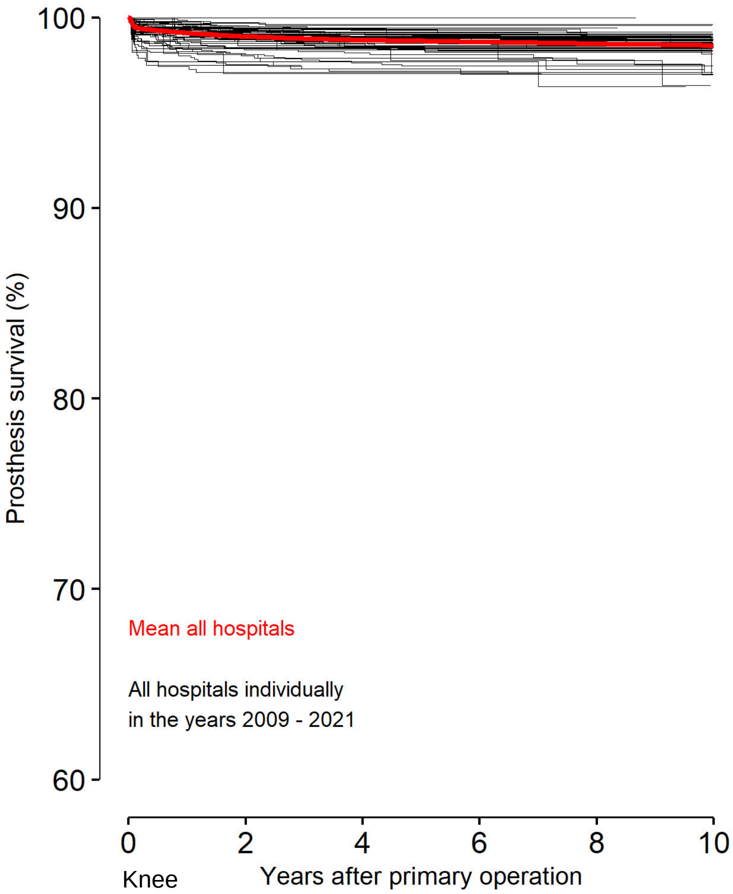
B.23) All hospitals in the years 1994 - 2008



B.24) All hospitals in the years 2009 - 2021

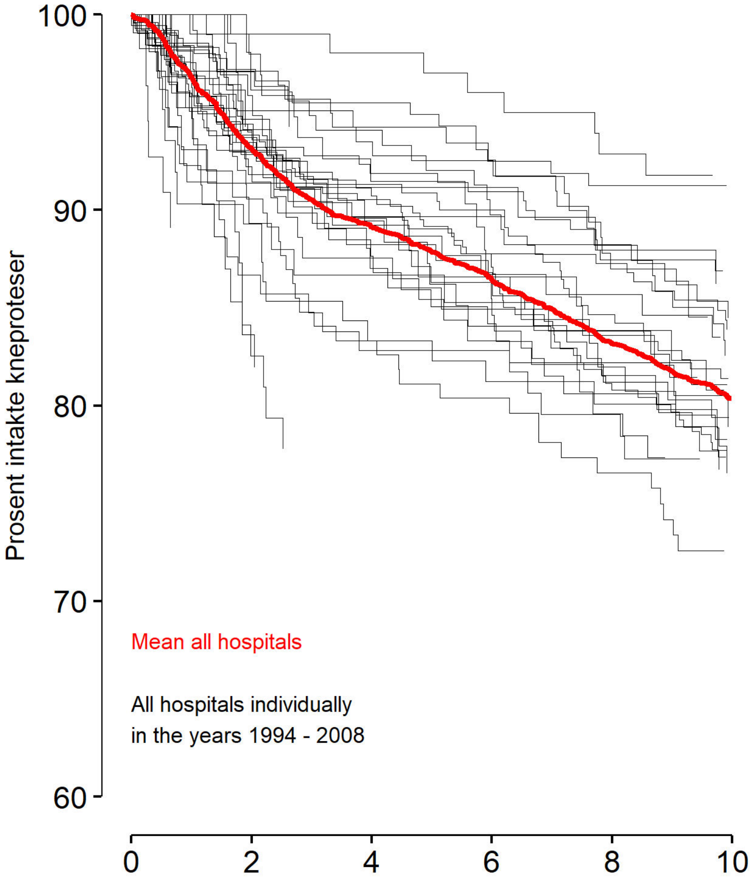


B.25) Endpoint revision for infection, 2009 - 2021

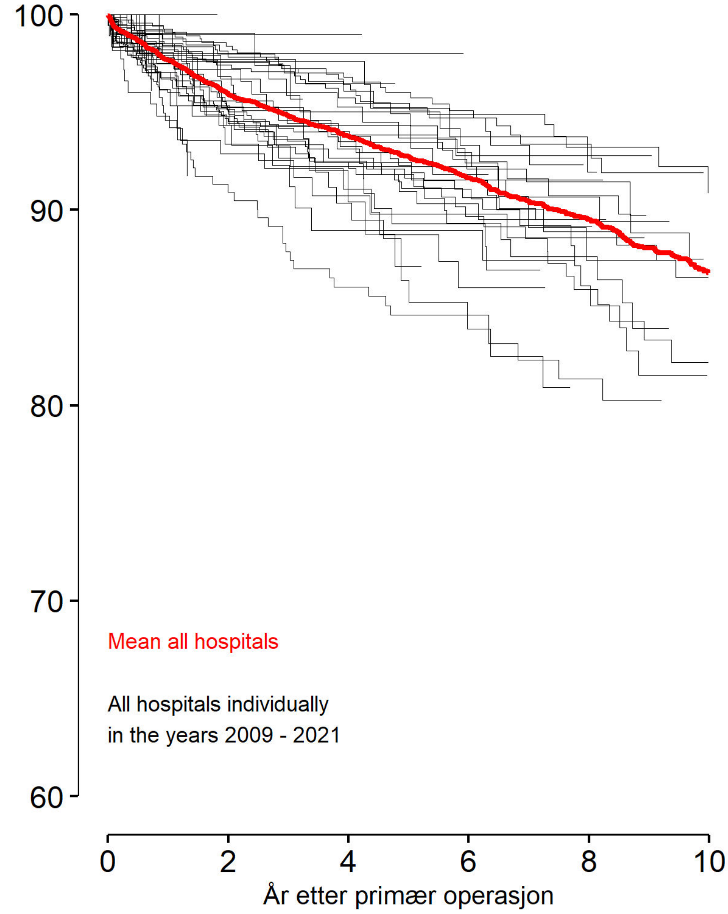


Survival curves for unicondylar kneeprostheses

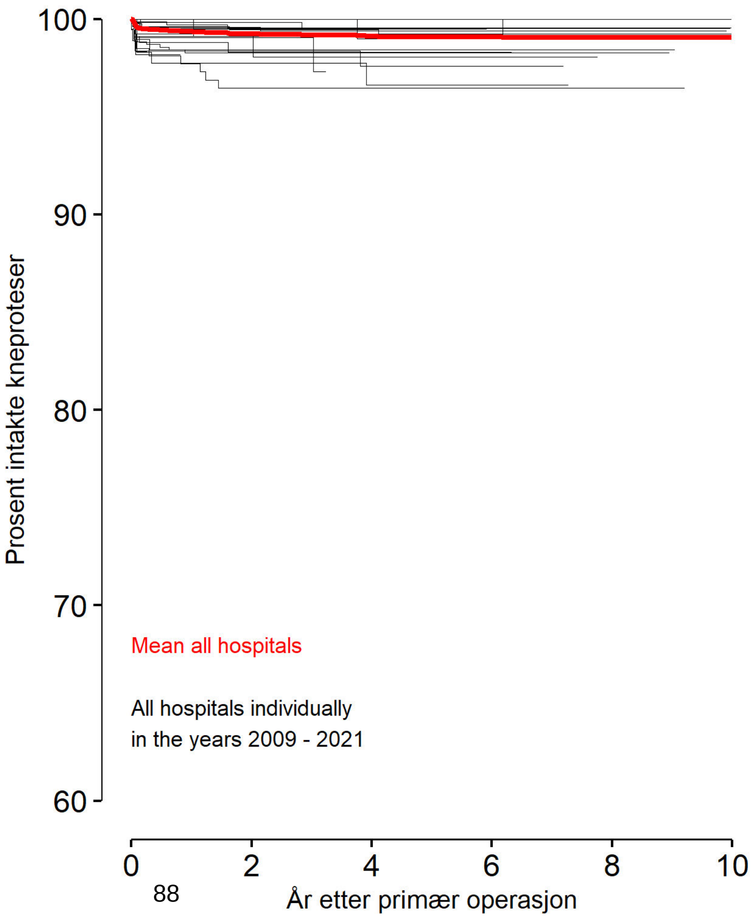
B.26) All hospitals in the years 1994 - 2008



B.27) All hospitals in the years 2009 - 2021



B.28) Endpoint revision for infection, 2009 - 2021

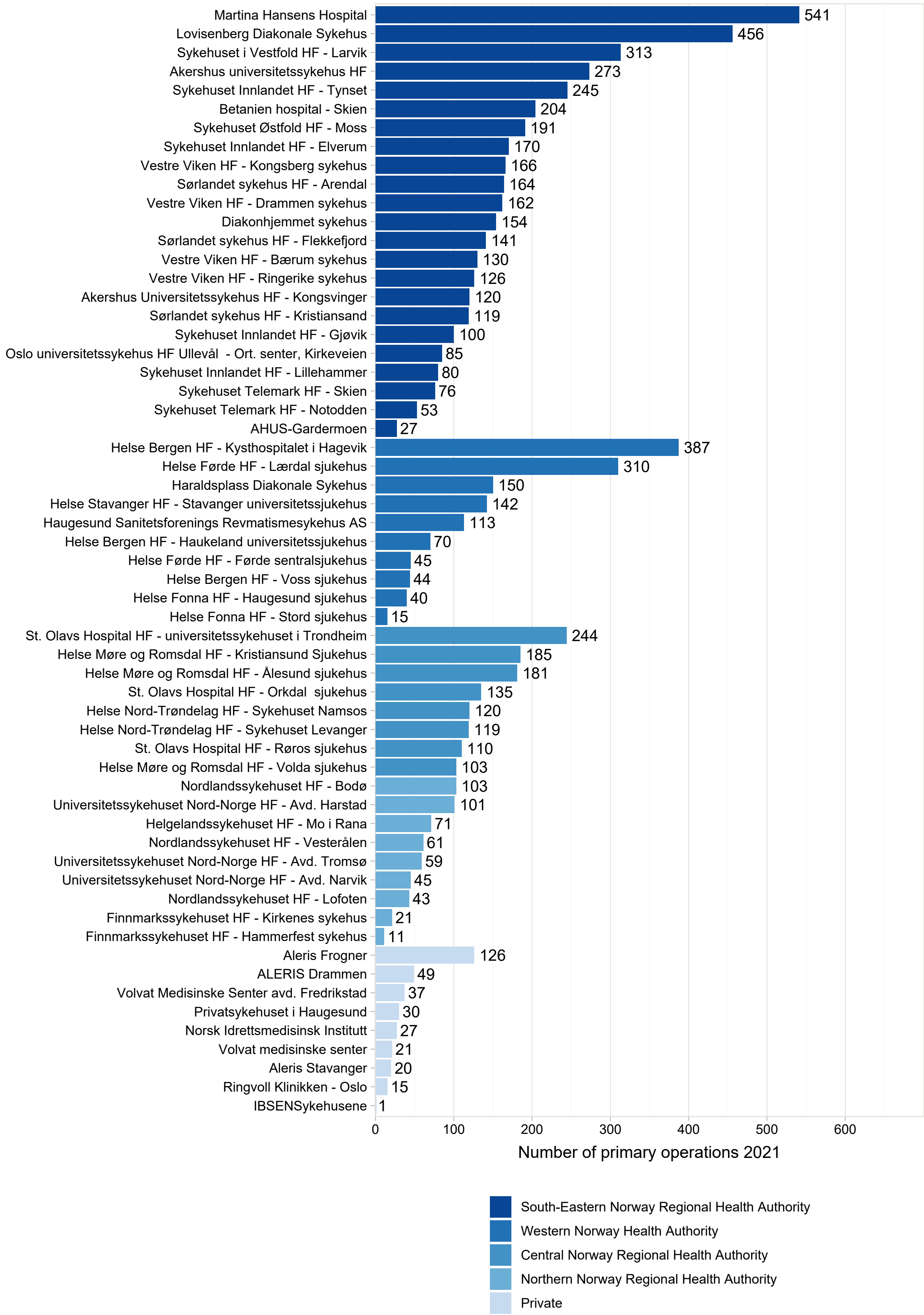


One stage bilateral operation in knee arthroplasty

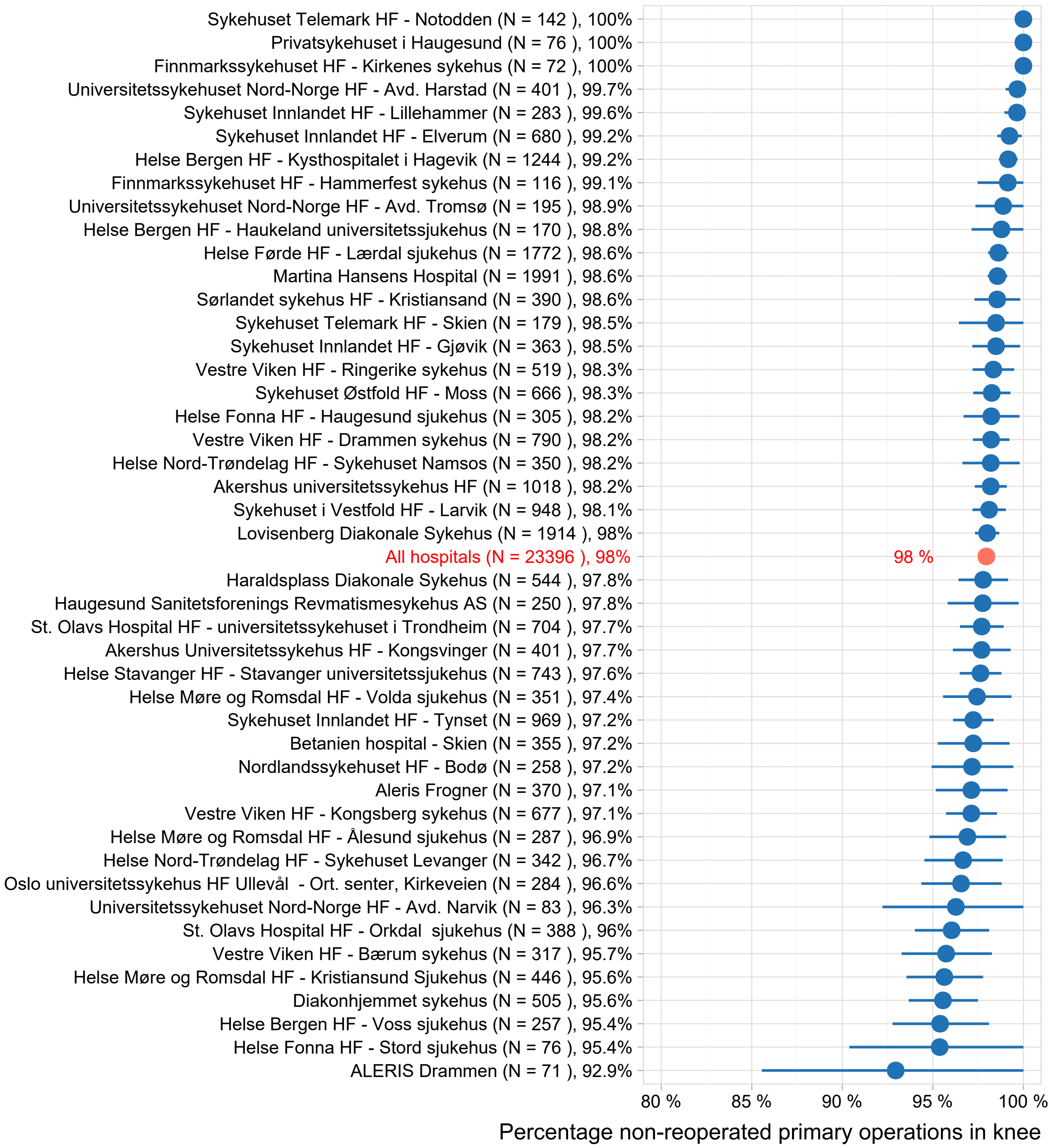
Year	1994-2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Sum:
Number of patients	81	21	22	43	50	79	74	74	88	109	86	727

A one stage bilateral operation is an operation where the patient is operated on both hips during the same operation or on the same day. Only primary operations are included

FIGUR B.29: Number of primary operations in knee 2021

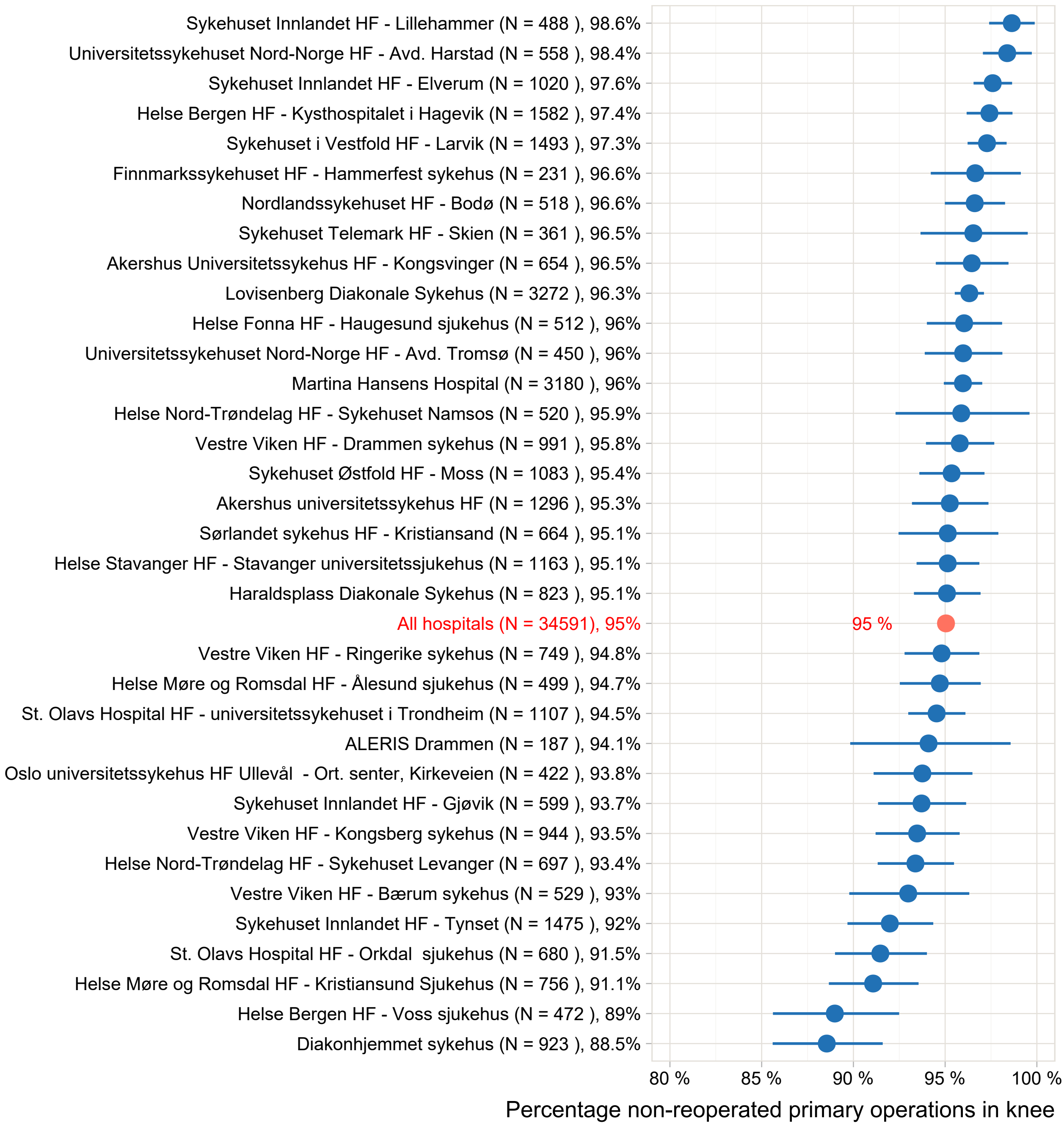


FIGUR B.30: Percentage non-revised standard patients two years after operations in 2015-2021



Kaplan-Meier estimates of percentage non-revised standard patients after two years with 95 % confidence interval. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2, with idiopathic arthrosis at primary operation and with total prostheses. Endpoint is all revisions. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2015 to 2021. Only hospitals with operations in 2021 and with more than 50 operations from 2015 to 2021 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than two years. Only hospitals with coverage of at least 80 % for revisions from 2015 to 2020 are included.

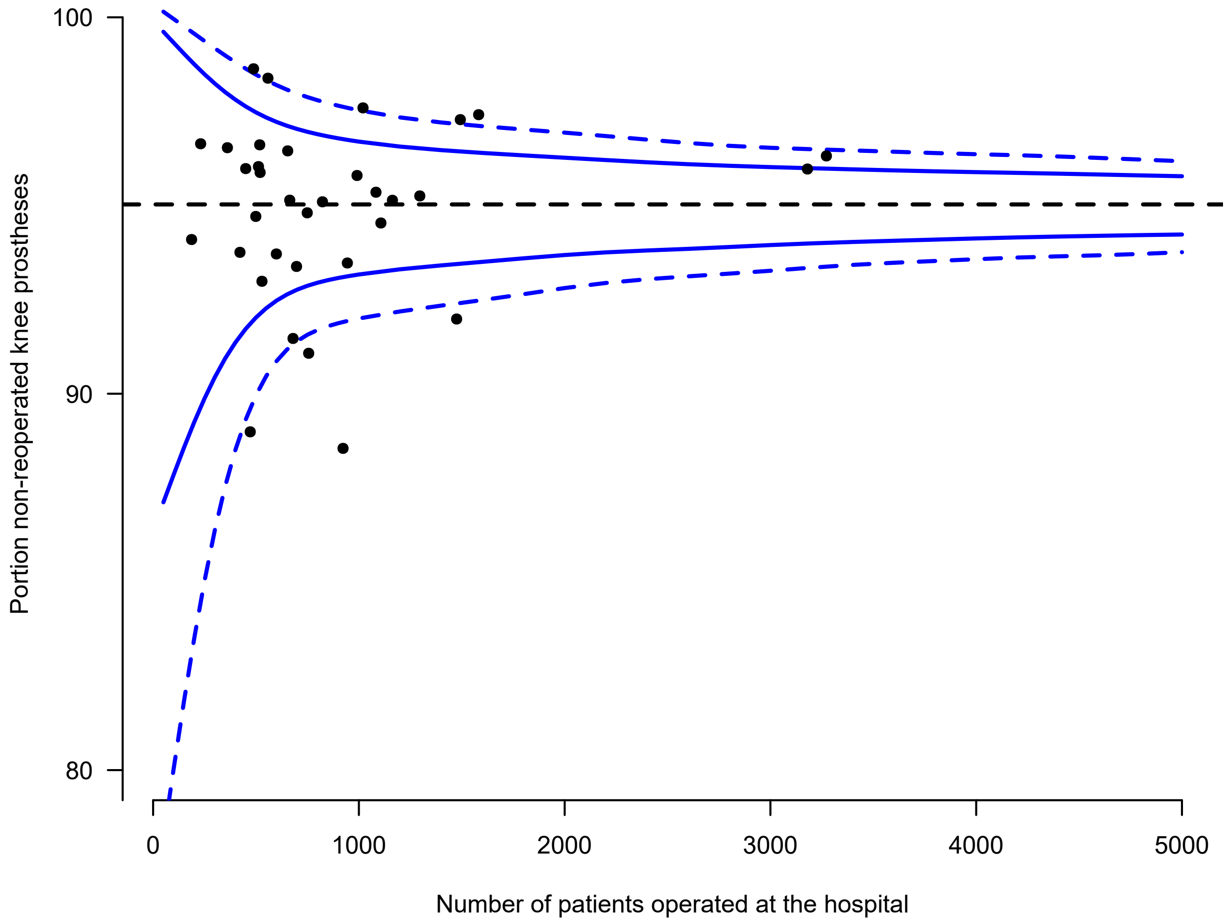
FIGUR B.31: Percentage non-revised standard patients ten years after operations in 2010-2021



Kaplan-Meier estimates of percentage non-revised standard patients after ten years with 95 % confidence interval. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2, with idiopathic arthrosis at primary operation and with total prostheses. Endpoint is all revisions. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2010 to 2021. Only hospitals with operations in 2021 and with more than 50 operations from 2010 to 2021 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than ten years. Only hospitals with coverage of at least 80 % for revisions from 2010 to 2020 are included.

See "How to interpret the hospital-based results" page 25.

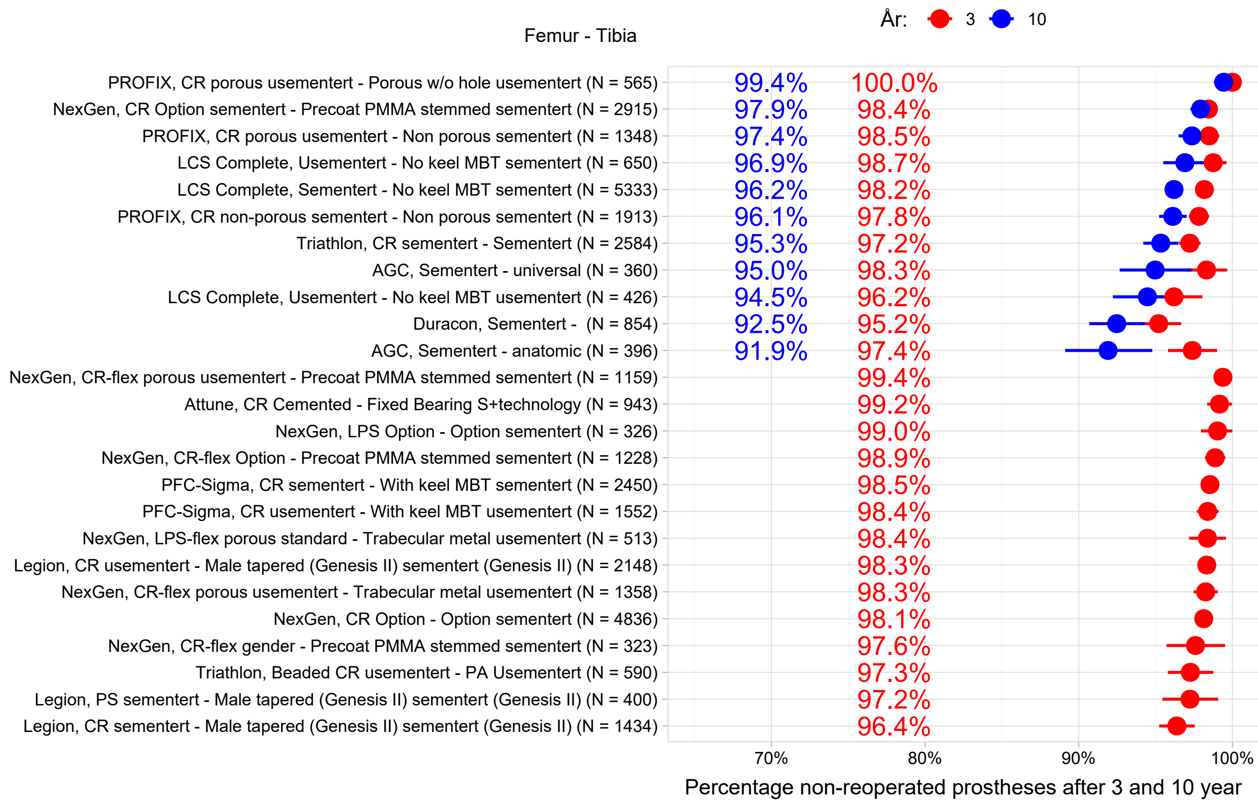
FIGUR B.32: Funnel plot, percentage non-revised standard patients ten years after operations in 2010-2021



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2010 to 2021 at Norwegian hospitals. Some hospitals are excluded. This can be due to low completeness of reporting of revisions (<80 % from 2008 to 2016), that less than 50 knee prostheses have been operated in the period, that fewer than 10 patients have been followed up for more than 10 years, or that the hospital don't have any operations in 2021. The solid blue lines show the interval where 95 % of the Norwegian patients will be. The dotted blue lines show the interval where 99.8 % of the patients will be. Points to the right represents hospitals with many operations (see the x-axis). Points above or below the dotted lines are regarded as outliers with exceptionally good or exceptionally bad results respectively.

All of the points in the funnel plot correspond to a hospital in figure B.31. By choosing any point, and using the corresponding values for "Number of patients" and "Portion non-reoperated" on the x and y axis respectively, the hospital belonging to the point can be found in figure B.31. The three hospitals with points below the dotted lines have inferior results. One of the hospitals has inserted patella components in many reoperations due to pain. This is a small reoperation, but can be beneficial for some patients with much pain. The threshold for inserting a patella component will therefore influence the number of reoperations at the hospital.

Figur B.33: Percentage non-reoperated total prostheses in knee after 3 and 10 years 2010-2021.



Figur B.34: Percentage non-reoperated uni prostheses in knee after 3 and 10 years 2010-2021.

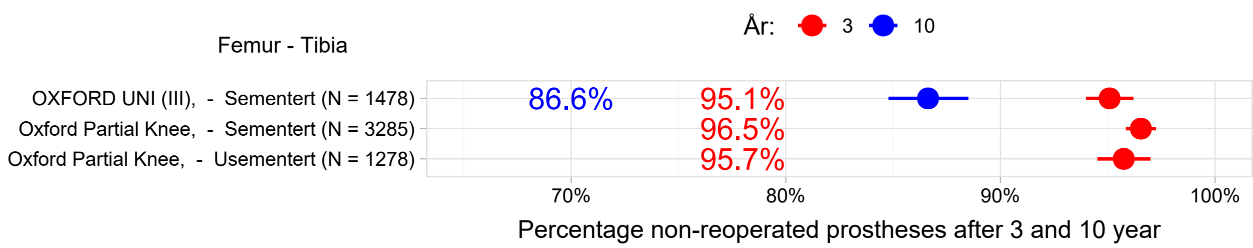
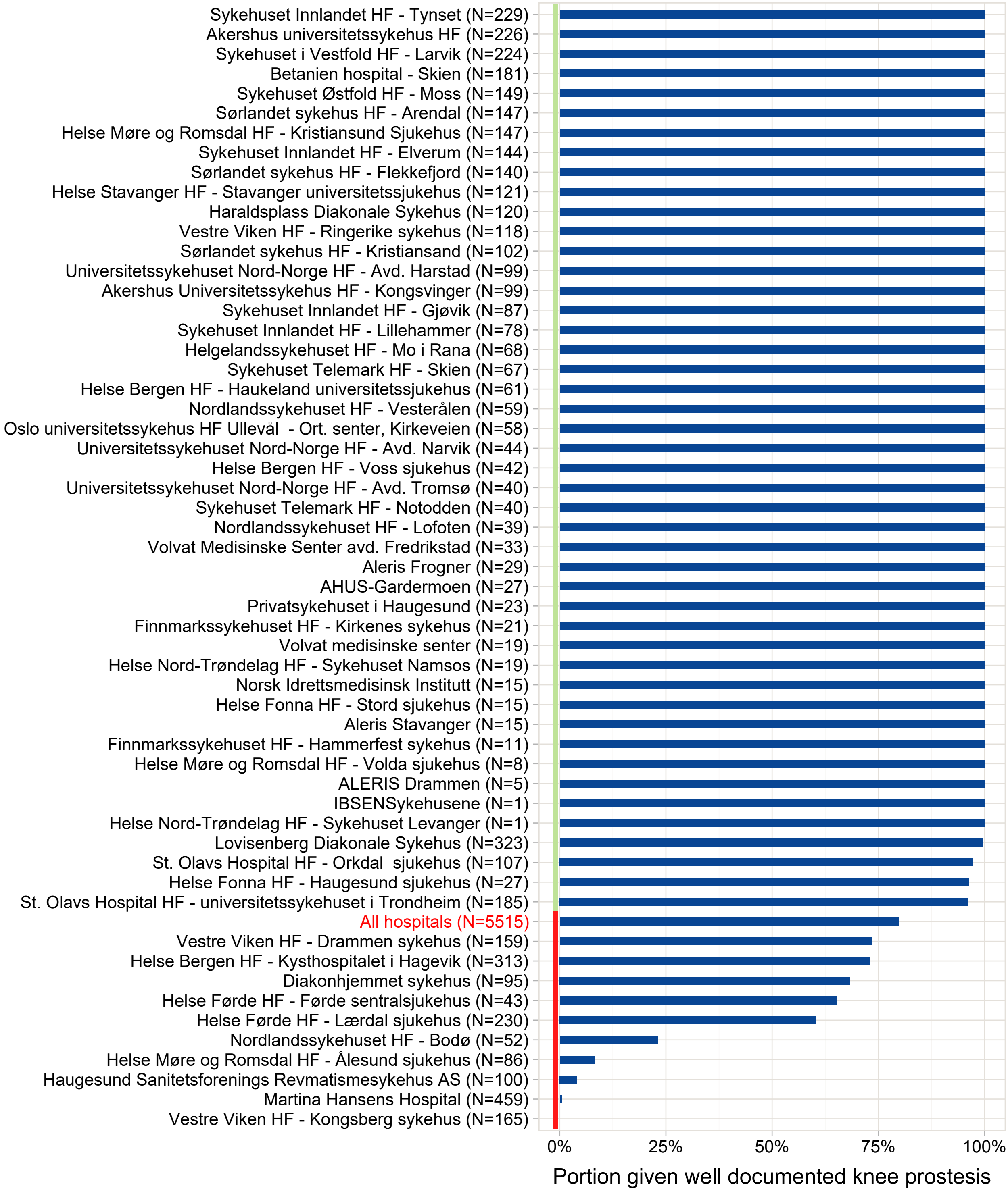


Figure B.33 and B.34 shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of knee prostheses. We have only included combinations used in 500 or more operations in 2010-2021. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2010 to 2021 have been included, and the number of prostheses will therefore be below 500 in some cases. A standard patient is aged 55-85 years, has ASA class 1 or 2 and was diagnosed with idiopathic osteoarthritis at primary surgery. Using standard patients provides a more homogenous group of patients, and we believe that this makes the results more comparable. Endpoint is all revision operations, except infections and reoperations without insertion, removal or replacement of the prosthesis.

Duracon, LCS, AGC Universal and Profix knee prosthesis is no longer in use.

See section "How to interpret the prosthesis results" page 25.

FIGUR B.35: Portion of patients recieving well documented knee prosthesis by hospital and nationally in 2021



Most inserted knee prosthetics are well documented. Most hospitals that do not use well documented prosthetics use un-documented combinations of components and fixations within the well documented prosthetic-brands. Documentation is based on 10 year survival in line with the standards set by ODEP(Orthopaedic Data Evaluation Panel-UK). More information on documentation can be found on our web-page. We are grateful to hear any comments or corrections.

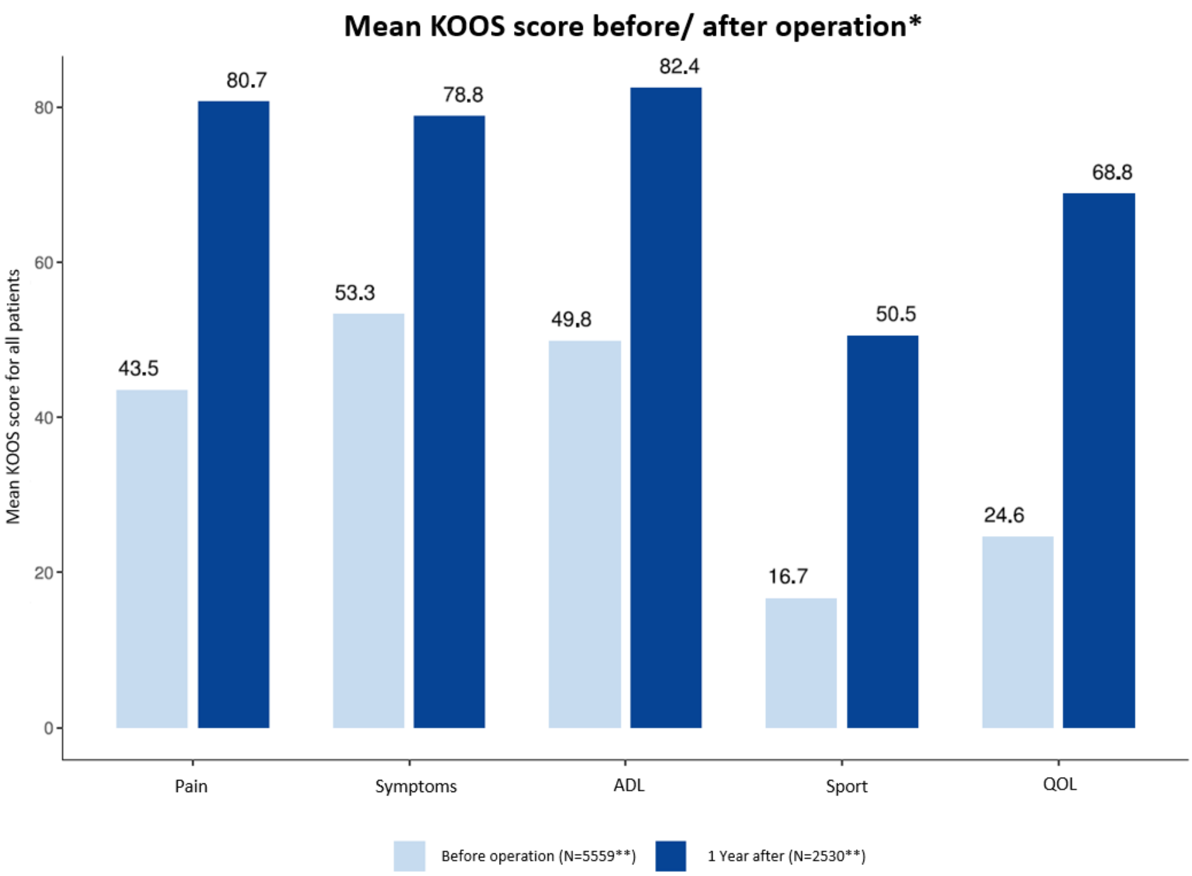
PROM, Knee Arthroplasty Register

The Hip Arthroplasty Register started electronic collection of PROM data in 2017. We wish to focus more on patients' perceived quality of life and joint function before and after surgery. Patients complete an electronic questionnaire before surgery and 1,6 and 10 years after surgery. We will compare the data we collect from patients with the data reported by surgeons for the same patient group. This will allow us to focus on function and quality of life in addition to a possible revision of the prosthesis.

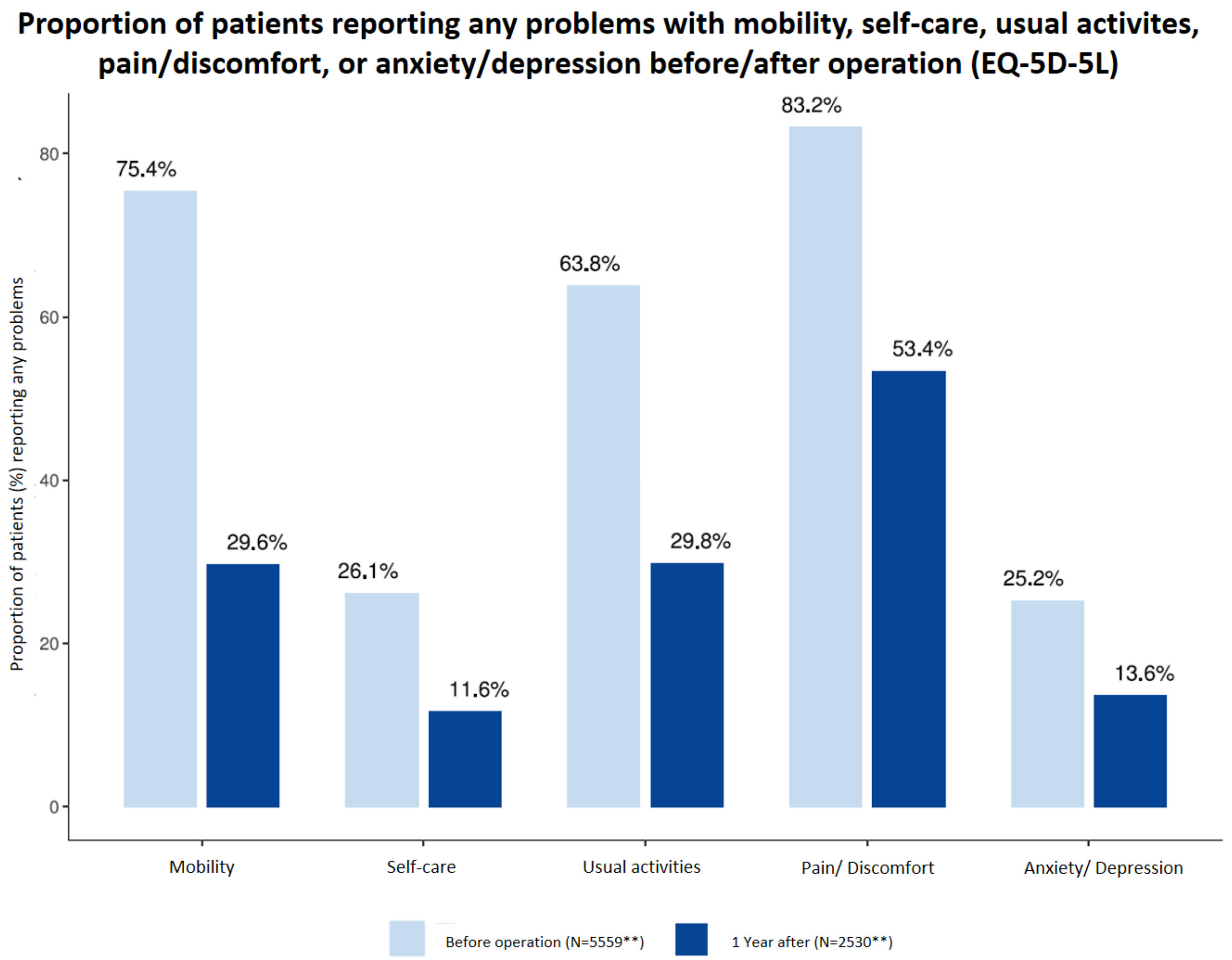
So far, 5559 pre-operative PROM forms and 2530 one year follow-up forms have been reported to the registry. Up until this point 35 hospitals have begun collecting and reporting PROMS. Due to a major bug in the MRS system, patients have been unable to fill out the questions regarding KOOS in the 1 year follow-up forms in 2020. We also received 439 paper forms from 13 hospitals. All hospitals will recieve reports containing analyses of their own results. Any questions regarding collection and reporting of PROMs should be sent to our consultant Mikal Solberg mikal.solberg@helse-bergen.no.

Patient demografic	Before operation	1 Year after
Number of forms (n)	4754	1910
Men (%)	45	53
Median age (min-max)	67 (25-98)	67 (30-90)
Body-Mass Index mean (SD)	29.9 (7.8)	29.4 (5.2)
Uses alchohol n (%)	2459 (51.7)	694 (36.3)
Smokes n (%)	353 (7.4)	144 (7.5)
High school education or higher n (%)	2452 (51.6)	1043 (54.6)
Lives alone n (%)	1074 (22.6)	390 (20.4)
UCLA activity* mean (SD)	4.9 (1.8)	5.7 (1.9)
Health** (VAS) mean (SD)	62.5 (18.5)	72.4 (17.8)

*Best possible score is 10, **100 is the best possible health



*100 is best possible score, **5559 forms have adequate completeness of the questions tied to KOOS before the operation, and 2530 forms 1 year after



Health Trust	Reporting hospitals	No Before operation	No 1 year after
Central Norway Regional Health Authority	4/8	326	156
Northern Norway Regional Health Authority	3/9	52	27
Private	5/8	930	237
South-Eastern Norway Regional Health Authority	20/23	2083	823
Western Norway Regional Health Authority	7/10	2168	1287

Figure B.36 Proportion of primary knee operations where pre-operative PROMS have been reported in 2020-2021

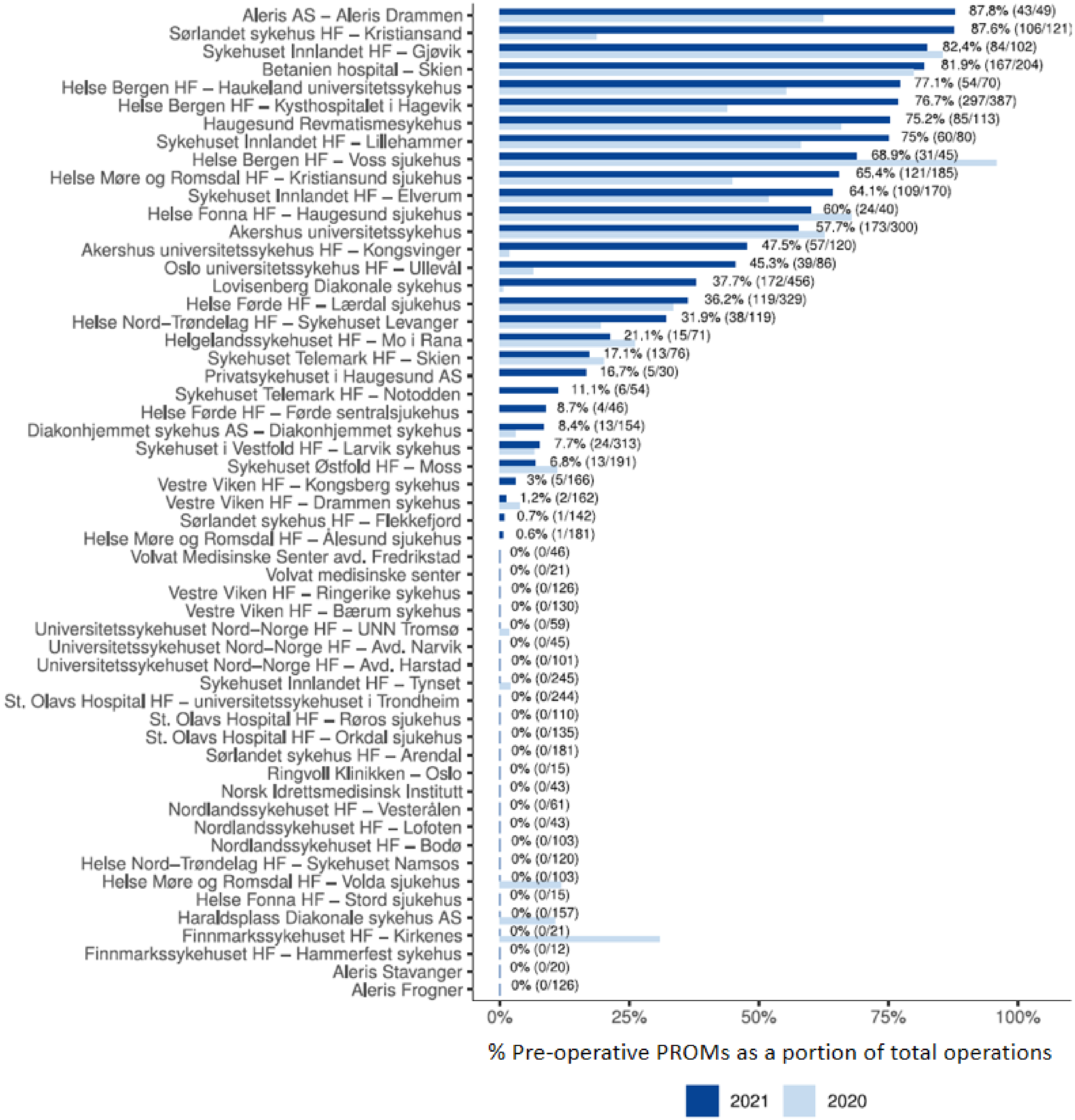


Figure B.36 presents pre-operative knee PROMs reported via paper or the online web solution MRS, as a portion of total number of hip operations reported in 2021 (dark blue line) and in 2020 (light blue line). The level is still low, but some hospitals seem to have taken steps to improve PROM reporting. We wish to remind the reader that any questions regarding registering and reporting of PROMs should be directed to the registry.

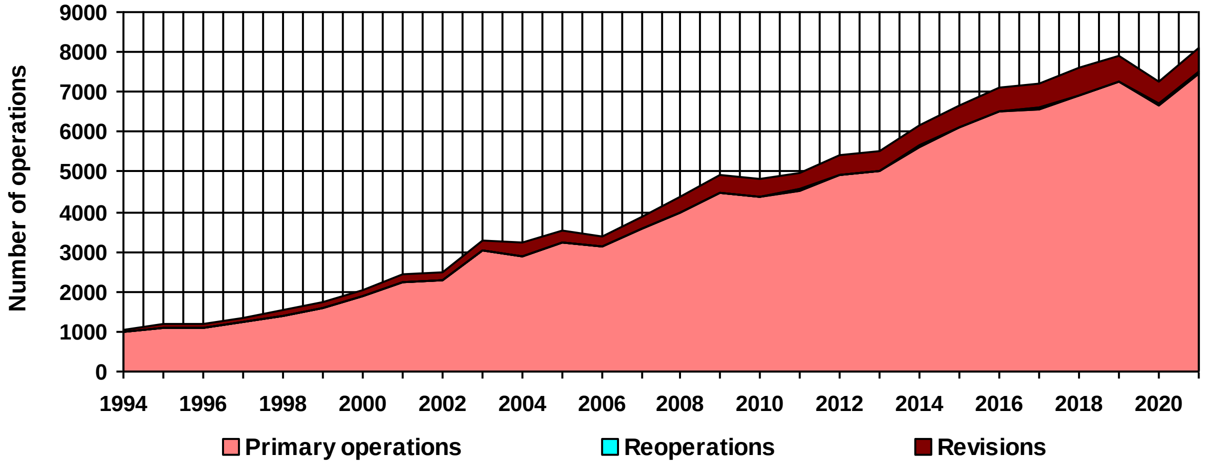
KNEE PROSTHESES

Table 1: Annual numbers of operations

Year	Primary operations		Reoperations *		Revisions		Total
2021	7 478	(92,3%)	36	(0,44%)	584	(7,2%)	**8 098**
2020	6 683	(92,0%)	22	(0,30%)	561	(7,7%)	**7 266**
2019	7 253	(91,8%)	19	(0,24%)	632	(8,0%)	**7 904**
2018	6 929	(91,2%)	13	(0,17%)	652	(8,6%)	**7 594**
2017	6 581	(91,3%)	15	(0,21%)	616	(8,5%)	**7 212**
2016	6 514	(91,5%)	16	(0,22%)	588	(8,3%)	**7 118**
2015	6 120	(91,7%)	8	(0,12%)	548	(8,2%)	**6 676**
2014	5 642	(91,9%)	7	(0,11%)	492	(8,0%)	**6 141**
2013	5 041	(91,3%)	5	(0,09%)	477	(8,6%)	**5 523**
1994-12	52 027	(91,6%)	9	(0,02%)	4 779	(8,4%)	**56 815**
Total	**110 268**	**(91,6%)**	**150**	**(0,12%)**	**9 929**	**(8,3%)**	**120 347**

* Reoperation where prosthetic parts were not changed or removed (soft tissue debridements for infected prosthesis, prosthetic parts were not changed)

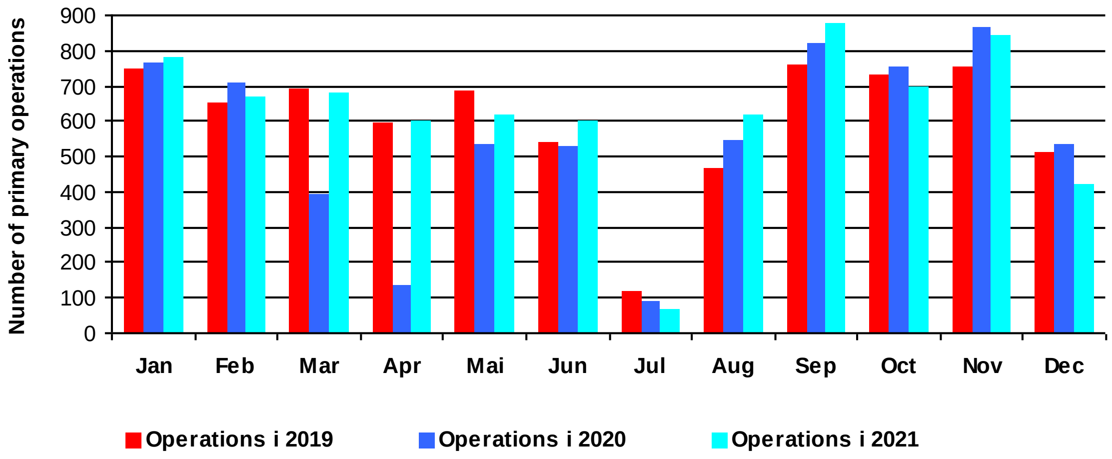
Figure 1a: Annual numbers of operations



53,1 % of all operations were performed on the right side. 61,3 % performed in women.
Mean age at primary surgery was 68,5 years, 69 years for women and 67,6 years for men
Mean age at primary surgery was 70,2 years in 1994, 70,8 years for women and 68,3 years for men.
Mean age at primary surgery was 68,3 years in 2021, 68,5 years for women and 68,1 years for men.

COVID-19

Figure 1b: Monthly primary operations in 2019 - 2021



Incidence

Figure 2a: Incidence of primary knee prostheses

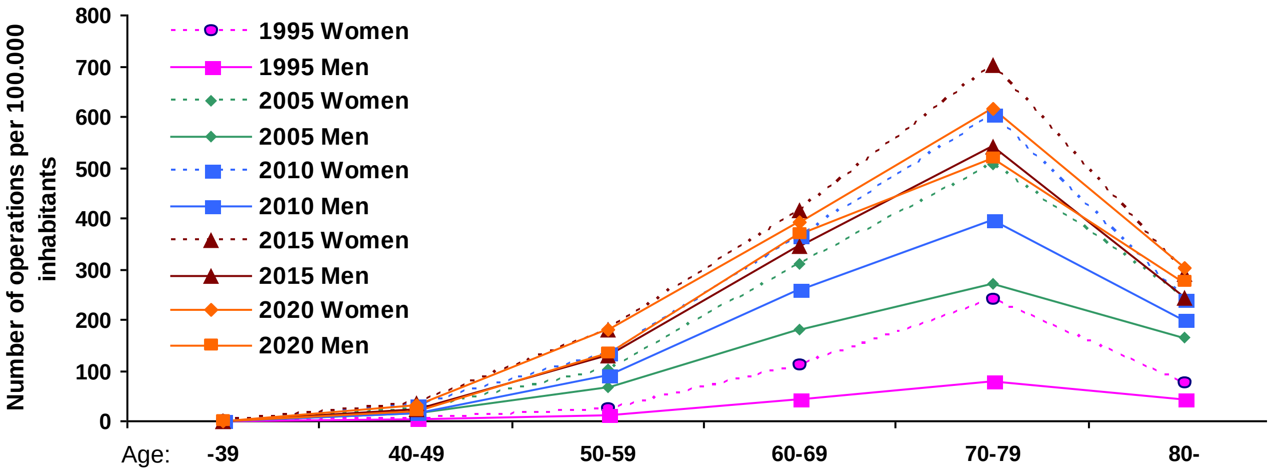


Figure 2b: Annual total incidence of primary knee prostheses for men and women

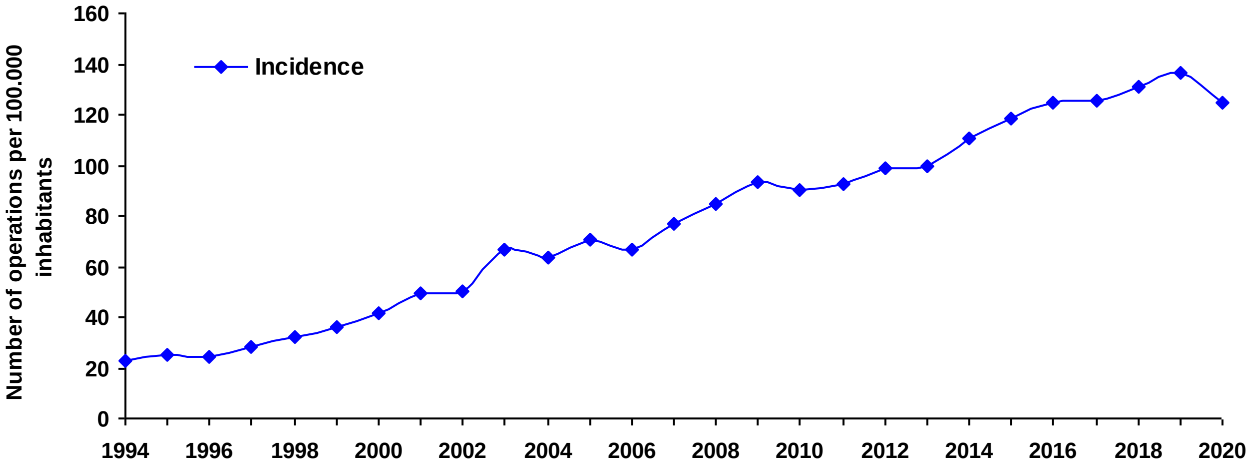


Figure 2c: Status of knee replacement surgery in the period 1994-2021 per 31.12.2021

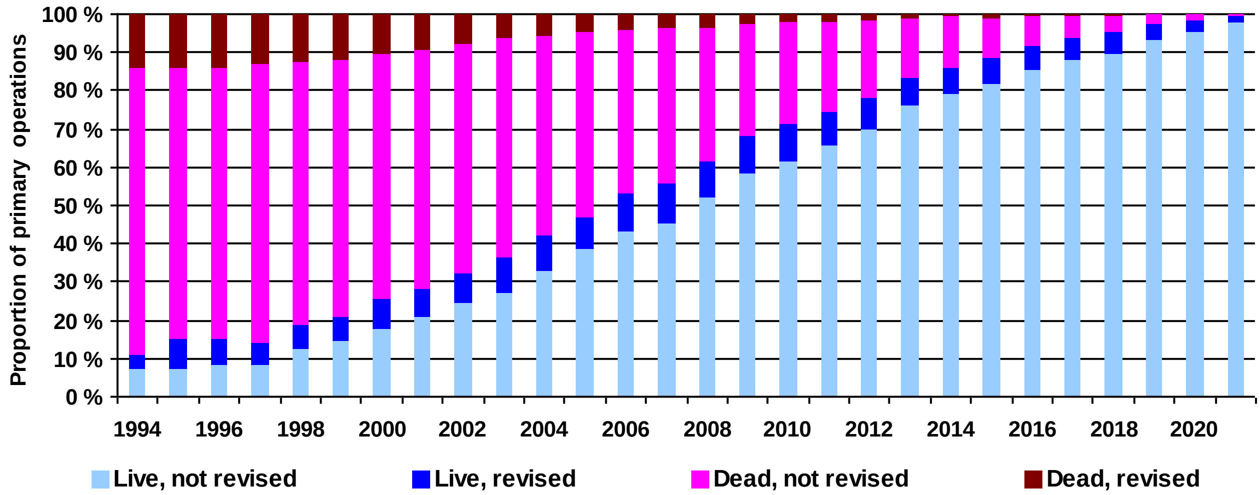


Figure 3: Age at the insertion of primary total knee prostheses

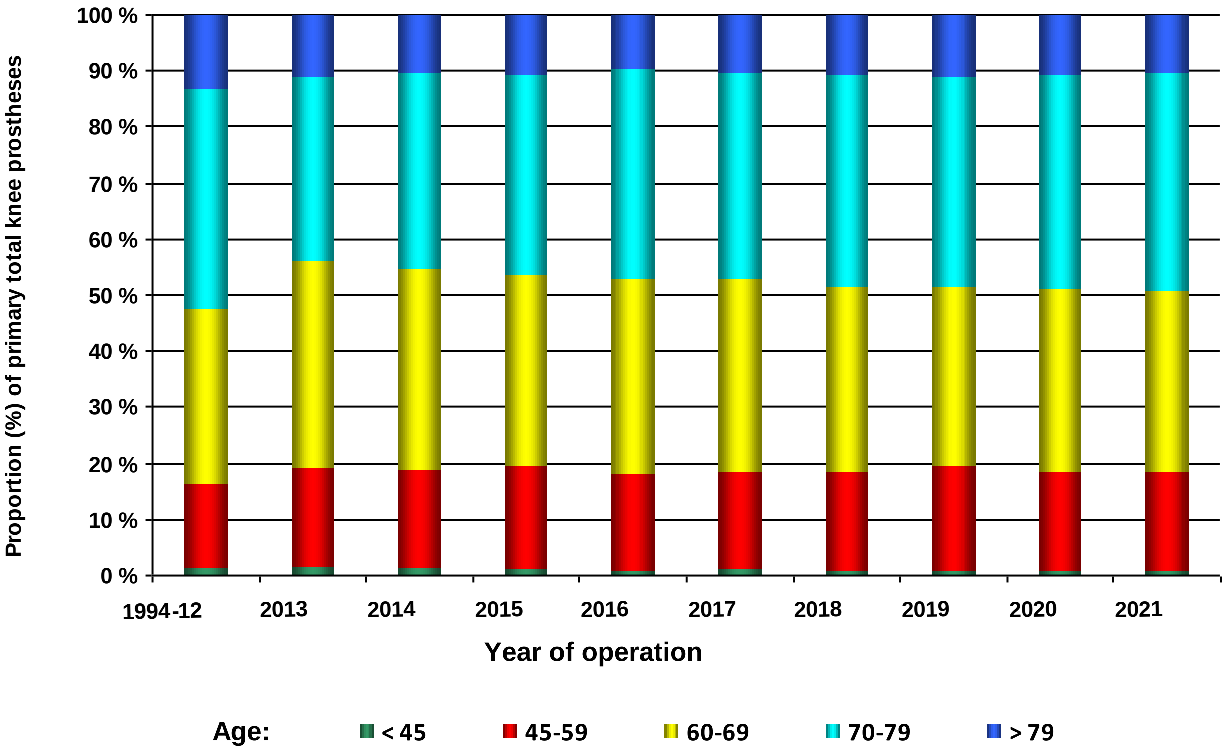


Figure 4: Age at the insertion of primary unicondylar knee prostheses

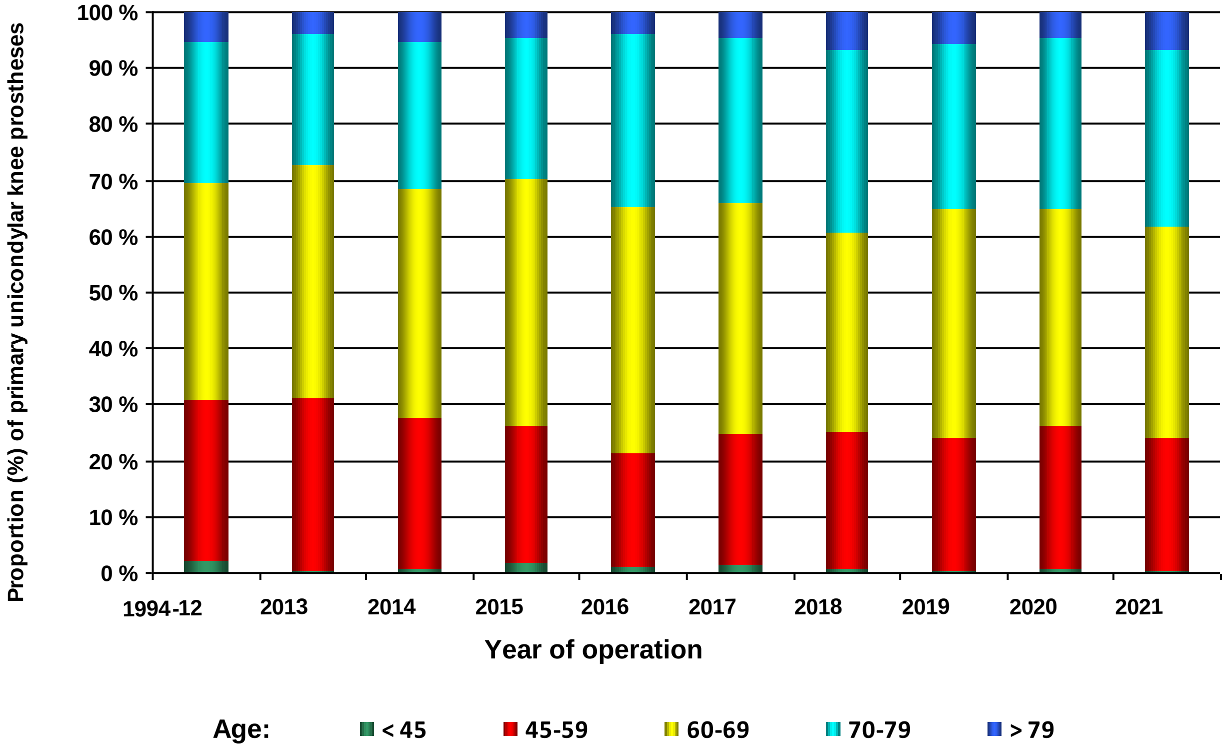


Figure 5: Age and sex at the insertion of primary total knee prostheses

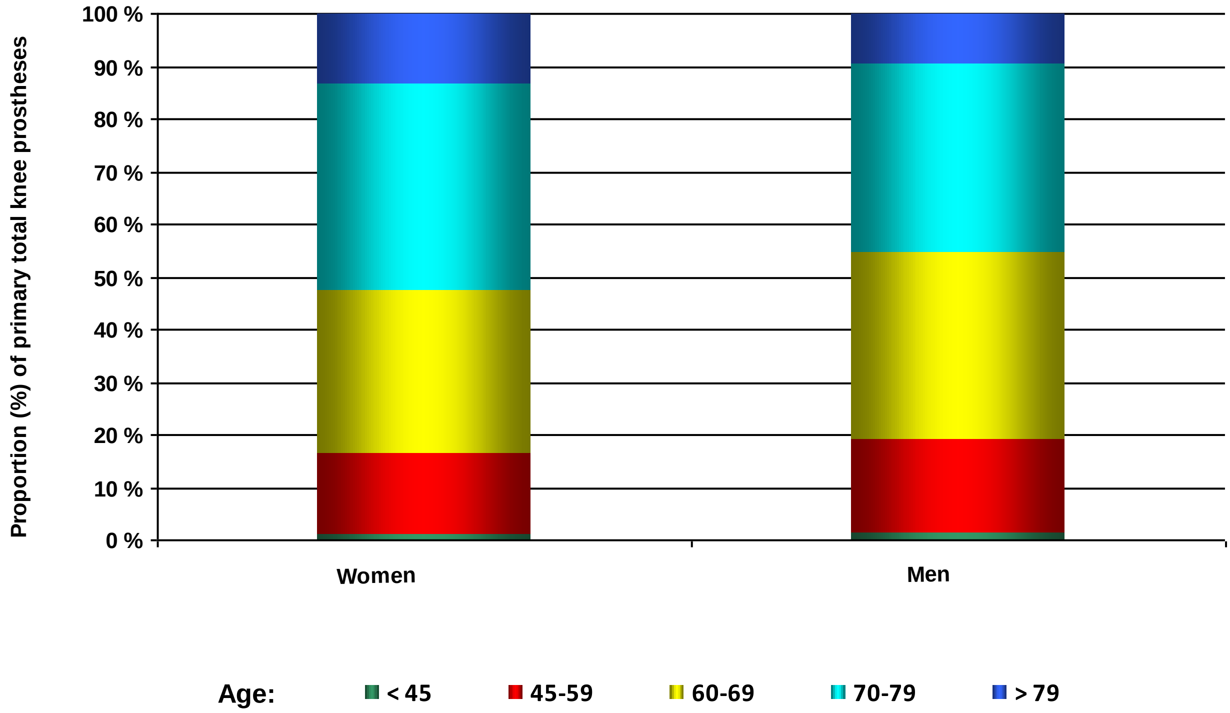
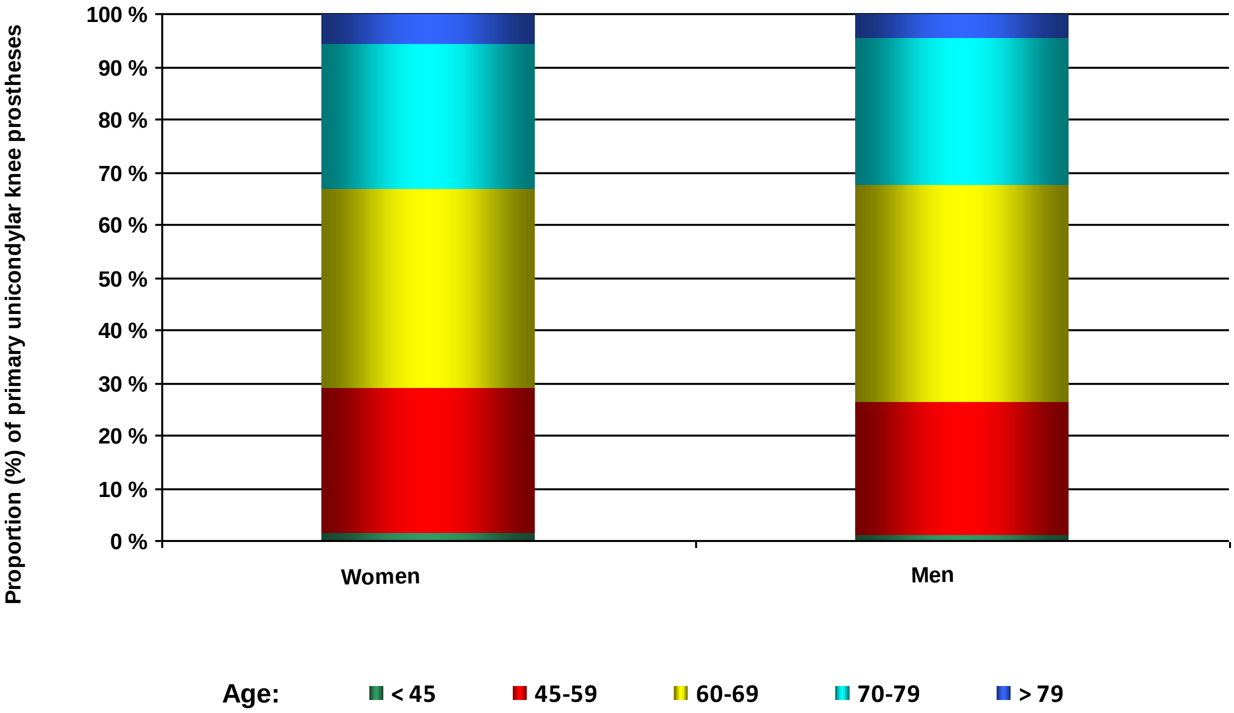


Figure 6: Age and sex at the insertion of primary unicondylar knee prostheses



Types of knee prostheses

Table 2: Primary operations

Year	Total with patella		Total without patella		Unicondylar		Patello-femoral		Bicompart-mental		Hinged * prostheses		Missing		Total
2021	639	(8,5%)	5 720	(76,5%)	990	(13,2%)	70	(0,9%)			53	(0,7%)	2	(0,0%)	**7 478**
2020	525	(7,9%)	5 228	(78,2%)	840	(12,6%)	43	(0,6%)			46	(0,7%)	1	(0,0%)	**6 683**
2019	586	(8,1%)	5 586	(77,0%)	994	(13,7%)	53	(0,7%)			33	(0,5%)	1	(0,0%)	**7 253**
2018	504	(7,3%)	5 334	(77,0%)	1 000	(14,4%)	58	(0,8%)			31	(0,4%)	2	(0,0%)	**6 929**
2017	454	(6,9%)	5 152	(78,3%)	868	(13,2%)	75	(1,1%)			32	(0,5%)			**6 581**
2016	221	(3,4%)	5 329	(81,8%)	863	(13,2%)	67	(1,0%)			32	(0,5%)	2	(0,0%)	**6 514**
2015	160	(2,6%)	5 134	(83,9%)	753	(12,3%)	39	(0,6%)			33	(0,5%)	1	(0,0%)	**6 120**
2014	108	(1,9%)	4 866	(86,2%)	606	(10,7%)	41	(0,7%)			20	(0,4%)	1	(0,0%)	**5 642**
2013	97	(1,9%)	4 420	(87,7%)	477	(9,5%)	38	(0,8%)			9	(0,2%)			**5 041**
1994-12	4 234	(8,1%)	41 648	(80,1%)	5 849	(11,2%)	182	(0,3%)	2	(0,0%)	111	(0,2%)	1	(0,0%)	**52 027**
Total	**7 528**	**(6,8%)**	**88 417**	**(80,2%)**	**13 240**	**(12,0%)**	**666**	**(0,6%)**	**2**	**(0,0%)**	**400**	**(0,4%)**	**11**	**(0,0%)**	**110 268**

* Indicated by the surgeon on the report form

Figure 7: Primary operations

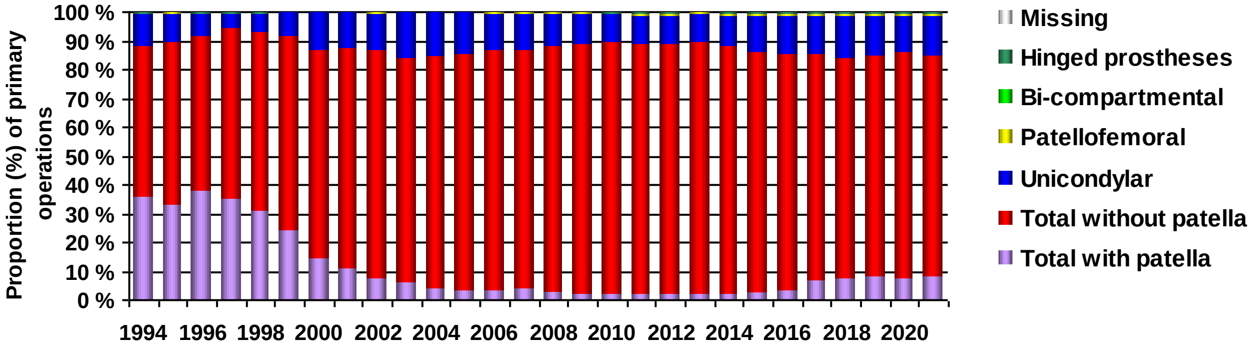


Table 3a: Classification of stability and modularity in primary total prostheses (with and without patella component)

	---------- MS ----------		----------- PS -----------						
Year	All poly	MT	All poly	MT	CCK	Rotating platform	Hinged * prostheses	Segmental prostheses	Total
2021	208	4 443	0	748	28	930	53	5	**6 410**
2020	245	4 050	1	603	33	821	46	5	**5 799**
2019	103	4 439	1	606	33	988	33	6	**6 203**
2018	1	3 998	1	565	26	1 244	31	3	**5 866**
2017	0	3 675	0	540	42	1 348	32	1	**5 637**
2016	4	3 688	0	465	19	1 370	32	7	**5 578**
2015	2	3 536	0	330	22	1 403	33	3	**5 326**
2014	2	3 398	0	131	22	1 416	20	2	**4 989**
2013	1	3 178	0	55	25	1 254	9	1	**4 522**
2012	5	2 855	0	21	16	1 490	17	1	**4 404**
2011	5	2 542	0	14	9	1 491	19	2	**4 080**
2010	3	2 487	0	21	5	1 429	18	3	**3 963**
2009	3	2 545	0	7	8	1 421	5	2	**3 989**
2008	1	2 172	0	22	3	1 325	8	0	**3 531**
2007	0	1 927	0	14	2	1 163	7	1	**3 113**
2006	0	1 637	0	8	2	1 049	2	1	**2 698**
1994-05	8	14 407	0	33	15	5 639	36	34	**20 138**
Total	**591**	**64977**	**3**	**4183**	**310**	**25 781**	**324**	**77**	**96 246**

MS = Minimally stabilized = Posterior cruciate retaining prosthesis and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
MT = Metal backed tibia
All poly = All polyethylene tibial component
* Information taken from the catalogue number of prostheses

Table 3b: Classification of stability and modularity in revision total prostheses (with and without patella component)

	---------- MS ----------		----------- PS -----------						
Year	**All poly**	**MT**	**All poly**	**MT**	**CCK**	**Rotating platform**	**Hinged * prostheses**	**Segmental protese**	**Total**
2021	0	130	0	101	52	64	76	8	**431**
2020	0	106	0	111	90	62	58	4	**431**
2019	1	137	0	119	80	82	70	11	**500**
2018	1	150	0	112	109	93	41	2	**508**
2017	0	124	0	134	66	89	59	6	**478**
2016	0	110	0	96	67	80	69	10	**432**
2015	0	129	0	100	50	75	59	7	**420**
2014	0	120	0	57	66	90	56	6	**395**
2013	1	132	0	61	75	87	29	3	**388**
2012	0	152	0	39	46	102	29	1	**369**
2011	1	142	0	19	58	98	22	1	**341**
2010	0	153	0	11	62	94	12	0	**332**
2009	0	148	0	12	44	121	21	0	**346**
2008	0	127	0	8	23	121	11	1	**291**
2007	0	103	0	6	14	99	9	0	**231**
2006	0	91	0	8	7	83	8	0	**197**
1994-05	2	930	0	46	51	336	22	16	**1 403**
Total	**6**	**2984**	**0**	**1040**	**960**	**1 776**	**651**	**76**	**7 493**

MS = Minimally stabilized = Posterior cruciate retaining prosthesis and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
MT = Metal backed tibia
All poly = All polyethylene tibial component

* Information taken from the catalogue number of prostheses

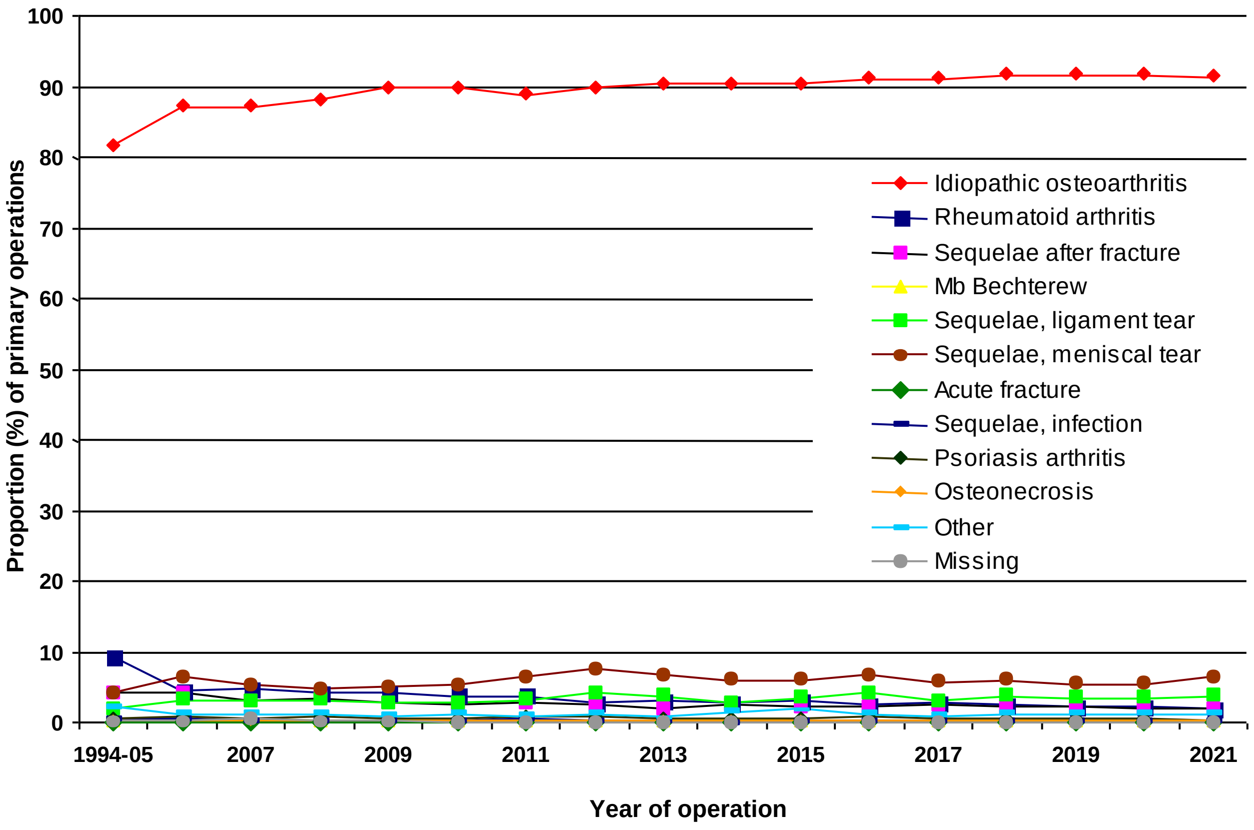
Reasons for primary operations - Total knee prostheses

Table 4:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Acute fracture	Sequelae, infection	Psoriasis arthritis	Osteonecrosis	Other	Missing
2021	5 816	128	122	15	242	410	7	13	26	23	94	0
2020	5 276	130	121	22	207	331	1	11	28	19	73	0
2019	5 669	134	137	14	234	345	4	10	29	16	95	0
2018	5 361	143	132	13	228	365	4	10	28	13	89	0
2017	5 116	156	147	19	180	339	3	18	39	13	71	0
2016	5 060	136	120	18	229	368	2	9	40	15	75	0
2015	4 794	166	114	16	199	321	1	17	36	10	99	2
2014	4 499	140	122	22	140	308	3	6	30	15	89	2
2013	4 086	145	94	11	174	311	1	16	29	9	41	4
2012	3 944	125	106	15	182	332	2	13	33	11	60	4
2011	3 618	160	113	12	133	260	1	18	35	10	51	2
2010	3 548	155	100	13	114	216	1	9	25	7	51	3
2009	3 579	167	117	11	116	200	2	13	25	7	42	10
2008	3 105	150	125	14	116	169	2	9	30	10	50	7
2007	2 715	146	94	17	97	162	4	11	17	11	43	16
2006	2 353	123	114	14	92	178	0	12	23	11	40	5
1994-05	16 498	1 888	825	78	417	826	20	86	121	47	456	70
Total	**85 037**	**4 192**	**2 703**	**324**	**3 100**	**5 441**	**58**	**281**	**594**	**247**	**1 519**	**125**

Diseases are not mutually exclusive. More than one reason for operation is possible

Figure 8:



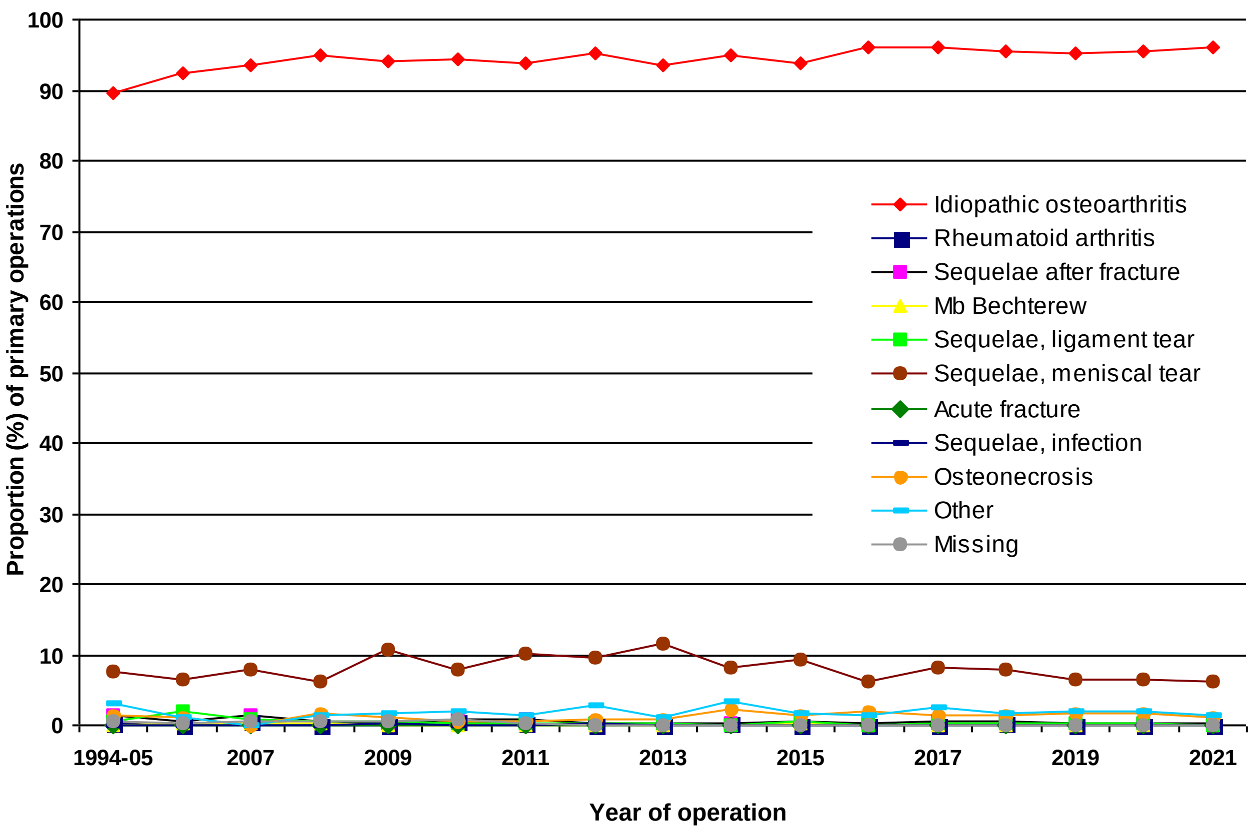
Reasons for primary operations - Unicondylar knee prostheses

Table 5:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Sequelae, infection	Osteonecrosis	Other	Missing
2021	952	0	2	1	0	61	0	11	14	0
2020	802	0	3	0	2	54	0	14	17	0
2019	947	1	2	0	2	64	0	18	20	0
2018	954	2	7	0	2	80	0	14	18	0
2017	833	1	4	0	3	71	0	13	22	0
2016	830	1	2	1	1	54	1	16	13	0
2015	706	0	4	2	5	70	0	11	13	0
2014	576	2	2	0	0	50	0	13	20	0
2013	446	0	1	0	1	55	0	4	6	0
2012	452	0	1	0	1	46	1	4	13	0
2011	412	1	4	0	1	45	0	3	6	1
2010	391	2	3	0	1	33	0	2	8	3
2009	435	0	1	0	2	50	1	5	8	2
2008	418	0	2	1	3	27	0	7	6	2
2007	436	2	7	1	4	37	0	0	0	2
2006	369	0	2	1	8	26	0	5	5	1
1994-05	2 466	7	42	1	16	211	3	39	88	12
Total	**12 425**	**19**	**89**	**8**	**52**	**1 034**	**6**	**179**	**277**	**23**

Diseases are not mutually exclusive. More than one reason for operation is possible

Figure 9:



Use of cement - Primary total knee prostheses

Figure 10: Femur

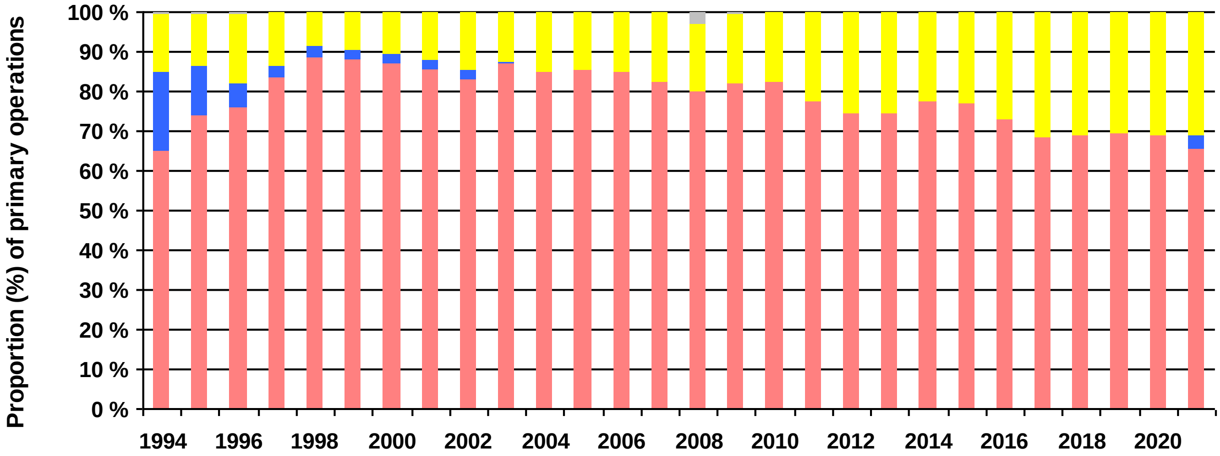


Figure 11: Tibia

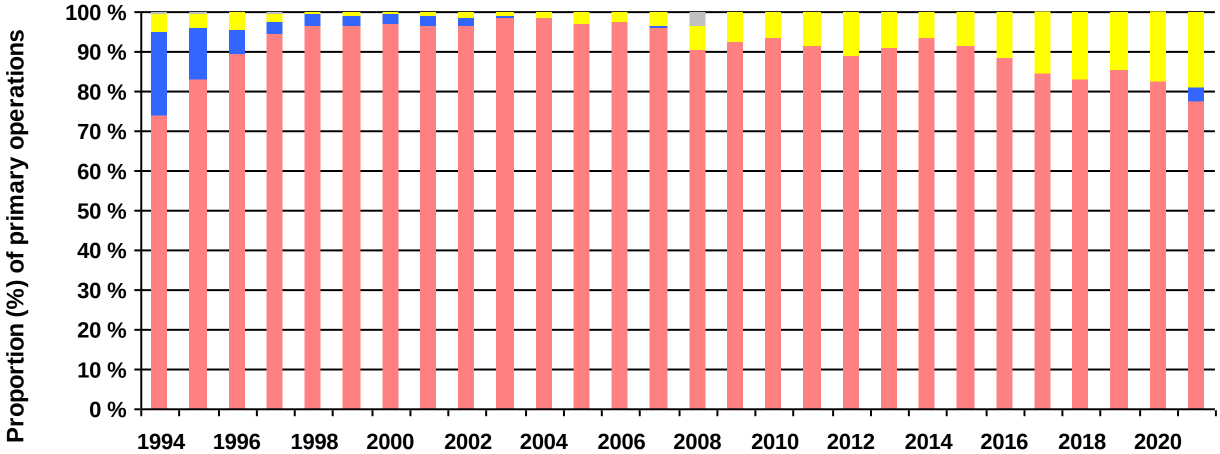
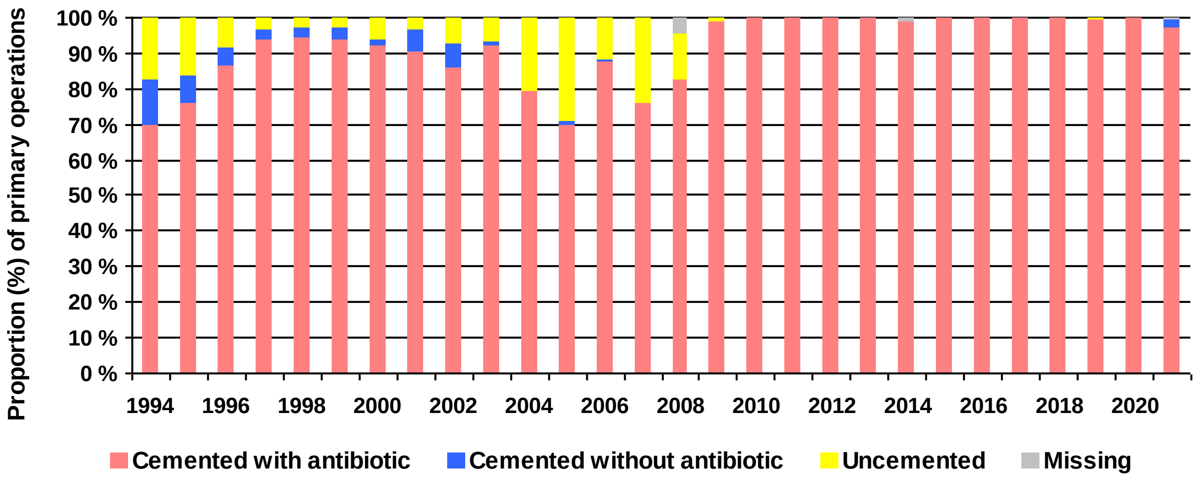


Figure 12: Patella



Use of cement in total knee prostheses

Figure 13: Primary operations

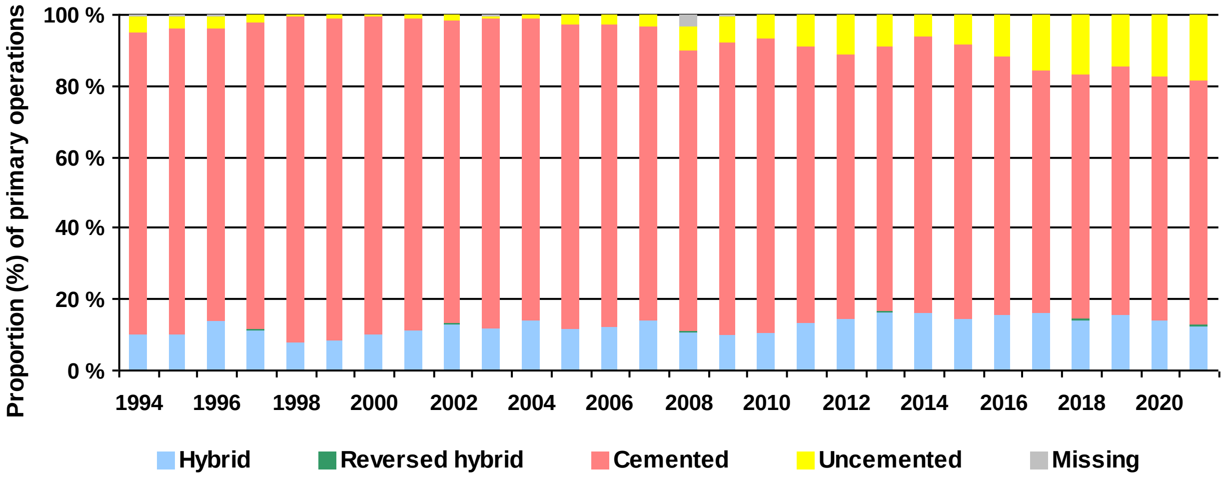
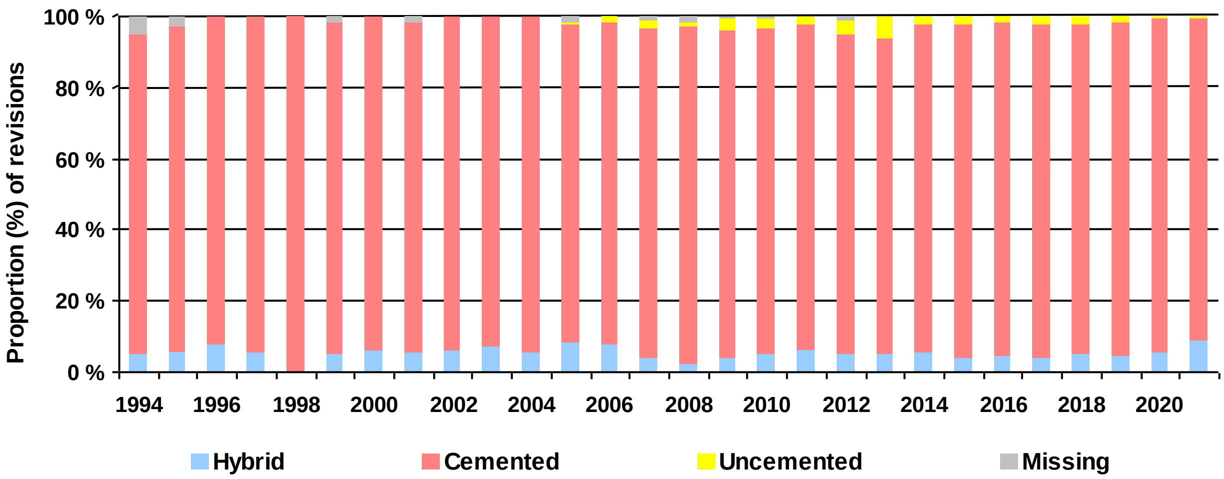
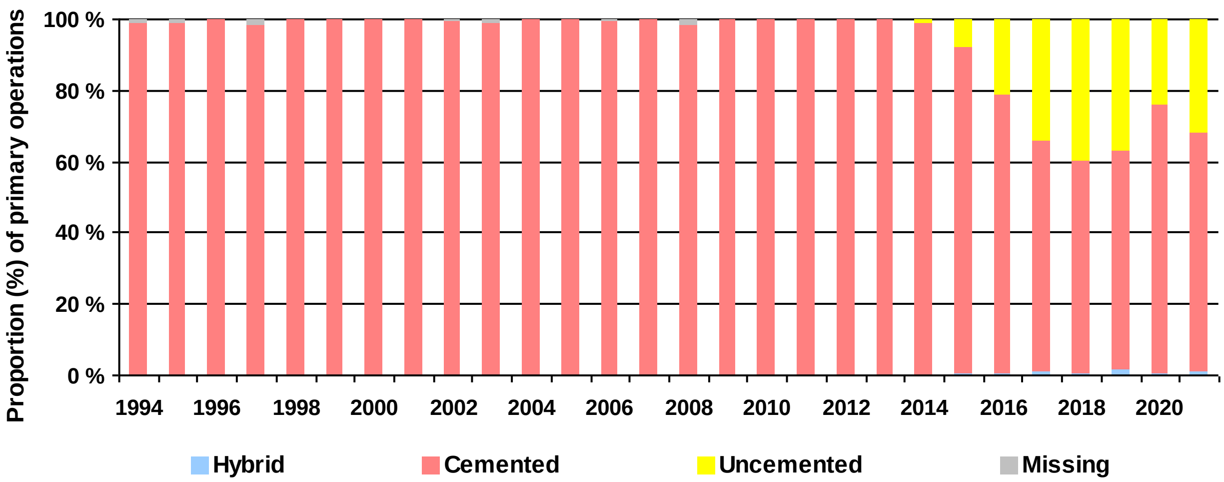


Figure 14: Revisions



Use of cement in unicondylar knee prostheses

Figure 15: Primary operations



The 8 most common primary total prostheses (with and without patella component) in 2015-2021

Table 6:

Product	Cemented *	Uncemented *	Hybrid	All poly	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
NexGen	13 406	2 399	2 446	0	0	2 603	15 948	2 089	215	**18 261**
Legion	3 056	9	2 674	9	0	451	4 955	786	2	**5 743**
PFC-Sigma	3 111	2 134	403	93	5 523	0	5 581	33	33	**5 653**
Triathlon	3 583	1 415	122	3	0	4 633	4 945	136	37	**5 123**
LCS Complete	2 282	2	271	0	2 556	0	0	5	3	**2 556**
Attune	2 098	0	0	0	24	2 098	1 663	435	0	**2 098**
Persona	442	9	70	0	0	57	521	1	0	**522**
Journey II BCS	376	0	0	0	0	377	0	377	0	**377**

Hybrid = Uncemented femur and cemented tibia
All poly = All polyethylene tibial component
HXLPE = Highly cross linked polyethylene
MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
* Surgeon's report for fixation

Table 6 A: Femur component

Product: NexGen (31)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR Option	9 277	0	9 281	0	0	**9 281**
CR-flex porous uncemented	105	3 567	3 676	0	0	**3 676**
CR-flex Option	1 648	1	1 650	0	0	**1 650**
LPS Option	994	0	0	994	0	**994**
LPS-flex porous standard	7	848	0	856	0	**856**
CR-flex gender	707	0	707	0	0	**707**
CR Precoat	231	4	235	0	0	**235**
LCCK Option	215	0	0	0	215	**215**
CR-flex porous	6	193	199	0	0	**199**
LPS-flex Option	164	20	0	184	0	**184**
CR Porous uncemented	10	173	183	0	0	**183**
LPS-flex gender	20	0	0	20	0	**20**
LPS-Flex Tivanium	12	0	0	12	0	**12**
LPS macro Option	10	0	0	10	0	**10**
CR Flex Precoat	5	0	5	0	0	**5**
Other	7	3	0	10	0	**10**
Unknown	15	9	0	0	0	**24**

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
Cemented	2 232	1	0	0	0	**2 233**
Uncemented	41	272	0	0	0	**313**
Revision	5	0	0	0	3	**5**
Unknown	5	0	0	5	0	**5**

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	3 063	1	3 069	0	0	**3 069**
CR uncemented	7	2 498	2 505	0	0	**2 505**
Revision	33	1	0	0	0	**34**
PS	33	0	0	33	0	**33**
Unknown	5	3	0	0	0	**8**

Product: Triathlon (58)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	3 406	5	3 414	0	0	**3 414**
Beaded w/pa CR uncemented	10	1 521	1 531	0	0	**1 531**
PS cemented	135	0	0	135	0	**135**
TS cemented	37	0	0	0	37	**37**
Other	0	1	0	0	0	**1**
Unknown	4	1	0	0	0	**5**

Product: Legion (62)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR uncemented	31	2 665	2 698	0	0	**2 698**
CR cemented	2 169	2	2 172	0	0	**2 172**
PS cemented	721	3	0	724	0	**724**
Legion CR cemented	54	0	54	0	0	**54**
PS Oxinium cemented	41	0	0	42	0	**42**
CR Oxinium cemented	27	1	28	0	0	**28**
Femur cemented	18	0	0	18	0	**18**
Other	3	1	1	1	2	**4**
Unknown	3	0	0	0	0	**3**

Product: Journey II BCS (75)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
Journey II BCS	375	0	0	376	0	**376**
Unknown	1	0	0	0	0	**1**

Product: Attune (83)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR Cemented	1 662	0	1 662	0	0	**1 662**
PS femur Cemented	434	0	0	434	0	**434**
Unknown	2	0	0	0	0	**2**

Product: Persona (84)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR Femoral	431	3	435	0	0	**435**
CR Femoral Porous, Trabecular Metal	4	76	80	0	0	**80**
Other	1	0	0	1	0	**1**
Unknown	6	0	0	0	0	**6**

MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
* Surgeon's report for fixation

Table 6 B: Tibia

Product: NexGen (31)

Product Category	Cemented *	Uncemented *	All poly	Total
Precoat PMMA stemmed cemented	8 390	1	0	**8 391**
Option cemented	7 208	5	0	**7 213**
Trabecular metal uncemented	9	2 417	0	**2 426**
Precoat AP wedge stemmed	192	0	0	**192**
Other	0	4	0	**4**
Unknown	32	3	0	**35**

Table 6 B: Tibia

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	All poly	Total
No keel MBT* cemented	2 526	2	0	**2 529**
MBT* revision	20	0	0	**20**
Other	5	2	0	**7**
Unknown	8	0	0	**8**

* MBT = Mobile bearing tray

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	All poly	Total
With keel MBT* cemented	3 282	10	0	**3 292**
With keel MBT* uncemented	6	2 141	0	**2 147**
All poly	113	0	113	**113**
MBT* revision	74	6	0	**80**
No keel MBT* cemented	3	2	0	**5**
Unknown	22	3	0	**25**

* MBT = Mobile bearing tray

Product: Triathlon (58)

Product Category	Cemented *	Uncemented *	All poly	Total
Cemented	3 142	3	0	**3 145**
PA uncemented	5	846	0	**851**
Tritanium baseplate	2	572	0	**574**
CS All poly, cemented	443	0	443	**443**
Universal cemented	98	0	0	**98**
Other	1	0	1	**1**
Unknown	8	3	0	**11**

Product: Legion (62)

Product Category	Cemented *	Uncemented *	All poly	Total
Male tapered cemented (Genesis II)	5 707	6	0	**5 713**
Porous HA tibial base w/o holes uncemented	1	14	0	**15**
All poly CR	7	0	7	**7**
Other	2	0	2	**2**
Unknown	6	0	0	**6**

Product: Journey II BCS (75)

Product Category	Cemented *	Uncemented *	All poly	Total
Journey II base NP	377	0	0	**377**

Product: Attune (83)

Product Category	Cemented *	Uncemented *	All poly	Total
FB Tib base with S+ technology	1 718	0	0	**1 718**
FB Tib base	328	0	0	**328**
RP Tib base	15	0	0	**15**
RP Tib base with S+ technology	5	0	0	**5**
Unknown	4	0	0	**4**

Table 6 B: Tibia

Product: Persona (84)

Product Category	Cemented *	Uncemented *	All poly	Total
Stemmed 5 Degree Tibia	507	0	0	**507**
Two-Peg Trabecular Metal Tibia	0	9	0	**9**
Unknown	6	0	0	**6**

All poly = All polyethylene tibial component
MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
* Surgeon's report for fixation

Table 6 C: Foring Tibia Insert

Product: NexGen (31)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR-Flex	0	0	13 305	0	0	**13 305**
CR-Prolong	0	2 577	2 577	0	0	**2 577**
LPS-FlexFixed	0	0	0	2 118	0	**2 118**
LCCK	0	0	0	0	175	**175**
LPS-flex	0	26	0	26	0	**26**
CR	0	0	11	0	0	**11**
Unknown	0	0	0	0	0	**46**

Product: LCS Complete (48)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Rotating platform RP	2 547	0	2 547	0	0	**2 547**
Other	3	0	0	0	3	**3**
Unknown	6	0	0	6	0	**6**

Product: PFC-Sigma (49)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Rotating platform RP-CV	5 458	0	5 458	0	0	**5 458**
Revision TC3	34	0	0	0	34	**34**
Revision STB	31	0	0	31	0	**31**
Other	0	0	1	0	0	**1**
Unknown	0	0	0	0	0	**10**

Product: Triathlon (58)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR-X3 HXLPE	0	2 306	2 306	0	0	**2 306**
CR-X3 HXLPE, EtO sterilized	0	1 116	1 080	36	0	**1 116**
CS-X3 HXLPE	0	860	860	0	0	**860**
CS-X3 HXLPE, EtO sterilized	0	215	215	0	0	**215**
PS-X3 HXLPE	0	94	0	94	0	**94**
PS	0	0	0	43	0	**43**
TS-X3 HXLPE	0	31	0	0	31	**31**
Other	0	2	3	0	2	**5**
Unknown	0	9	0	0	0	**9**

Table 6 C: Foring Tibia Insert

Product: Legion (62)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR standard	0	0	3 212	0	0	**3 212**
Dished	0	0	1 624	0	0	**1 624**
PS	0	0	0	383	0	**383**
PS high flex	0	334	0	334	0	**334**
CR-highflex HXLPE	0	102	102	0	0	**102**
Constrained	0	0	0	0	64	**64**
Other	0	1	1	0	0	**1**
Unknown	0	14	0	0	0	**14**

Product: Journey II BCS (75)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Journey II BCS, XLPE	0	377	0	377	0	**377**

Product: Attune (83)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR FB insert	0	1 638	1 638	0	0	**1 638**
PS FB insert	0	435	0	435	0	**435**
CR RP insert	19	19	19	0	0	**19**
Other	3	3	0	3	0	**3**
Unknown	0	4	0	0	0	**4**

Product: Persona (84)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR Articular Surface	0	0	412	0	0	**412**
Medial congruent bearing	0	57	57	0	0	**57**
UC Articular Surface	0	0	53	0	0	**53**

HXLPE = Highly cross linked polyethylene
MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized

Total prostheses

Table 7a: Cemented femoral prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen	2 386	1 436	2 201	2 313	2 047	1 794	1 853	2 139	1 611	1 673	**19 453**
LCS Complete	7 853	625	590	587	567	558	313	140	93	25	**11 351**
Profix	9 170	598	112		1						**9 881**
Triathlon	991	183	195	257	449	404	381	502	802	797	**4 961**
LCS	4 164										**4 164**
PFC-Sigma	5	288	428	428	473	455	548	478	327	431	**3 861**
Legion	3	10	252	350	324	343	397	452	468	730	**3 329**
AGC Universal	3 085	27									**3 112**
Genesis I	3 100										**3 100**
Duracon	2 575										**2 575**
Attune					44	122	424	484	465	559	**2 098**
AGC Anatomic	1 725										**1 725**
Tricon -C with Pro-Fit	1 079										**1 079**
Vanguard TM	561	146	65	65	42	2					**881**
E-motion	461										**461**
Persona					12	78	60	72	126	87	**435**
Kinemax	411										**411**
Journey II BCS			7	69	57	31	6	35	81	96	**382**
Advance	247	51	12								**310**
NexGen Rotating Hinge	50	4	19	29	25	29	25	23	29	34	**267**
Scorpio	126										**126**
Evolution Medial-Pivot				10	19	26	42	1			**98**
Tricon M	47										**47**
AGC Dual	43										**43**
Search	40										**40**
GMK Sphere					18	16	3			1	**38**
Legion Hinge Knee				3	5	1	3	5	4	10	**31**
Interax I.S.A.	24										**24**
S-ROM Rotat. Hinge	1			1		2	1	1	8	7	**21**
RT-Plus Modular	12	4						1			**17**
Other (n<15)	58	2	2		2	1	1	2	5	4	**77**
Total	**38 217**	**3 374**	**3 883**	**4 112**	**4 085**	**3 862**	**4 057**	**4 335**	**4 019**	**4 454**	**74 398**

Table 7b: Uncemented femoral prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen	81	174	234	382	652	814	815	726	679	747	**5 304**
Profix	4 323	443	19								**4 785**
Legion		126	422	401	448	421	367	420	360	255	**3 220**
PFC-Sigma		165	278	300	280	283	314	443	420	462	**2 945**
LCS Complete	1 734	177	121	88	51	55	52	15		12	**2 305**
Triathlon	67	62	33	41	57	203	257	259	293	418	**1 690**
LCS	652										**652**
Tricon M	288										**288**
Genesis I	192										**192**
Duracon	163										**163**
Interax I.S.A.	81										**81**
Persona								2	26	51	**79**
Kotz	29										**29**
Other (n<15)	22		1					1	1	11	**36**
Total	**7 632**	**1 147**	**1 108**	**1 212**	**1 488**	**1 776**	**1 805**	**1 866**	**1 779**	**1 956**	**21 769**

* Surgeon's report for fixation

Total prostheses

Table 8a: Cemented femoral prostheses in revisions *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen LCCK Option	119	84	73	79	80	79	86	59	62	31	**752**
Profix	517	36	4								**557**
NexGen Rotating Hinge	77	18	47	53	53	39	26	64	48	52	**477**
LCS Complete	316	24	16	11	16	23	24	17	10	3	**460**
NexGen	157	22	29	40	26	38	42	37	37	25	**453**
Legion		1	18	33	30	46	53	62	50	54	**347**
Triathlon TS	35	26	13	12	6	20	28	31	37	30	**238**
Genesis I	207										**207**
PFC-Sigma		9	15	20	27	15	26	30	17	28	**187**
LCS	172										**172**
Triathlon	22	8	11	11	11	11	12	8	11	11	**116**
Scorpio TS	76										**76**
LCS Complete VVS	39	3	12	5	5	1	4		1		**70**
Vanguard TM	65	2									**67**
Duracon	64										**64**
AGC Dual	62										**62**
AGC Universal	61	1									**62**
Legion Hinge Knee			1	7	8	9	5	3	6	19	**58**
Profix constrained	42	1	2								**45**
S-ROM Rotat. Hinge	13		3	1	3	7	6	2	1	1	**37**
Legion constrained	17	4	3	2	3	1	2	1			**33**
Dual Articular 2000	30										**30**
RT-Plus Modular	12	9	1							1	**23**
Tricon -C with Pro-Fit	20										**20**
AGC Anatomic	19										**19**
Scorpio	18										**18**
E-motion	16										**16**
Kinemax	16										**16**
Other (n<15)	85	2	2		4	10	4	7	7	14	**135**
Total	**2 277**	**250**	**250**	**274**	**272**	**299**	**318**	**321**	**287**	**269**	**4 817**

Table 8b: Uncemented femoral prostheses in revisions *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Profix	73	6									**79**
LCS Complete	45	8	2		2	1	2	2			**62**
PFC-Sigma		3	6	4	3	4	7	6	5	5	**43**
Legion		1	5	6	5	4	5	1	4	6	**37**
NexGen	4	1	1	2	1	7	4	4	1	5	**30**
LCS Complete VVS	9	7	1								**17**
Other (n<15)	31	1	1	1	4	1	3	2		2	**46**
Total	**162**	**27**	**16**	**13**	**15**	**17**	**21**	**15**	**10**	**18**	**314**

* Surgeon's report for fixation

Table 9a: Cemented tibial prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen	2 395	1 544	2 366	2 513	2 363	2 206	2 223	2 518	1 939	2 065	**22 132**
Profix	12 735	908	113		1						**13 757**
LCS Complete	8 503	744	712	674	618	615	364	155	94	37	**12 516**
Legion	3	136	672	751	772	764	760	866	826	981	**6 531**
Triathlon	1 008	228	229	294	458	408	399	521	812	807	**5 164**
AGC Universal	4 483	26									**4 509**
LCS	4 351										**4 351**
PFC-Sigma	5	321	477	473	506	465	565	616	391	484	**4 303**
Genesis I	3 284										**3 284**
Duracon	2 704										**2 704**
Attune					44	122	424	483	454	543	**2 070**
Tricon II	1 346										**1 346**
Vanguard TM	561	145	65	65	42	2					**880**
Persona					12	78	61	74	152	129	**506**
E-motion	468										**468**
Kinemax	411										**411**
Journey II BCS			7	70	57	31	6	35	81	96	**383**
LCS Universal	372										**372**
AGC Anatomic	329	1									**330**
Advance	247	51	12								**310**
NexGen Rotating Hinge	49	4	19	29	25	29	26	23	29	34	**267**
Scorpio	126										**126**
Interax I.S.A.	106										**106**
Evolution Medial-Pivot				10	19	26	42	1			**98**
Search	40										**40**
GMK Sphere					18	16	3			1	**38**
Legion Hinge Knee				3	5	1	3	5	4	11	**32**
ATTUNE-REVISION								1	12	18	**31**
AGC Dual	28										**28**
RT-Plus Modular	12	4						1			**17**
Other (n<15)	73	3	3		2	1	1	2	3	2	**90**
Total	**43 639**	**4 115**	**4 675**	**4 882**	**4 942**	**4 764**	**4 877**	**5 301**	**4 797**	**5 208**	**87 200**

Table 9b: Uncemented tibial prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen	68	68	69	182	340	402	447	350	351	356	**2 633**
PFC-Sigma		132	230	257	247	273	300	306	363	416	**2 524**
Triathlon	48	17		4	50	199	239	241	283	408	**1 489**
LCS Complete	1 035	58			1		2				**1 096**
Profix	753	134	18								**905**
LCS	141										**141**
Tricon II	66										**66**
Duracon	28										**28**
Kotz	27										**27**
Legion			2	1	2		4	6	3	4	**22**
Other (n<15)	13							1		19	**33**
Total	**2 179**	**409**	**319**	**444**	**640**	**874**	**992**	**904**	**1 000**	**1 203**	**8 964**

* Surgeon's report for fixation

Table 10a: Cemented tibial prostheses in revisions *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen	280	111	110	122	114	124	132	97	94	55	**1 239**
LCS Complete	484	39	40	24	25	33	38	21	14	5	**723**
Profix	633	44	7	1	1	1					**687**
NexGen Rotating Hinge	75	18	47	51	51	39	24	62	48	52	**467**
Legion	17	6	26	40	38	48	64	57	47	55	**398**
Triathlon	60	35	24	24	20	31	44	43	49	43	**373**
Genesis I	257										**257**
LCS	232										**232**
PFC-Sigma		8	13	21	32	22	31	32	21	33	**213**
Duracon	110	7									**117**
Scorpio	97			1							**98**
AGC Universal	77										**77**
Vanguard TM	64	3									**67**
AGC Dual	59										**59**
Legion Hinge Knee			1	7	8	9	5	3	6	20	**59**
Tricon II	57										**57**
Dual Articular 2000	29										**29**
RT-Plus Modular	12	9	1								**22**
ATTUNE-REVISION							1		9	12	**22**
Maxim	20										**20**
E-motion	18										**18**
Kinemax	16										**16**
Other (n<15)	77	3	3		4	11	4	7	2	5	**116**
Total	**2 674**	**283**	**272**	**291**	**293**	**318**	**343**	**322**	**290**	**280**	**5 366**

Table 10b: Uncemented tibial prostheses in revisions *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
LCS Complete	44	16	6	1							**67**
PFC-Sigma		4	7	3	1	6	8	3	1		**33**
Other (n<15)	14		1	2	6	1	1	1	3	2	**31**
Total	**58**	**20**	**14**	**6**	**7**	**7**	**9**	**4**	**4**	**2**	**131**

* Surgeon's report for fixation

Table 10c: Material in tibia insert for total prostheses in primary operations

Prosthesis	Material	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Advance	Uhmwpe	245	51	12								**308**
AGC	Uhmwpe	4 822	27									**4 849**
AGC Dual	Uhmwpe	36										**36**
Attune	HXLPE					44	122	424	484	466	559	**2 099**
ATTUNE-REVISION	HXLPE										2	**2**
Dual Articular 2000	Uhmwpe	4										**4**
Duracon	Uhmwpe	2 750										**2 750**
E-motion	Uhmwpe	468										**468**
Evolution Medial-Pivot	Uhmwpe				10	19	26	42	1			**98**
Freemann/Samuelson	Uhmwpe	4										**4**
Genesis I	Uhmwpe	3 284										**3 284**
GMK Sphere	Uhmwpe					18	16	3			11	**48**
INTERAX I.S.A.	Uhmwpe	103										**103**
Journey II BCS	HXLPE			7	70	57	31	6	35	81	97	**384**
Kinemax	Uhmwpe	410										**410**
LCS	Uhmwpe	4 481										**4 481**
LCS Complete	Uhmwpe	9 566	802	712	675	618	613	365	155	93	37	**13 636**
LCS Universal	Uhmwpe	383										**383**
Legion	HXLPE		7	13	29	18	44	62	104	57	137	**471**
Legion	Uhmwpe	2	129	658	721	752	720	701	768	772	848	**6 071**
MAXIM	Uhmwpe	5										**5**
MG II	Uhmwpe	1										**1**
Mutars	Uhmwpe	9	1	1				1	1	3		**16**
NexGen	HXLPE	32	54	120	152	292	493	498	522	311	335	**2 809**
NexGen	Uhmwpe	2 449	1 558	2 315	2 543	2 411	2 115	2 168	2 346	1 979	2 087	**21 971**
NexGen Rotating Hinge	Uhmwpe	50	4	19	29	24	29	25	23	29	34	**266**
Persona	HXLPE									4	53	**57**
Persona	Uhmwpe					12	78	61	74	148	85	**458**
PFC-Sigma	Uhmwpe	5	453	707	729	753	738	865	921	747	893	**6 811**
PROFIX	Uhmwpe	13 511	1 042	131		1						**14 685**
RT-Plus Modular	Uhmwpe	12	4						1			**17**
Scan Knee	Uhmwpe	8										**8**
Scorpio	HXLPE	18										**18**
Scorpio	Uhmwpe	109										**109**
Search	Uhmwpe	40										**40**
S-ROM Rotating Hinge	Uhmwpe	1			1		2	1	1	8	7	**21**
Triathlon	HXLPE	852	241	222	295	499	601	633	743	862	1 000	**5 948**
Triathlon	Uhmwpe	206	4	7	3	9	6	5	19	233	215	**707**
Tricon II	Uhmwpe	1 410										**1 410**
Vanguard 360 Revision	Uhmwpe	2										**2**
Vanguard TM	Uhmwpe	236	134	62	65	42	2					**541**
Total		**45 514**	**4 511**	**4 986**	**5 322**	**5 569**	**5 636**	**5 860**	**6 198**	**5 793**	**6 400**	**95 789**

* Surgeon's report for fixation

Figure 16: Material in tibia insert for total prostheses in primary operations

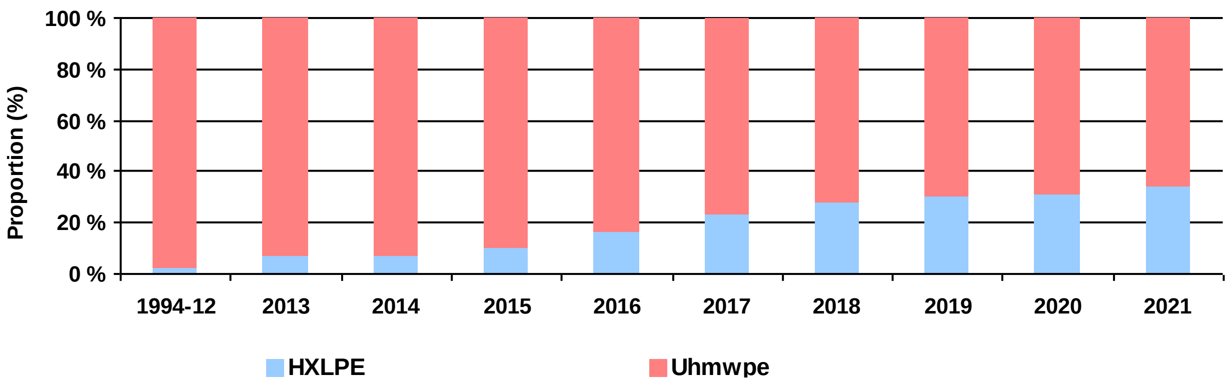
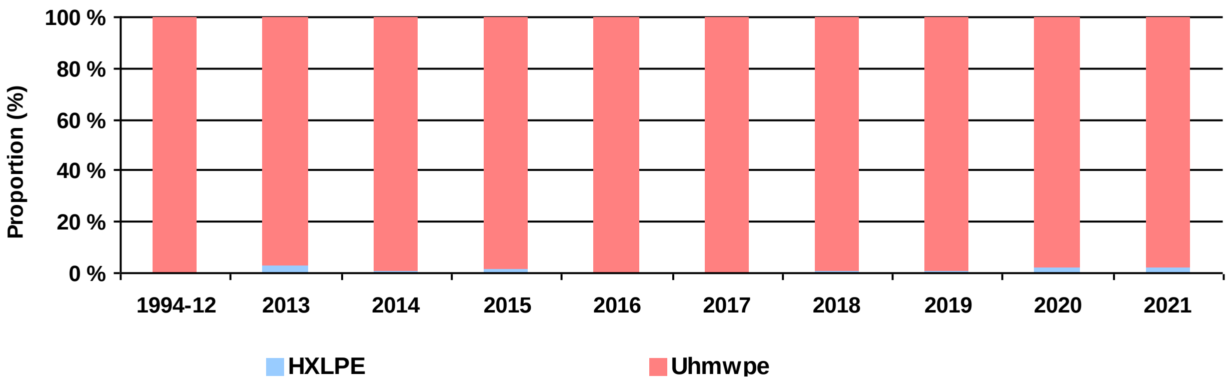


Table 10d: Material in tibia insert for unicondylar knee prostheses in primary operations

Prosthesis	Material	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Genesis UNI	Uhmwpe	231										**231**
iBalance UKA	Uhmwpe							12		10	9	**31**
Journey Uni	Uhmwpe			3	2	6	2					**13**
Miller-Galante UNI	Uhmwpe	184										**184**
Oxford Partial Knee	Uhmwpe	111	206	374	523	634	557	762	951	801	944	**5 863**
Oxford UNI (III)	Uhmwpe	4 543	232	205	191	202	292	204				**5 869**
Oxford UNI II	Uhmwpe	46										**46**
Persona Partial Knee	HXLPE								11	19	26	**56**
Preservation Uni	Uhmwpe	69										**69**
Sigma High Performance Uni	HXLPE	14	11	6	9	3	1	5				**49**
Thriathlon PKR - UNI	HXLPE		3									**3**
Total		**5 198**	**452**	**588**	**725**	**845**	**852**	**983**	**962**	**830**	**979**	**12 414**

* Surgeon's report for fixation

Figure 17: Material in tibia insert for unicondylar knee prostheses in primary operations



Unicondylar knee prostheses

Table 11a: Cemented femoral prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Oxford UNI (III)	4 546	233	198	136	18	1					**5 132**
Oxford Partial Knee	107	205	374	517	631	551	575	591	604	622	**4 777**
Genesis UNI	332										**332**
Miller-Galante UNI	294										**294**
MOD III uni	198										**198**
Preservation Uni	166										**166**
LINK Schlitten UNI	26	21	15	17	17	14	8	11	7	6	**142**
Journey Uni	21	3	6	13	7	2					**52**
Duracon uni	50										**50**
Sigma High Performance Uni	14	11	6	9	3	1	5				**49**
Oxford UNI II	45										**45**
iBalance UKA							12		10	9	**31**
ZUK (Unicondylar)	27										**27**
Other (n<15)	17	3								2	**22**
Total	**5 843**	**476**	**599**	**692**	**676**	**569**	**600**	**602**	**621**	**639**	**11 317**

Table 11b: Uncemented femoral prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Oxford Partial Knee	2		7	61	187	299	400	380	200	322	**1 858**
Other (n<15)										2	**2**
Total	**2**	**0**	**7**	**61**	**187**	**299**	**400**	**380**	**200**	**324**	**1 860**

Table 12a: Cemented tibial prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Oxford UNI (III)	4 546	232	199	131	24	3	1				**5 136**
Oxford Partial Knee	107	206	373	521	628	545	573	601	600	626	**4 780**
Genesis UNI	332										**332**
Miller-Galante UNI	282										**282**
MOD III uni	199										**199**
Preservation Uni	165										**165**
LINK Schlitten UNI	26	21	15	17	17	14	8	11	7	6	**142**
Journey Uni	21	3	6	13	7	2					**52**
Duracon uni	49										**49**
Sigma High Performance Uni	14	11	6	9	3	1	5				**49**
Oxford UNI II	46										**46**
iBalance UKA							12		10	9	**31**
ZUK (Unicondylar)	27										**27**
Other (n<15)	15	3								2	**20**
Total	**5 829**	**476**	**599**	**691**	**679**	**565**	**599**	**612**	**617**	**643**	**11 310**

Table 12b: Uncemented tibial prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Oxford Partial Knee	1		7	62	184	303	401	371	204	319	**1 852**
PFC-Sigma										1	**1**
Total	**1**	**0**	**7**	**62**	**184**	**303**	**401**	**371**	**204**	**320**	**1 853**

* Surgeon's report for fixation

Patellofemoral prostheses

Table 13a: Cemented femoral prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen PFJ Gender	26	16	19	32	49	53	45	35	29	61	**365**
Journey PFJ	96	18	22	7	18	17	10	16	11	9	**224**
Patella Mod III / II	29										**29**
LCS PFJ	18										**18**
iBalance PFJ							3	2	3		**8**
Legion						5					**5**
Other (n<5)	8	4									**12**
Total	**177**	**38**	**41**	**39**	**67**	**75**	**58**	**53**	**43**	**70**	**661**

Patellofemoral femoral prostheses in primary operations are all cemented

Table 14a: Cemented patella prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
NexGen PFJ Gender	26	16	19	31	48	53	45	34	29	61	**362**
Journey PFJ	94	18	22	7	18	22	10	16	11	9	**227**
Patella Mod III / II	31										**31**
LCS PFJ	11										**11**
iBalance PFJ							2	2	3		**7**
Other (n<5)	7	4		1	1			1			**14**
Total	**169**	**38**	**41**	**39**	**67**	**75**	**57**	**53**	**43**	**70**	**652**

Table 14b: Uncemented patella prostheses in primary operations *

Prosthesis	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
LCS PFJ	6										**6**
LCS Complete	1										**1**
Total	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**

* Surgeon's report for fixation

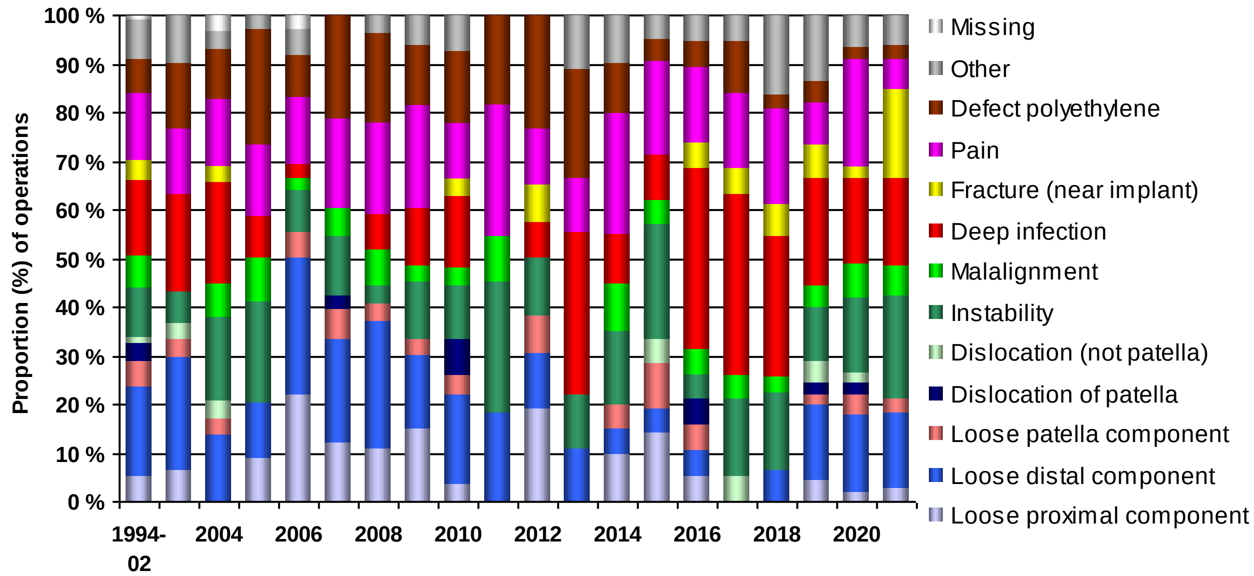
Reasons for revisions

Table 15: Reasons for revisions of primary total knee prostheses with patella

Year of revision	Loose proximal comp.	Loose distal comp.	Loose patella comp.	Dislocation of patella	Dislocation (not patella)	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2021	1	5	1	0	0	7	2	6	6	2	1	2	0
2020	1	7	2	1	1	7	3	8	1	10	1	3	0
2019	2	7	1	1	2	5	2	10	3	4	2	6	0
2018	0	2	0	0	0	5	1	9	2	6	1	5	0
2017	0	0	0	0	1	3	1	7	1	3	2	1	0
2016	1	1	1	1	0	1	1	7	1	3	1	1	0
2015	3	1	2	0	1	5	1	2	0	4	1	1	0
2014	2	1	1	0	0	3	2	2	0	5	2	2	0
2013	0	1	0	0	0	1	0	3	0	1	2	1	0
2012	5	3	2	0	0	3	0	2	2	3	6	0	0
2011	0	2	0	0	0	3	1	0	0	3	2	0	0
2010	1	5	1	2	0	3	1	4	1	3	4	2	0
2009	5	5	1	0	0	4	1	4	0	7	4	2	0
2008	3	7	1	0	0	1	2	2	0	5	5	1	0
2007	4	7	2	1	0	4	2	0	0	6	7	0	0
2006	8	10	2	0	0	3	1	1	0	5	3	2	1
2005	3	4	0	0	0	7	3	3	0	5	8	1	0
2004	0	4	1	0	1	5	2	6	1	4	3	1	1
2003	2	7	1	0	1	2	0	6	0	4	4	3	0
1994-02	12	43	12	8	3	24	15	36	9	32	16	19	2
Total	**53**	**122**	**31**	**14**	**10**	**96**	**41**	**118**	**27**	**115**	**75**	**53**	**4**

Revision causes are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Figure 18: Reasons for revisions of primary total knee prostheses with patella



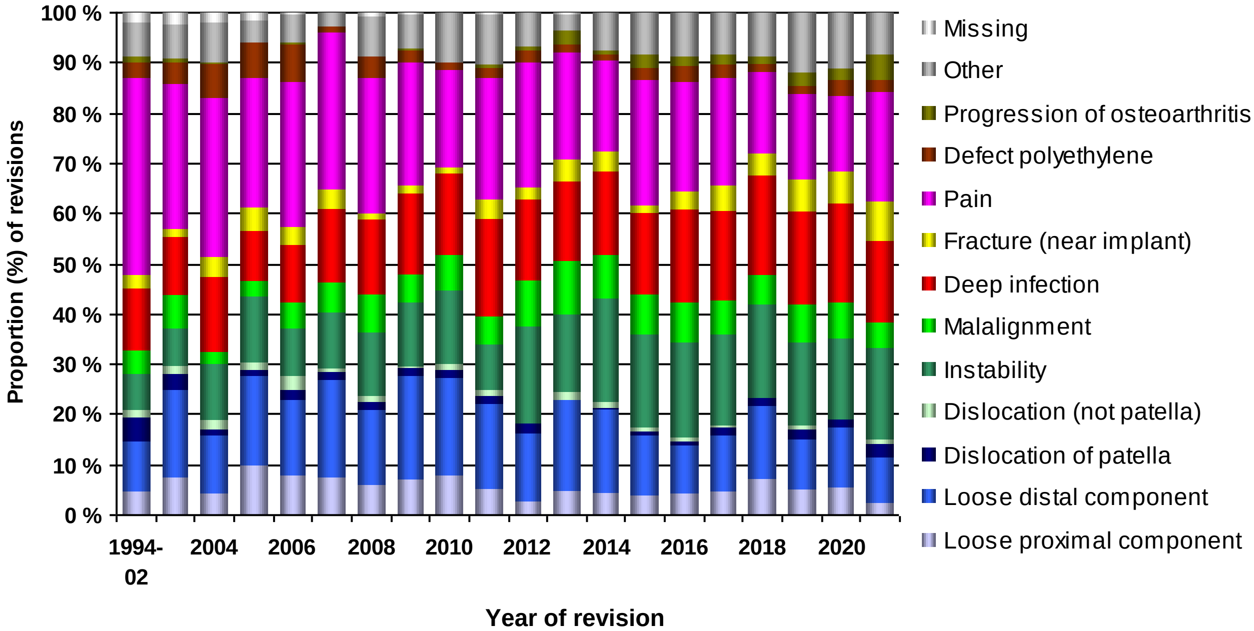
Reasons for revisions

Table 16: Reasons for revisions of primary total knee prostheses without patella

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation of patella	Dislocation (not patella)	Instability	Malalignment	Deep infection	Fracture (near implant)	Fracture osteosynthesis	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021	11	42	13	3	84	23	74	15	21	101	11	22	39	0
2020	21	46	6	0	63	27	76	13	11	58	12	10	42	0
2019	21	42	9	3	69	32	78	16	11	71	7	12	49	0
2018	32	67	7	1	84	26	90	15	5	74	8	6	40	0
2017	20	49	6	3	78	30	77	20	3	92	13	8	36	0
2016	19	39	3	3	81	33	78	9	5	92	13	8	37	0
2015	15	47	3	3	73	30	63	7		97	9	10	33	0
2014	16	60	2	4	75	31	61	14		67	4	2	28	0
2013	15	58	1	5	49	34	51	14		68	6	8	11	1
2012	8	42	7	0	60	28	51	7		77	8	2	21	0
2011	16	54	5	3	29	17	62	12		76	6	3	31	1
2010	21	51	4	4	38	19	43	3		52	4		26	0
2009	20	60	4	2	36	16	47	5		71	6	1	20	1
2008	15	39	4	3	32	19	39	3		69	11		20	2
2007	13	33	3	1	19	10	25	7		53	2		5	0
2006	14	26	3	5	16	9	20	6		50	13	1	9	1
2005	13	23	2	2	17	4	13	6		34	9		6	2
2004	7	19	2	3	18	4	24	7		51	11	1	13	3
2003	10	23	4	2	10	9	15	2		38	6	1	9	3
1994-02	21	44	21	8	32	21	54	12		176	14	6	30	8
Total	**328**	**864**	**109**	**58**	**963**	**422**	**1 041**	**193**	**56**	**1 467**	**173**	**101**	**505**	**22**

Revision causes are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Figure 19: Reasons for revisions of primary total knee prostheses without patella



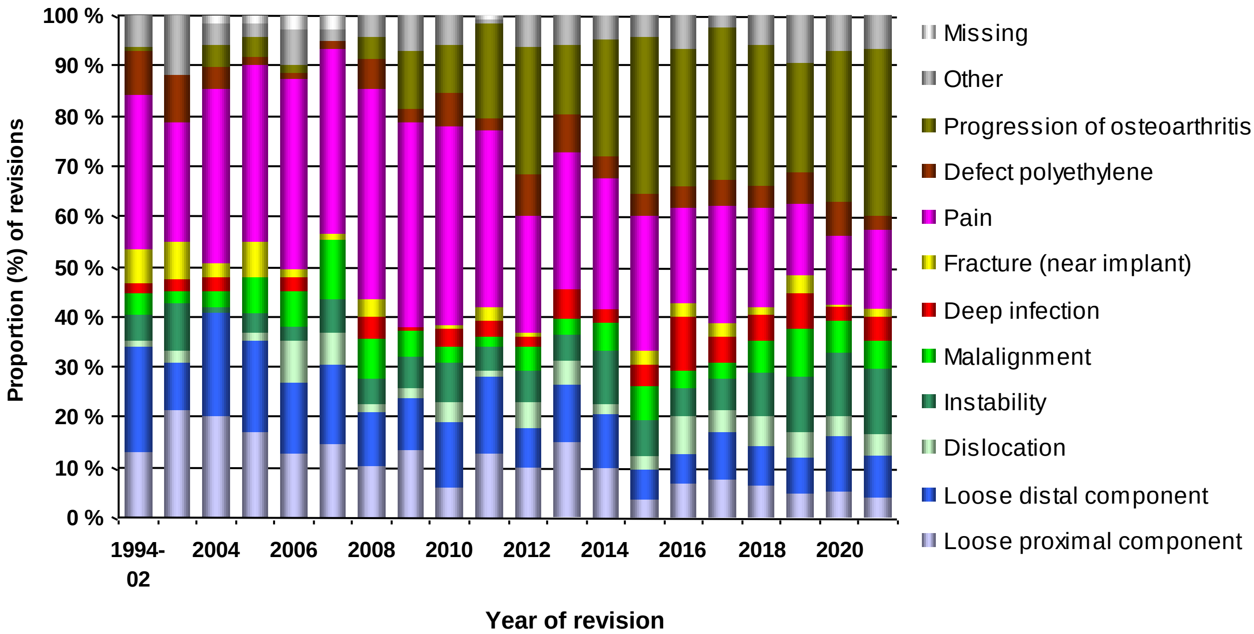
Reasons for revisions

Table 17: Reasons for revisions of primary unicondylar knee prostheses

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021	6	12	6	19	8	7	2	23	4	48	10	0
2020	8	17	6	19	10	4	1	21	10	46	11	0
2019	9	13	9	20	18	13	6	26	12	40	17	0
2018	12	15	11	16	12	10	3	37	8	53	11	0
2017	12	15	7	10	5	8	4	37	8	48	4	0
2016	9	8	10	7	5	14	4	25	6	36	9	0
2015	5	8	4	10	9	6	4	37	6	43	6	0
2014	14	15	3	15	8	4	0	37	6	33	7	0
2013	18	14	6	6	4	7	0	33	9	17	7	0
2012	13	10	7	8	6	3	1	30	11	33	8	0
2011	15	18	1	6	2	4	3	41	3	22	1	1
2010	7	15	5	9	4	4	1	46	8	11	7	0
2009	19	14	3	9	7	1	0	57	4	16	10	0
2008	12	12	2	6	9	5	4	48	7	5	5	0
2007	11	12	5	5	9	0	1	28	1		2	2
2006	9	10	6	2	5	2	1	27	1	1	5	2
2005	12	13	1	3	5	0	5	25	1	3	2	1
2004	14	14	0	1	2	2	2	24	3	3	3	1
2003	9	4	1	4	1	1	3	10	4		5	0
1994-02	18	29	2	7	6	3	9	43	12	1	9	0
Total	**232**	**268**	**95**	**182**	**135**	**98**	**54**	**655**	**124**	**459**	**139**	**7**

Revision causes are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Figure 20: Reasons for revisions of primary unicondylar knee prostheses

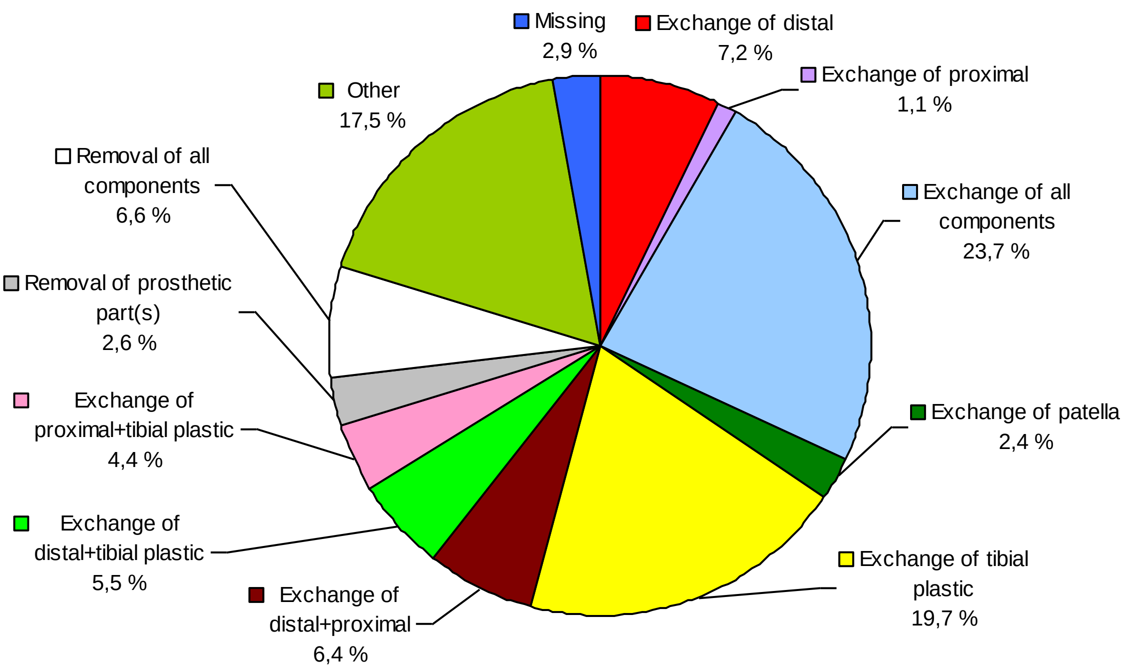


Type of revision

Table 18: Total knee prostheses with patella in first reoperation after primary surgery

Year of primary operation	Exchange of distal	Exchange of distal+tibial plastic	Exchange of distal+ proximal	Exchange of whole prosthesis	Exchange of patella	Exchange of tibial plastic	Exchange of proximal	Exchange of proximal+tibial plastic	Removal of whole prosthesis	Removal of prosthetic part(s)	Other	Missing	Total
2021				1		2					2	1	**6**
2020						4		1			3		**8**
2019		2		4		8		2			7		**23**
2018		5		4		5		3					**18**
2017		4		2		7		3			5	1	**22**
2016		1		1		8					5		**15**
2015					2	1					4		**7**
2014		2				3					2	1	**8**
2013				1		2						1	**4**
2012		1	1	1		1							**4**
2011						3					1		**4**
2010				1		1					1		**3**
2009						3		1			2	1	**7**
2008				2		1		1	1			1	**6**
2007				2		2				1			**5**
2006		1			1			1					**4**
2005		1		1	1				1		1	1	**6**
2004		1		2		3		1		1	2		**10**
2003	1	1		6		2			1		2		**13**
1994-02	32	6	28	80	7	34	5	7	27	10	43	6	**287**
Total	**33**	**25**	**29**	**108**	**11**	**90**	**5**	**20**	**30**	**12**	**80**	**13**	**460**

Figure 21: Total knee prostheses with patella in first reoperation after primary surgery

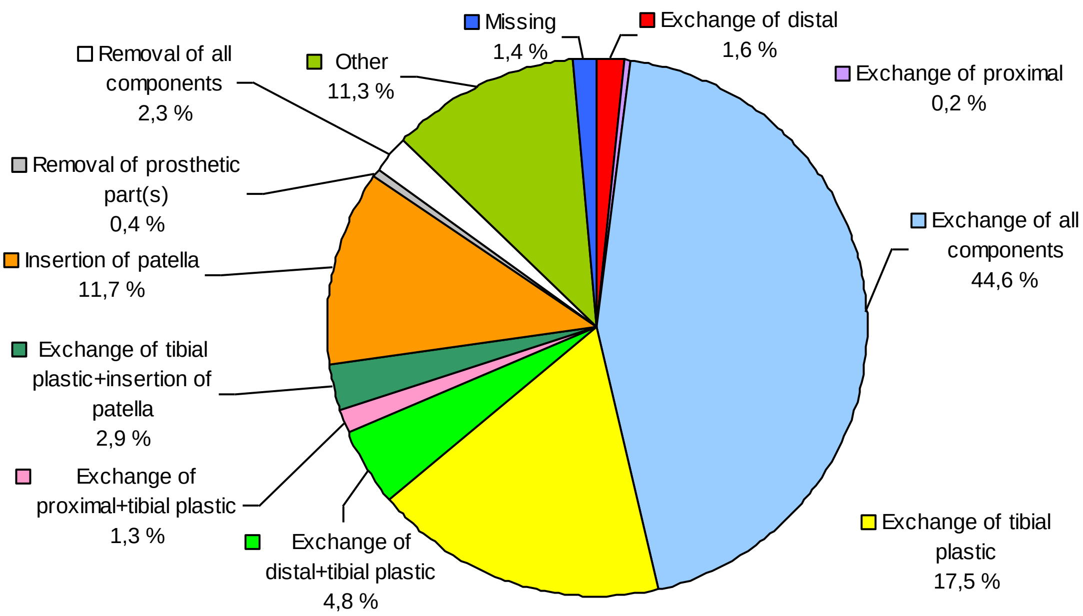


Type of revision

Table 19: Total knee prostheses without patella in first reoperation after primary surgery

Year of primary operation	Exchange of distal + proximal	Exchange of distal+tibial plastic	Exchange of whole prosthesis	Exchange of tibial plastic+inns. patella	Exchange of tibial plastic	Exchange of patella	Exchange of proximal+tibial plastic	Removal of whole prosthesis	Removal of prosthetic part(s)	Insertion of patella	Osteosynthesis	Other	Missing	Total
2021		3	14	1	36		2			2		9	1	**68**
2020		4	22	2	37		3			11	1	23	3	**106**
2019	1	5	57	6	40		6			12	4	30	1	**162**
2018		8	93	6	69		6			14	5	27	2	**230**
2017		17	78	8	68	1	8			23	1	25	4	**233**
2016		8	96	13	62		2	2		9	7	56	7	**262**
2015		8	101	11	70		4			35	2	43	4	**278**
2014		15	127	18	61		1	9	1	21	3	25	4	**285**
2013	1	10	147	11	51		5	2	1	22	4	26	6	**286**
2012	1	22	177	11	52			5	1	18	5	35	7	**334**
2011	1	24	181	11	64	1	2	8		31	2	39	6	**370**
2010	2	23	172	7	47		2	5	2	37	5	26	3	**331**
2009	4	22	179	3	54		6	9	1	29	5	30	3	**345**
2008	2	21	132	9	52		2	9	2	22	1	25	2	**279**
2007	2	14	142	6	35	1	2	6	2	22	4	23	3	**262**
2006	6	11	119	5	21		3	10	1	25	6	16	1	**224**
2005	6	11	86	2	15		2	7		27		25		**181**
2004	9	11	82	4	30		5	9		23		16	3	**192**
2003	5	7	83	1	30		2	13		30		15	2	**188**
1994-02	63	26	425	28	94	1	9	34	13	244	1	65	18	**1 021**
Total	**103**	**270**	**2 513**	**163**	**988**	**4**	**72**	**128**	**24**	**657**	**56**	**579**	**80**	**5 637**

Figure 22: Total knee prostheses without patella in first reoperation after primary surgery

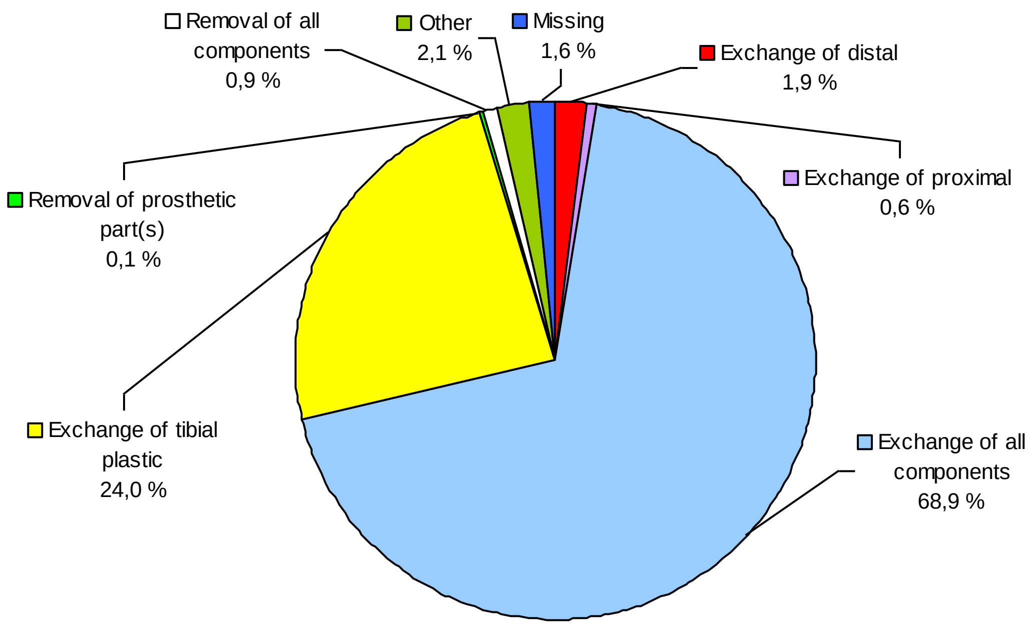


Type of revision

Table 20: Unicondylar prostheses in first reoperation after primary surgery

Year of primary operation	Exchange of distal	Exchange of whole prosthesis	Exchange of tibial plastic	Exchange of proximal	Removal of whole prosthesis	Removal of prosthetic part(s)	Other	Missing	Total
2021		2	12						**14**
2020		8	18				1		**27**
2019	4	26	38				1		**69**
2018		33	36	1				1	**71**
2017	1	21	30					1	**53**
2016	1	37	28				6	1	**73**
2015	1	46	24				2	1	**74**
2014	2	44	10		1		3		**60**
2013		25	24		1		1		**51**
2012	2	50	22	1	1			1	**77**
2011	1	47	16	1			1	1	**67**
2010		65	26				2	1	**94**
2009		71	24		1		1		**97**
2008	1	74	20		2			1	**98**
2007		100	14	1	2		4	2	**123**
2006	1	87	14	1	1		4	2	**110**
2005	2	90	22				1	4	**119**
2004	1	105	16		2			2	**126**
2003	4	119	18	1			8	5	**155**
1994-02	14	253	42	5	6	1	4	7	**332**
Total	**35**	**1 303**	**454**	**11**	**17**	**1**	**39**	**30**	**1 890**

Figure 23: Unicondylar prostheses in first reoperation after primary surgery



ASA classification all knee prostheses

Table 21: Primary operations all knee prostheses

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2021	704	5 053	1 561	11		149	**7 478**
2020	624	4 497	1 397	10		155	**6 683**
2019	720	4 808	1 520	7		198	**7 253**
2018	708	4 608	1 438	7		168	**6 929**
2017	668	4 410	1 275	13		215	**6 581**
2016	707	4 391	1 236	12		168	**6 514**
2015	683	4 153	1 189	7		88	**6 120**
2014	587	3 914	1 058	8		75	**5 642**
2013	551	3 520	896	5	1	68	**5 041**
2012	667	3 277	902	8		63	**4 917**
2011	582	3 023	873	6		65	**4 549**
2010	661	2 845	797	7		90	**4 400**
2009	832	2 745	794	8		94	**4 473**
2005-08	3 216	7 700	2 574	20	2	436	**13 948**

Table 22: Revisions

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2021	25	320	232	12		31	**620**
2020	30	319	200	12		22	**583**
2019	27	369	212	11		32	**651**
2018	39	364	224	11		27	**665**
2017	50	354	192	5	1	29	**631**
2016	27	358	184	2		33	**604**
2015	35	314	180	7		20	**556**
2014	50	297	137	2		13	**499**
2013	45	292	133			12	**482**
2012	52	287	136	3		15	**493**
2011	54	249	119			9	**431**
2010	77	199	121	1		13	**411**
2009	93	212	117	1		15	**438**
2005-08	293	533	284	6		70	**1 186**

Figure 24: Primary operations

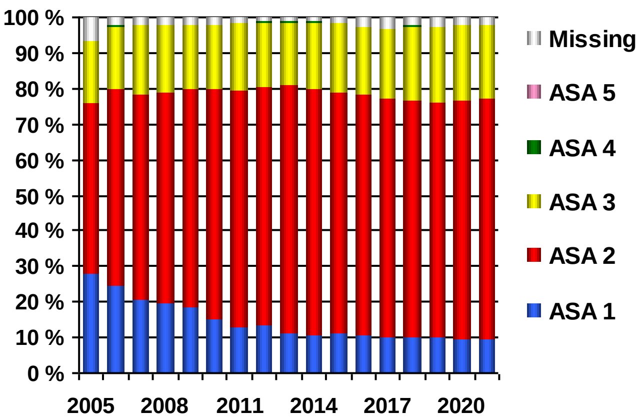
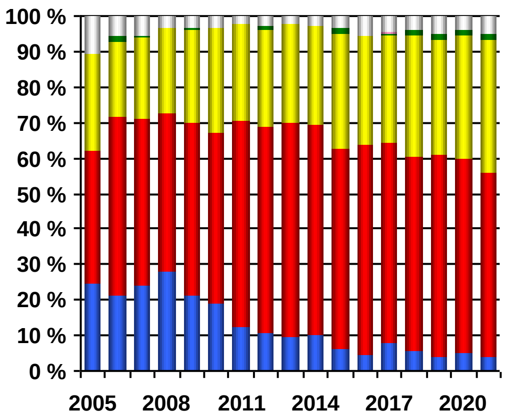


Figure 25: Revisions



ASA 1 = Healthy patients who smoke less than 5 cigarettes a day.
ASA 2 = Patients with an asymptomatic condition who are kept under medical control (f.ex. hypertension), or with diet (f. ex. diabetes mellitus type 2), and otherwise healthy patients who smoke five cigarettes or more daily.
ASA 3 = Patients having a condition that can cause symptoms. However, patients are kept under medical control (f. ex. moderate angina pectoris and mild asthma).
ASA 4 = Patients with a condition that is out of control (f. ex. heart failure and asthma).
ASA 5 = A moribund patient who is not expected to survive the operation.

Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 23: Primary operations

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2021	395	6 276	662	81	64	**7 478**
2020	391	5 602	564	67	59	**6 683**
2019	407	5 890	804	101	51	**7 253**
2018	712	5 306	833	48	30	**6 929**
2017	778	4 896	826	51	30	**6 581**
2016	846	4 793	787	59	29	**6 514**
2015	931	4 299	816	29	45	**6 120**
2014	811	4 015	763	25	28	**5 642**
2013	909	3 352	716	10	54	**5 041**
2012	1 132	2 879	871	7	28	**4 917**
2011	1 271	2 289	952	8	29	**4 549**
2010	1 412	2 408	533	8	39	**4 400**
2009	1 610	2 388	424	10	41	**4 473**
2005-08	7 352	4 151	2 160	40	245	**13 948**

Table 24: Revisions

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2021	75	472	46	15	12	**620**
2020	62	451	43	18	9	**583**
2019	74	478	70	23	6	**651**
2018	83	488	76	11	7	**665**
2017	84	460	75	7	5	**631**
2016	97	426	72	7	2	**604**
2015	65	407	68	11	5	**556**
2014	70	350	67	7	5	**499**
2013	77	317	77	6	5	**482**
2012	105	268	111	6	3	**493**
2011	97	229	100	2	3	**431**
2010	107	227	70	6	1	**411**
2009	93	262	74	4	5	**438**
2005-08	529	380	218	18	41	**1 186**

* Missing information on medication start

Figure 26: Primary operations

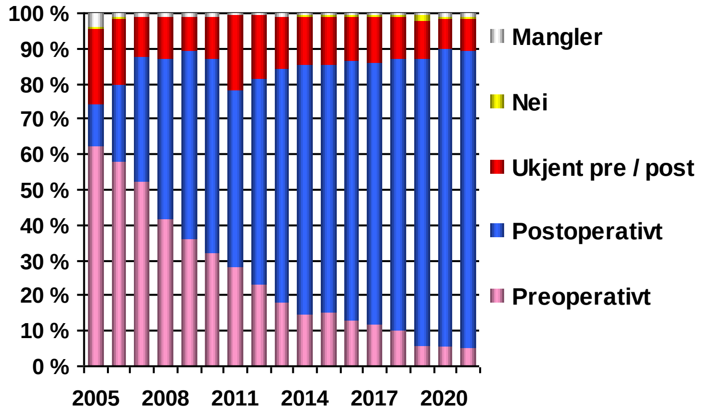
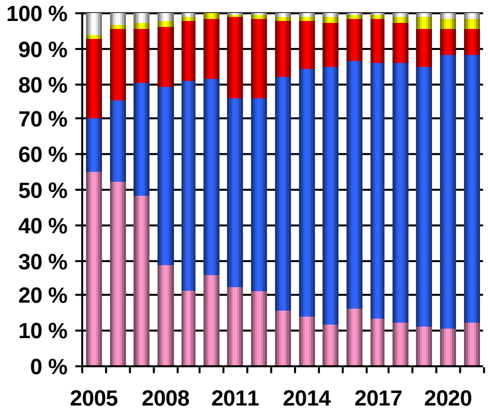


Figure 27: Revisions



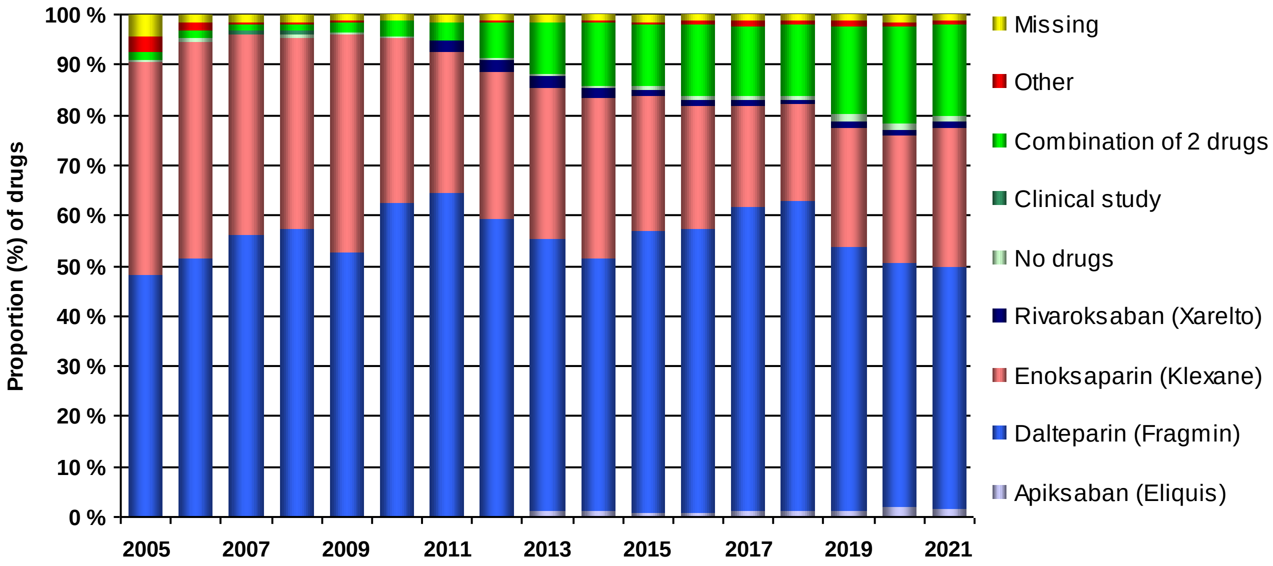
Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 25a: Drugs - All operations

Drugs	2005-11	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)	0,0%	0,0%		0,3%	0,4%	0,6%	0,9%	1,0%	1,0%	1,0%	0,9%
Apiksaban (Eliquis)			1,2%	1,1%	0,9%	1,0%	1,1%	1,3%	1,1%	1,9%	1,8%
Dalteparin (Fragmin)	56,7%	59,2%	54,1%	50,2%	56,2%	56,5%	60,6%	61,5%	52,7%	48,8%	48,2%
Enoksaparin (Klexane)	37,7%	29,3%	29,9%	32,1%	26,8%	24,4%	20,2%	19,3%	23,7%	25,1%	27,4%
Rivaroksaban (Xarelto)	0,4%	2,6%	2,4%	1,8%	1,4%	1,1%	1,1%	1,1%	1,3%	1,2%	1,4%
Ximelagatran (Exanta, Malagatran)	0,4%										
No drugs	0,3%	0,2%	0,3%	0,5%	0,6%	0,9%	0,8%	0,8%	1,6%	1,2%	1,2%
Clinical study	0,3%										
Combination of 2 drugs	2,1%	7,2%	10,2%	12,5%	12,3%	14,2%	13,9%	13,9%	17,3%	19,5%	17,8%
Other	0,2%	0,2%	0,2%	0,2%	0,1%	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%
Missing	1,8%	1,2%	1,6%	1,2%	1,5%	1,2%	1,3%	1,1%	1,3%	1,4%	1,2%

Figure 28: Drugs



Thrombosis prophylaxis

Tablle 25b: Combination of 2 drugs - All operations

Drugs	2005-11	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Enoksaparin + Apiksaban		20,9%	29,4%	27,3%	27,6%	33,8%	33,5%	26,6%	49,1%	48,2%	51,1%
Enoksaparin + Acetylsalicylsyre	38,5%	31,6%	21,6%	19,3%	18,3%	17,8%	15,8%	14,4%	16,3%	16,5%	14,0%
Dalteparin + Apiksaban		2,8%	16,6%	17,8%	17,4%	21,3%	29,8%	28,5%	12,4%	12,8%	12,9%
Dalteparin + Dabigatranetixalat	0,2%	38,5%	25,7%	22,0%	22,4%	14,3%	3,7%	2,2%	0,1%		0,1%
Dalteparin + Acetylsalicylsyre	7,1%	1,5%	1,4%	1,2%			4,4%	15,2%	11,5%	10,5%	5,3%
Dalteparin + Rivaroksaban	1,9%	0,3%	0,2%	0,9%	3,2%	2,6%	4,4%	1,6%	6,9%	10,0%	14,3%
Enoksaparin + Rivaroksaban	0,5%	0,5%	1,1%	7,6%	7,3%	7,3%	6,8%	8,0%	2,0%	0,1%	0,1%
Dalteparin + Warfarin	27,4%	2,8%	1,8%	1,2%	1,0%	0,7%	0,1%	0,2%	0,1%		0,1%
Enoksaparin + Dabigatranetixalat			0,5%	1,3%	1,7%	1,5%	1,3%	3,0%	1,4%	1,8%	2,1%
Enoksaparin + Warfarin	11,7%	0,8%	1,4%	1,0%	0,9%	0,4%	0,1%	0,1%			0,1%
Enoksaparin + Dekstran	8,2%										
Dalteparin + Enoksaparin	1,1%	0,3%	0,4%								0,1%
Dalteparin + Dekstran	1,0%										
Dalteparin + Klopidogrel	0,3%				0,1%	0,1%					
Enoksaparin + Klopidogrel	0,5%					0,1%					
Enoksaparin + Dipyridamol + Acetylsalicylsyre	0,3%			0,1%							
Acetylsalicylsyre + Klopidogrel									0,1%		
Acetylsalicylsyre + Ticagrelor				0,1%							
Dalteparin + Fondaparinuks	0,2%										
Dalteparin + Heparin	0,2%										
Dalteparin + Klinisk studie	0,2%										
Dalteparin + Prasugrel	0,2%										
Dalteparin + Ximelagatran					0,1%						
Dekstran + Apiksaban				0,1%							
Dekstran + Klopidogrel	0,2%										
Dipyridamol + Acetylsalicylsyre							0,1%				
Enoksaparin + Heparin									0,1%		
Enoksaparin + Hydroksyetylstivelse								0,1%			
Enoksaparin + Ximelagatran	0,2%										
Fondaparinuks + Rivaroksaban						0,1%					
Warfarin + Fondaparinuks	0,2%										
Ximelagatran + Pyrazolidon	0,2%										

Thrombosis prophylaxis

Table 26: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2021	2 403	3 908	203	9	505	13	96	961	**8 098**
2020	2 254	3 150	235	11	572	5	85	954	**7 266**
2019	2 197	3 319	394	29	692	9	124	1 140	**7 904**
2018	1 690	3 208	442	142	803	5	59	1 245	**7 594**
2017	1 185	3 202	502	281	781	13	58	1 190	**7 212**
2016	1 178	3 162	551	314	718	38	66	1 091	**7 118**
2015	1 018	2 390	977	326	866	143	40	916	**6 676**
2014	975	1 799	1 024	370	1 065	153	32	723	**6 141**
2013	733	1 595	1 005	398	1 002	120	16	654	**5 523**
2012	584	1 633	1 206	335	890	96	13	653	**5 410**
2011	289	1 345	1 381	403	799	101	10	652	**4 980**
2010	348	1 348	1 321	239	779	52	14	710	**4 811**
2009	398	1 588	1 168	228	762	8	14	745	**4 911**
2005-08	1 901	4 734	2 823	515	2 571	117	58	2 415	**15 134**

Registration of thrombosis prophylaxis started in 2005

Fibrinolysis Inhibitor

Table 27: Drugs - Primary operations

Drugs	2010-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Cyclokapron (Tranexamic acid)	4 869	3 960	4 730	5 324	5 755	5 819	6 187	6 718	6 275	7 041	56 678
Missing	219	92	114	72	63	84	72	66	68	66	916
Total	**5 088**	**4 052**	**4 844**	**5 396**	**5 818**	**5 903**	**6 259**	**6 784**	**6 343**	**7 107**	**57 594**

Registration of fibrinolysis inhibitor started in 2010

Perioperative complications

Table 28: For primary total prostheses (the 10 most common complications)

Type	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Patella tendon rupture / Avulsion fractures / ligament rupture / tendon injury	93	10	21	17	15	6	11	19	17	8	217
Fracture	116	10	8	12	12	10	7	8	7	16	206
Rupture / damage MCL (medial colateral ligament)	39	12	5	5	10	19	18	22	20	15	165
Technical problem with cement	46	6	5	4		1	5	3	2	4	76
Adm. failure (missing comp. etc.)	30	7	2		4	3	7	3	1		57
Problem due to difficult anatomy	26	3	5	5	3	2	4	5		3	56
Blood torniquet failing	43	3		1			1	1	6		55
Failure of instruments	38	3	7	1	1		1				51
Anesthesia problems	22	4	7	4	1	3	3			3	47
Violation of sterility routines	15	7	4	6	1		1	1			35
Other periop. compl.	198	26	30	34	26	22	22	23	19	27	427

Previous operation in relevant joint

Table 29: For primary total prostheses

Type	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Meniscus	4 924	703	769	757	882	737	764	703	635	776	11 650
Osteotomy	2 065	112	134	119	137	111	108	151	113	137	3 187
Arthroscopy (diagnostic)	1 066	97	183	205	194	166	149	93	75	77	2 305
Cruciate Ligament	591	105	104	125	188	119	143	144	146	165	1 830
Osteosynthesis of intraarticular joint fracture	971	60	95	94	98	114	107	109	86	91	1 825
Synovectomy	1 135	64	66	66	41	51	41	32	33	32	1 561
Artrodesis	25	2			2	1	1			2	33
Other previous op.	819	90	89	78	86	120	146	123	125	159	1 835

Mini-invasive surgery

Table 30: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2021	18 (0%)	5 950 (94%)	391 (6%)	**6 359**
2020	8 (0%)	5 316 (92%)	429 (7%)	**5 753**
2019	8 (0%)	5 712 (93%)	452 (7%)	**6 172**
2018	14 (0%)	5 347 (92%)	477 (8%)	**5 838**
2017	9 (0%)	5 035 (90%)	562 (10%)	**5 606**
2016	10 (0%)	4 964 (89%)	576 (10%)	**5 550**
2015	5 (0%)	4 632 (87%)	657 (12%)	**5 294**
2014	2 (0%)	4 325 (87%)	647 (13%)	**4 974**
2013	10 (0%)	3 791 (84%)	716 (16%)	**4 517**
2012	16 (0%)	3 689 (84%)	685 (16%)	**4 390**
2011	15 (0%)	3 582 (88%)	465 (11%)	**4 062**
2010	21 (1%)	3 739 (95%)	185 (5%)	**3 945**
2009	25 (1%)	3 796 (95%)	165 (4%)	**3 986**
2005-08	45 (0%)	##### (94%)	699 (6%)	**12 117**

Figure 29: Primary operations - Total knee prostheses

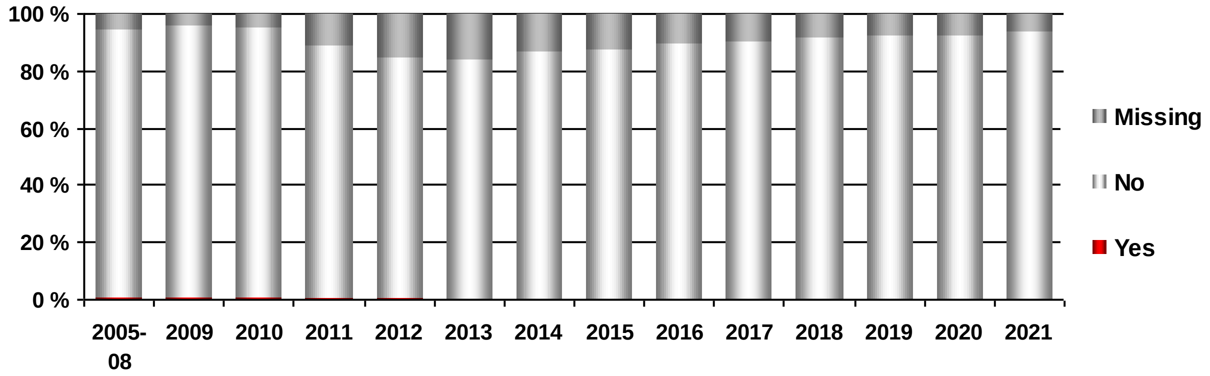


Table 31: Primary operations - Unicondylar knee prostheses

Year	Yes	No	Missing	Total
2021	396 (40%)	559 (56%)	35 (4%)	**990**
2020	320 (38%)	493 (59%)	27 (3%)	**840**
2019	358 (36%)	575 (58%)	61 (6%)	**994**
2018	409 (41%)	555 (56%)	36 (4%)	**1 000**
2017	382 (44%)	429 (49%)	57 (7%)	**868**
2016	318 (37%)	486 (56%)	59 (7%)	**863**
2015	285 (38%)	399 (53%)	69 (9%)	**753**
2014	241 (40%)	280 (46%)	85 (14%)	**606**
2013	224 (47%)	167 (35%)	86 (18%)	**477**
2012	199 (42%)	222 (47%)	54 (11%)	**475**
2011	196 (45%)	191 (44%)	52 (12%)	**439**
2010	196 (47%)	205 (50%)	13 (3%)	**414**
2009	293 (63%)	161 (35%)	9 (2%)	**463**
2005-08	668 (38%)	1 023 (58%)	70 (4%)	**1 761**

Registration of MIS started in 2005

Computernavigation

Table 32: Primary operations - Total knee prostheses

Year	Yes		No		Missing		Total
2021	542	(9%)	5 440	(86%)	377	(6%)	**6 359**
2020	501	(9%)	4 836	(84%)	416	(7%)	**5 753**
2019	514	(8%)	5 224	(85%)	434	(7%)	**6 172**
2018	597	(10%)	4 789	(82%)	452	(8%)	**5 838**
2017	569	(10%)	4 520	(81%)	517	(9%)	**5 606**
2016	584	(11%)	4 413	(80%)	553	(10%)	**5 550**
2015	475	(9%)	4 167	(79%)	652	(12%)	**5 294**
2014	443	(9%)	3 883	(78%)	648	(13%)	**4 974**
2013	390	(9%)	3 404	(75%)	723	(16%)	**4 517**
2012	416	(9%)	3 292	(75%)	682	(16%)	**4 390**
2011	445	(11%)	3 170	(78%)	447	(11%)	**4 062**
2010	659	(17%)	3 101	(79%)	185	(5%)	**3 945**
2009	762	(19%)	3 064	(77%)	160	(4%)	**3 986**
2005-08	1 555	(13%)	9 918	(82%)	644	(5%)	**12 117**

Figure 30: Primary operations - Total knee prostheses

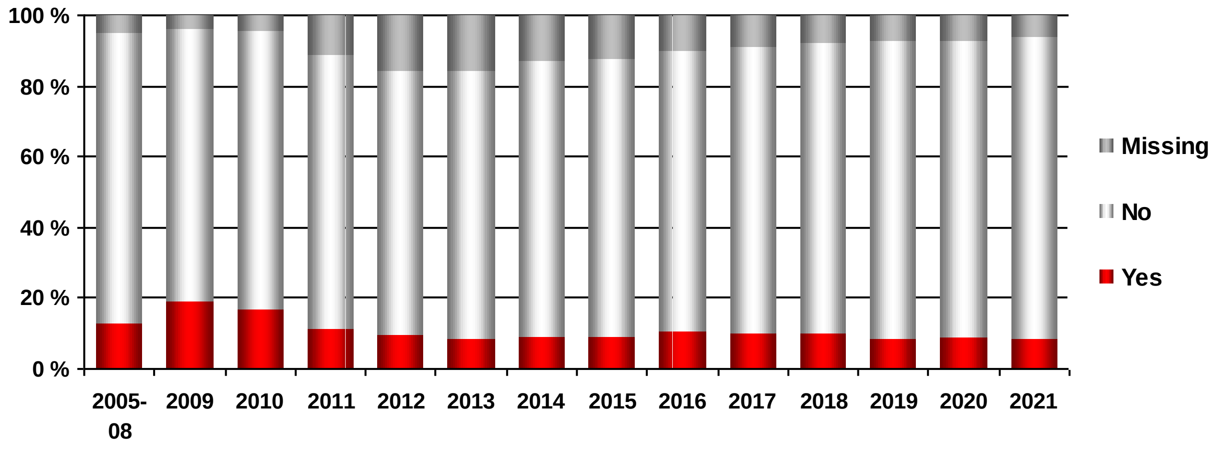


Table 33: Primary operations - Unicondylar knee prostheses

Year	Yes		No		Missing		Total
2021	3	(0%)	951	(96%)	36	(4%)	**990**
2020	3	(0%)	811	(97%)	26	(3%)	**840**
2019	0		930	(94%)	64	(6%)	**994**
2018	1	(0%)	961	(96%)	38	(4%)	**1 000**
2017	0		810	(93%)	58	(7%)	**868**
2016	0		800	(93%)	63	(7%)	**863**
2015	4	(1%)	681	(90%)	68	(9%)	**753**
2014	0		519	(86%)	87	(14%)	**606**
2013	0		389	(82%)	88	(18%)	**477**
2012	0		419	(88%)	56	(12%)	**475**
2011	1	(0%)	387	(88%)	51	(12%)	**439**
2010	7	(2%)	394	(95%)	13	(3%)	**414**
2009	3	(1%)	452	(98%)	8	(2%)	**463**
2005-08	36	(2%)	1 647	(94%)	78	(4%)	**1 761**

Registration of CAOS started in 2005

Cements used in total knee prostheses

Table 34: Primary operations - Femur

Cement	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Palacos R + G	10 117	1 406	1 444	1 479	1 429	1 001	957	633	360	321	**19 147**
Optipac Refobacin Bonecement R	4 585	1 324	1 731	2 150	1 835	1 456	1 473	483			**15 037**
Palacos w/gentamicin	14 677										**14 677**
Palacos R+G pro				5	15	360	1 537	2 920	3 179	3 651	**11 667**
Refobacin Bone Cement R	4 814	349	353	158	551	882	49	1			**7 157**
SmartSet GHV Genta. Smartmix	285	185	269	291	275	246	214	242	299	196	**2 502**
Cemex w/gentamicin	1 169	216	209	160	149	92	43	24	4	1	**2 067**
Refobacin-Palacos	1 577										**1 577**
Optipac Refobacin Bonecement R-3							2	259	373	229	**863**
Simplex w/Tobramycin	674										**674**
Palacos	424										**424**
Cemex System Genta FAST	202										**202**
Palacos R										189	**189**
Simplex	184										**184**
CMW I w/gentamicin	169										**169**
Copal G+ V	1	1	5	5	2	11	6	6	4	12	**53**
CMW I	53										**53**
Other (n<50)	140	6	1	2	2	10	9	8	17	52	**247**
Missing information	63										**63**
Total	**39 134**	**3 487**	**4 012**	**4 250**	**4 258**	**4 058**	**4 290**	**4 576**	**4 236**	**4 651**	**76 952**

Table 35: Primary operations - Tibia

Cement	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Palacos R + G	13 694	2 133	2 186	2 225	2 249	1 143	1 096	730	403	375	**26 234**
Palacos w/gentamicin	17 799										**17 799**
Palacos R+G pro		1	1	5	40	1 132	2 318	4 003	4 145	4 650	**16 295**
Optipac Refobacin Bonecement R	4 956	1 478	1 912	2 324	1 969	1 525	1 558	480			**16 202**
Refobacin Bone Cement R	5 170	394	374	171	567	931	47				**7 654**
SmartSet GHV Genta. Smartmix	295	184	270	293	277	246	214	242	300	198	**2 519**
Cemex w/gentamicin	1 302	214	222	165	150	91	43	24	4	1	**2 216**
Refobacin-Palacos	1 626										**1 626**
Optipac Refobacin Bonecement R-3							2	272	362	222	**858**
Simplex w/Tobramycin	679										**679**
Palacos	452										**452**
Cemex System Genta FAST	283										**283**
CMW I w/gentamicin	194										**194**
Palacos R										189	**189**
Simplex	186										**186**
Copal G+ V	4	1	4	10	3	13	6	7	4	26	**78**
CMW I	54										**54**
Other (n<50)	162	8	2	2	2	17	11	10	17	54	**285**
Missing information	69		1								**70**
Total	**46 925**	**4 413**	**4 972**	**5 195**	**5 257**	**5 098**	**5 295**	**5 768**	**5 235**	**5 715**	**93 873**

Cements used in unicondylar knee prostheses

Table 36: Primary operations - Femur

Cement	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Palacos R + G	1 561	288	390	428	364	169	130	172	127	146	**3 775**
Palacos w/gentamicin	2 211										**2 211**
Optipac Refobacin Bonecement R	567	156	171	228	222	176	250	62			**1 832**
Palacos R+G pro			1		6	110	214	320	413	472	**1 536**
Refobacin Bone Cement R	779	18	26	25	81	111					**1 040**
Refobacin-Palacos	269										**269**
Simplex w/Tobramycin	219	2	2								**223**
Optipac Refobacin Bonecement R-3								57	99	47	**203**
Cemex w/gentamicin	63										**63**
Cemex System Genta FAST	63										**63**
SmartSet GHV	16	11	6	9	2	1	6	1			**52**
Simplex	40										**40**
Other (n<20)	68	2	3	2	1	2		1		1	**80**
Total	**5 856**	**477**	**599**	**692**	**676**	**569**	**600**	**613**	**639**	**666**	**11 387**

Table 37: Primary operations - Tibia

Cement	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Palacos R + G	1 571	289	391	427	366	170	129	172	127	146	**3 788**
Palacos w/gentamicin	2 205										**2 205**
Optipac Refobacin Bonecement R	564	154	170	228	223	175	250	62			**1 826**
Palacos R+G pro			1		6	108	214	330	410	475	**1 544**
Refobacin Bone Cement R	769	18	26	25	81	109					**1 028**
Refobacin-Palacos	266										**266**
Simplex w/Tobramycin	214	2	2								**218**
Optipac Refobacin Bonecement R-3								57	99	47	**203**
Cemex w/gentamicin	63										**63**
Cemex System Genta FAST	62										**62**
SmartSet GHV	16	11	6	9	2	1	6	1			**52**
Simplex	39										**39**
Other (n<20)	63	2	3	2	1	2		1		1	**75**
Total	**5 832**	**476**	**599**	**691**	**679**	**565**	**599**	**623**	**636**	**669**	**11 369**

Antibiotic prophylaxis

Table 38: Primary operations

Drugs	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Cefalotin (Keflin)	41 349	4 184	4 895	5 229	5 640	5 642	4 718	605	467	948	**73 677**
Cefazolin (Cephazolin)	39		1			339	1 670	5 916	5 743	6 111	**19 819**
Klindamycin (Dalacin, Clindamycin)	1 128	227	281	316	341	346	405	365	302	328	**4 039**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	3 844	101	14		1			74	1		**4 035**
Kloksacillin (Ekvacillin)	1 856	185	134	208	23	1	1	200	109	18	**2 735**
Dikloksacillin (Diclocil, Dicillin)	1 653	22	8	1	3	1	1			1	**1 690**
Imipenem (Tienam)	51										**51**
Cefaleksin (Keflex, Cefalexin)	20		1					5			**26**
Benzylpenicillin (Penicillin G)	18	1	1								**20**
Erytromycin (Ery-max, Abboticin)	16	1									**17**
Vankomycin (Vancomycin, Vancocin)	5	1		1		3		3	1	1	**15**
Cefotaksim (Claforan)	2				1	2			4	3	**12**
Ciprofloksasin (Ciproxin)	8				2						**10**
Combination of 2 drugs	1 679	283	248	312	462	223	107	57	26	32	**3 429**
Other (n<10)	21	1	2	3	5	1			2	1	**36**
Missing	338	35	57	50	36	23	27	28	28	35	**657**
Total	**52 027**	**5 041**	**5 642**	**6 120**	**6 514**	**6 581**	**6 929**	**7 253**	**6 683**	**7 478**	**110 268**

Table 39: Revisions

Drugs	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Cefalotin (Keflin)	3 034	300	290	322	356	355	276	20	28	49	**5 030**
Cefazolin (Cephazolin)	1					25	158	380	340	363	**1 267**
Klindamycin (Dalacin, Clindamycin)	193	23	27	25	27	27	35	42	22	39	**460**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	323	2	1	1	1		1	4	1		**334**
Kloksacillin (Ekvacillin)	119	18	21	19	15	9	15	24	20	22	**282**
Dikloksacillin (Diclocil, Dicillin)	207	8	3	6	5	4	9	2		4	**248**
Vankomycin (Vancomycin, Vancocin)	99	21	19	8	14	10	8	7	11	7	**204**
Benzylpenicillin (Penicillin G)	30	4	2	4	4	7	5	4	6	1	**67**
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	12	1				1	1	1	1		**17**
Cefotaksim (Claforan)	2		1	2		3	2	1	1	4	**16**
Ciprofloksasin (Ciproxin)	8		1		1	1			2		**13**
Combination of 2 drugs	563	98	123	158	139	150	104	111	95	88	**1 629**
Annet - MRS (Annet - MRS)										1	**1**
Other (n<10)	20	1	3	4	1	1	2	3	1	1	**37**
Missing	177	6	8	7	41	38	49	52	55	41	**474**
Total	**4 788**	**482**	**499**	**556**	**604**	**631**	**665**	**651**	**583**	**620**	**10 079**

Patient specific instruments

Table 40:

Year	Yes	No	Missing	Total
2021	4	8 351	1 135	**9 490**
2020	7	7 698	774	**8 479**
2019	7	8 204	917	**9 128**
2018	7	7 882	1 014	**8 903**
2017	1	7 195	1 150	**8 346**
2016	5	7 069	1 157	**8 231**
2015	14	6 223	1 521	**7 758**
2014	22	5 509	1 573	**7 104**
2013	25	4 682	1 784	**6 491**
2012	88	4 243	1 958	**6 289**
2011	65	1 696	4 142	**5 903**

Registration started in 2011

Drain

Table 41:

Year	Yes	No	Missing	Total
2021	370	8 729	391	**9 490**
2020	609	7 391	479	**8 479**
2019	813	7 603	712	**9 128**
2018	1 196	6 817	890	**8 903**
2017	1 586	5 711	1 049	**8 346**
2016	2 061	5 161	1 009	**8 231**
2015	2 277	4 695	786	**7 758**
2014	2 246	3 934	924	**7 104**
2013	2 085	3 353	1 053	**6 491**
2012	2 208	2 842	1 239	**6 289**
2011	1 096	1 129	3 678	**5 903**

Registration started in 2011

Torniquet

Table 42:

	Torniquet		
Year	Yes	No	Mean Time (min) *
2021	4 566	2 773	67
2020	3 855	2 444	70
2019	4 075	2 145	69
2018	1 900	710	70

Registration started in 2018. There are 37 forms are missing registration

* Mean duration of torniquet time

Completeness of reporting analysis for the Knee Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Knee Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Knee Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Knee Arthroplasty Register

Type	Code	Description
Primary operation	NGB 0y	Primary partial prosthetic replacement of knee joint not using cement
	NGB 1y	Primary partial prosthetic replacement of knee joint using cement
	NGB 20	Primary total prosthetic replacement of knee joint not using cement
	NGB 30	Primary total prosthetic replacement of knee joint using hybrid technique
	NGB 40	Primary total prosthetic replacement of knee joint using cement
	NGB 7y	Primary implantation of reconstruction prosthesis
With or without	NGB 99	Other Primary prosthetic replacement in knee joint
Revision level 1	NGC 0y	Secondary implantation of partial prosthesis in knee joint not using cement
	NGC 1y	Secondary implantation of partial prosthesis in knee joint using cement
	NGC 2y	Secondary implantation of total prosthesis in knee joint not using cement
	NGC 3y	Secondary implantation of total prosthesis in knee joint using hybrid technique
	NGC 4y	Secondary implantation of total prosthesis in knee joint using cement
	NGC 7y	Secondary implantation of reconstruction prosthesis
	NGC 99	Other secondary prosthetic replacement in knee joint
	NGU 0y	Removal of partial prosthesis from knee joint
	NGU 1y	Removal of total prosthesis from knee joint

Formulas for completeness of reporting

$$\text{Completeness rate NAR} = \frac{\text{only NAR + both registers}}{\text{only NPR + only NAR + both registers}}$$

$$\text{Completeness rate NPR} = \frac{\text{only NPR + both registers}}{\text{only NPR + only NAR + both registers}}$$

Primary operations. In 2019-2020, 14208 primary knee replacements were reported to one or both of the registers. 9 650,0 % of these were reported to the NAR while 9 470,0 % were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the Knee Arthroplasty Register, either the form was not sent to the NAR or other interventions than hip arthroplasties were incorrectly coded with NGB 0*/NGB 1*/NGB 20/NGB 30/NGB 40.

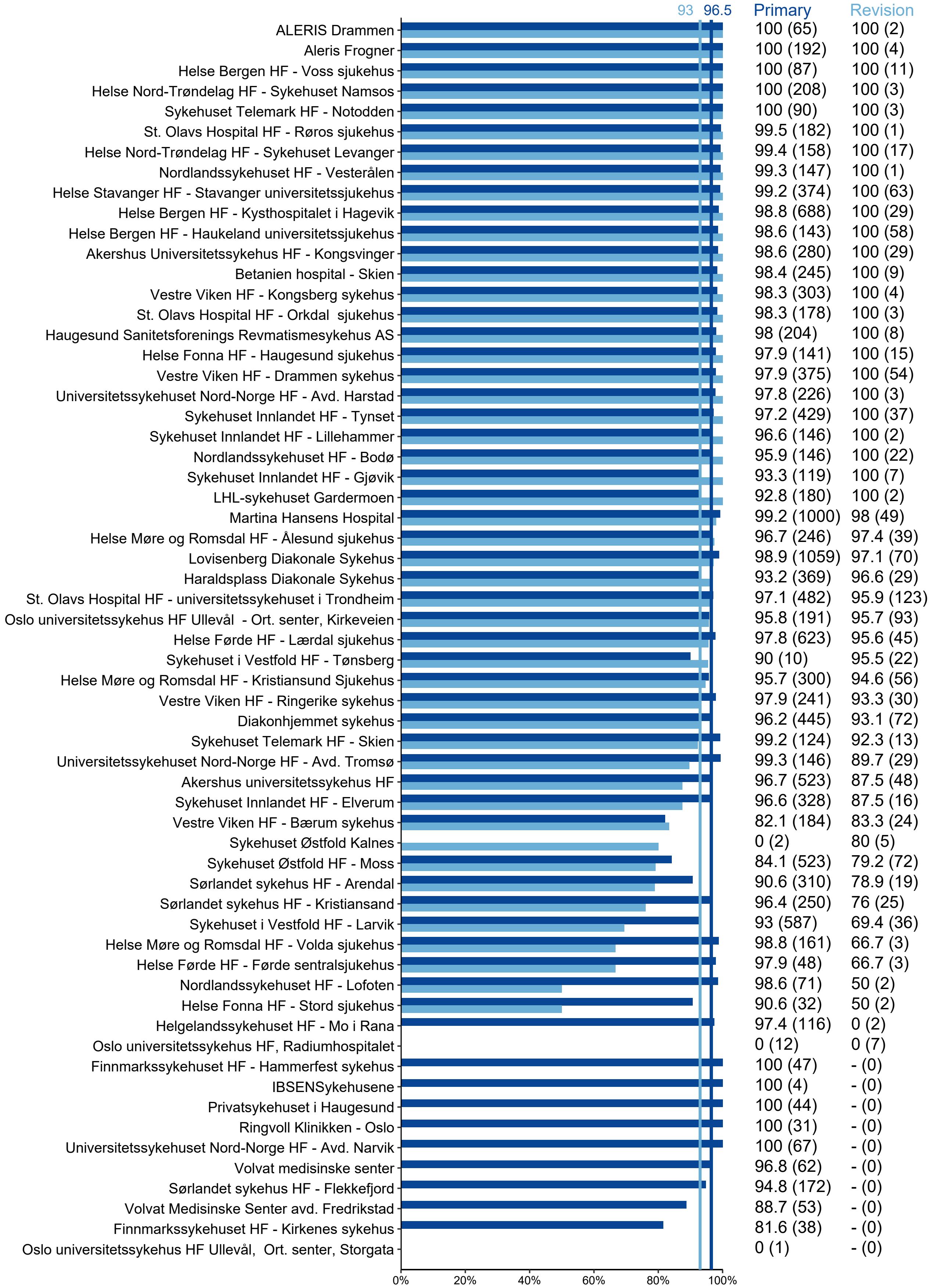
Procedure codes to be used for primary operations:
NGB 0* - NGB 1* - NGB 20 - NGB 30 - NGB 40

Revision operations. In 2019-2020, 1321 revisions were reported to one or both of the registers. 9 300,0 % of these were reported to the NAR while 7 710,0 % were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the revision form was not sent to the NAR. The analysis shows that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:
NGC 0* - NGC 1* - NGC 2* - NGC 3* - NGC 4* - NGC 99 - NGU 0* - NGU 1*

New: From 2012, revisions due to infection, even where parts of the prosthesis are not removed or replaced, are to be reported on the form to the NAR. These must be coded NGS 19 or NGS 49 with the additional code NGW 69.

Completeness of reporting for Knee Arthroplasty Register, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

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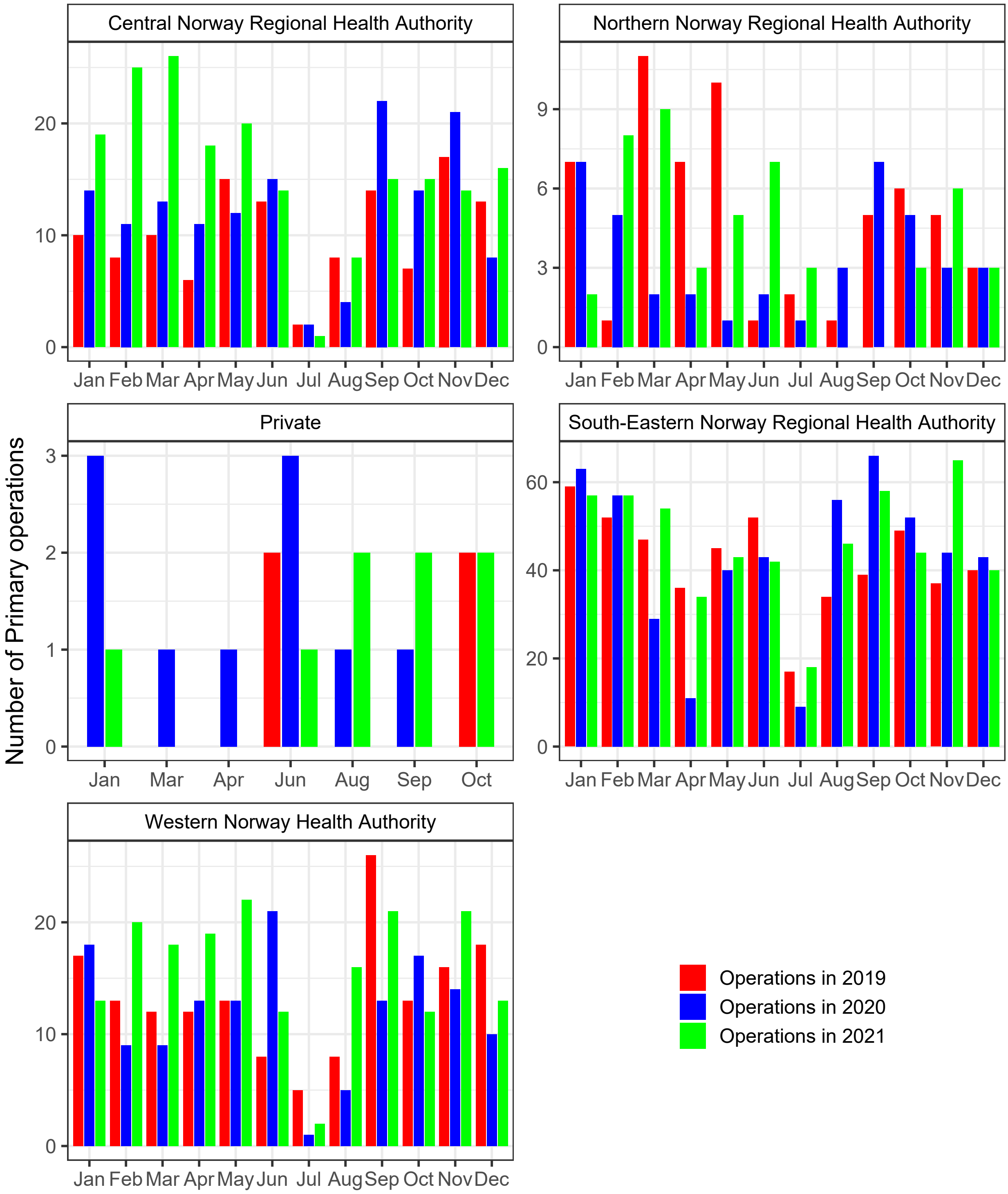
Toe joint prostheses

Completeness analysis

COVID-19

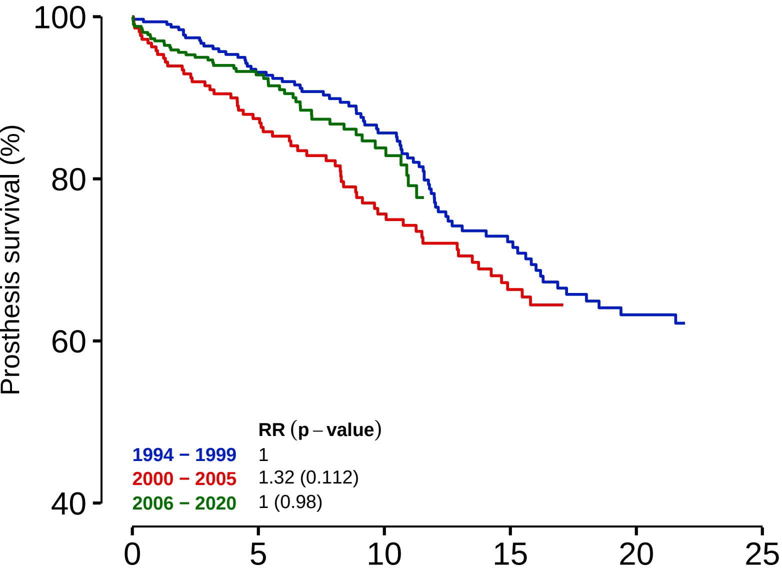
The number of shoulder prothesis operations for each Health Trust and month for 2019-2021



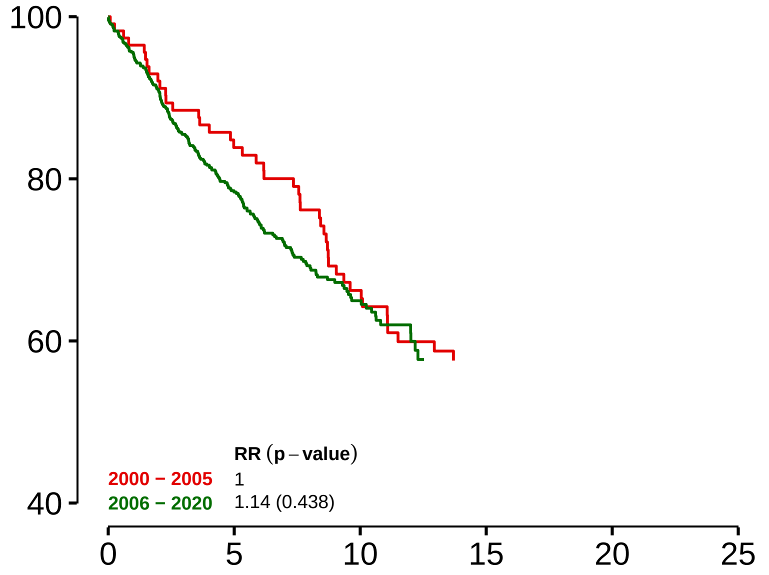
Survival curves for joint prosthesis
1994−2021

Report 2022

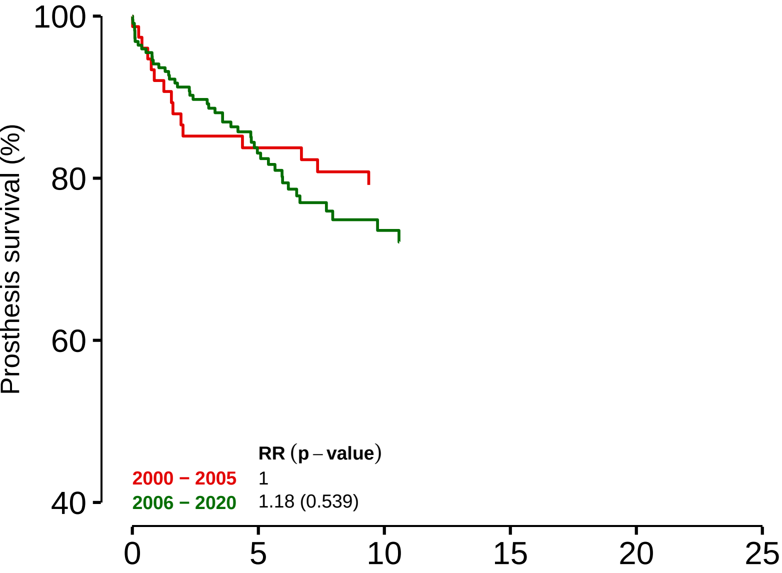
C.1) Total prosthesis in elbow*



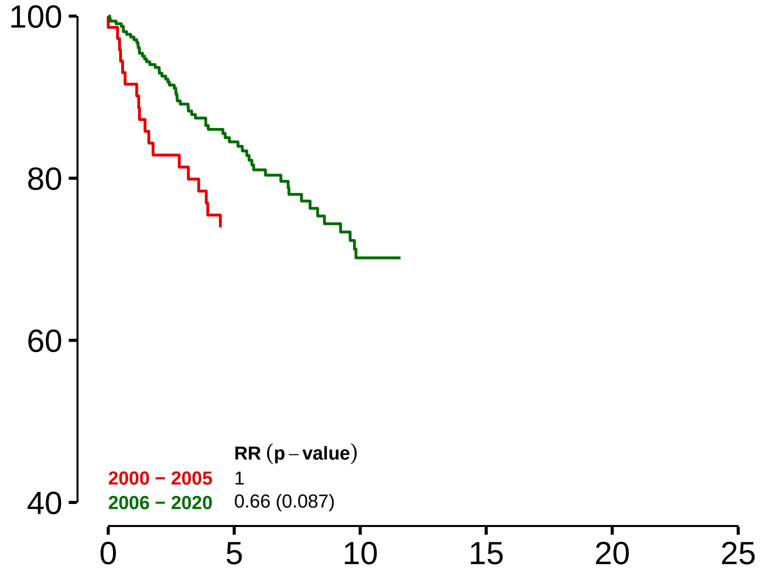
C.2) Ankle, without rheumatoid arthritis



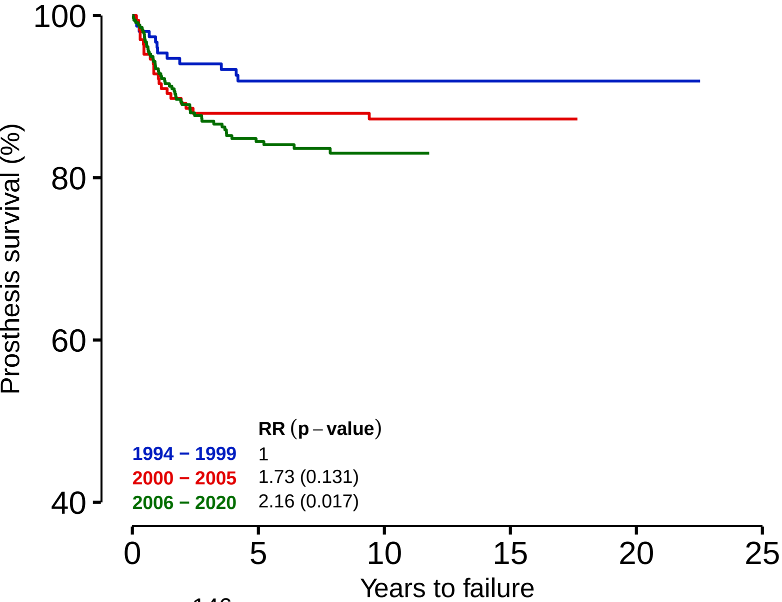
C.3) Ankle, only rheumatoid arthritis



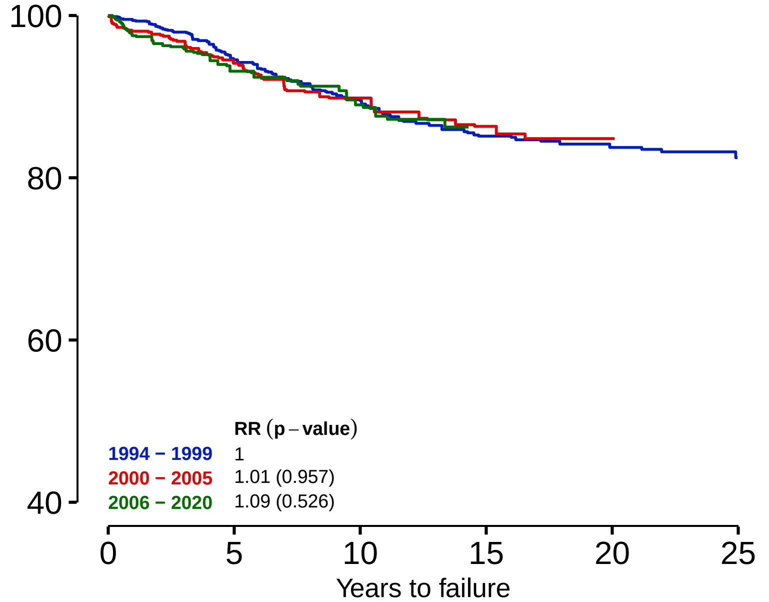
C.4) Wrist



C.5) Carpometacarpal (CMC I)



C.6) Finger (MCP)

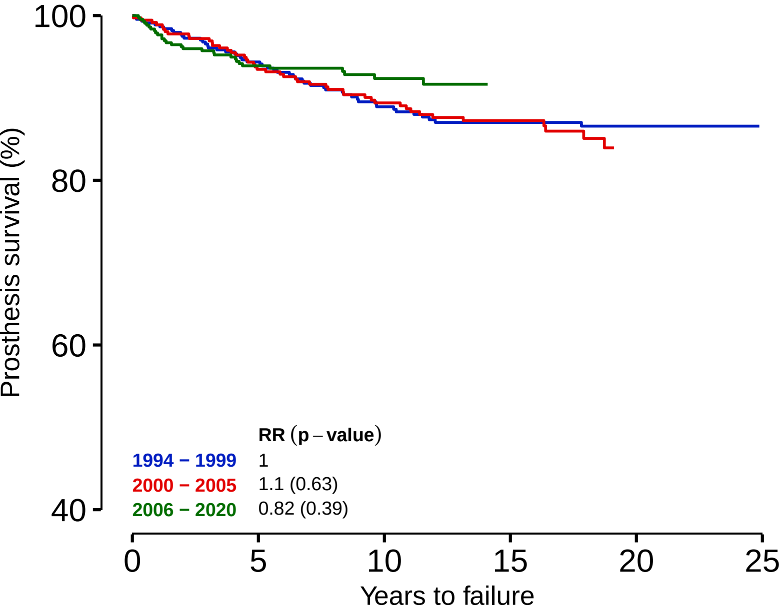


*Caput radii prosthesis for acute fracture is not included.

Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.

Risk Ratio (RR) is adjusted for age and gender.

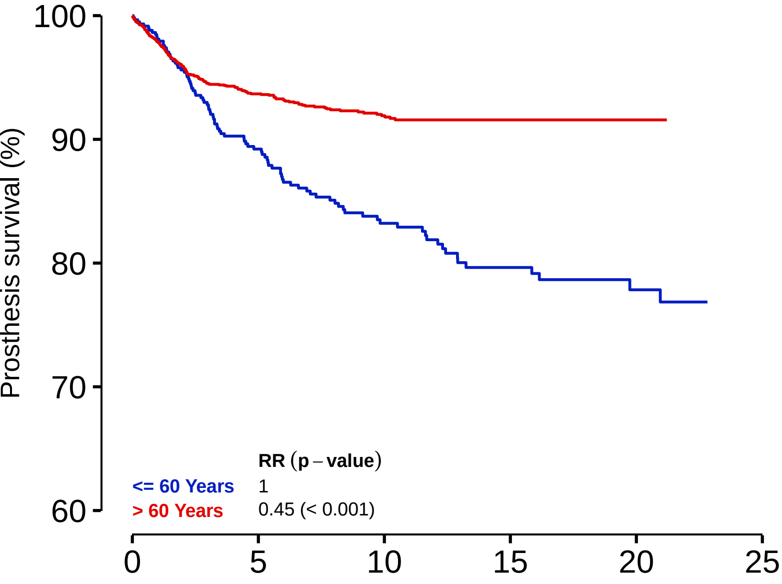
C.7) Toes



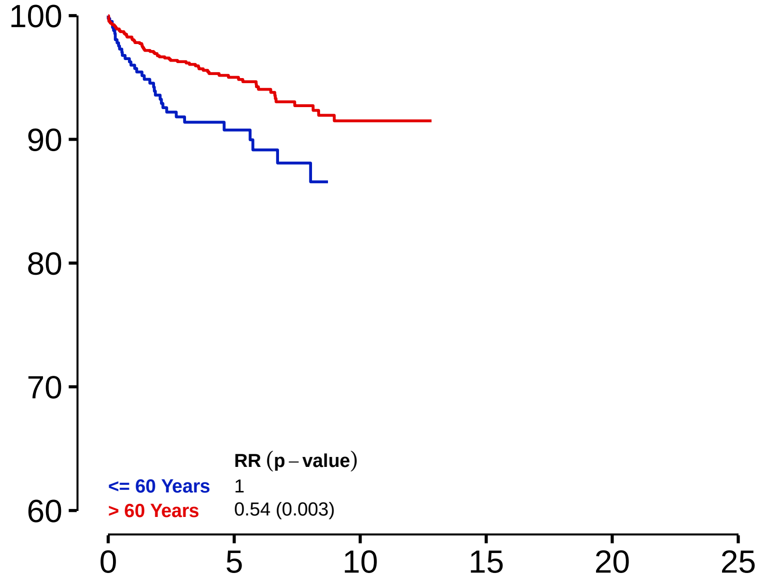
Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk Ratio (RR) is adjusted for age and gender.

Survival curves of shoulder prosthesis
1994−2021

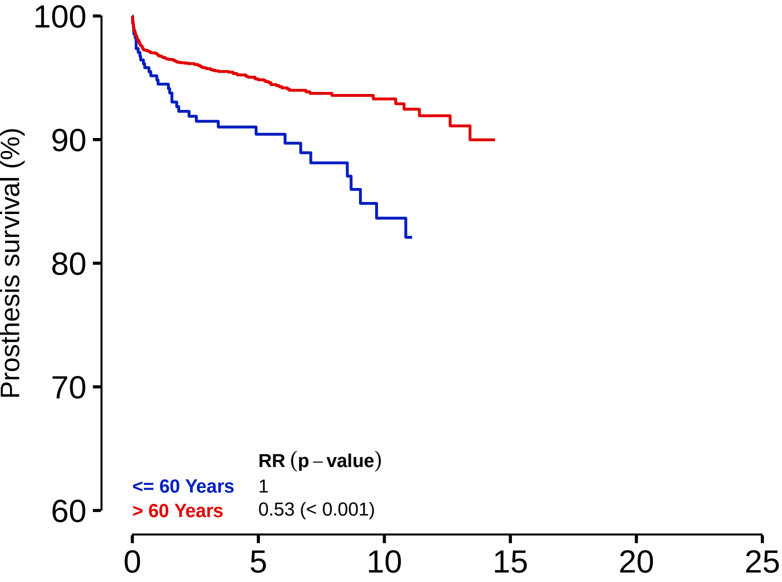
C.8) Hemi standard



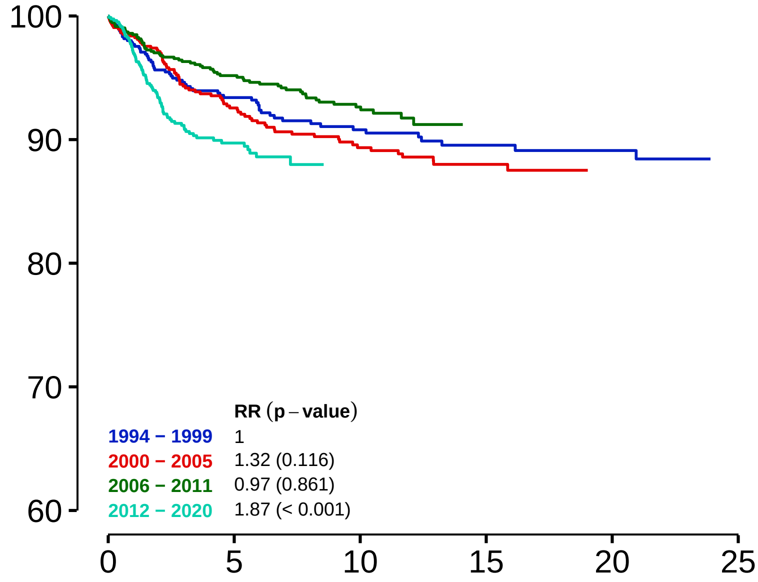
C.9) Anatomical total standard



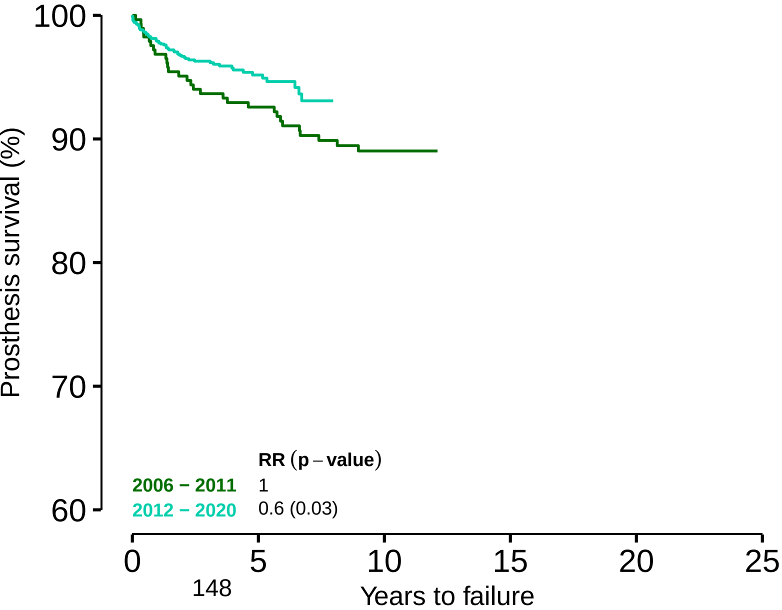
C.10) Reversed total standard



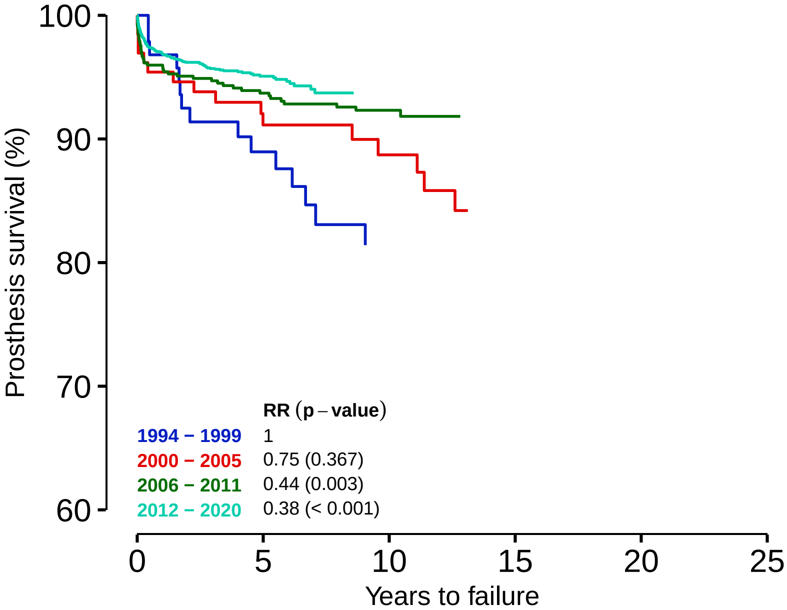
C.11) Hemi standard



C.12) Anatomical total standard



C.13) Reversed total standard



Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk Ratio (RR) is adjusted for age and gender.

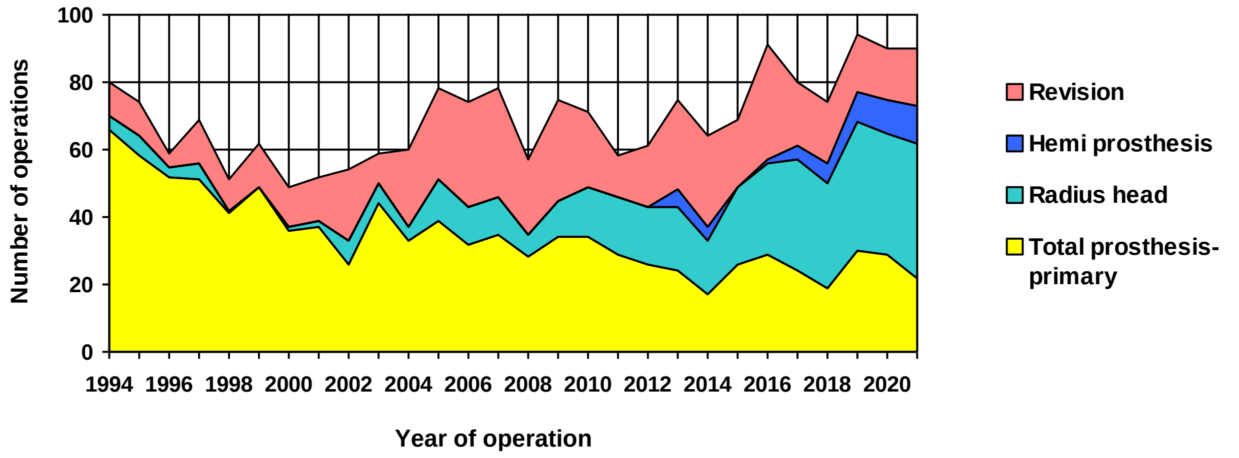
ELBOW PROSTHESES

Table 1: Annual number of prostheses

Year	Primary operations: Hemi prosthesis		Primary operations: Total prosthesis		Primary operations: Radius head		Reoperations *		Revisions		Total
2021	10	(11,2%)	23	(25,8%)	40	(44,9%)	1	(1,1%)	15	(16,9%)	**89**
2020	9	(10,0%)	30	(33,3%)	36	(40,0%)			15	(16,7%)	**90**
2019	9	(9,6%)	30	(31,9%)	38	(40,4%)	1	(1,1%)	16	(17,0%)	**94**
2018	6	(8,1%)	19	(25,7%)	31	(41,9%)	1	(1,4%)	17	(23,0%)	**74**
2017	4	(5,0%)	24	(30,0%)	33	(41,3%)			19	(23,8%)	**80**
2016	1	(1,1%)	29	(31,9%)	27	(29,7%)	1	(1,1%)	33	(36,3%)	**91**
2015			26	(37,7%)	23	(33,3%)			20	(29,0%)	**69**
2014	4	(6,3%)	17	(26,6%)	16	(25,0%)			27	(42,2%)	**64**
2013	5	(6,7%)	24	(32,0%)	19	(25,3%)			27	(36,0%)	**75**
2012			26	(42,6%)	17	(27,9%)			18	(29,5%)	**61**
2011			29	(50,0%)	17	(29,3%)	1	(1,7%)	11	(19,0%)	**58**
2010			34	(47,9%)	15	(21,1%)			22	(31,0%)	**71**
2009			34	(45,3%)	11	(14,7%)			30	(40,0%)	**75**
2008			28	(49,1%)	7	(12,3%)			22	(38,6%)	**57**
2007			35	(44,9%)	11	(14,1%)			32	(41,0%)	**78**
2006			32	(43,2%)	11	(14,9%)			31	(41,9%)	**74**
1994-05			532	(71,2%)	51	(6,8%)			164	(22,0%)	**747**
Total	**48**	**(2,5%)**	**972**	**(49,9%)**	**403**	**(20,7%)**	**5**	**(0,3%)**	519	(26,7%)	**1 947**

* Reoperation where prosthetic parts were not changed or removed (soft tissue debridements for infected prosthesis, prosthetic parts were not changed)

Figure 1: Annual numbers of operations



51,9 % of all operations were performed on the right side. 73,5 % performed in women. Mean age: 62,2 years.

Table 2: Elbow disease in primary operations - Total prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2021	2	8	7			6	2		
2020	3	9	9			10	1	3	
2019	1	12	6		1	12		2	
2018	1	9	5			3		2	
2017	1	9	10			6		1	
2016	3	18	4			6			
2015	1	13	4			8		2	
2014		13	4			2			
2013	2	9	6		1	7		3	
2012	1	16	5			4		1	
2011	4	18	6			3		1	
2010	6	19	5			2		4	
2009	1	18	6		1	7	1	6	
2008	1	19	1			6	1	1	
2007	3	22	4			2		6	
2006	3	19	9					1	
1994-05	26	465	30	6	1	11	1	19	7
Total	**59**	**696**	**121**	**6**	**4**	**95**	**6**	**52**	**7**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Table 3: Elbow disease in primary operations - Hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2021						10			
2020			1			8			
2019						9			
2018	1		1			5			
2017						4			
2016						1			
2014		1	1			3			
2013			1			4			
Total	**1**	**1**	**4**	**0**	**0**	**44**	**0**	**0**	**0**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Table 4: Elbow disease in primary operations - Radius head prostheses (Caput radii)

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2021			3			37			
2020	1		3			32		1	
2019			6		2	32			
2018			1			29		1	
2017		1	4			29			
2016			3			23		1	
2015			5			20		1	
2014	1		3			12			
2013	1					19			
2012	1		3			13			
2011	2		2			13			
2010			2			13			
2009						11			
2008			2			5			
2007						11			
2006			5			5		1	
1994-05	4	13	12			21		5	1
Total	**10**	**14**	**54**	**0**	**2**	**325**	**0**	**10**	**1**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in elbow prostheses

Table 5: Primary operations - Humerus

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2021	32	(94,1%)			2	(5,9%)			**34**
2020	39	(97,5%)			1	(2,5%)			**40**
2019	38	(97,4%)			1	(2,6%)			**39**
2018	25	(100,0%)							**25**
2017	28	(96,6%)			1	(3,4%)			**29**
2016	30	(100,0%)							**30**
2015	25	(96,2%)			1	(3,8%)			**26**
2014	19	(90,5%)					2	(9,5%)	**21**
2013	27	(93,1%)			2	(6,9%)			**29**
2012	23	(88,5%)			3	(11,5%)			**26**
2011	26	(89,7%)			1	(3,4%)	2	(6,9%)	**29**
2010	30	(88,2%)			4	(11,8%)			**34**
2009	29	(85,3%)			4	(11,8%)	1	(2,9%)	**34**
2008	24	(85,7%)			2	(7,1%)	2	(7,1%)	**28**
2007	31	(88,6%)			4	(11,4%)			**35**
2006	24	(75,0%)			8	(25,0%)			**32**
1994-05	284	(53,4%)	95	(17,9%)	150	(28,2%)	3	(0,6%)	**532**
Total	**734**	**(71,7%)**	**95**	**(9,3%)**	**184**	**(18,0%)**	**10**	**(1,0%)**	**1 023**

Table 6: Primary operations - Ulna/radius

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2021	28	(43,1%)			36	(55,4%)	1	(1,5%)	**65**
2020	34	(50,7%)			33	(49,3%)			**67**
2019	39	(57,4%)			29	(42,6%)			**68**
2018	22	(44,0%)			28	(56,0%)			**50**
2017	29	(50,0%)			29	(50,0%)			**58**
2016	36	(64,3%)			20	(35,7%)			**56**
2015	31	(63,3%)			18	(36,7%)			**49**
2014	22	(66,7%)	1	(3,0%)	8	(24,2%)	2	(6,1%)	**33**
2013	23	(53,5%)			20	(46,5%)			**43**
2012	24	(55,8%)			19	(44,2%)			**43**
2011	40	(87,0%)			4	(8,7%)	2	(4,3%)	**46**
2010	44	(89,8%)			1	(2,0%)	4	(8,2%)	**49**
2009	37	(82,2%)			6	(13,3%)	2	(4,4%)	**45**
2008	29	(82,9%)			4	(11,4%)	2	(5,7%)	**35**
2007	44	(93,6%)			2	(4,3%)	1	(2,1%)	**47**
2006	36	(83,7%)			7	(16,3%)			**43**
1994-05	425	(72,9%)	96	(16,5%)	59	(10,1%)	3	(0,5%)	**583**
Total	**942**	**(68,3%)**	**97**	**(7,0%)**	**324**	**(23,5%)**	**17**	**(1,2%)**	**1 380**

Prostheses used in elbow prostheses - Total prostheses

Table 7: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Discovery	133	19	9	18	16	5	1	1		2	**204**
Norway	180										**180**
Kudo	162										**162**
IBP	135	1									**136**
Nexel				4	13	19	17	28	22	20	**123**
GSB III	70	3	3	1							**77**
NES	54										**54**
Mutars	5		1	2			1	1	1		**11**
Latitude EV			2						7	1	**10**
IBP Reconstruction	5										**5**
Coonrad/Morrey	3		1	1							**5**
Other (n < 5)	3	1	1								**5**
Total	**750**	**24**	**17**	**26**	**29**	**24**	**19**	**30**	**30**	**23**	**972**

Table 8: Primary operations - Ulna/radius

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Discovery	133	19	9	18	16	5	1	1		2	**204**
Norway	179										**179**
Kudo	162										**162**
IBP	135	1									**136**
Nexel				4	13	19	17	28	22	20	**123**
GSB III	70	3	3	1							**77**
NES	55										**55**
Mutars	5		1	2			1	1	1		**11**
Latitude EV			2						7	1	**10**
IBP Reconstruction	5										**5**
Coonrad/Morrey	3		1	1							**5**
Other (n < 5)	3	1	1								**5**
Total	**750**	**24**	**17**	**26**	**29**	**24**	**19**	**30**	**30**	**23**	**972**

Prostheses used in elbow prostheses - Hemiprostheses

Table 9: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Latitude EV			1					4	9	10	**24**
Latitude Anatomic hemi		5	3		1	4	6	5			**24**
Total		**5**	**4**		**1**	**4**	**6**	**9**	**9**	**10**	**48**

Prostheses used in elbow prostheses - Radius head prostheses

Table 10: Primary operations - Radius

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Acumed anatomic radial head	16	16	5	13	13	12	17	20	17	24	**153**
Explor	4	3	5	7	10	17	14	16	15	5	**96**
rHead	60		2		1	1					**64**
Radial Head	29										**29**
EVOLVE (Proline)	5					3		2	1	10	**21**
Silastic H.P. 100	20										**20**
Link radius	3		4	3							**10**
Other (n < 5)	3				3				3	1	**10**
Total	**140**	**19**	**16**	**23**	**27**	**33**	**31**	**38**	**36**	**40**	**403**

Reasons for revisions in elbow prostheses

Table 11:

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021	1	1				2	3	3		1	5	
2020	1			2		2	1	2	3	3	5	
2019	2	4		2		1	1	2	3		3	
2018	2	2	2	3		1	2	2	6		4	
2017	3	3		2		3	5	1	5		3	
2016	2	5	1		1	3		1	2	1	3	
2015	3	4	1	1		2		1	6		1	
2014	4	4		1	1	1	1	2	4		4	
2013	2	2	1	2		2	2	1	7		3	
2012		1		1		3			3		6	
2011	3	5	1	1			2	2	3		3	1
2010	2	6	2	2			6	2	2		2	
2009	6	5		1	1	1	2	3	4		5	
2008	5	5		1	4	1	4	3	2		3	
2007	3	7	1	2	1	1		5	4		4	
2006	6	5	1	2	1	3	2		1		2	
1994-05	55	51	14	12	6	7	20	24	7		16	1
Total	**100**	**110**	**24**	**35**	**15**	**33**	**51**	**54**	**62**	**5**	**72**	**2**

More than one reason for revision is possible. Only the first reoperation is counted.

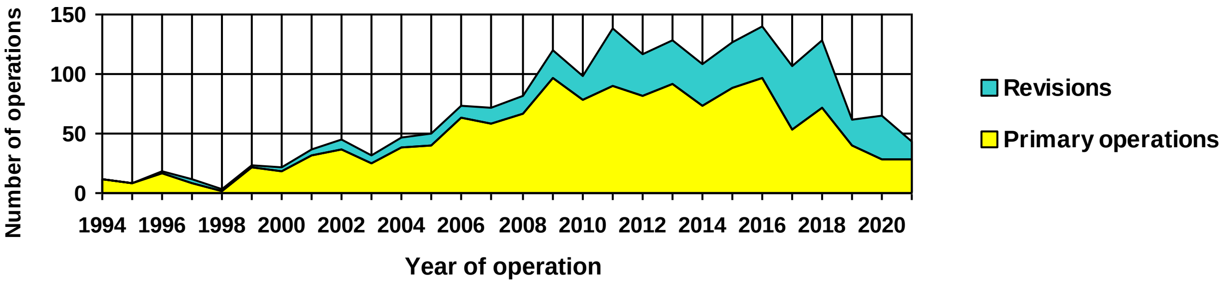
ANKLE PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Reoperations *		Revisions		Total
2021	29	(65,9%)			15	(34,1%)	**44**
2020	29	(44,6%)			36	(55,4%)	**65**
2019	40	(64,5%)	1	(1,6%)	21	(33,9%)	**62**
2018	71	(55,0%)	1	(0,8%)	57	(44,2%)	**129**
2017	54	(50,5%)			53	(49,5%)	**107**
2016	97	(69,3%)			43	(30,7%)	**140**
2015	89	(70,1%)			38	(29,9%)	**127**
2014	74	(68,5%)			34	(31,5%)	**108**
2013	92	(71,9%)			36	(28,1%)	**128**
2012	82	(70,7%)			34	(29,3%)	**116**
2011	90	(65,2%)			48	(34,8%)	**138**
2010	79	(79,8%)			20	(20,2%)	**99**
2009	96	(80,0%)			24	(20,0%)	**120**
2008	66	(80,5%)			16	(19,5%)	**82**
2007	58	(80,6%)			14	(19,4%)	**72**
2006	63	(86,3%)			10	(13,7%)	**73**
1994-05	259	(83,8%)			50	(16,2%)	**309**
Total	**1 368**	**(71,3%)**	**2**	**(0,1%)**	**549**	**(28,6%)**	**1 919**

* Reoperation where prosthetic parts were not changed or removed (soft tissue debridements for infected prosthesis, prosthetic parts were not changed)

Figure 1: Annual numbers of operations



57,1 % of all operations were performed on the right side. 53,3 % performed in women. Mean age: 60,3 years.

Table 2: Ankle disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2021	3	9	10		6		1		
2020	7	8	2		8		1	4	
2019	4	9	13		10			6	
2018	20	15	17	1	18	1	1	6	
2017	14	12	17	1	8		1	5	
2016	24	14	28	1	31			6	
2015	22	18	25	2	18			11	
2014	21	11	27	1	10			5	
2013	36	20	25	1	16			2	1
2012	21	8	44		9			2	
2011	32	18	35		5		1	3	
2010	22	20	29		9			5	
2009	31	26	28		13		1	1	
2008	20	15	24		7		2	2	
2007	13	16	20	2	6			2	
2006	19	14	24		5			5	
1994-05	55	129	57	4	5			25	1
Total	**364**	**362**	**425**	**13**	**184**	**1**	**8**	**90**	**2**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in ankle prostheses

Table 3: Primary operations - Tibia

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2021					29	(100,0%)			**29**
2020					29	(100,0%)			**29**
2019					39	(100,0%)			**39**
2018					69	(97,2%)	2	(2,8%)	**71**
2017					54	(100,0%)			**54**
2016					97	(100,0%)			**97**
2015					89	(100,0%)			**89**
2014					74	(100,0%)			**74**
2013					91	(100,0%)			**91**
2012					82	(100,0%)			**82**
2011					90	(100,0%)			**90**
2010					79	(100,0%)			**79**
2009	5	(5,2%)			89	(92,7%)	2	(2,1%)	**96**
2008	1	(1,5%)			62	(93,9%)	3	(4,5%)	**66**
2007					58	(100,0%)			**58**
2006					63	(100,0%)			**63**
1994-05	23	(8,9%)	10	(3,9%)	225	(86,9%)	1	(0,4%)	**259**
Total	**29**	**(2,1%)**	**10**	**(0,7%)**	**1 319**	**(96,6%)**	**8**	**(0,6%)**	**1 366**

Table 4: Primary operations - Talus

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2021					29	(100,0%)			**29**
2020					29	(100,0%)			**29**
2019					40	(100,0%)			**40**
2018					70	(98,6%)	1	(1,4%)	**71**
2017					54	(100,0%)			**54**
2016					97	(100,0%)			**97**
2015					89	(100,0%)			**89**
2014					74	(100,0%)			**74**
2013					91	(100,0%)			**91**
2012					82	(100,0%)			**82**
2011					90	(100,0%)			**90**
2010					79	(100,0%)			**79**
2009	5	(5,2%)			89	(92,7%)	2	(2,1%)	**96**
2008	1	(1,5%)			62	(93,9%)	3	(4,5%)	**66**
2007					58	(100,0%)			**58**
2006	1	(1,6%)			62	(98,4%)			**63**
1994-05	24	(9,3%)	11	(4,2%)	224	(86,5%)			**259**
Total	**31**	**(2,3%)**	**11**	**(0,8%)**	**1 319**	**(96,5%)**	**6**	**(0,4%)**	**1 367**

Prostheses used in ankle prostheses

Table 5: Primary operations - Tibia

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
STAR	577	38		1							**616**
Salto Talaris		26	62	85	81	28	35				**317**
Mobility	86	15									**101**
INFINITY						2	11	29	28	24	**94**
TM Total Ankle			3	3	16	22	20	8	1	5	**78**
CCI	58	11	9								**78**
Norwegian TPR	32										**32**
Rebalance	15										**15**
Salto Mobile	11	1									**12**
Hintegra	11										**11**
Integra Cadence						2	4	2			**8**
AES	3										**3**
Total	**793**	**91**	**74**	**89**	**97**	**54**	**70**	**39**	**29**	**29**	**1 365**

Table 6: Primary operations - Talus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
STAR	577	38		1							**616**
Salto Talaris		22	61	84	80	27	35				**309**
Mobility	86	15									**101**
INFINITY						2	11	29	25	21	**88**
TM Total Ankle			3	3	16	22	20	8	1	5	**78**
CCI	58	11	9								**78**
Norwegian TPR	32										**32**
Rebalance	15										**15**
Salto Mobile	11	1									**12**
Hintegra	11										**11**
Salto XT		4	1	1	1	1					**8**
Integra Cadence						2	4	2			**8**
INVISION									3	3	**6**
AES	3										**3**
Talus Hemicap								1			**1**
Total	**793**	**91**	**74**	**89**	**97**	**54**	**70**	**40**	**29**	**29**	**1 366**

In 2019, 1 form was registered with another type of prosthesis (partial resurfacing)

Prostheses used in ankle total prostheses

Table 7: Primary operations - Foring Tibia Insert in total prostheses

Prostheses	Materiale	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Totalt
STAR	Uhmwpe	577	38		1							**616**
Salto Talaris	Uhmwpe		25	62	85	81	28	35				**316**
Mobility	Uhmwpe	86	15									**101**
INFINITY	Uhmwpe						2	11	29	28	24	**94**
TM Total Ankle	HXLPE			3	3	16	22	20	8	1	5	**78**
CCI	Uhmwpe	58	10	9								**77**
Rebalance	Uhmwpe	15										**15**
Salto Mobile	Uhmwpe	11	1									**12**
Hintegra	Uhmwpe	11										**11**
Integra Cadence	HXLPE						2	4	2			**8**
AES	Uhmwpe	3										**3**
Salto XT	Uhmwpe		1									**1**
Totalt		**761**	**90**	**74**	**89**	**97**	**54**	**70**	**39**	**29**	**29**	**1 332**

Reasons for revisions in ankle prostheses

Table 8:

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Osteolysis	Poor mobility	Other	Missing
2021	2			1	1	2	2	2	4	1			
2020	7	8	1	1	3	1	2	11	4	1		2	
2019		2		1		2	1	6	4	2		3	
2018	9	8		1	7	4	3	19	14	1			
2017	8	8		2	8		1	23	8	7		5	
2016	10	10		2	1	1	2	13	4	2	1		
2015	5	5			6	1		13	9	6			
2014	11	9		1	3	1		9	8				
2013	5	2	1	3	8	2	1	14	16	3			
2012	6	3		2	1	2	1	12	9	1		1	
2011	6	6	1	5	4	1	1	16	8		1	2	
2010	2	1		2	3	1	2	10	3		3		
2009	5	2	1	4	7	3	1	8	3				
2008	3	4	1	1	5			4	1			2	
2007	2	2		2	1	1		5	3			1	
2006	3	2		2	2	1	1	4	1				
1994-05	23	17		4	9	3	1	13	3		1	3	
Total	**107**	**89**	**5**	**34**	**69**	**26**	**19**	**182**	**102**	**24**	**6**	**19**	**0**

More than one reason for revision is possible. Only the first reoperation is counted.

FINGER JOINT PROSTHESES

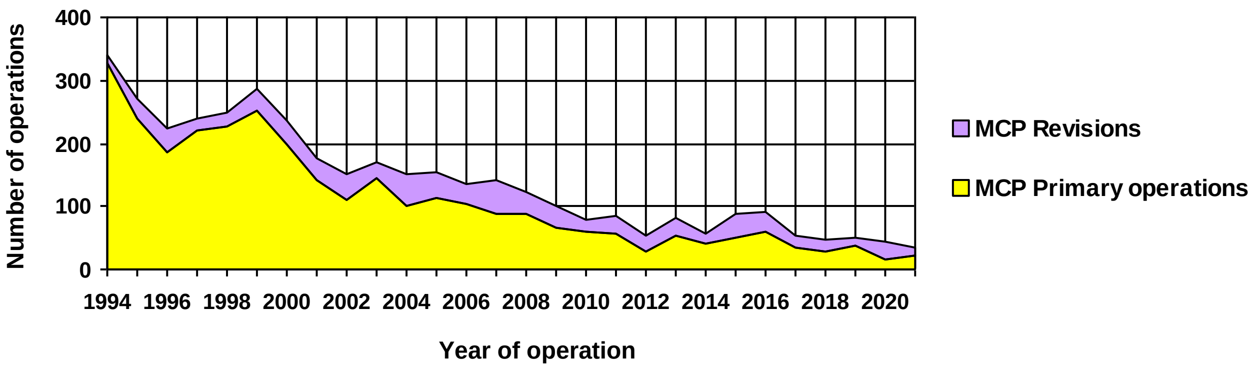
Table 1: Annual number of operations - MCP

Year	Primary operations		Revisions		Total
2021	22	(61,1%)	14	(38,9%)	**36**
2020	16	(35,6%)	29	(64,4%)	**45**
2019	37	(75,5%)	12	(24,5%)	**49**
2018	28	(59,6%)	19	(40,4%)	**47**
2017	34	(61,8%)	21	(38,2%)	**55**
2016	61	(67,0%)	30	(33,0%)	**91**
2015	50	(56,8%)	38	(43,2%)	**88**
2014	42	(75,0%)	14	(25,0%)	**56**
2013	55	(67,9%)	26	(32,1%)	**81**
2012	27	(50,9%)	26	(49,1%)	**53**
2011	57	(66,3%)	29	(33,7%)	**86**
2010	60	(76,9%)	18	(23,1%)	**78**
2009	66	(66,0%)	34	(34,0%)	**100**
2008	88	(71,0%)	36	(29,0%)	**124**
2007	88	(62,4%)	53	(37,6%)	**141**
2006	104	(77,6%)	30	(22,4%)	**134**
1994-05	2 254	(85,1%)	394	(14,9%)	**2 648**
Total	**3 089**	**(79,0%)**	**823**	**(21,0%)**	**3 912**

Table 2: Annual number of operations - PIP

Year	Primary operations		Revisions		Total
2021	15	(93,8%)	1	(6,3%)	**16**
2020	16	(100,0%)			**16**
2019	14	(93,3%)	1	(6,7%)	**15**
2018	9	(81,8%)	2	(18,2%)	**11**
2017	6	(100,0%)			**6**
2016	3	(75,0%)	1	(25,0%)	**4**
2015	5	(100,0%)			**5**
2014	4	(100,0%)			**4**
2013	6	(100,0%)			**6**
2011	3	(100,0%)			**3**
2010	6	(100,0%)			**6**
2009	3	(100,0%)			**3**
2008	4	(57,1%)	3	(42,9%)	**7**
2007	6	(85,7%)	1	(14,3%)	**7**
2006	7	(87,5%)	1	(12,5%)	**8**
1994-05	45	(83,3%)	9	(16,7%)	**54**
Total	**152**	**(88,9%)**	**19**	**(11,1%)**	**171**

Figure 1: Annual number of operations



61,5 % of all operations were performed on the right side. 87,3 % performed in women. Mean age: 61,4 years.

Reasons for primary operations

Table 3: MCP prostheses - Finger disease

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2021	5	16		1					
2020	1	15							
2019	4	28					1	4	
2018	4	22		1			1	1	
2017	5	27						2	
2016	4	57						2	
2015	4	43		1				2	
2014		33					1	8	
2013		53	1					3	
2012		25	1					1	
2011	1	50						6	
2010	3	54	1					2	
2009	2	62						2	
2008	2	85						1	
2007	2	85		1				4	
2006	10	91	1		1			3	
1994-05	46	2 146	12	8		1	2	57	3
Total	**93**	**2 892**	**16**	**12**	**1**	**1**	**5**	**98**	**3**

More than one reason for primary operation is possible

Table 4: PIP prostheses - Finger disease

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2021	13	2							
2020	14	3	1						
2019	10	2	2					1	
2018	6	1	2						
2017	6								
2016	1						2		
2015	3		2						
2014	3		2						
2013	1	5							
2011		2	1						
2010	1	2	2		1			1	
2009	2						1		
2008	3		1					1	
2007	3		1		1				1
2006	4	3							
1994-05	17	24	3			3		5	
Total	**87**	**44**	**17**	**0**	**2**	**3**	**3**	**8**	**1**

More than one reason for primary operation is possible

Use of cement in MCP prostheses

Table 5: Primary operations - Proximal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2021					12	(100,0%)			**12**
2020					11	(100,0%)			**11**
2019					24	(100,0%)			**24**
2018					16	(100,0%)			**16**
2017					21	(100,0%)			**21**
2016	1	(2,2%)			44	(97,8%)			**45**
2015	1	(3,0%)			31	(93,9%)	1	(3,0%)	**33**
2014					34	(97,1%)	1	(2,9%)	**35**
2013					52	(98,1%)	1	(1,9%)	**53**
2012					27	(100,0%)			**27**
2011					57	(100,0%)			**57**
2010					59	(100,0%)			**59**
2009					66	(100,0%)			**66**
2008	1	(1,2%)			85	(98,8%)			**86**
2007					87	(100,0%)			**87**
2006					102	(99,0%)	1	(1,0%)	**103**
2005			2	(1,8%)	109	(97,3%)	1	(0,9%)	**112**
2004	1	(1,0%)			99	(99,0%)			**100**
2003					143	(100,0%)			**143**
2002					107	(99,1%)	1	(0,9%)	**108**
2001	1	(0,7%)			139	(99,3%)			**140**
2000					197	(100,0%)			**197**
1999					253	(100,0%)			**253**
1998					228	(100,0%)			**228**
1997					216	(98,6%)	3	(1,4%)	**219**
1996					187	(100,0%)			**187**
1995					238	(100,0%)			**238**
1994					324	(99,4%)	2	(0,6%)	**326**
Total	**5**	**(0,2%)**	**2**	**(0,1%)**	**2 968**	**(99,4%)**	**11**	**(0,4%)**	**2 986**

Table 6: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented		Missing	Total
2019			1	(100,0%)		**1**
2016			2	(100,0%)		**2**
2014			1	(100,0%)		**1**
2011			2	(100,0%)		**2**
2010			1	(100,0%)		**1**
2009			1	(100,0%)		**1**
2008			2	(100,0%)		**2**
2007			2	(100,0%)		**2**
2006			7	(100,0%)		**7**
2005			4	(100,0%)		**4**
2004			1	(100,0%)		**1**
2003			1	(100,0%)		**1**
2002			5	(100,0%)		**5**
2001			1	(100,0%)		**1**
2000			1	(100,0%)		**1**
1996			2	(100,0%)		**2**
1995			4	(100,0%)		**4**
Total			**38**	**(100,0%)**		**38**

Use of cement in PIP prostheses

Table 7: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented		Missing		Total
2021			13	(100,0%)			**13**
2020			10	(100,0%)			**10**
2019			12	(100,0%)			**12**
2018			7	(100,0%)			**7**
2017			5	(100,0%)			**5**
2016			3	(100,0%)			**3**
2015			3	(100,0%)			**3**
2014			4	(100,0%)			**4**
2013			5	(83,3%)	1	(16,7%)	**6**
2011			2	(66,7%)	1	(33,3%)	**3**
2010			6	(100,0%)			**6**
2009			3	(100,0%)			**3**
2008			4	(100,0%)			**4**
2007			5	(83,3%)	1	(16,7%)	**6**
2006			7	(100,0%)			**7**
2005			6	(100,0%)			**6**
2004			7	(100,0%)			**7**
2002			6	(100,0%)			**6**
2001			2	(100,0%)			**2**
2000			4	(100,0%)			**4**
1999			7	(100,0%)			**7**
1998			4	(100,0%)			**4**
1996			5	(100,0%)			**5**
1995			2	(100,0%)			**2**
1994			1	(100,0%)			**1**
Total			**133**	**(97,8%)**	**3**	**(2,2%)**	**136**

Table 8: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented		Missing		Total
2021			13	(100,0%)			**13**
2020			9	(100,0%)			**9**
2019			10	(100,0%)			**10**
2018			7	(100,0%)			**7**
2017			5	(100,0%)			**5**
2016			2	(100,0%)			**2**
2014			1	(100,0%)			**1**
2011			2	(100,0%)			**2**
2010			2	(100,0%)			**2**
2008			1	(100,0%)			**1**
2007			2	(100,0%)			**2**
2006			4	(80,0%)	1	(20,0%)	**5**
2005			5	(100,0%)			**5**
2004			5	(100,0%)			**5**
2002			1	(100,0%)			**1**
1996			3	(100,0%)			**3**
1995			1	(100,0%)			**1**
Total			**73**	**(98,6%)**	**1**	**(1,4%)**	**74**

Finger prostheses

Table 9: MCP prostheses in primary operations - Proximal

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Silastic HP 100	1 932	25		4	1	2		2			**1 966**
Avanta	554			1		3					**558**
Silastic HP 100 II	16	28	34	28	41	16	16	19	11	12	**221**
NeuFlex	198										**198**
Ascension MCP	29		1		2						**32**
MCS	6										**6**
HAPY								2			**2**
TACTYS								1			**1**
SR Avanta					1						**1**
Moje	1										**1**
Total	**2 736**	**53**	**35**	**33**	**45**	**21**	**16**	**24**	**11**	**12**	**2 986**

Table 10: MCP prostheses in primary operations - Distal

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Ascension MCP	27		1		2						**30**
MCS	6										**6**
TACTYS								1			**1**
Moje	1										**1**
Total	**34**		**1**		**2**			**1**			**38**

Table 11: PIP prostheses in primary operations - Proximal

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
TACTYS					2	5	6	5	6	12	**36**
Silastic HP 100	21	4	2						1		**28**
SR Avanta	15	1	1	3	1			2			**23**
Ascension MCP	18										**18**
Ascension PIP PyroCarbon	4		1				1	1	2		**9**
NeuFlex	7										**7**
CapFlex PIP								4	1	1	**6**
MCS	4										**4**
Avanta	3	1									**4**
Moje	1										**1**
Total	**73**	**6**	**4**	**3**	**3**	**5**	**7**	**12**	**10**	**13**	**136**

Table 12: PIP prostheses in primary operations - Distal

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
TACTYS					2	5	6	5	7	12	**37**
Ascension MCP	18										**18**
Ascension PIP PyroCarbon	4		1				1	1	1		**8**
CapFlex PIP								4	1	1	**6**
MCS	4										**4**
Moje	1										**1**
Total	**27**		**1**		**2**	**5**	**7**	**10**	**9**	**13**	**74**

Finger prostheses - Reasons for revisions

Table 13: MCP prostheses - Reasons for revisions

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Fractured/defect component	Other	Missing
2021	4				1					7	3	
2020									4	10	4	
2019			2	2	2		2	5		4		
2018				3	1		3	4		2		
2017			1	1			1	2		4	4	
2016			5	1	4		2	6	5		9	
2015	5	2		4		1		15	8	4	10	
2014		1		1					2		4	
2013				4	12			8		6	4	
2012				2				10	3	6	7	
2011					4	2		8		5	7	
2010	1	1	1				2	3		2	5	
2009	1	2	3	1	1	3		5	3	13	5	
2008		1	2	4	11	1		9	1	5	3	
2007		2	10	7	2	1		7		20	8	3
2006			2	10	4	1		4	4	4	4	1
1994-05	5	16	14	42	52	5	20	100	5	78	142	13
Total	**16**	**25**	**40**	**82**	**94**	**14**	**30**	**186**	**35**	**170**	**219**	**17**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Table 14: PIP prostheses - Reasons for revisions

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Fractured/defect component	Other	Missing
2021								1				
2019											1	
2018	1								1			
2016	1											
2008	1	1	1	1	1			2				
2007								1			1	
2006					1							
1994-05	3	2		1							6	
Total	**6**	**3**	**1**	**2**	**2**	**0**	**0**	**4**	**1**	**0**	**8**	**0**

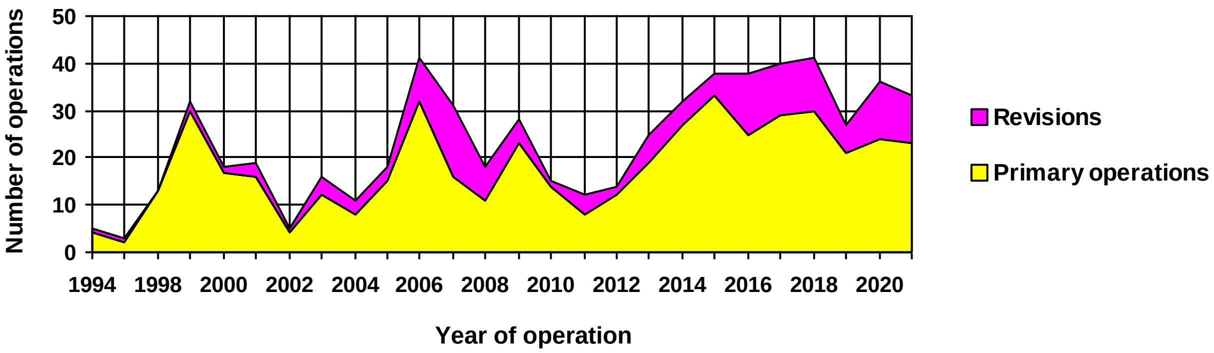
Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

WRIST PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2021	23	(69,7%)	10	(30,3%)	**33**
2020	24	(66,7%)	12	(33,3%)	**36**
2019	21	(77,8%)	6	(22,2%)	**27**
2018	30	(73,2%)	11	(26,8%)	**41**
2017	29	(72,5%)	11	(27,5%)	**40**
2016	25	(65,8%)	13	(34,2%)	**38**
2015	33	(86,8%)	5	(13,2%)	**38**
2014	27	(84,4%)	5	(15,6%)	**32**
2013	19	(76,0%)	6	(24,0%)	**25**
2012	12	(85,7%)	2	(14,3%)	**14**
2011	8	(66,7%)	4	(33,3%)	**12**
2010	14	(93,3%)	1	(6,7%)	**15**
2009	23	(82,1%)	5	(17,9%)	**28**
2008	11	(61,1%)	7	(38,9%)	**18**
2007	16	(51,6%)	15	(48,4%)	**31**
2006	32	(78,0%)	9	(22,0%)	**41**
1994-05	121	(86,4%)	19	(13,6%)	**140**
Total	**468**	**(76,8%)**	**141**	**(23,2%)**	**609**

Figure 1: Annual number of operations



56,8 % of all operations were performed on the right side. 57,6 % performed in women. Mean age: 57 years.

Table 2: Wrist disease in primary operations

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2021	3	3	9		8			2	
2020	3	2	8		8			4	
2019	4	3	9		3			2	
2018	5	3	7		10			7	
2017	2	3	11		12	1	1	4	
2016	5		10		10	1		1	
2015	4	2	13		10			7	
2014	7	1	11		9			3	
2013	4	3	5		3		1	3	
2012	3	5	2		2			1	
2011	1	3	4					2	
2010		4	4		4			2	
2009	4	5	9		4		1	1	
2008	4	2	2		2				1
2007	1	6	6		1			2	
2006	5	19	6		1			3	
1994-05	8	90	9	1				13	
Total	**63**	**154**	**125**	**1**	**87**	**2**	**3**	**57**	**1**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in wrist prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2021			19 (100,0%)		**19**
2020			18 (100,0%)		**18**
2019			6 (100,0%)		**6**
2018			21 (100,0%)		**21**
2017			27 (100,0%)		**27**
2016			25 (100,0%)		**25**
2015			31 (96,9%)	1 (3,1%)	**32**
2014			27 (100,0%)		**27**
2013			19 (100,0%)		**19**
2012			11 (91,7%)	1 (8,3%)	**12**
2011			8 (100,0%)		**8**
2010			14 (100,0%)		**14**
2009			21 (91,3%)	2 (8,7%)	**23**
2008			10 (100,0%)		**10**
2007			16 (100,0%)		**16**
2006			32 (100,0%)		**32**
2005			15 (100,0%)		**15**
2004	2 (25,0%)		6 (75,0%)		**8**
2003	1 (8,3%)		11 (91,7%)		**12**
2002			4 (100,0%)		**4**
2001	1 (6,3%)	1 (6,3%)	14 (87,5%)		**16**
2000	3 (17,6%)		14 (82,4%)		**17**
1999			29 (96,7%)	1 (3,3%)	**30**
1998			13 (100,0%)		**13**
1995			2 (100,0%)		**2**
1994			4 (100,0%)		**4**
Total	**7 (1,6%)**	**1 (0,2%)**	**417 (97,0%)**	**5 (1,2%)**	**430**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2021			23 (100,0%)		**23**
2020			24 (100,0%)		**24**
2019			21 (100,0%)		**21**
2018			30 (100,0%)		**30**
2017			29 (100,0%)		**29**
2016			25 (100,0%)		**25**
2015			33 (100,0%)		**33**
2014			27 (100,0%)		**27**
2013			19 (100,0%)		**19**
2012			12 (100,0%)		**12**
2011			8 (100,0%)		**8**
2010			14 (100,0%)		**14**
2009			20 (95,2%)	1 (4,8%)	**21**
2008			9 (100,0%)		**9**
2007			15 (100,0%)		**15**
2006			32 (100,0%)		**32**
2005			15 (100,0%)		**15**
2004	4 (50,0%)		4 (50,0%)		**8**
2003	3 (25,0%)		9 (75,0%)		**12**
2002			3 (100,0%)		**3**
2001	1 (6,7%)		14 (93,3%)		**15**
2000	1 (5,9%)		16 (94,1%)		**17**
1999			30 (100,0%)		**30**
1998			13 (100,0%)		**13**
Total	**9 (2,0%)**		**445 (97,8%)**	**1 (0,2%)**	**455**

Wrist prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Motec Wrist	101	4	9	17	12	9	19	1	17	16	**205**
Biax	90										**90**
Remotion Wrist	6	10	13	13	8	6		2	1	2	**61**
Scheker Radio-ulnar	3	3	3	1	3	8	2	3		1	**27**
Elos[1]	23										**23**
Uhead (Druj)	3	2	2	1	2	4					**14**
Silastic ulnar head	7										**7**
Eclypse radio-ulnar	2										**2**
TMW	1										**1**
Total	**236**	**19**	**27**	**32**	**25**	**27**	**21**	**6**	**18**	**19**	**430**

Table 6: Primary operations - Distal

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Motec Wrist	101	4	9	17	12	9	19	1	17	16	**205**
Biax	89										**89**
Remotion Wrist	6	10	13	14	8	6		2	1	2	**62**
Scheker Radio-ulnar	1	3	3	1	3	8	2	3		1	**25**
Elos[1]	23										**23**
Herbert UHP							6	7	5	3	**21**
RCPI						2	3	8	1	1	**15**
Uhead (Druj)	3	2	2	1	2	4					**14**
TMW	1										**1**
Total	**224**	**19**	**27**	**33**	**25**	**29**	**30**	**21**	**24**	**23**	**455**

Table 7: Reasons for revisions

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing	Total
2021	1	5			1			3	1	1		12
2020	3	1						4		1		9
2019	2				1			2	1	1		7
2018	2	4					1	3		2		12
2017	3	5			1			3		1		13
2016		4	2	1		2		3	1			13
2015		2		1		1		1	1			6
2014		1						1		2		4
2013		1			1			2	1	1		6
2012					1			1				2
2011		2			1	1		2				6
2010										1		1
2009		2		1	1			2				6
2008		4	1			1		2		1		9
2007		5		1	1	1		2	1	2		13
2006	3	5				1						9
1994-05	2	7	1	2	6	2		8				28
Total	**16**	**48**	**4**	**6**	**14**	**9**	**1**	**39**	**6**	**13**	**0**	**156**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

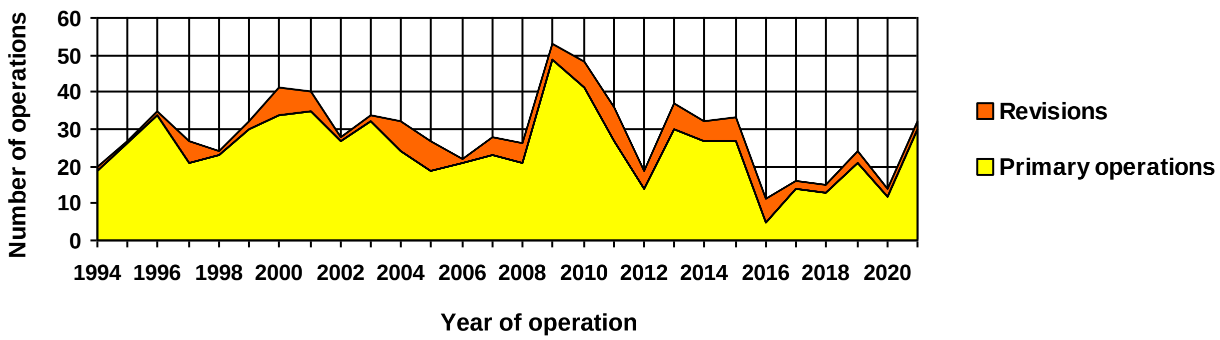
[1]Elos are 3 different development models of Motec Wrist. Motec Wrist was previously sold under the name Gibbon.

CARPOMETACARPAL PROSTHESES (CMC I)

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2021	30	(93,8%)	2	(6,3%)	**32**
2020	12	(85,7%)	2	(14,3%)	**14**
2019	21	(87,5%)	3	(12,5%)	**24**
2018	13	(86,7%)	2	(13,3%)	**15**
2017	14	(87,5%)	2	(12,5%)	**16**
2016	5	(45,5%)	6	(54,5%)	**11**
2015	27	(81,8%)	6	(18,2%)	**33**
2014	27	(84,4%)	5	(15,6%)	**32**
2013	30	(81,1%)	7	(18,9%)	**37**
2012	14	(73,7%)	5	(26,3%)	**19**
2011	27	(75,0%)	9	(25,0%)	**36**
2010	41	(85,4%)	7	(14,6%)	**48**
2009	49	(92,5%)	4	(7,5%)	**53**
2008	21	(80,8%)	5	(19,2%)	**26**
2007	23	(82,1%)	5	(17,9%)	**28**
2006	21	(95,5%)	1	(4,5%)	**22**
1994-05	324	(88,3%)	43	(11,7%)	**367**
Total	**699**	**(86,0%)**	**114**	**(14,0%)**	**813**

Figure 1: Annual number of operations



47,6 % of all operations were performed on the right side. 79,8 % performed in women. Mean age: 62,4 years.

Table 2: Carpometacarpal disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2021	28	2							
2020	12								
2019	19				2				
2018	13								
2017	14								
2016	3	2							
2015	25	1				1			
2014	24	2						1	
2013	23	5		1				1	
2012	13	1							
2011	26		1						
2010	37	4							
2009	47	2						1	
2008	18	3							
2007	17	6						1	
2006	15	4						2	
1994-05	229	80	2	4				15	
Total	**563**	**112**	**3**	**5**	**2**	**1**	**0**	**21**	**0**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in carpometacarpal prostheses

Table 3: Primary operations - Proximal (Single-component)

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2021	1 (3,3%)		29 (96,7%)		**30**
2020			12 (100,0%)		**12**
2019			21 (100,0%)		**21**
2018			13 (100,0%)		**13**
2017			14 (100,0%)		**14**
2016			5 (100,0%)		**5**
2015			27 (100,0%)		**27**
2014			26 (96,3%)	1 (3,7%)	**27**
2013			30 (100,0%)		**30**
2008-12			146 (96,7%)	5 (3,3%)	**151**
2002-07	2 (1,4%)		144 (98,6%)		**146**
1994-01	1 (0,5%)		220 (99,1%)	1 (0,5%)	**222**
Total	**4 (0,6%)**		**687 (98,4%)**	**7 (1,0%)**	**698**

Carpometacarpal prostheses - Prosthesis brand

Table 4: Primary operations - Proximal (Single-component)

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Swanson Silastic Trapezium	343	8	8	5	2	1	1				**368**
Swanson Titanium Basal	72										**72**
Motec	55										**55**
Elektra	36	4	5	8	2						**55**
Motec II	1	18	14	14							**47**
Moovis							4	7	8	27	**46**
ARPE					1	9	8	10	4	2	**34**
Avanta Trapezium	7										**7**
Pyrocardan								4		1	**5**
Custom made	5										**5**
IVORY						4					**4**
Total	**519**	**30**	**27**	**27**	**5**	**14**	**13**	**21**	**12**	**30**	**698**

Reasons for revisions

Table 5:

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2021	1										
2020									1		
2019			1	1					1		
2018	2					1					
2017			1								
2016	3							1			
2015	4		1	1		1		3			
2014	2		2							1	
2013	3		4					1			
2012	4		1					1			
2011	7		2				1	5			
2010	4		2	1		1		3			
2009	1		2					1		1	
2008			2					4			
2007			1	3				1			
2006			1								
1994-05	2		17	3				25	1	8	1
Total	**33**	**0**	**37**	**9**	**0**	**3**	**1**	**45**	**3**	**10**	**1**

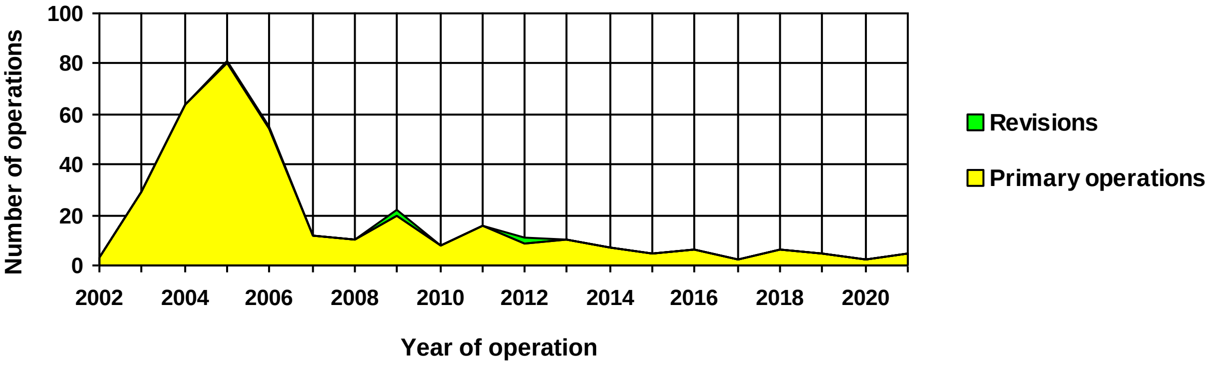
Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

LUMBAR DISC PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2021	5	(100,0%)			**5**
2020	2	(100,0%)			**2**
2019	5	(100,0%)			**5**
2018	6	(100,0%)			**6**
2017	2	(100,0%)			**2**
2016	6	(100,0%)			**6**
2015	5	(100,0%)			**5**
2014	7	(100,0%)			**7**
2013	10	(100,0%)			**10**
2008-12	63	(94,0%)	4	(6,0%)	**67**
2002-07	242	(99,2%)	2	(0,8%)	**244**
Total	**353**	**(98,3%)**	**6**	**(1,7%)**	**359**

Figure 1: Annual number of operations



60,2 % performed in women. Mean age: 43,3 years.

Table 2: Back disease - Primary operations

Year	Idiopathic osteoarthritis	Sequelae after fracture	Spondylitis	Sequelae after prolapse surgery	Disc degeneration	Sequelae of infection	Other	Missing
2021					5			
2020					2			
2019					5			
2018	1				6			
2017					2			
2016	1				6			
2015					5			
2014			5		2			
2013				1	9			
2008-12			6	7	51		4	
2002-07	10	1	150	35	51	1	24	
Totalt	**12**	**1**	**161**	**43**	**144**	**1**	**28**	**0**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in lumbar disc prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2021					5	(100,0%)			**5**
2020					2	(100,0%)			**2**
2019					5	(100,0%)			**5**
2018					6	(100,0%)			**6**
2017					2	(100,0%)			**2**
2016					6	(100,0%)			**6**
2015					5	(100,0%)			**5**
2014					7	(100,0%)			**7**
2013					10	(100,0%)			**10**
2008-12					63	(100,0%)			**63**
2002-07					242	(100,0%)			**242**
Total					**353**	**(100,0%)**			**353**

Table 4: Primary operations - Distal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2021					5	(100,0%)			**5**
2020					2	(100,0%)			**2**
2019					5	(100,0%)			**5**
2018					6	(100,0%)			**6**
2017					2	(100,0%)			**2**
2016					6	(100,0%)			**6**
2015					5	(100,0%)			**5**
2014					7	(100,0%)			**7**
2013					10	(100,0%)			**10**
2008-12	2	(3,2%)			61	(96,8%)			**63**
2002-07	1	(0,4%)			239	(98,8%)	2	(0,8%)	**242**
Total	**3**	**(0,8%)**			**348**	**(98,6%)**	**2**	**(0,6%)**	**353**

Lumbar disc prostheses - Prosthesis brand

Table 5: Primary operations - Proximal

Prostheses	2002-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Prodisc	243	10	7	5	6	2	1				**274**
Charité	62										**62**
BAGUERA L							3	5	2	5	**15**
Mobidisc L							2				**2**
Total	**305**	**10**	**7**	**5**	**6**	**2**	**6**	**6**	**2**	**5**	**353**

Table 6: Primary operations - Distal

Prostheses	2002-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Prodisc	243	10	7	5	6	2	1				**274**
Charité	62										**62**
BAGUERA L							3	5	2	5	**15**
Mobidisc L							2				**2**
Total	**305**	**10**	**7**	**5**	**6**	**2**	**6**	**6**	**2**	**5**	**353**

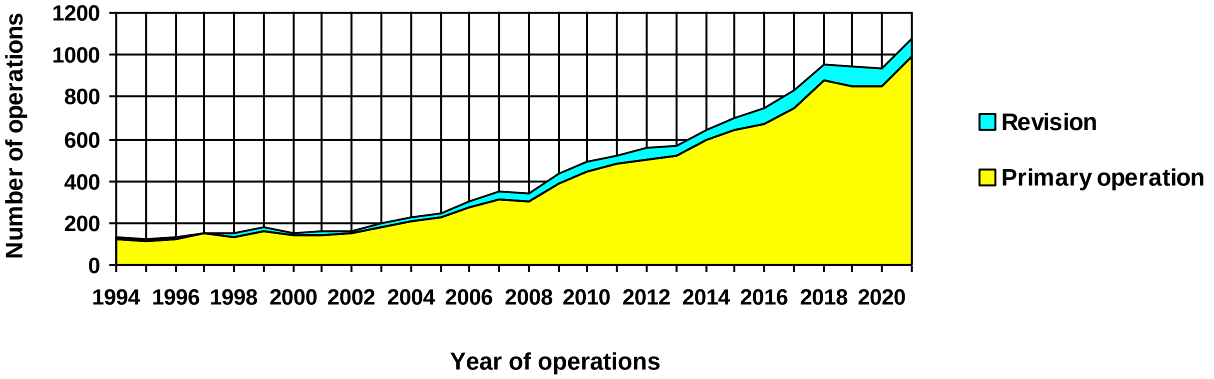
SHOULDER PROSTHESES

Table 1: Annual number of operations in shoulder prostheses

Year	Primary operations		Reoperations *		Revisions		Total
2021	980	(92,5%)			79	(754%)	**1 059**
2020	852	(90,5%)	4	(0,4%)	85	(9,0%)	**941**
2019	854	(90,5%)	1	(0,1%)	89	(9,4%)	**944**
2018	878	(91,8%)			78	(8,2%)	**956**
2017	743	(89,6%)	1	(0,1%)	85	(10,3%)	**829**
2016	673	(90,3%)			72	(9,7%)	**745**
2015	644	(91,7%)			58	(8,3%)	**702**
2014	596	(92,5%)			48	(7,5%)	**644**
2013	517	(90,9%)	2	(0,4%)	50	(8,8%)	**569**
1994-12	4 552	(91,1%)	1	(0,0%)	441	(8,8%)	**4 994**
Total	**11 286**	**(91,2%)**	**9**	**(0,1%)**	**1 085**	**(8,8%)**	**12 383**

* Reoperation where prosthetic parts were not changed or removed (soft tissue debridements for infected prosthesis, prosthetic parts were not changed)

Figure 1a: Annual number of operations - All prostheses



53,6 % of all operations were performed on the right side   68,9 % performed in women.   Mean age: 70,2 years.

COVID-19

Figure 1b: Monthly primary operations in 2019 - 2021

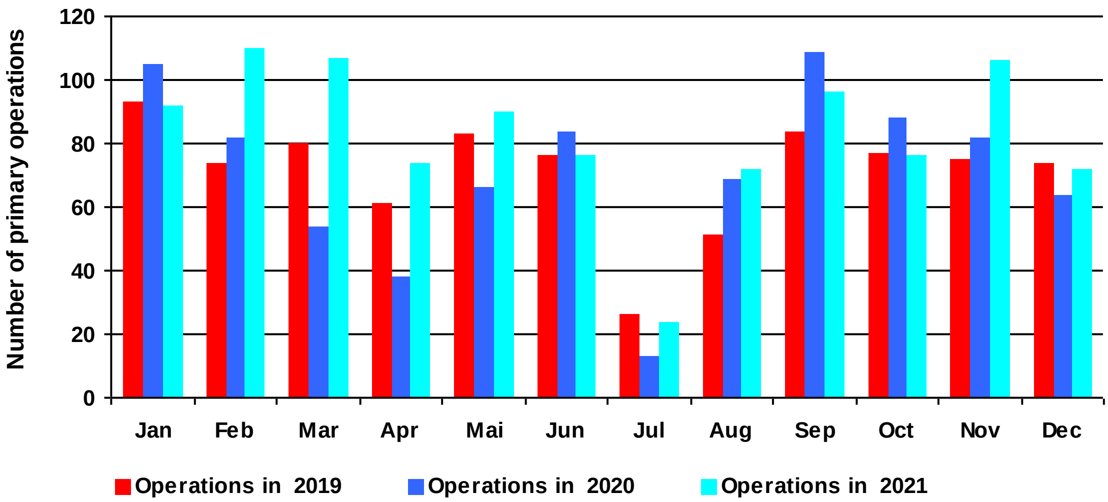


Figure 2a: Prostheses - all operations

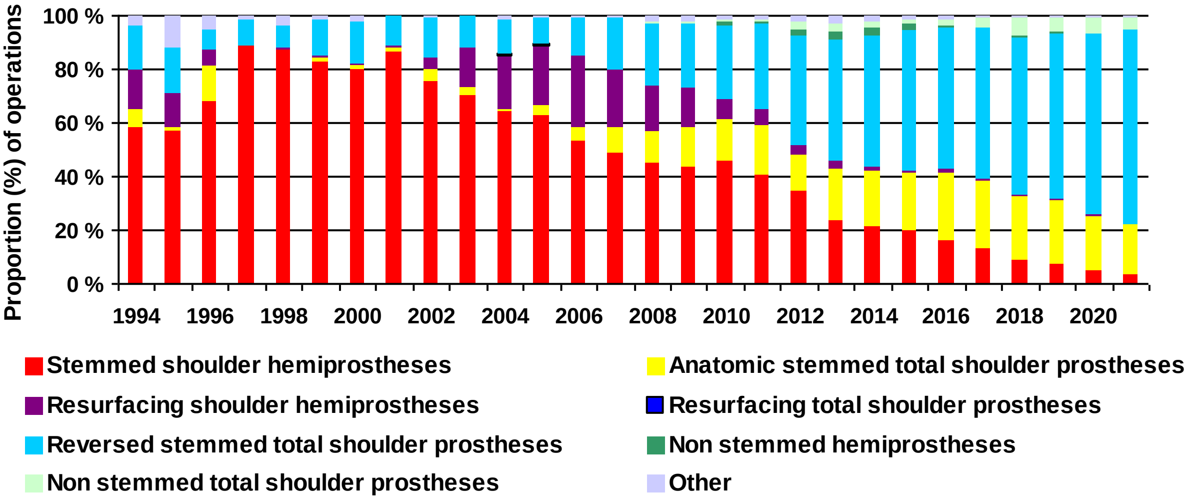


Figure 2b: Prostheses - Idiopathic osteoarthritis

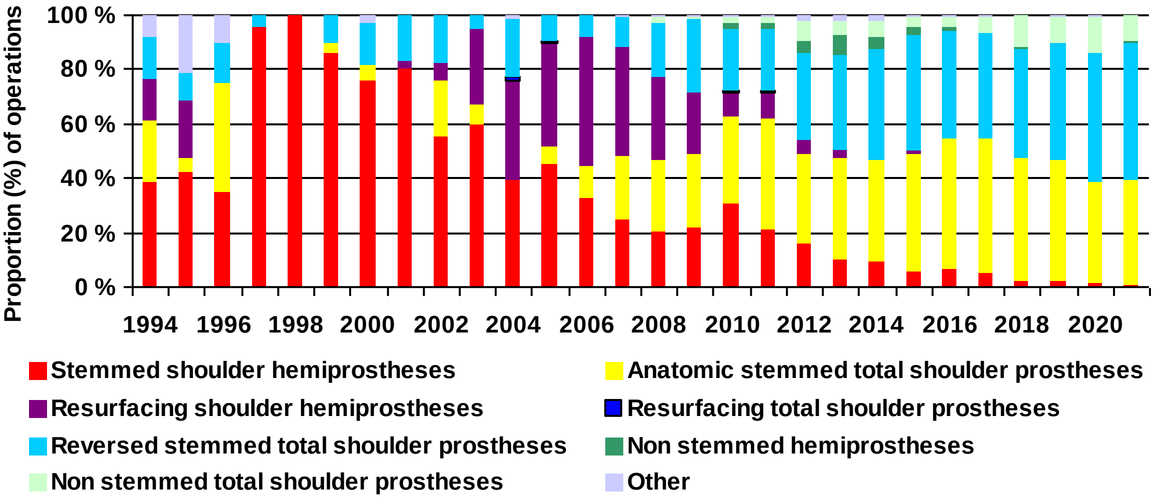


Figure 2c: Prostheses - Acute fracture

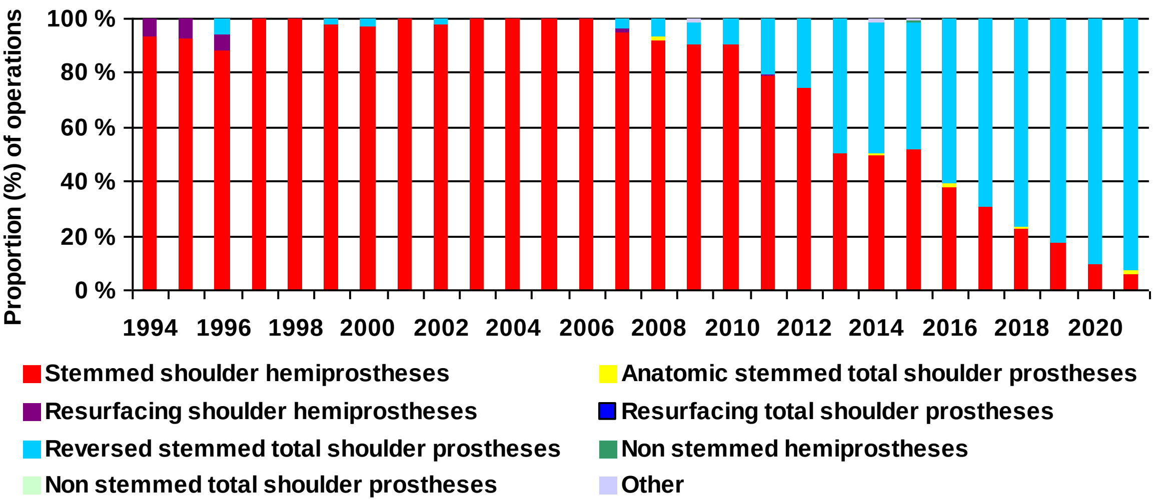


Figure 3: Age at the insertion of primary anatomic total prostheses

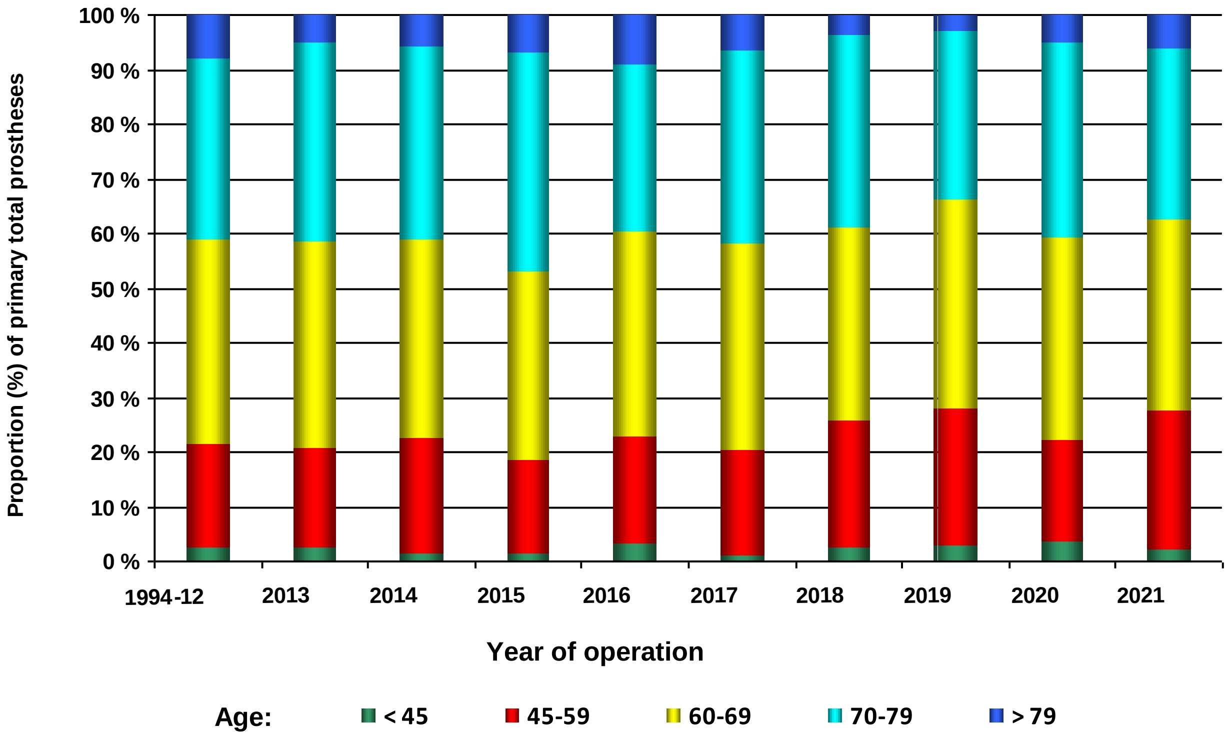


Figure 4: Age at the insertion of primary reversed total prostheses

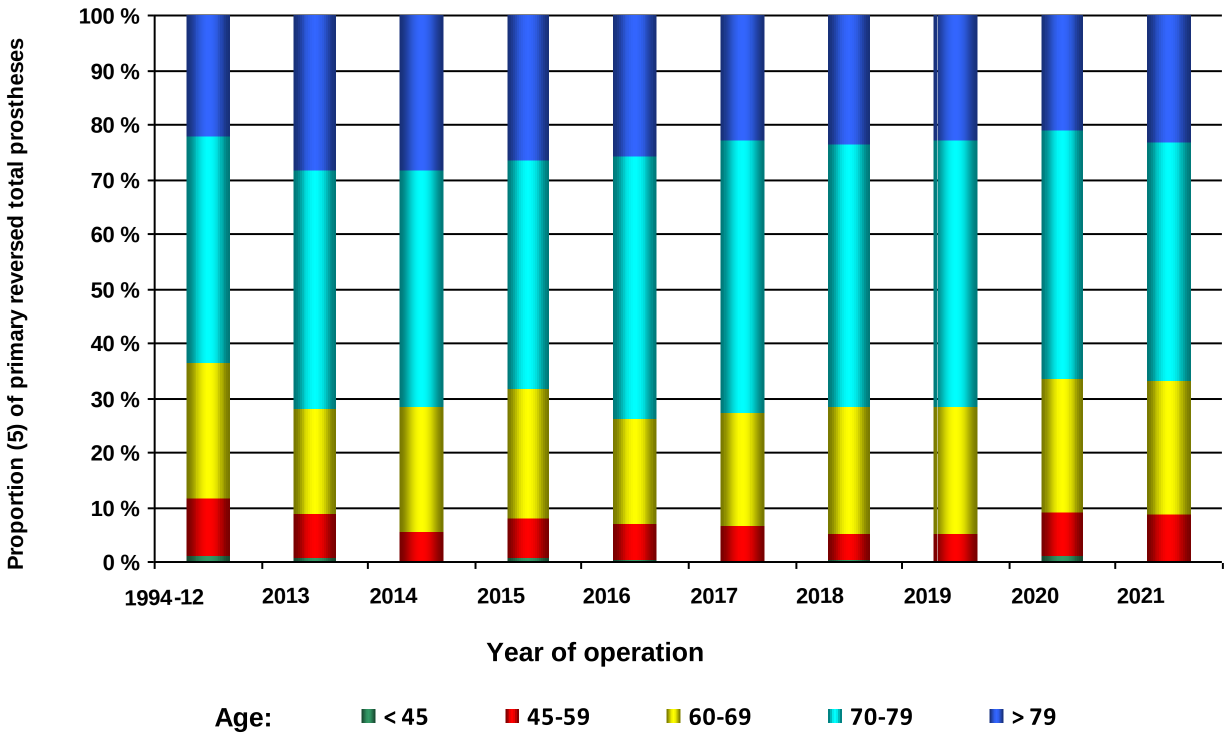


Figure 5: Age at the insertion of primary hemiprostheses

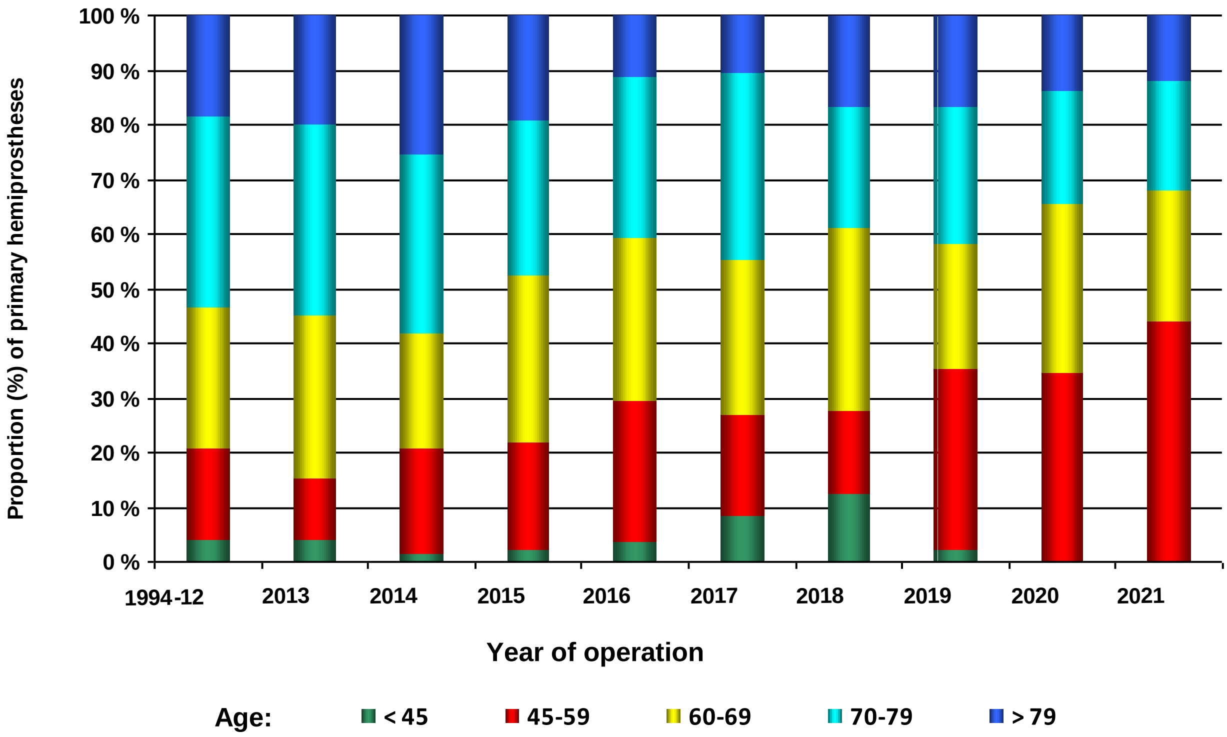


Table 2: Annual number of operations - Stemmed shoulder hemiprostheses

Year	Primary operations		Reoperations *		Revisions		Total
2021	24	(64,9%)			13	(36,1%)	**37**
2020	28	(58,3%)	2	(4,2%)	18	(37,5%)	**48**
2019	46	(63,9%)			26	(36,1%)	**72**
2018	65	(73,9%)			23	(26,1%)	**88**
2017	84	(75,7%)	1	(0,9%)	26	(23,4%)	**111**
2016	100	(80,6%)			24	(19,4%)	**124**
2015	118	(84,9%)			21	(15,1%)	**139**
2014	130	(92,2%)			11	(7,8%)	**141**
2013	116	(85,9%)	1	(0,7%)	18	(13,3%)	**135**
1994-12	2 571	(92,7%)			201	(7,3%)	**2 772**
Total	**3 282**	**(89,5%)**	**4**	**(0,1%)**	**381**	**(10,4%)**	**3 667**

* Reoperation where prosthetic parts were not changed or removed (soft tissue debridements for infected prosthesis, prosthetic parts were not changed)

Figure 6: Annual number of operations - Stemmed hemiprostheses

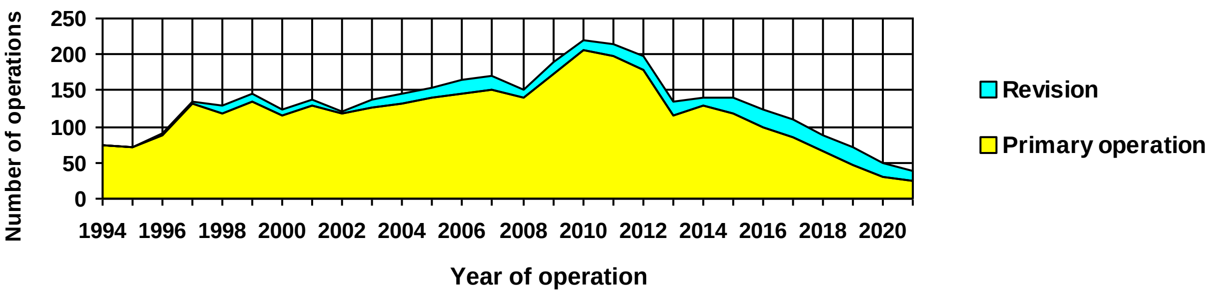


Table 3: Annual number of operations - Anatomic stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2021	180	(92,3%)	15	(7,7%)	**195**
2020	178	(94,2%)	10	(5,3%)	**189**
2019	202	(91,0%)	20	(9,0%)	**222**
2018	210	(94,6%)	12	(5,4%)	**222**
2017	191	(91,8%)	17	(8,2%)	**208**
2016	173	(92,0%)	15	(8,0%)	**188**
2015	144	(93,5%)	10	(6,5%)	**154**
2014	123	(91,1%)	12	(8,9%)	**135**
2013	102	(95,3%)	5	(4,7%)	**107**
1994-12	427	(89,5%)	50	(10,5%)	**477**
Total	**1 931**	**(92,0%)**	**166**	**(7,9%)**	**2 097**

Figure 7: Annual number of operations - Anatomic stemmed total shoulder prostheses

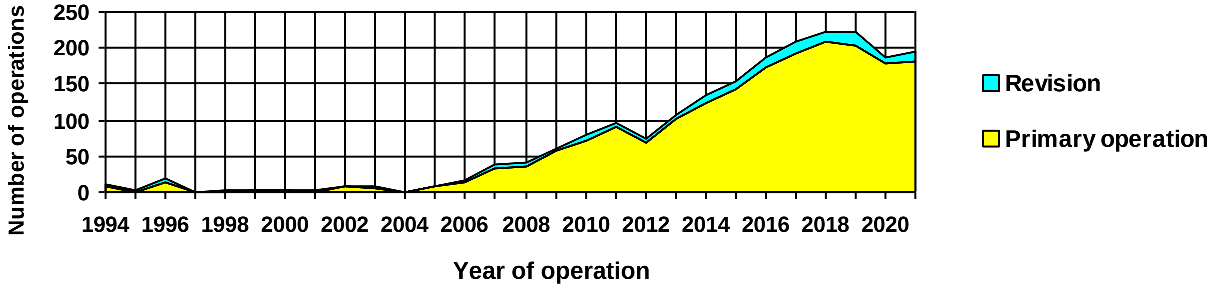


Table 4: Annual number of operations - Resurfacing shoulder hemiprostheses

Year	Primary operations		Revisions		Total
2021			5	(100,0%)	5
2020			4	(100,0%)	**4**
2019			3	(100,0%)	**3**
2018			9	(100,0%)	**9**
2017			10	(100,0%)	**10**
2016			11	(100,0%)	**11**
2015	3	(37,5%)	5	(62,5%)	**8**
2014			11	(100,0%)	**11**
2013	9	(52,9%)	8	(47,1%)	**17**
1994-12	468	(87,6%)	66	(12,4%)	**534**
Total	**480**	**(78,3%)**	**132**	**(21,6%)**	**612**

Table 5: Annual number of operations - Resurfacing total shoulder prostheses

Year	Primary operations		Revisions		Total
1994-12	4	(80,0%)	1	(20,0%)	**5**
Total	**4**	**(80,0%)**	**1**	**(20,0%)**	**5**

Table 6: Annual number of operations - Reversed stemmed total shoulder prostheses

Year	Primary operations		Reoperations *		Revisions		Total
2021	724	(94,4%)			43	(5,6%)	**767**
2020	583	(92,0%)	5	(0,8%)	46	(7,3%)	**634**
2019	545	(93,5%)	1	(0,2%)	37	(6,3%)	**583**
2018	524	(92,1%)	2	(0,4%)	43	(7,6%)	**569**
2017	438	(94,0%)			28	(6,0%)	**466**
2016	377	(95,0%)	1	(0,3%)	19	(4,8%)	**397**
2015	347	(92,3%)			29	(7,7%)	**376**
2014	299	(94,3%)			18	(5,7%)	**317**
2013	245	(95,0%)			13	(5,0%)	**258**
1994-12	997	(91,6%)	1	(0,1%)	91	(8,4%)	**1 089**
Total	**5 079**	**(93,1%)**	**10**	**(0,2%)**	**367**	**(6,7%)**	**5 456**

Figure 8: Annual number of operations - Reversed stemmed total shoulder prostheses

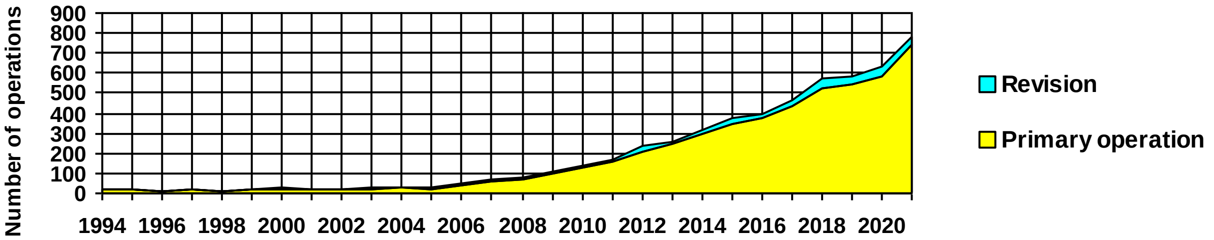


Table 7: Annual number of operations - Non stemmed hemiprostheses

Year	Primary operations		Revisions		Total
2021	1	(33,3%)	2	(66,7%)	**3**
2020			2	(100,0%)	**2**
2019	2	(33,3%)	4	(66,7%)	**6**
2018	7	(77,8%)	2	(22,2%)	**9**
2017	1	(33,3%)	2	(66,7%)	**3**
2016	8	(100,0%)			**8**
2015	13	(76,5%)	4	(23,5%)	**17**
2014	16	(84,2%)	3	(15,8%)	**19**
2013	19	(100,0%)			**19**
1994-12	22	(95,7%)	1	(4,3%)	**23**
Total	**89**	**(81,7%)**	**20**	**(18,3%)**	**109**

Table 8: Annual number of operations - Non stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2021	43	(89,6%)	5	(10,4%)	**48**
2020	53	(98,1%)	1	(1,9%)	**54**
2019	46	(92,0%)	4	(8,0%)	**50**
2018	60	(89,6%)	7	(10,4%)	**67**
2017	26	(92,9%)	2	(7,1%)	**28**
2016	14	(82,4%)	3	(17,6%)	**17**
2015	12	(92,3%)	1	(7,7%)	**13**
2014	18	(100,0%)			**18**
2013	14	(100,0%)			**14**
1994-12	28	(93,3%)	2	(6,7%)	**30**
Total	**314**	**(92,6%)**	**25**	**(7,4%)**	**339**

Reasons for primary operations

Table 9: Shoulder disease in primary operations

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2021	406	24	99	1	20	287	4	177	51	15
2020	388	23	96	2	21	224	6	121	51	
2019	396	26	109		16	208	4	129	46	
2018	408	45	102	1	22	212	5	131	45	
2017	332	40	104		12	167	4	124	44	
2016	294	39	97	3	17	168	3	85	20	
2015	294	36	89	1	19	164	6	61	31	
2014	267	29	79	2	22	177	2	39	23	
2013	238	31	59	1	19	156	2	26	12	
1994-12	1451	855	791	27	61	1194	29	153	208	18
Total	**4 474**	**1 148**	**1 625**	**38**	**229**	**2 957**	**65**	**1 046**	**531**	**33**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Table 10: Shoulder disease in primary operations - Stemmed shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2021	4					18		1	3	
2020	5		1			20	1		1	
2019	8		2			36			2	
2018	8		7			48		3	6	
2017	17	3	10			52	1	1	8	
2016	18	1	11	1	1	64		2	3	
2015	17	2	15			85	1		5	
2014	25		15			89			5	
2013	25	2	8		1	78		2	4	
1994-12	498	446	495	18	7	1082	9	7	107	10
Total	**625**	**454**	**564**	**19**	**9**	**1 572**	**12**	**16**	**144**	**10**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Figure 9: Shoulder disease in primary operations - Stemmed shoulder hemiprostheses

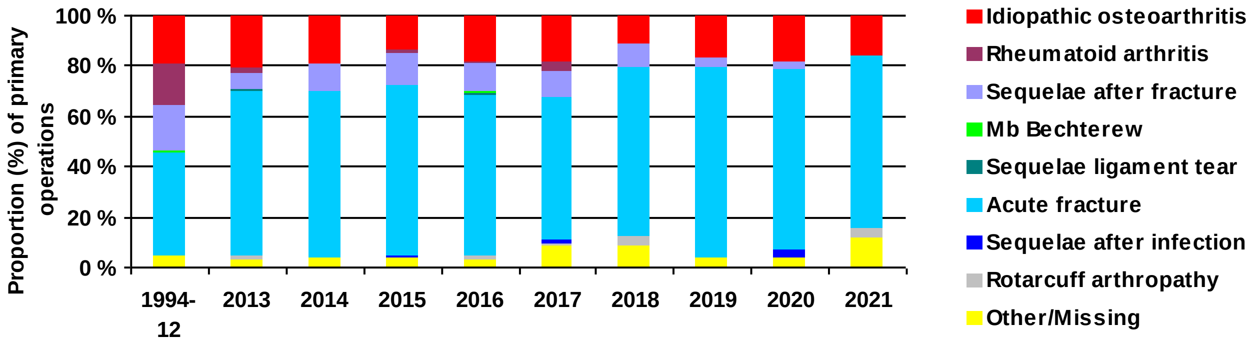


Table 11: Shoulder disease in primary operations - Anatomic stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2021	156	4	9		1	3			10	3
2020	148	5	12		6	1	1	1	7	
2019	175	7	16		4		1		11	
2018	185	13	9		2	1		2	7	
2017	162	3	16		4				11	
2016	143	8	20		1	2	1		2	
2015	128	4	7		1		1		6	
2014	98	5	15		3				4	
2013	87	3	11		1		1			
1994-12	333	26	45	2	5	1	3		17	1
Total	**1 615**	**78**	**160**	**2**	**28**	**8**	**8**	**3**	**75**	**4**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Figure 10: Shoulder disease in primary operations - Anatomic stemmed total shoulder prostheses

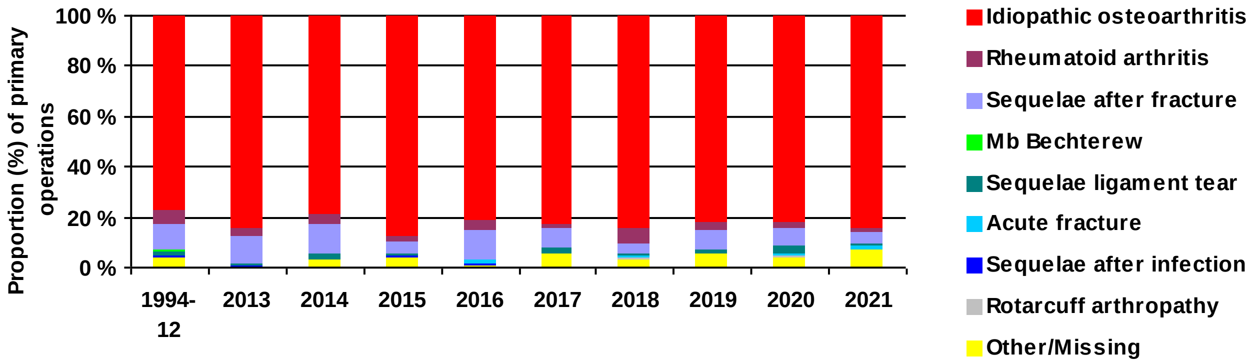


Table 12: Shoulder disease in primary operations - Resurfacing shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	3									
2013	8		1	1						
1994-12	288	124	35	3	6	4	3	5	19	3
Total	**299**	**124**	**36**	**4**	**6**	**4**	**3**	**5**	**19**	**3**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Table 13: Shoulder disease in primary operations - Resurfacing total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
1994-12	4								1	
Total	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Table 14: Shoulder disease in primary operations - Reversed stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2021	201	17	88	1	18	266	4	175	37	12
2020	183	17	81	1	12	203	4	114	37	
2019	169	16	88		10	172	2	122	25	
2018	160	31	78		16	163	4	123	19	
2017	132	33	74		8	115	2	123	19	
2016	119	28	62	2	13	102	2	82	14	
2015	123	28	63	1	17	78	4	60	18	
2014	111	24	45	2	18	86	2	39	9	
2013	81	23	37		15	78	1	24	4	
1994-12	271	248	206	4	42	107	14	140	57	3
Total	**1 550**	**465**	**822**	**11**	**169**	**1 370**	**39**	**1 002**	**239**	**15**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Figure 11: Shoulder disease in primary operations - Reversed stemmed total shoulder prostheses

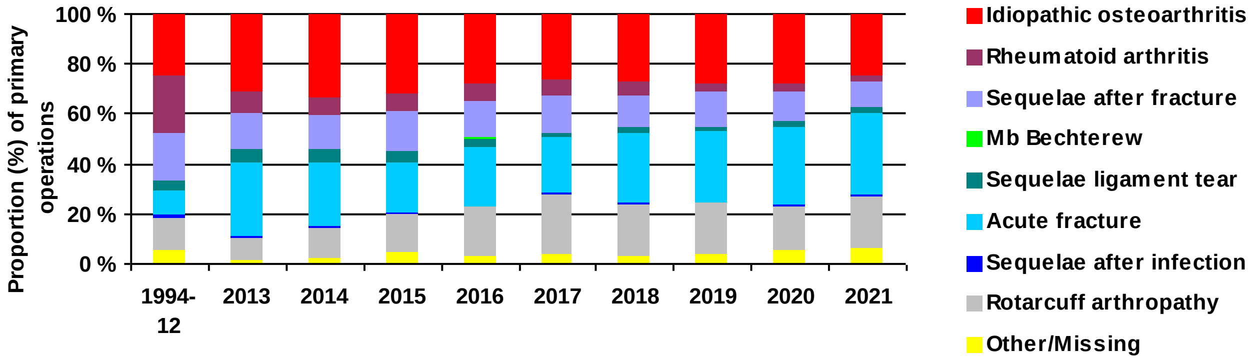


Table 15: Shoulder disease in primary operations - Non stemmed shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2021	1									
2019	1							1		
2018	3				1			1	3	
2017							1			
2016	5		3						1	
2015	10		3			1		1		
2014	11		2		1				2	
2013	18		1						1	
1994-12	16	1	4						2	
Total	**65**	**1**	**13**	**0**	**2**	**1**	**1**	**3**	**9**	**0**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Figure 12: Shoulder disease in primary operations - Non stemmed shoulder hemiprostheses

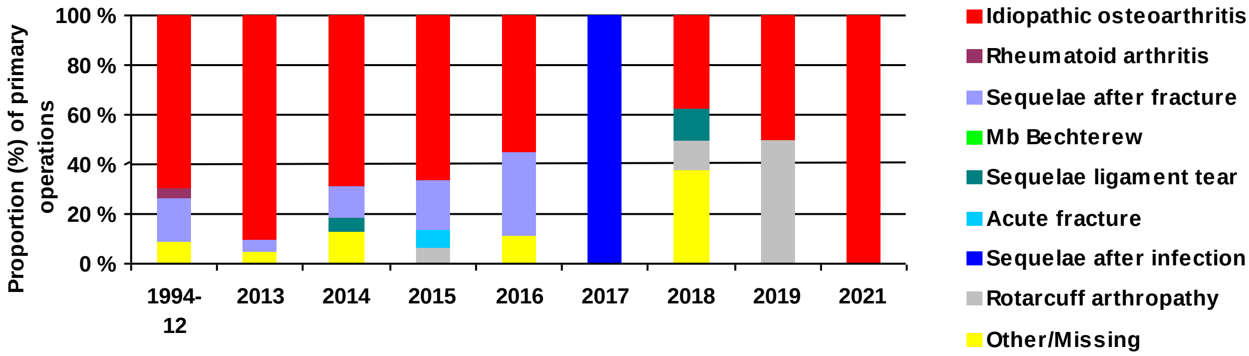
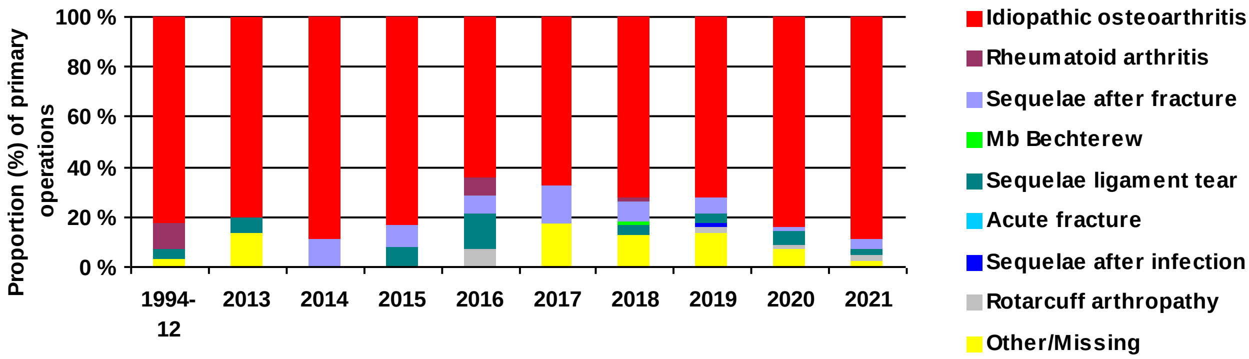


Table 16: Shoulder disease in primary operations - Non stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2021	39		2		1			1	1	
2020	48		1		3			1	4	
2019	37		3		2		1	1	7	
2018	47	1	5	1	3				8	
2017	19		4						5	
2016	9	1	1		2			1		
2015	10		1		1					
2014	16		2							
2013	12				1				2	
1994-12	23	3			1				1	
Total	**260**	**5**	**19**	**1**	**14**	**0**	**1**	**4**	**28**	**0**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Figure 13: Shoulder disease in primary operations - Non stemmed total shoulder prostheses



Use of cement in shoulder prostheses

Figure 14: Stemmed shoulder hemiprostheses - Primary operations - Humerus

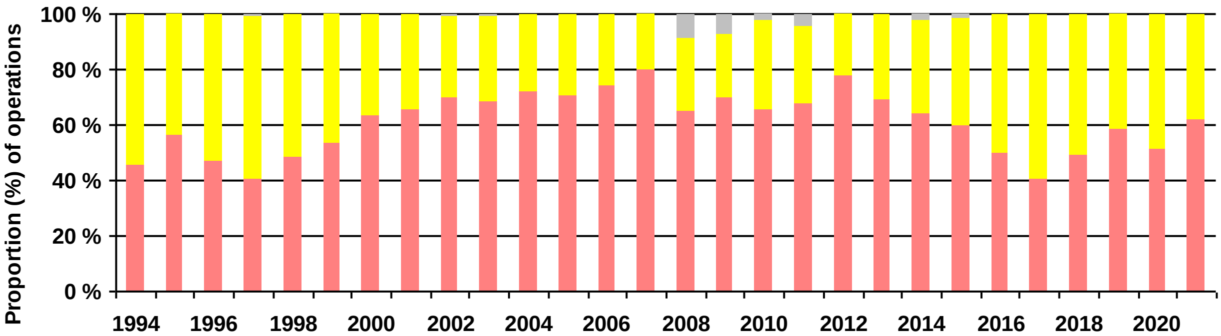


Figure 15: Anatomic stemmed total shoulder prostheses - Primary operations - Glenoid

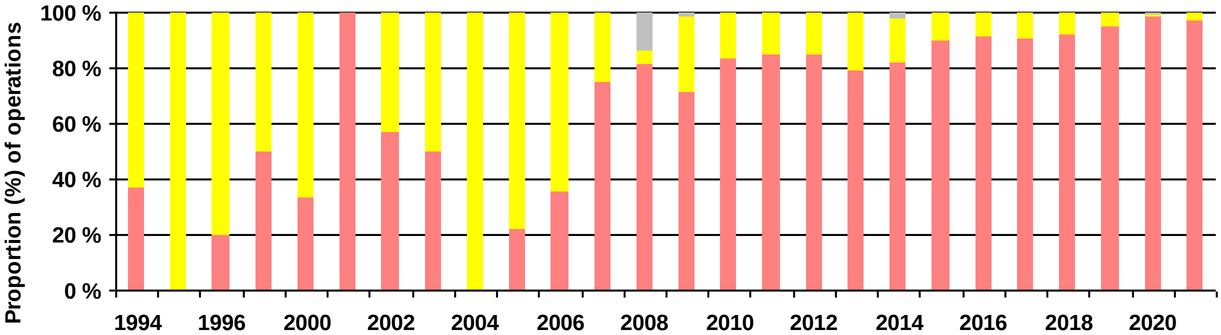


Figure 16: Anatomic stemmed total shoulder prostheses - Primary operations - Humerus

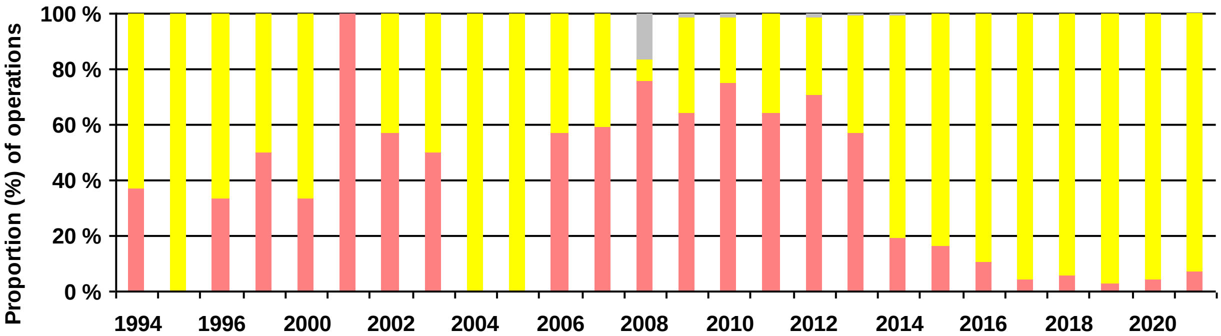


Figure 17: Resurfacing shoulder hemiprostheses - Primary operations - Humerus

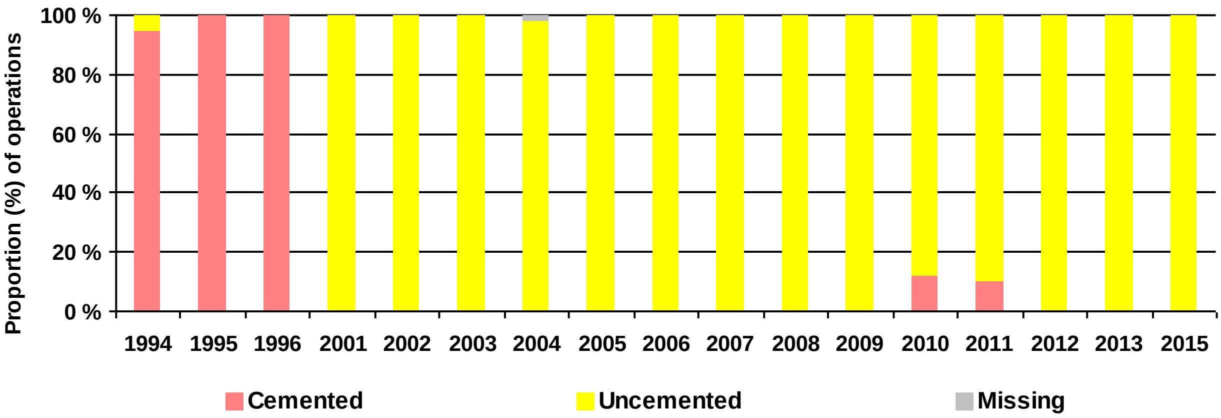


Figure 18: Reversed stemmed total shoulder prostheses - Primary operations - Glenoid

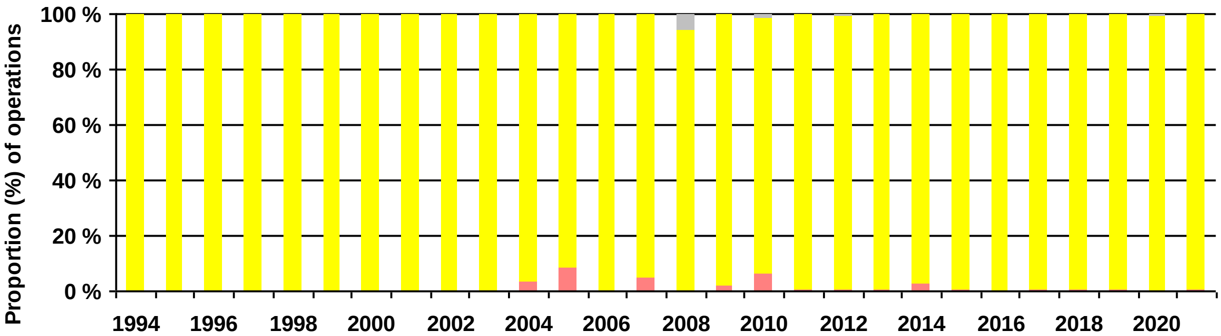


Figure 19: Reversed stemmed total shoulder prostheses - Primary operations - Humerus

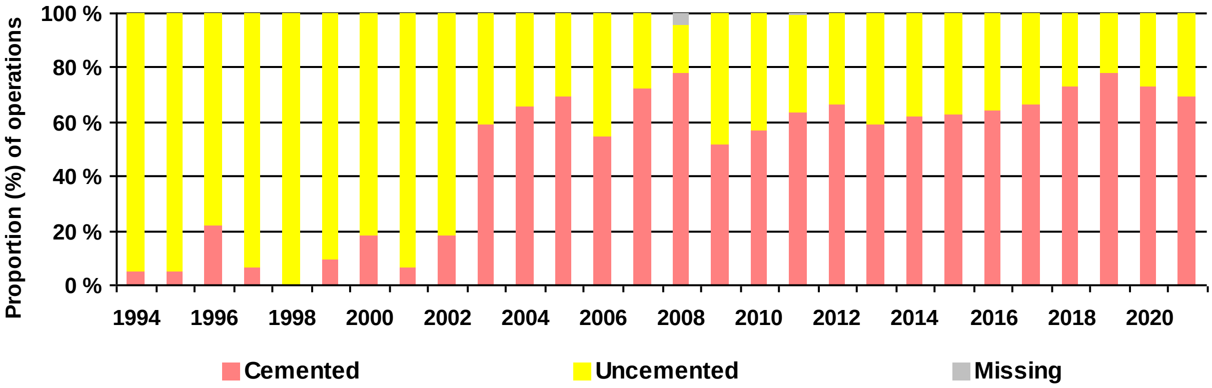


Figure 20: Non stemmed shoulder hemiprostheses - Primary operations - Humerus

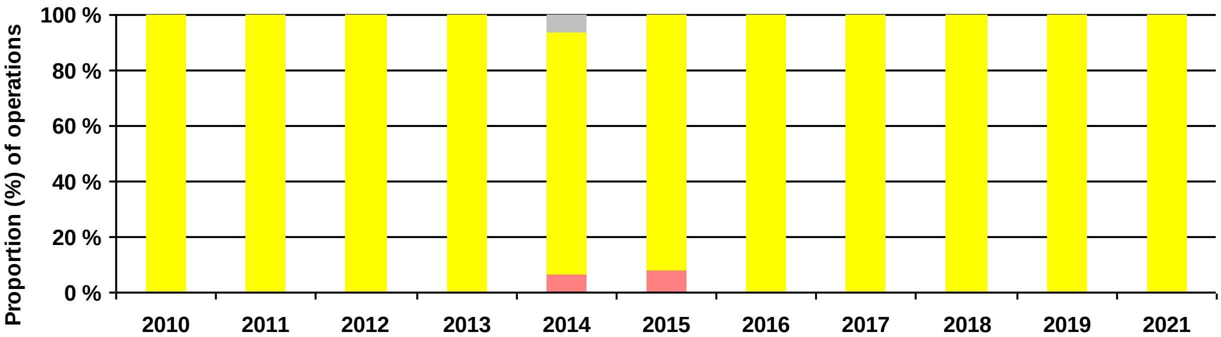


Figure 21: Non stemmed total shoulder prostheses - Primary operations - Glenoid

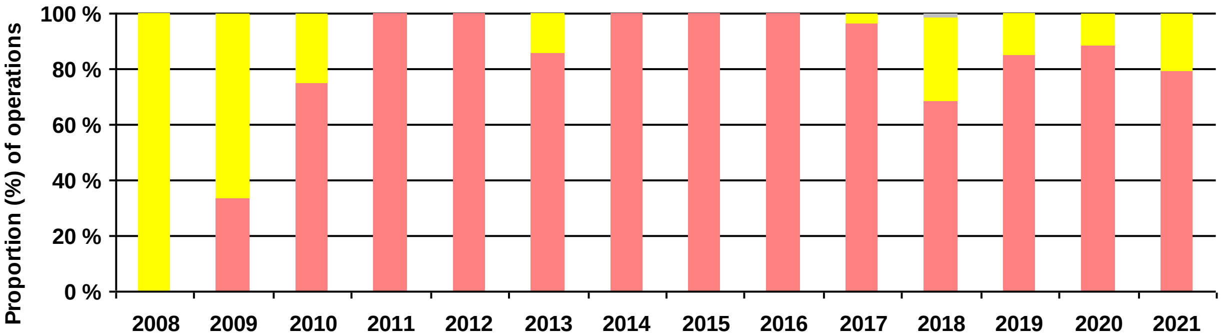
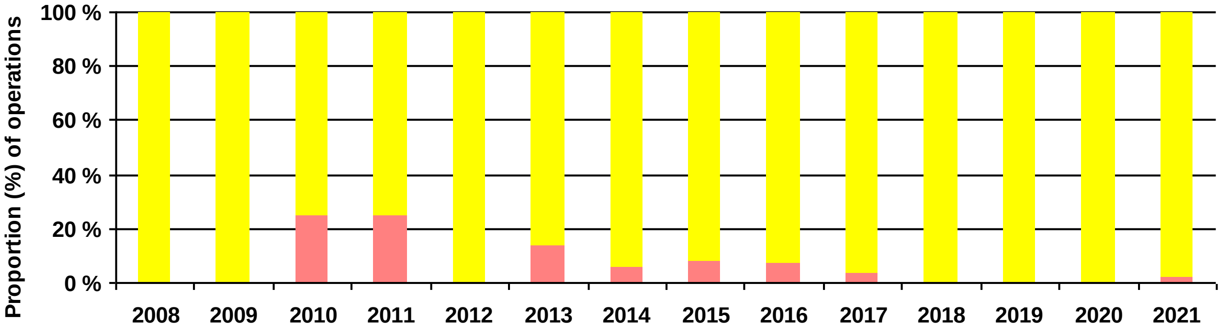


Figure 22: Non stemmed total shoulder prostheses - Primary operations - Humerus



Prosthesis brand

Stemmed hemiprostheses shoulder

Table 17: Primary operations- Caput humeri

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Bio - Modular	762	2	1	2			2				**769**
Global Advantage	605	36	40	34	15	1					**731**
Global Fx	221	17	16	13	11			1			**279**
Global	248										**248**
Nottingham	204										**204**
Global Unite	1		14	23	34	31	37	26	12	8	**186**
EPOCA	99	20	21	5							**145**
Tess-Anatomic	64	7	7	3	5						**86**
Comprehensive	2	4	6	5	13	16	4	5	7	7	**69**
Delta I	63										**63**
Promos standard	8	15	11	11	6	2					**53**
SMR- anatomic			1	2	7	13	10	8	4	4	**49**
Aequalis Ascend Flex Anatomic		1	2	8	2	11	6	4	5	5	**44**
Aequalis	38	6									**44**
Aequalis-Fracture	28	3	3	1	1	3	2				**41**
Nottingham 1	36	2									**38**
Modular	33										**33**
Bigliani/Flatow	27	2		1			1	1			**32**
JR-Vaios Anatomic		1	7	9	3	6	2	1			**29**
Other (n < 15)	25		1	1	3	1	1				**32**
Total	**2 464**	**116**	**130**	**118**	**100**	**84**	**65**	**46**	**29**	**24**	**3 175**

Table 18: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Bio - Modular	771	2	1	2			2				**778**
Global Advantage	411	35	38	33	15	1					**533**
Global Fx	415	18	18	14	11			1			**477**
Global	261										**261**
Nottingham	210										**210**
Global Unite	1		14	23	34	31	37	26	12	8	**186**
EPOCA	100	20	21	5							**146**
Tess-Anatomic	63	7	7	3	5						**85**
Delta I	64										**64**
Promos standard	8	14	11	11	6	2					**52**
SMR- anatomic			1	2	7	13	10	8	4	4	**49**
Neer II	47										**47**
Aequalis-Fracture	31	4	3	1	1	3	2				**45**
Aequalis Ascend Flex Anatomic		1	2	8	2	11	6	4	5	5	**44**
Aequalis	34	5									**39**
Comprehensive Fracture	3	4	6	5	3	3	2	3	3	4	**36**
Comprehensive					10	13	2	2	4	3	**34**
Modular	33										**33**
Nottingham 1	30	2									**32**
Bigliani/Flatow	27	2		1			1	1			**32**
JR-Vaios Anatomic		1	7	9	3	6	2	1			**29**
Other (n < 15)	62	1	1	1	3	1	1				**70**
Total	**2 571**	**116**	**130**	**118**	**100**	**84**	**65**	**46**	**29**	**24**	**3 282**

Anatomic stemmed total shoulder prostheses

Table 19: Primary operations - Glenoid

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Global unite anatomic			3	82	100	130	137	142	148	134	**876**
Aequalis	208	37	3								**248**
Aequalis Ascend Flex Anatomic		12	68	15	30	25	25	10	8	13	**206**
Comprehensive	5	2		1		10	24	41	16	31	**130**
Global	84	30	9	1							**124**
Global Advantage	4	2	18	27	19	1					**71**
JR-Vaios Anatomic		4	8	8	11	8	8	1			**48**
Tess-Anatomic	29	3	3	3	4	1	3				**46**
Bio - Modular	37										**37**
SMR- anatomic			1		4	11	9	7	2	2	**36**
Promos standard	1	3	7	6	4	3	3				**27**
Bigliani/Flatow	17	1	2		1	2	1				**24**
Anatomical shoulder	5	8	1	1							**15**
Other (n < 15)	37							1	4		**42**
Total	**427**	**102**	**123**	**144**	**173**	**191**	**210**	**202**	**178**	**180**	**1 930**

Table 20: Primary operations - Caput humeri

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Global unite anatomic			3	82	100	130	136	141	146	132	**870**
Aequalis	208	36	6								**250**
Aequalis Ascend Flex Anatomic		13	65	14	30	25	25	10	11	13	**206**
Global Advantage	86	31	27	28	18	1					**191**
Comprehensive	5	2		1		10	24	41	16	31	**130**
JR-Vaios Anatomic		4	8	8	11	8	8	1			**48**
Bio - Modular	47										**47**
Tess-Anatomic	29	3	3	3	4	1	3				**46**
SMR- anatomic			1		4	11	9	7	2	2	**36**
Promos standard	1	3	7	6	4	3	3				**27**
Bigliani/Flatow	17	1	2		1	2	1				**24**
Anatomical shoulder	5	8	1	2							**16**
Nottingham	15										**15**
Other (n < 15)	12	1			1		1	2	3	2	**22**
Total	**425**	**102**	**123**	**144**	**173**	**191**	**210**	**202**	**178**	**181**	**1 928**

Table 21: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Global unite anatomic			3	82	100	130	136	141	146	132	**870**
Aequalis	208	36	6								**250**
Aequalis Ascend Flex Anatomic		13	63	14	30	25	25	10	11	13	**204**
Global Advantage	85	31	26	27	17	1					**187**
Comprehensive	5	2		1		10	24	41	16	31	**130**
Bio - Modular	48										**48**
JR-Vaios Anatomic		3	8	8	11	8	8	1			**47**
Tess-Anatomic	29	3	3	3	4	1	3				**46**
SMR- anatomic			1		4	11	9	7	2	2	**36**
Promos standard	1	3	7	6	4	3	3				**27**
Bigliani/Flatow	17	1	2		1	2	1				**24**
Anatomical shoulder	5	8	1	2							**16**
Nottingham	15										**15**
Other (n < 15)	14	2	3	1	2		1	2	3	2	**30**
Total	**427**	**102**	**123**	**144**	**173**	**191**	**210**	**202**	**178**	**181**	**1 930**

Resurfacing shoulder hemiprostheses

Table 22: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Copeland	304										**304**
Global C.A.P.	95	2		2							**99**
Scan Shoulder	42										**42**
EPOCA Resurfacing	11	7		1							**19**
Aequalis Resurfacing	16										**16**
Total	**468**	**9**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**480**

Resurfacing total shoulder prostheses

Table 23: Primary operations - Glenoid

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Copeland	2										**2**
Aequalis Resurfacing	2										**2**
Total	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**

Table 24: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Copeland	2										**2**
Aequalis Resurfacing	2										**2**
Total	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**

Reversed stemmed total shoulder prostheses

Table 25: Primary operations - Glenoid

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Delta Xtend	477	141	181	221	245	305	394	420	424	523	**3 331**
Aequalis Reversed II	18	53	49	60	45	40	52	38	58	65	**478**
Delta III	315										**315**
Comprehensive Reverse	2	1	4	8	29	22	20	43	64	103	**296**
Tess Reversed	123	23	31	34	27	22	3				**263**
SMR-reverse			2	3	11	31	41	36	35	33	**192**
Promos Reverse	19	17	19	14	17	11	9				**106**
JRI-Vaios Inverse		9	5	4	3	5	5	6			**37**
Aequalis-Reversed	32										**32**
Trebecular Metal Reverse Shou	5	1	3	2		2					**13**
Anatomical shoulder Reversed	5		5								**10**
Other (n < 10)	1			1				2	2		**6**
Total	**997**	**245**	**299**	**347**	**377**	**438**	**524**	**545**	**583**	**724**	**5 079**

Table 26: Primary operations - Caput humeri

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Delta Xtend	478	141	181	221	245	305	394	420	424	523	**3 332**
Aequalis Ascend Flex Reversed		16	41	44	34	32	31	27	47	48	**320**
Delta III	307										**307**
Comprehensive Reverse	2	1	4	8	29	22	20	43	64	103	**296**
Tess Reversed	121	22	31	34	27	22	3				**260**
SMR-reverse			2	4	11	31	41	37	35	33	**194**
Aequalis Reversed Fracture	3	16	8	16	11	8	21	12	13	17	**125**
Promos Reverse	19	17	19	14	17	11	9				**106**
Aequalis-Reversed	37	13									**50**
JRI-Vaios Inverse		9	5	4	3	5	5	6			**37**
Aequalis Reversed II	6	8									**14**
Trebecular Metal Reverse Shou	5		3	2		2					**12**
Anatomical shoulder Reversed	5		5								**10**
Other (n < 10)	1	1									**2**
Total	**984**	**244**	**299**	**347**	**377**	**438**	**524**	**545**	**583**	**724**	**5 065**

Table 27: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Delta Xtend	478	141	181	221	245	305	394	420	424	522	**3 331**
Aequalis Ascend Flex Reversed		16	41	44	34	32	31	27	47	48	**320**
Delta III	315										**315**
Tess Reversed	122	22	31	34	27	22	3				**261**
Comprehensive Reverse	2	1	4	8	27	21	19	33	44	74	**233**
SMR-reverse			2	4	11	31	41	37	35	33	**194**
Aequalis Reversed Fracture	3	16	8	16	11	8	21	12	13	17	**125**
Promos Reverse	19	17	19	14	17	11	9				**106**
Comprehensive Fracture					2	1	1	9	20	29	**62**
Aequalis-Reversed	42	19									**61**
JRI-Vaios Inverse		9	5	4	3	5	5	6			**37**
Trebecular Metal Reverse Shou	5	1	3	2		2					**13**
Anatomical shoulder Reversed	5		5								**10**
Other (n < 10)	6	3						1		3	**13**
Total	**997**	**245**	**299**	**347**	**377**	**438**	**524**	**545**	**584**	**737**	**5 079**

Non stemmed shoulder hemiprostheses

Table 28: Primary operations - Caput humeri

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
ECLIPSE TM	20	15	10	11	3						**59**
Simpliciti	1	3	4		1		1				**10**
Other (n < 10)	1	1	2	2	4	1	6	2		1	**20**
Total	**22**	**19**	**16**	**13**	**8**	**1**	**7**	**2**	**0**	**1**	**89**

Table 29: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
ECLIPSE TM	20	15	10	11	3						**59**
Simpliciti	1	3	4		1		1				**10**
Other (n < 10)	1	1	2	2	4	1	6	2		1	**20**
Total	**22**	**19**	**16**	**13**	**8**	**1**	**7**	**2**	**0**	**1**	**89**

Non stemmed total shoulder prostheses

Table 30: Primary operations - Glenoid

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Aequalis Ascend Flex Anatomic			13	7	12	13	24	12	8	15	**104**
Global unite anatomic						9	16	24	34	20	**103**
SMR- anatomic							18	8	7	7	**40**
ECLIPSE TM	8	2	4	5		2	1	2	4	1	**29**
Simpliciti	10	10									**20**
Tess-Anatomic	10					1					**11**
Other (n < 10)		2	1		2	1	1				**7**
Total	**28**	**14**	**18**	**12**	**14**	**26**	**60**	**46**	**53**	**44**	**314**

Table 31: Primary operations - Caput humeri

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Simpliciti	10	12	13	7	12	13	24	12	8	15	**126**
Global Icon						9	16	24	34	20	**103**
SMR- anatomic							18	8	7	7	**40**
ECLIPSE TM	8	2	4	5		2	1	2	4	1	**29**
Tess-Anatomic	10					1					**11**
Other (n < 10)			1		2	1	1				**5**
Total	**28**	**14**	**18**	**12**	**14**	**26**	**60**	**46**	**53**	**44**	**314**

Table 32: Primary operations - Humerus

Prostheses	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Simpliciti	10	12	14	7	12	13	24	11	8	15	**126**
Global Icon						9	16	24	34	20	**103**
SMR- anatomic							18	8	7	7	**40**
ECLIPSE TM	8	2	4	5		2	1	2	4	1	**29**
Tess-Anatomic	10					1					**11**
Other (n < 10)					2	1	1	1			**5**
Total	**28**	**14**	**18**	**12**	**14**	**26**	**60**	**46**	**53**	**44**	**314**

Reasons for revisions

Table 33: Stemmed shoulder hemiprostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021				4			1	3			3	2
2020				2		2	3	6	1	4	8	
2019		2	1	1		1	2	10		4	9	
2018		1		2		2		8		2	6	
2017			2	2		2	2	12		3	10	
2016		2	1	1			1	10		6	8	
2015			1	3		1		8		1	7	
2014			2	1				8			2	
2013		1	2	5		2	1	10			2	
2012		2	4	1		1	2	5			4	1
2011			2	2		1		5		2	3	
2010		3	2	1		1	1	8			5	
2009				1		2	1	6			1	
2008				2		1		5			2	1
2007		1	1	2		1		10			2	2
2006		2		4		1	2	9			3	
1994-05		6	11	6	1	5	1	42			21	1
Total	**0**	**20**	**29**	**40**	**1**	**23**	**17**	**165**	**1**	**22**	**96**	**7**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Table 34: Anatomic stemmed total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021	3		1	1				1	3		3	
2020	2					1		4	2		5	
2019	3	1	1	5		1	1	3	2		7	
2018	1		2	2	1			2	1		5	
2017	5		2	4			1	2			5	
2016	3	1		1		2		2			1	
2015	2					2		3			1	
2014	3			4	1		1	4			3	
2013	1					1		1	1			
2012	1			1		1		2	1			
2011	1	1	2					1				
2010			1	2							1	
2009			1									
2008								1	3			
2007	1		1						2			
2006			1									
1994-05	3		5					4			2	
Total	**29**	**3**	**17**	**20**	**2**	**8**	**3**	**30**	**15**	**0**	**33**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Table 35: Resurfacing shoulder hemiprostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021		1					1	1		2	1	
2020								1				
2019		1					1	2		2		
2018							1	5		2	3	
2017				1				6		4		
2016		3		1				7		3	2	
2015		2						1			1	
2014		1		1			1	9		1	2	
2013		1						7		1	1	
2012		1	1	2		1		5		2	3	
2011					1			5			5	
2010								8		1	1	
2009								9			2	
2008		2		1				11			2	
2007			1			1		2	1		1	
2006		1		1		1		2				
1994-05		3					1	5			1	
Total	**0**	**16**	**2**	**7**	**1**	**3**	**5**	**86**	**1**	**18**	**25**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Table 36: Resurfacing total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
1994-05			1	1								
Total	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible Only the first reoperation is counted..

Table 37: Reversed stemmed total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021	5	5	5			14	5	2	2		4	
2020	3		13	1		8	7		1		1	
2019	1	1	7	1	1	5		1			2	
2018	1	3	11	2		5	5	3	1		2	
2017	2	2	6	2	1	7	2	6	2			
2016	2	3	3	1		5	4	2	1			
2015	4	1	4	1	1	5	2	2	3		1	
2014	1	2	2	1		4	1	1				
2013	3	2	3	1		3		1			1	
2012	4	4	6	1		5			2		2	
2011	1		2	1			2					
2010	3	1	2	1		1	1				2	
2009	1					2					1	
2008			3		1							
2007	2	1	2	2		3		1				
2006			1	1					1			
1994-05	12	5	4	2		6	1	3			3	
Total	**45**	**30**	**74**	**18**	**4**	**73**	**30**	**22**	**13**	**0**	**19**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Table 38: Non stemmed shoulder hemiprostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021						1						
2020										1		
2019		1		1							1	
2018		1									1	
2017								1		1		
2015								3		2		
2014		1						2			1	
2012						1						
Total	**0**	**3**	**0**	**1**	**0**	**2**	**0**	**6**	**0**	**4**	**3**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Table 39: Non stemmed total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2021	1	1		1		2		1			2	
2020	1											
2019	1	1				1		1	1			
2018	2			2		1			1		3	
2017			1								1	
2016						1		1			1	
2015				1								
2012	1											
Total	**6**	**2**	**1**	**4**	**0**	**5**	**0**	**3**	**2**	**0**	**7**	**0**

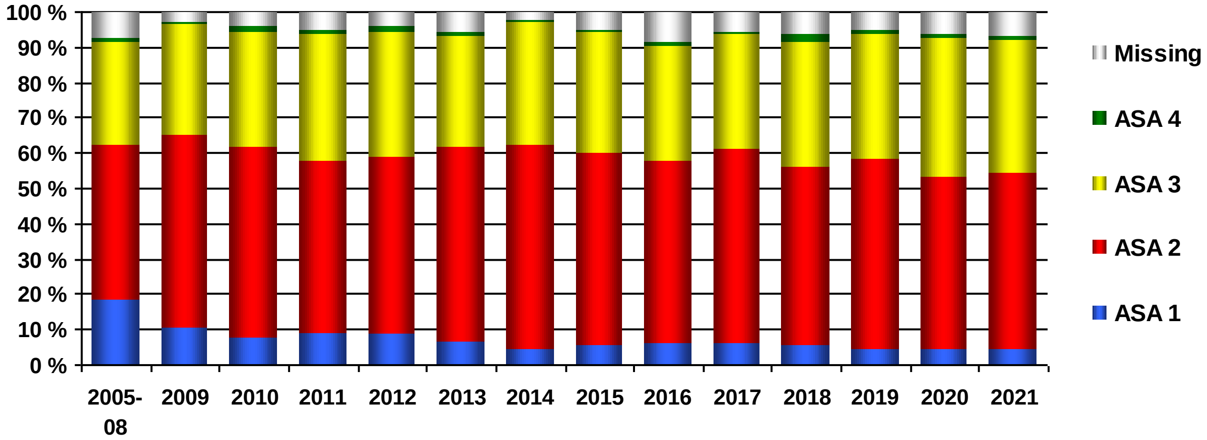
Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

ASA classification all shoulder prostheses

Table 40: Primary operations

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2021	44	488	370	11		67	**980**
2020	38	418	332	13		51	**852**
2019	37	460	306	6		45	**854**
2018	49	443	313	20		53	**878**
2017	45	410	243	4		41	**743**
2016	41	347	220	7		58	**673**
2015	37	349	223	3		32	**644**
2014	28	343	207	4		14	**596**
2013	36	283	163	5		30	**517**
2012	44	252	177	8		19	**500**
2011	42	236	174	6		23	**481**
2010	36	240	147	6		18	**447**
2009	41	215	123	3		10	**392**
2005-08	209	489	324	13		82	**1 117**

Figure 23: Primary operations



ASA 1 = Healthy patients who smoke less than 5 cigarettes a day.
ASA 2 = Patients with an asymptomatic condition who are kept under medical control (f.ex. hypertension), or with diet (f. ex. diabetes mellitus type 2), and otherwise healthy patients who smoke five cigarettes or more daily.
ASA 3 = Patients having a condition that can cause symptoms. However, patients are kept under medical control (f. ex. moderate angina pectoris and mild asthma).
ASA 4 = Patients with a condition that is out of control (f. ex. heart failure and asthma).
ASA 5 = A moribund patient who is not expected to survive the operation.

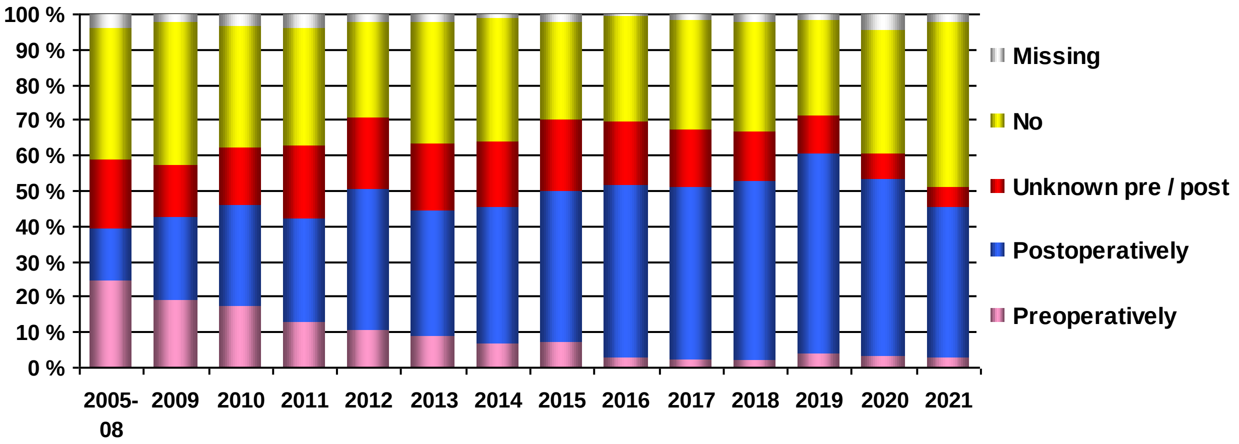
Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 41: Primary operations

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2021	26	419	59	455	22	**980**
2020	27	429	60	298	38	**852**
2019	34	485	88	233	14	**854**
2018	18	445	122	273	20	**878**
2017	18	360	123	229	13	**743**
2016	18	329	123	198	5	**673**
2015	46	276	129	180	13	**644**
2014	40	230	113	205	8	**596**
2013	46	183	99	176	13	**517**
2012	52	201	101	134	12	**500**
2011	62	141	100	160	18	**481**
2010	78	128	72	155	14	**447**
2009	75	92	58	159	8	**392**
2005-08	273	169	219	413	43	**1 117**

Figure 24: Primary operations



Registration of thrombosis prophylaxis started in 2005

Previous operation in relevant joint

Table 42: For primary total prostheses

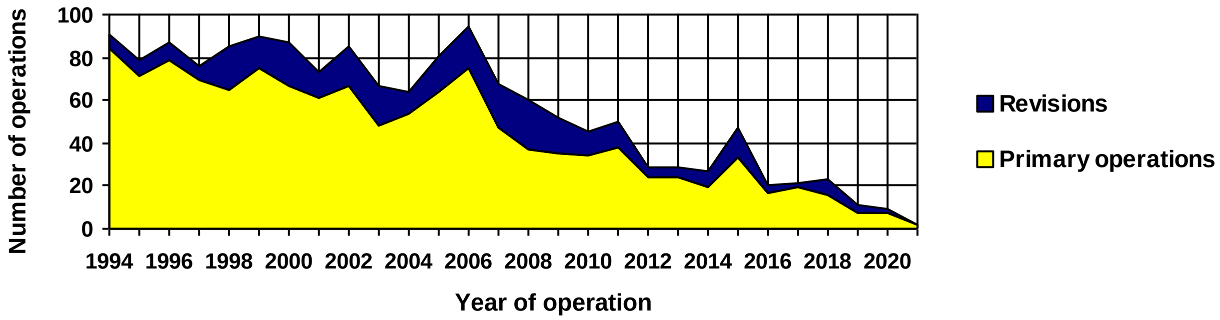
Type	1994-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Osteosynthesis of intraarticular joint fracture	294	25	30	37	46	55	46	47	50	45	675
Rotator cuff reconstruction	55	14	13	17	24	29	29	30	24	44	279
Synovectomy	137	9	6	5	5	7	9	4	6	9	197
Diagnostic arthroscopy	46	8	14	10	11	9	28	10	7	11	154
Biceps stenotomy / tenodesis	14	2	3	6	8	11	29	14	2	20	109
"Shaving"/Cleanup (Debridement)	11	2	1		1	5	3		2	1	26
Osteotomy	8	2	1	1	4	1	3	1	1	1	23
Surgery for purulent arthritis	10	2	1	2	1		2		2	1	21
Subacromial decompression										14	14
Ligament	2			1	2	6				1	12
Artrodesis	3				1	1		1		2	8
Soft tissue procedure (eg Bankart)									1	2	3
Stabilizing interventions									1	2	3
Other previous op.	134	19	28	19	24	35	58	40	39	24	420

TOE JOINT PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2021	2	(100,0%)			**2**
2020	7	(77,8%)	2	(22,2%)	**9**
2019	7	(63,6%)	4	(36,4%)	**11**
2018	16	(69,6%)	7	(30,4%)	**23**
2017	19	(90,5%)	2	(9,5%)	**21**
2016	17	(85,0%)	3	(15,0%)	**20**
2015	33	(70,2%)	14	(29,8%)	**47**
2014	19	(70,4%)	8	(29,6%)	**27**
2013	24	(82,8%)	5	(17,2%)	**29**
2012	24	(82,8%)	5	(17,2%)	**29**
2011	38	(76,0%)	12	(24,0%)	**50**
2010	34	(75,6%)	11	(24,4%)	**45**
2009	35	(67,3%)	17	(32,7%)	**52**
2008	37	(61,7%)	23	(38,3%)	**60**
2007	47	(69,1%)	21	(30,9%)	**68**
2006	75	(79,8%)	19	(20,2%)	**94**
1994-05	804	(83,3%)	161	(16,7%)	**965**
Total	**1 238**	**(79,8%)**	**314**	**(20,2%)**	**1 552**

Figure 1: Annual number of operations



52,4 % of all operations were performed on the right side. 82,9 % performed in women. Mean age: 60,3 years.

Table 2: Toe disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2021	2								
2020	6							1	
2019	7								
2018	11	3	1					1	
2017	14	3						2	
2016	14	3						1	
2015	22	5	2					4	
2014	10	9							
2013	11	11	1					1	
2012	15	9							
2011	18	16						4	
2010	13	20	1	1	1	1	1	8	
2009	12	20		1				2	
2008	6	29						2	
2007	13	28		1				4	1
2006	21	46	2					8	
1994-05	104	640	13	7	1		1	50	3
Total	**299**	**842**	**20**	**10**	**2**	**1**	**2**	**88**	**4**

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in toe joint prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics		Cement without antibiotics	Uncemented		Missing		Total
2021				2	(100,0%)			**2**
2020				7	(100,0%)			**7**
2019				7	(100,0%)			**7**
2018				16	(100,0%)			**16**
2017				19	(100,0%)			**19**
2016				16	(100,0%)			**16**
2015				31	(96,9%)	1	(3,1%)	**32**
2014				19	(100,0%)			**19**
2013				24	(100,0%)			**24**
2012				24	(100,0%)			**24**
2011				35	(92,1%)	3	(7,9%)	**38**
2010				34	(100,0%)			**34**
2009				35	(100,0%)			**35**
2008				37	(100,0%)			**37**
2007				46	(100,0%)			**46**
2006				74	(98,7%)	1	(1,3%)	**75**
2005				64	(100,0%)			**64**
2004	1	(1,9%)		53	(98,1%)			**54**
2003	1	(2,1%)		47	(97,9%)			**48**
2002	1	(1,5%)		65	(97,0%)	1	(1,5%)	**67**
2001	1	(1,6%)		60	(98,4%)			**61**
2000	2	(3,0%)		65	(97,0%)			**67**
1999				75	(100,0%)			**75**
1998				65	(100,0%)			**65**
1997				69	(100,0%)			**69**
1996				79	(100,0%)			**79**
1995				71	(100,0%)			**71**
1994				82	(97,6%)	2	(2,4%)	**84**
Total	**6**	**(0,5%)**		**1 221**	**(98,9%)**	**8**	**(0,6%)**	**1 235**

Table 4: Primary operations - Distal

Year	Cement with antibiotics		Cement without antibiotics	Uncemented		Missing	Total
2015				1	(100,0%)		**1**
2013				1	(100,0%)		**1**
2012				1	(100,0%)		**1**
2011				2	(100,0%)		**2**
2010				5	(100,0%)		**5**
2009				7	(100,0%)		**7**
2008				4	(100,0%)		**4**
2007				5	(100,0%)		**5**
2006				13	(100,0%)		**13**
2005				6	(100,0%)		**6**
2004				7	(100,0%)		**7**
2002				4	(100,0%)		**4**
2001	1	(9,1%)		10	(90,9%)		**11**
2000	1	(6,7%)		14	(93,3%)		**15**
1999	1	(9,1%)		10	(90,9%)		**11**
1998				2	(100,0%)		**2**
Total	**3**	**(3,2%)**		**92**	**(96,8%)**		**95**

Toe joint prostheses

Table 5: Primary operations - Proximal

Prostheses	2002-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Silastic HP 100	891	13	11	10	4	6	4				**939**
LPT	64	10	8	20	12		6	6	2		**128**
Toefit-plus	50	1		1							**52**
Sutter	26										**26**
Biomet Total Toe	25										**25**
Moje	18										**18**
LaPorta	14										**14**
Epyc				1		10					**11**
HAPY						3	6				**9**
CARTIVA								1	5	2	**8**
Swanson Titanium	5										**5**
Total	**1 093**	**24**	**19**	**32**	**16**	**19**	**16**	**16**	**7**	**2**	**1 235**

Table 6: Primary operations - Distal

Prostheses	2002-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Toefit-plus	50	1		1							**52**
Biomet Total Toe	25										**25**
Moje	18										**18**
Total	**93**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**95**

Reasons for revisions

Table 7:

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2020						1		1			1	
2019		1						3		2	1	
2018					3	1	1	3	3		3	
2017	1							1			1	
2016								1		1		
2015				1	3			2	5		2	
2014		1		1	2			1	2	1		
2013					1			3	2			
2012								2			3	
2011					1			2	1		2	
2010		2			1	2		3	2		3	
2009					2	2		6	2		3	
2008				2	9			13	1		6	
2007	2	2	2	1	3	2	1	9			4	
2006		1		1	4	2		10	1		6	1
1994-05	2	14	3	9	40	17	2	62	3	1	51	7
Total	**5**	**21**	**5**	**15**	**69**	**27**	**4**	**122**	**22**	**5**	**86**	**8**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Completeness of reporting analysis for the Elbow Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Elbow Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Elbow Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Elbow Arthroplasty Register

Type	Code	Description
Primary operation	NCB20	Primary total prosthetic replacement of elbow joint not using cement
	NCB 30	Primary total prosthetic replacement of elbow joint using hybrid technique
	NCB 40	Primary total prosthetic replacement of elbow joint using cement
	NCB 99	Other primary prosthetic replacement in elbow joint
Revision (level 1)	NCC 2y	Secondary implantation of total prosthesis in elbow joint not using cement Includes: Of component of total prosthesis
	NCC 3y	Secondary implantation of total prosthesis in elbow joint using hybrid technique Includes: Of component of total prosthesis
	NCC 4y	Secondary implantation of total prosthesis in elbow joint using cement Includes: Of component of total prosthesis
	NCC 99	Other secondary prosthetic replacement in elbow joint
	NCU 1y	Removal of total prosthesis from elbow joint

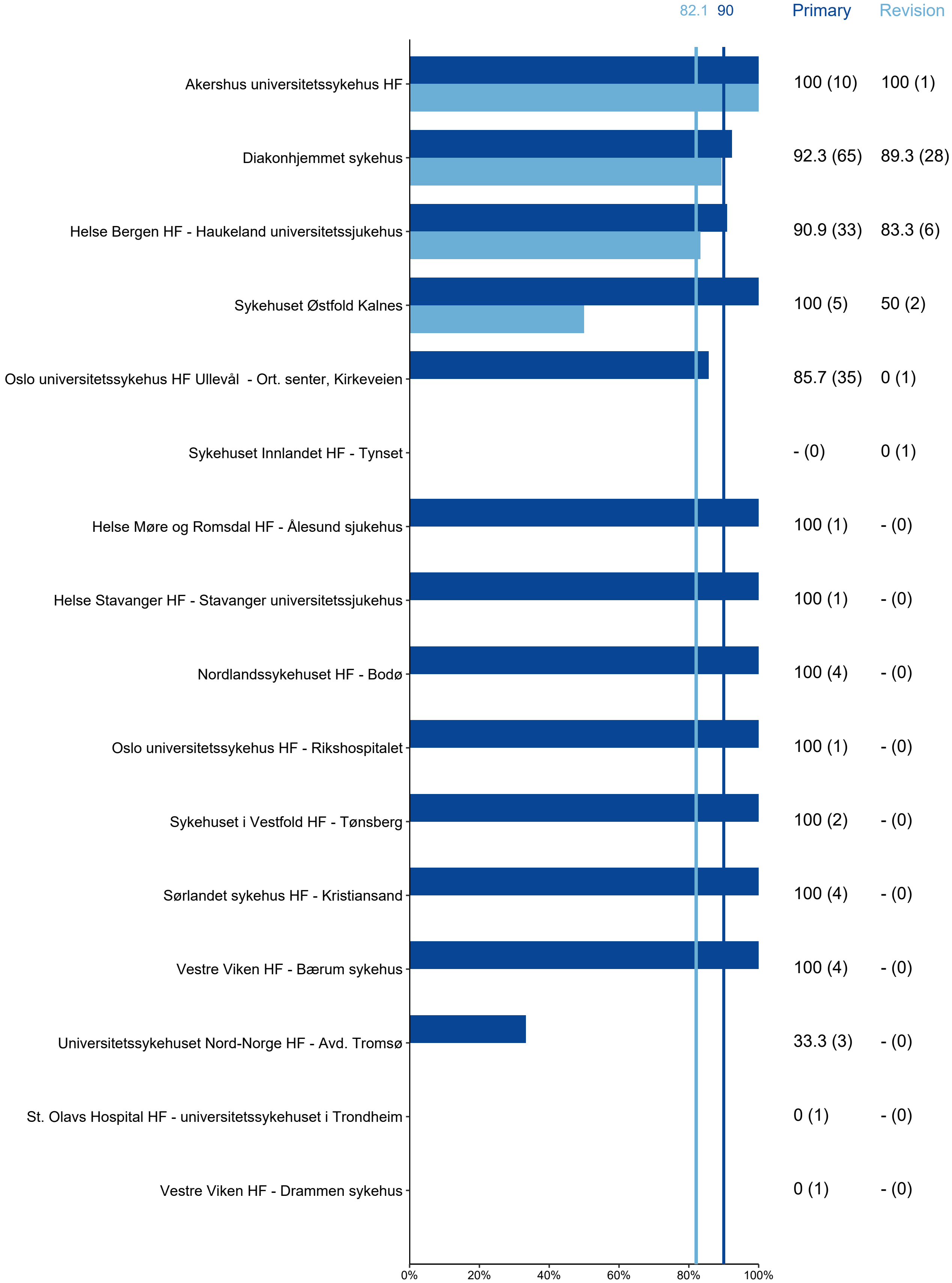
Primary operations. From 2019-2020, 170 primary total elbow arthroplasties were reported to one or both of the registers. 90% were reported to the NAR while 45.3% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than elbow arthroplasties were incorrectly coded with NCB 20*/NCB 30*/NCB 40*.

Procedure codes to be used for primary operations:
NCB 20*/NCB 30*/NCB 40*

Revision operations. From 2019-2020, 39 revisions were reported to one or both of the registers. 82.1% of these were reported to the NAR, while 71.8% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations, level 1:
NCC 2* - NCC 3* - NCC 4* and possibly NCU 1* og NCC 99.

Completeness of reporting for primary operations and revisions, Elbow prosthesis, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

Completeness of reporting analysis for the Ankle Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Ankle Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Ankle Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Ankle Arthroplasty Register

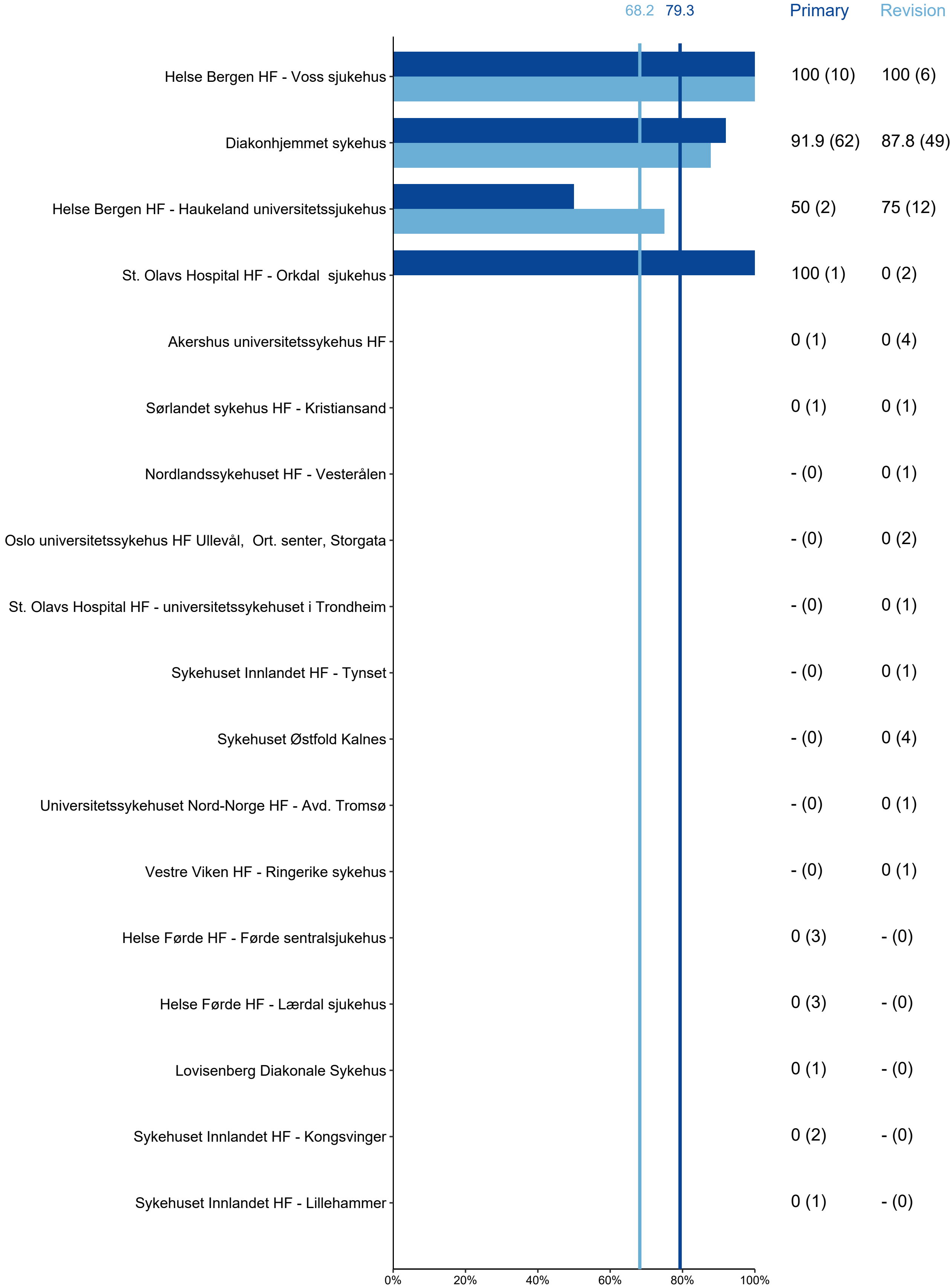
Type	Code	Description
Primary operation	NHB 0y	Primary partial prosthetic replacement of ankle joint not using cement
	NHB 1y	Primary partial prosthetic replacement of ankle joint using cement
	NHB 20	Primary total prosthetic replacement of ankle joint not using cement
	NHB 30	Primary total prosthetic replacement of ankle joint using hybrid technique
	NHB 40	Primary total prosthetic replacement of ankle joint using cemen
	NHB 99	Other primary prosthetic replacement in ankle joint or foot
Revision (level 1)	NHC 0y	Secondary implantation of partial prosthesis in ankle joint not using cement Excludes: Of component of total prosthesis
	NHC 1y	Secondary implantation of partial prosthesis in ankle joint using cement Excludes: Of component of total prosthesis
	NHC 2y	Secondary implantation of total prosthesis in ankle joint not using cement Includes: Of component of total prosthesis
	NHC 3y	Secondary implantation of total prosthesis in ankle joint using hybrid technique Includes: Of component of total prosthesis
	NHC 4y	Secondary implantation of total prosthesis in ankle joint using cement
	NHU 0y	Removal of partial prosthesis from ankle joint
	NHU 1y	Removal of total prosthesis from ankle joint

Primary operations. From 2019-2020, 87 primary total ankle arthroplasties were reported to one or both of the registers. 79.3% were reported to the NAR while 98.9% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than elbow arthroplasties were incorrectly coded with NHB 0*/NHB 1*/NHB 20/NHB 30/NHB 40.
Procedure codes to be used for primary operations:
NHB 0* - NHB 1* - NHB 20 - NHB 30 - NHB 40

Revision operations. From 2019-2020, 85 revisions were reported to one or both of the registers. 68.2% of these were reported to the NAR, while 77.6% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations, level 1:
NHC 0* - NHC 1* - NHC 2* - NHC 3* - NHC 4* - NHC 99 - NHU 0* - NHU 1*

Completeness of reporting for primary operations and revisions, Ankle prosthesis, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

Completeness of reporting analysis for the Finger Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Finger Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Finger Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Finger Arthroplasty Register

Type	Code	Description
Primary operation	NDB 8y	Primary prosthetic replacement of joint of finger or metacarpal
	NDB 99	Other primary prosthetic replacement in other joint of hand
Revision (level 1)	NDC 8y	Secondary prosthetic replacement in joint of finger or metacarpal
	NDU 2y	Removal of prosthesis from other joint of hand

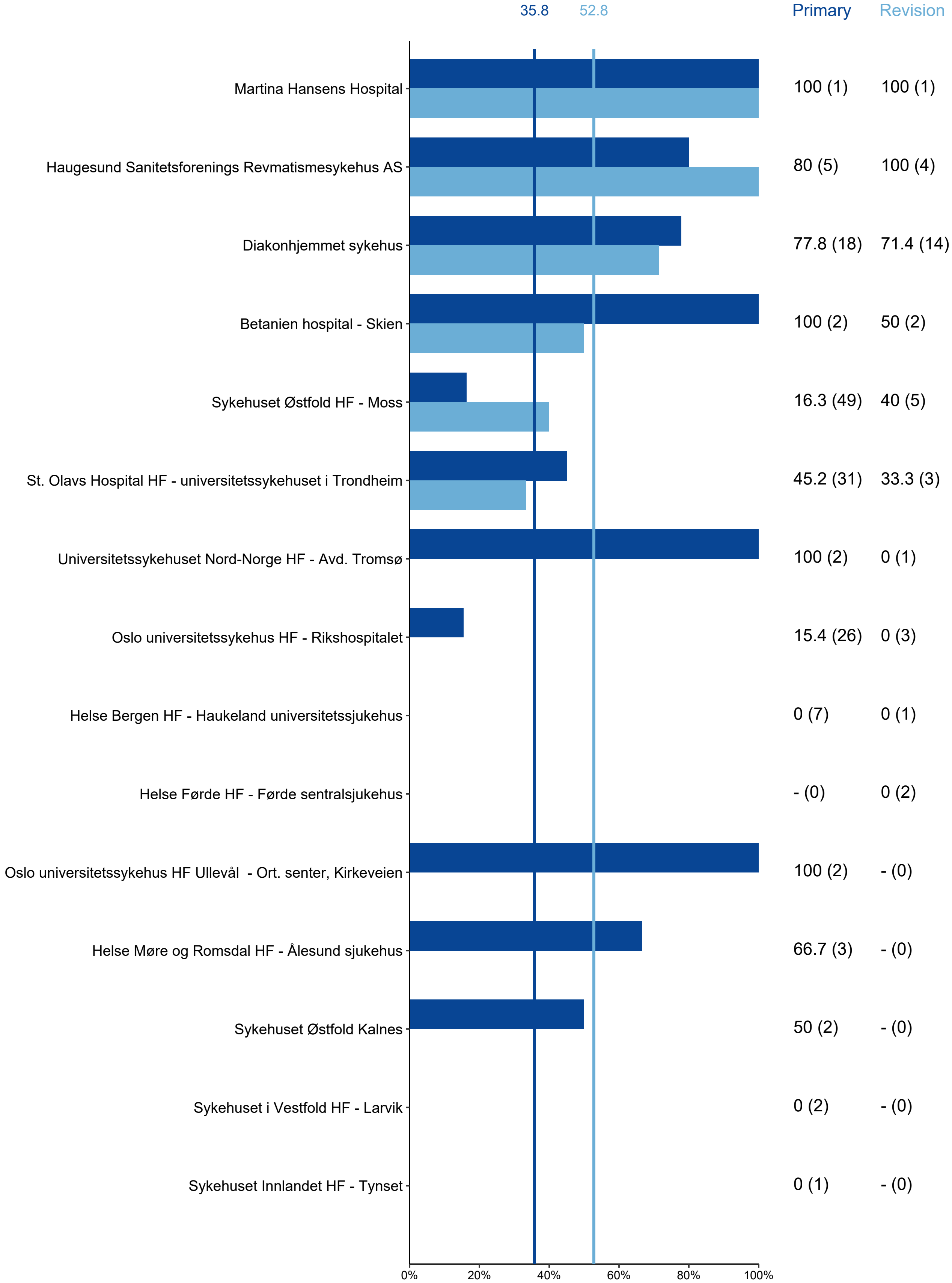
Primary operations. From 2019-2020, 151 primary total finger arthroplasties were reported to one or both of the registers. 35.8% were reported to the NAR while 98.7% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than elbow arthroplasties were incorrectly coded with NDB 8y.

Procedure codes to be used for primary operations:
NDB 8y

Revision operations. From 2019-2020, 36 revisions were reported to one or both of the registers. 52.8% of these were reported to the NAR, while 83.3% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations, level 1:
NDC 8y – NDU 2y

Completeness of reporting for primary operations and revisions, Finger prosthesis, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

Completeness of reporting analysis for the Wrist/Carpus/Distal radioulnar joint Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Wrist/Carpus/Distal radioulnar joint Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Wrist/Carpus/Distal radioulnar joint Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Wrist/Carpus/Distal radioulnar joint Arthroplasty Register

Type	Code	Description
Primary operation	NDB 0y	Primary partial prosthetic replacement of joint of wrist not using cement
	NDB 1y	Primary partial prosthetic replacement of joint of wrist using cement
	NDB 2y	Primary total prosthetic replacement of joint of wrist not using cement
	NDB 3y	Primary total prosthetic replacement of joint of wrist using hybrid technique
	NDB 4y	Primary total prosthetic replacement of joint of wrist using cement
	NDB 5y	Primary interposition prosthesis in joint of wrist
	NDB 99	Other primary prosthetic replacement in other joint of hand
Revision (level 1)	NDC 0y	Secondary implantation of partial prosthesis in joint of wrist not using cement Excludes: Of component of total prosthesis
	NDC 1y	Secondary implantation of partial prosthesis in joint of wrist using cement Excludes: Of component of total prosthesis
	NDC 2y	Secondary implantation of total prosthesis in joint of wrist not using cement Includes: Of component of total prosthesis
	NDC 3y	Secondary implantation of total prosthesis in joint of wrist using hybrid technique Includes: Of component of total prosthesis
	NDC 4y	Secondary implantation of total prosthesis in joint of wrist using cement
	NDC 5y	Secondary implantation of interposition prosthesis in joint of wrist
	NDU 0y	Removal of partial prosthesis from joint of wrist
	NDU 1y	Removal of total prosthesis from joint of wrist
	NDU 2y	Removal of prosthesis from other joint of hand
	NDC 99	Other secondary prosthetic replacement in other joint of hand

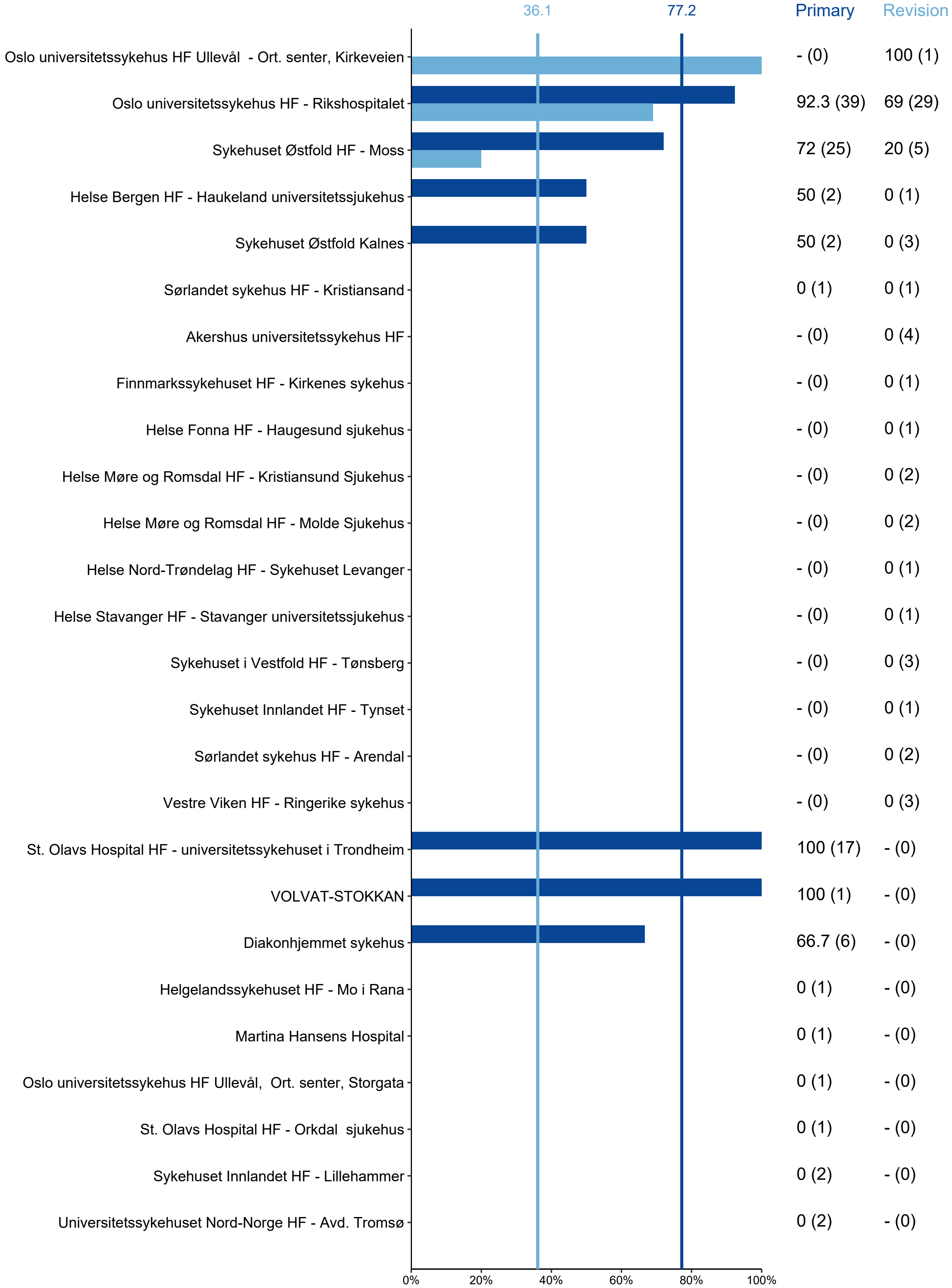
Primary operations. From 2019-2020, 101 primary total wrist/carpus/distal radioulnar joint arthroplasties were reported to one or both of the registers. 77.2% were reported to the NAR while 54.5% were reported to the NPR. Completeness of reporting varies much between the different hospitals.

Procedure codes to be used for primary operations:
NDB 0* - NDB 1* - NDB 2* - NDB 3* - NDB 4*

Revision operations. From 2019-2020, 61 revisions were reported to one or both of the registers. 36.1% of these were reported to the NAR, while 82% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations, level 1:
NDC 0* – NDC 1* - NDC 2* - NDC 3* - NDC 4* - NDC 5*

Completeness of reporting for primary operations and revisions, Wrist/Carpus/Distal radioulnar joint prosthesis, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

Completeness of reporting analysis for the Shoulder Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Shoulder Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Shoulder Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Shoulder Arthroplasty Register

Type	Code	Description
Primæroperasjon	NBB 0y	Primary partial prosthetic replacement of humero-scapular joint not using cement
	NBB 1y	Primary partial prosthetic replacement of humero-scapular joint using cement
	NBB 20	Primary total prosthetic replacement of humero-scapular joint not using cement
	NBB 30	Primary total prosthetic replacement of humero-scapular joint using hybrid technique
	NBB 40	Primary total prosthetic replacement of humero-scapular joint using cement
	NBB 70	Primary total reconstruction prosthesis replacement of humero-scapular joint
	NBB 72	Primary total reconstruction prosthesis replacement of proximal humero-scapular joint, includes partial prosthesis
	NBB 76	Primary distal humero-scapular reconstruction prosthesis, combined with elbow-joint
	NBB 99	Other primary prosthetic replacement in joint of shoulder
Revision (level 1)	NBC 0y	Secondary implantation of partial prosthesis in humero-scapular joint not using cement Excludes: Of component of total prosthesis
	NBC 1y	Secondary implantation of partial prosthesis in humero-scapular joint using cement Excludes: Of component of total prosthesis
	NBC 2y	Secondary implantation of total prosthesis in humero-scapular joint not using cement Includes: Of component of total prosthesis
	NBC 3y	Secondary implantation of total prosthesis in humero-scapular joint using hybrid technique Includes: Of component of total prosthesis
	NBC 4y	Secondary implantation of total prosthesis in humero-scapular joint using cement
	NBC 70	Secondary total reconstruction prosthesis replacement of humero-scapular joint
	NBC 72	Secondary total reconstruction prosthesis replacement of proximal humero-scapular joint, includes partial prosthesis
	NBC 76	Secondary distal humero-scapular reconstruction prosthesis, combined with elbow-joint
	NBC 99	Other secondary prosthetic replacement in joint of shoulder
	NBU 0y	Removal of partial prosthesis from humero-scapular joint
	NBU 1y	Removal of total prosthesis from humero-scapular joint

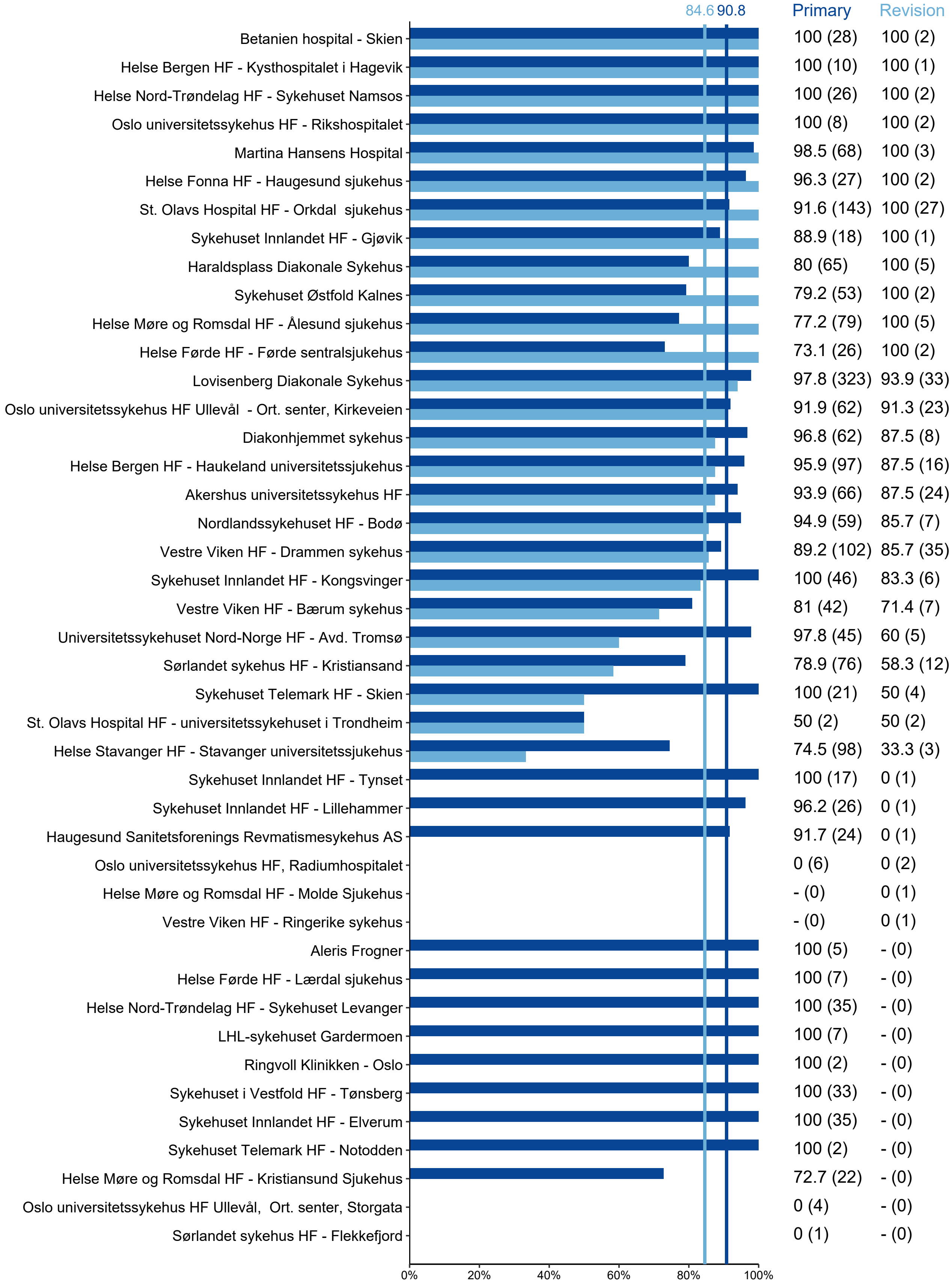
Primary operations. From 2019-2020, 1878 primary total shoulder arthroplasties were reported to one or both of the registers. 90.8% were reported to the NAR while 96.9% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than elbow arthroplasties were incorrectly coded with NBB0*/NBB 1*/NBB 20/NBB 30/NBB 40.

Procedure codes to be used for primary operations:
NBB 0* - NBB 1* - NBB 20 - NBB 30 - NBB 40

Revision operations. From 2019-2020, 246 revisions were reported to one or both of the registers. 84.6% of these were reported to the NAR, while 77.6% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations, level 1:
NBC 0* - NBC 1* - NBC 2* - NBC 3* - NBC 4* - NBC 99 - NBU 0* - NBU 1*

Completeness of reporting for primary operations and revisions, Shoulder prosthesis, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

Completeness of reporting analysis for the Toe Arthroplasty Register, 2019-2020

A completeness of reporting analysis for the Toe Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Toe Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Toe Arthroplasty Register

Type	Code	Description
Primary operation	NHB 6y	Primary prosthetic replacement of first metatarsophalangeal joint
	NHB 7y	Primary prosthetic replacement of other metatarsophalangeal joint
	NHB 8y	Primary prosthetic replacement of other joint of foot
	NHB 99	Other primary prosthetic replacement in joint of ankle or foot
Revision (level 1)	NHC 6y	Secondary prosthetic replacement of first metatarsophalangeal joint
	NHC 7y	Secondary prosthetic replacement of other metatarsophalangeal joint
	NHC 8y	Secondary prosthetic replacement in other joint of foot
	NHC 99	Other secondary prosthetic replacement in joint of ankle or foot
	NHU 2y	Removal of prosthesis from other joint of foot

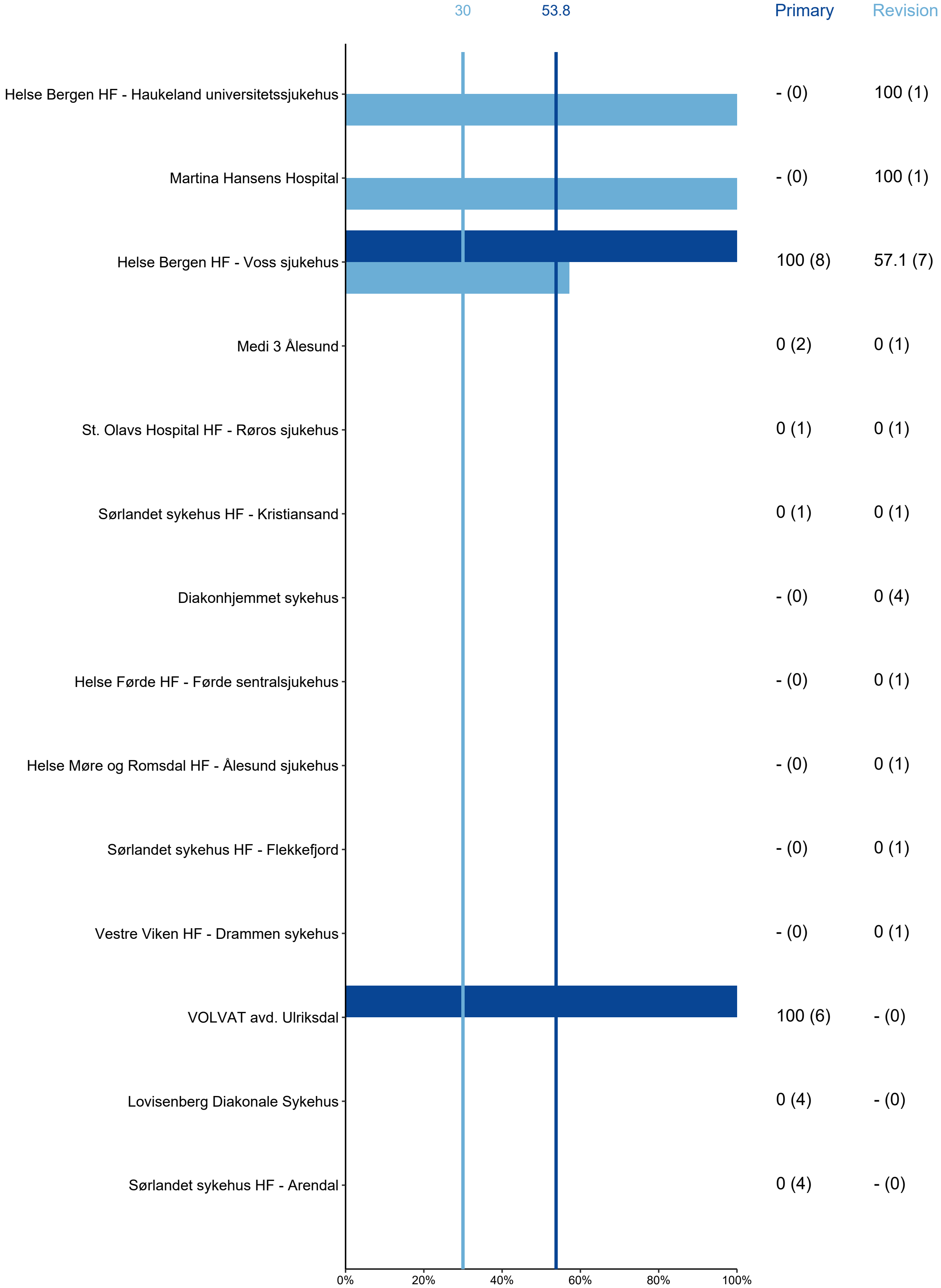
Primary operations. From 2019-2020, 26 primary total toe arthroplasties were reported to one or both of the registers. 53.8% were reported to the NAR while 76.9% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than elbow arthroplasties were incorrectly coded with NHB 6y/NHB 7y/NHB 8y.

Procedure codes to be used for primary operations:
NHB 6y - NHB 7y - NHB 8y

Revision operations. From 2019-2020, 20 revisions were reported to one or both of the registers. 30% of these were reported to the NAR, while 90% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations, level 1:
NHC 6y - NHC 7y - NHC 8y - NHU 2y

Completeness of reporting for primary operations and revisions, Toe prosthesis, 2019-2020



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

CONTENTS

Norwegian Hip Fracture Register

HIP FRACTURE REGISTER: ANNUAL REPORT 2022

The Norwegian Hip Fracture Register now contains data from more than 137 566 primary operations and 14 949 reoperations. In 2021, 8 165 primary operations and 757 reoperations were reported to the register. The number of primary operations reported has therefore increased since 2020. For the past two years, we have been concerned about fewer reported hip fractures than previously. We know that reporting in some hospitals was very poor in those years due to the difficulty of obtaining patient consent. After the requirement for consent to be included in the Hip Fracture Register was removed in 2021, we are pleased to note that reporting seems to be improving again in those hospitals. A high reporting rate is important to enable results to be as representative as possible. Updated coverage rates (reporting rates) for the years 2019-2020 are included in this year's report. We would like all hospitals to check their reporting rates. When the annual report containing the hospital results is sent out later this year, we would therefore ask all hospitals to compare their numbers of primary operations and reoperations with those recorded in the Hip Fracture Register.

Since July 2021, there is no longer a requirement for written consent from patients to be included in the Hip Fracture Register. Future reporting to the register is based on patients' right to, at any time, refuse to have their data in the register. In order to ensure that patients have a real right to refuse, it is therefore essential to provide them with information about the Hip Fracture Register during their hospital stay. Information leaflets have been written for distribution to patients, and a separate leaflet has been produced for children under 18. These have been sent to the contact persons. In addition, posters containing information about the Hip Fracture Register have been sent to all departments that report hip surgery with a request for them to be hung at a clearly visible place in the ward. When sending out the four-month questionnaire, the register will also enclose information for patients about the possibility to refuse to consent to registration. In 2022, patients will be able to use the website www.helsenorge.no to refuse to have their personal data stored in the Hip Fracture Register.

We are working hard to enable the paper forms to be replaced by electronic reporting. This registration solution is in place in the medical registration system (MRS) in the Norwegian Health Network (Norsk helsenett). It is already being used by Haukeland University Hospital and seems to be working well. There have been some technical problems in connection with the scanning of implants, but these are now being solved. We are now just waiting for a new update in MRS before the solution can be extended to more hospitals. We hope that all hospitals will soon be able to start electronic reporting, which will be a milestone in the history of the register. The advantages of electronic registration are more accurate reporting and immediate access for hospitals to their own data. It will therefore be possible to increase the use of data from the Hip Fracture Register for local quality improvement. Surgeons must register as users in the Hip Fracture Register in the Norwegian Health Network at falk.nhn.no before they can register patients for the first time. Once approved, they can log in to mrs.nhn.no and enter the patient data in the surgery form. In electronic registration, implants must be scanned using the Procordo scanning software. Instructions will be sent to hospitals shortly before the start of electronic reporting. Instructions will also be posted on www.helse-bergen.no/nrl.

In connection with the change to electronic reporting, some new variables will be introduced on the surgery form. If waiting time from fracture to surgery is entered as longer than 48 hours, a drop-down menu will ask for a reason for the long delay. For undisplaced femoral neck fractures (Garden 1 and 2), it must be stated whether the posterior tilt is above or below 20 degrees.

The Fragility Fracture Network has facilitated the creation of a common international dataset for the monitoring of treatment of hip fracture patients. The idea of this dataset is to compare hip fracture treatment in different countries. It will also make it possible to combine data from different hip fracture registers in large multinational studies. In order to adapt the Hip Fracture Register to this dataset, we are expanding the list of variables in the register. A new electronic registration form will be introduced in MRS to be completed by a doctor upon discharge. This form will contain variables such as length of hospital stay, in-hospital mobilisation, fall prevention, osteoporosis treatment, medical complications in connection with the hospital stay and level of care after discharge. As with the surgery form, hospitals will have immediate access to their own data. Although an additional electronic reporting form will involve some extra work for surgeons, we believe that this new form will be of great benefit for hospitals, since it will be possible to increase the use of the data reported in local quality improvement work. Results based on the new form will be a useful tool for ensuring that hip fracture patients are treated according to the Norwegian interdisciplinary guidelines.

The COVID-19 pandemic has brought major changes to everyday work in orthopaedic wards throughout Norway in the past few years. However, we are pleased to note that the situation is now almost back to normal. In many wards, elective surgery was periodically reduced, but acute surgery was fortunately less affected. International recommendations have stated that treatment goals for hip fractures should not change due to the pandemic situation. We have conducted an analysis to determine whether COVID-19 has affected the number of hip fractures and the waiting time for hip fracture surgery. These results are presented in the first part of this year’s report from the Hip Fracture Register. We are currently collaborating with RIKSHÖFT, the Swedish hip fracture register, in a project with the aim of comparing treatment of hip fracture patients in Norway and Sweden during the COVID-19 pandemic. We expect the results of this study to be published in 2022.

The National Service Centre for Medical Quality Registers assesses all medical quality registers in Norway every year. The Norwegian Hip Fracture Register is still assessed as a stage 3A register. The main reason why our register again did not quite qualify as a stage 4 register in last year’s evaluation was that electronic reporting has not yet been implemented in all hospitals. The Hip Fracture Register has published interactive results online since 2017. The interactive results are hospital-based and are available at www.kvalitetsregistre.no. These results have so far been well received and we hope that they will be used for local quality improvement work.

The Hip Fracture Register has in recent years been collaborating with the Hip Arthroplasty Register on a quality improvement project. The aim has been to reduce the use of uncemented femoral stems in older hip fracture patients. The Hip Fracture Register has previously recommended avoiding the use of uncemented femoral stems in hip fracture surgery for patients over 70 years. The proportion of uncemented stems has been steadily decreasing in recent years and only 3.2% of hemiarthroplasties were uncemented in 2021.

In 2021, two PhD students completed their PhDs using data from the Hip Fracture Register.

Sunniva Leer-Salvesen defended her PhD thesis on 27 August 2021 at the University of Bergen. The title was “Timing of anticoagulation and surgery for hip fracture patients - A search for factors influencing outcomes after surgery”.

Målfrid Holen Kristoffersen defended her PhD thesis on 22 October 2021 at the University of Bergen. The title was "Hip fracture in patients with cognitive impairment: Epidemiology and Patient-Reported Outcome Measures. Data from the Norwegian Hip Fracture Register".

We congratulate Sunniva and Målfrid with important publications and with brilliant defence of their theses.

We expect further PhDs using data from the Hip Fracture Register to be completed in the next few years. We are pleased that researchers from all parts of Norway are interested in using data from the register in their PhDs and we believe that this collaboration is useful and productive for both parties.

PUBLICATIONS SINCE 1 JANUARY 2021

Carl Erik Alm explored the role of the trochanteric support plate used in conjunction with a sliding hip screw in the treatment of trochanteric and subtrochanteric fractures. Hospitals varied considerably in their use of the trochanteric support plate. The most common factor affecting the use was type of fracture. The support plate was mostly used for AO/OTA A3 trochanteric fractures and subtrochanteric fractures.

Målfrid Holen Kristoffersen published an article comparing PROM data from hip fracture patients with and without chronic cognitive impairment. Patients with chronic cognitive impairment had significantly lower health-related quality of life than cognitively healthy patients at four and twelve months. Both walking ability and the ability to perform daily activities were poorer in cognitively impaired patients. The study shows that it is possible to include patients with cognitive impairment in studies of PROM data.

Cato Kjærvik investigated the factors that affect waiting time for surgery. Both patient-related factors (ASA grade and Charlson Comorbidity Index) and hospital-related factors (hospital volume) affected waiting time. Patients who did not have expedited surgery (defined as surgery on the day of admission or the following day) had higher 30-day and one-year mortality.

Kirsten Marie Larsen Grønhaug published an article comparing treatment with sliding hip screws and intramedullary nails for trochanteric and subtrochanteric fractures. Surgery with intramedullary nails gave a lower risk of reoperation after one and three years for unstable trochanteric fractures (AO/OTA types A2 and A3) and subtrochanteric fractures, when compared with sliding hip screws. One-year mortality was lower when nails were used for both stable and unstable fractures.

Please also see the list of publications at the end of this report and on the website of the Advisory Unit: www.helse-bergen.no/nrl.

The Hip Fracture Register cooperates with a number of hospitals on studies of national and local results. We are very pleased that the huge amount of data in the register is being used in research and we encourage all researchers who wish to use data from the register to contact us.

Thank you all for good reporting and we look forward to continued fruitful cooperation!

Bergen, June 2022

Jan-Erik Gjertsen
Chief Physician/Professor
Head of Hip Fracture Register

Torbjørn Berge Kristensen
Chief Physician/researcher

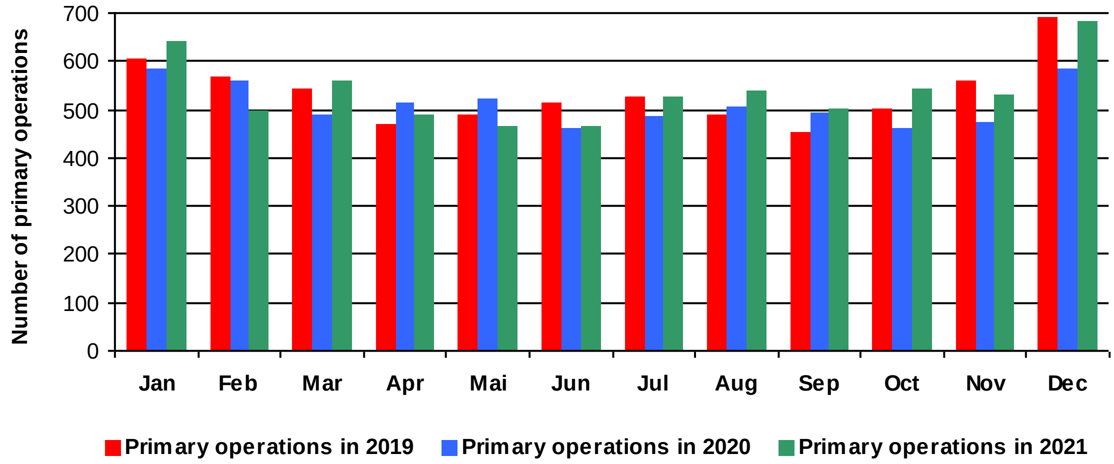
Eva Dybvik
Biostatistician/researcher

Ruth Gunvor Wasmuth
Consultant

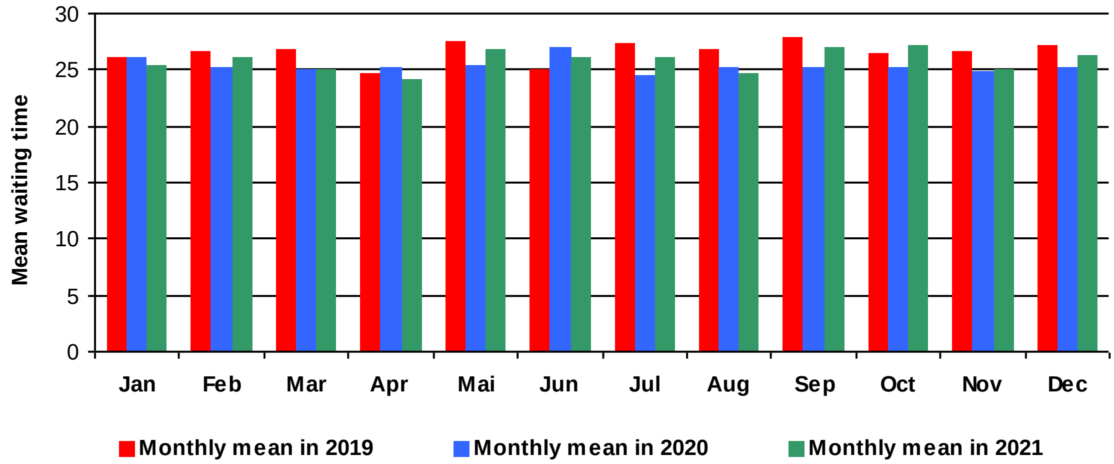
Irina Kvinnesland
IT consultant

COVID-19

Monthly primary operations in 2019 - 2021



Monthly mean waiting time from fracture to surgery (hours) in 2019 - 2021

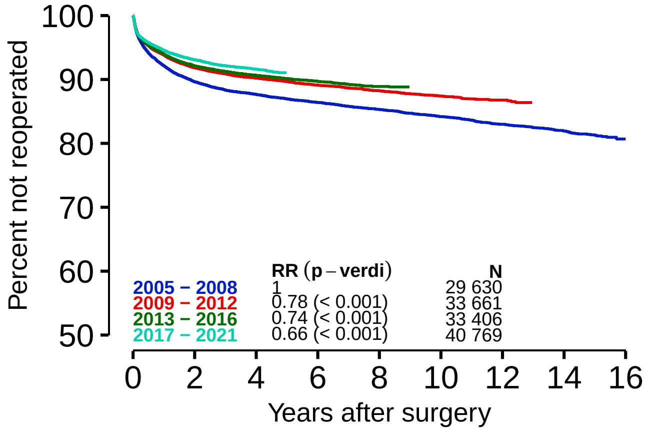


* Only for waiting time <= 96 hours

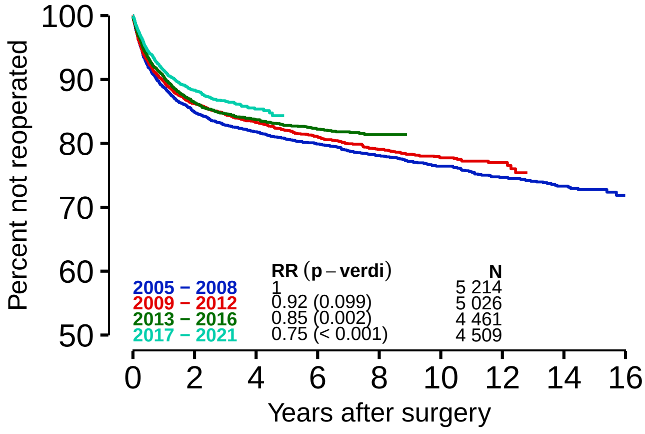
Report 2022

Survival of hip fracture implants, 2005−2021
Endpoint: All reoperations

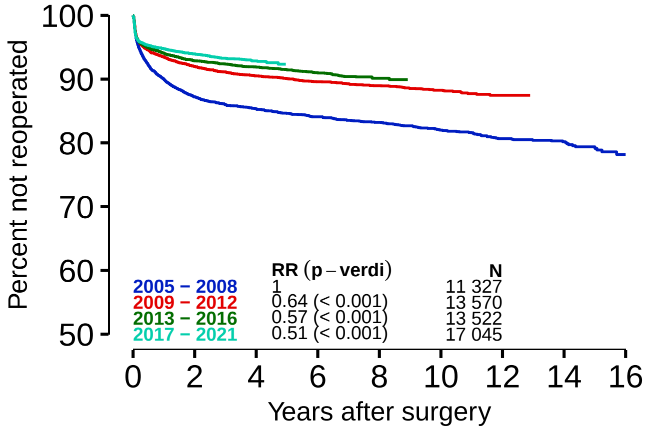
D.1) All hip fractures



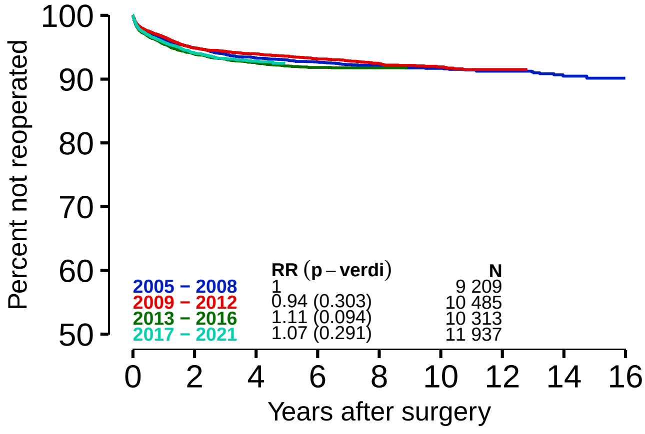
D.2) Undisplaced femoral neck fractures



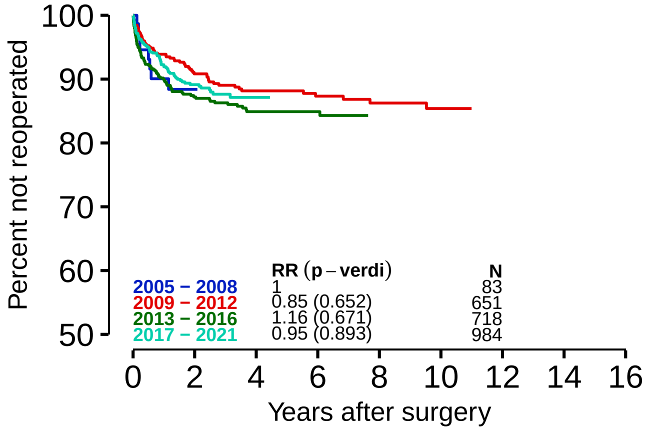
D.3) Displaced femoral neck fractures



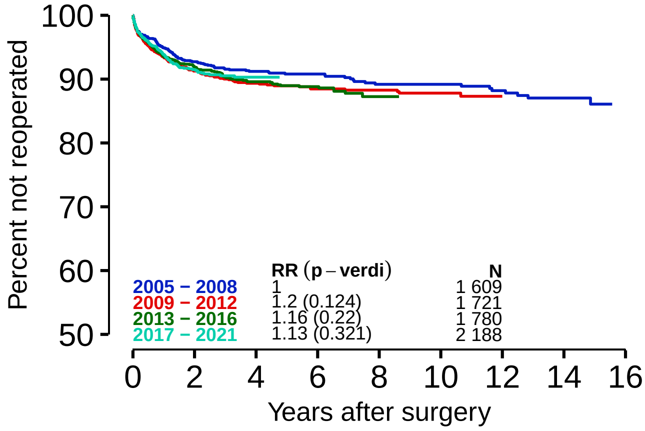
D.4) Trochanteric fractures (AO/OTA A1+A2)



D.5) Intertrochanteric fractures (AO/OTA A3)



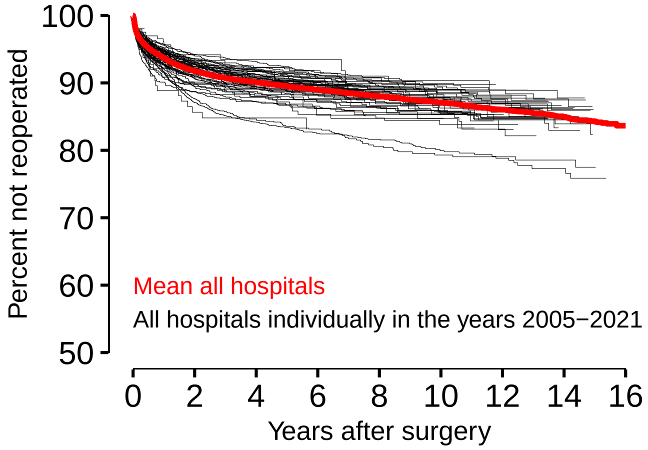
D.6) Subtrochanteric fractures



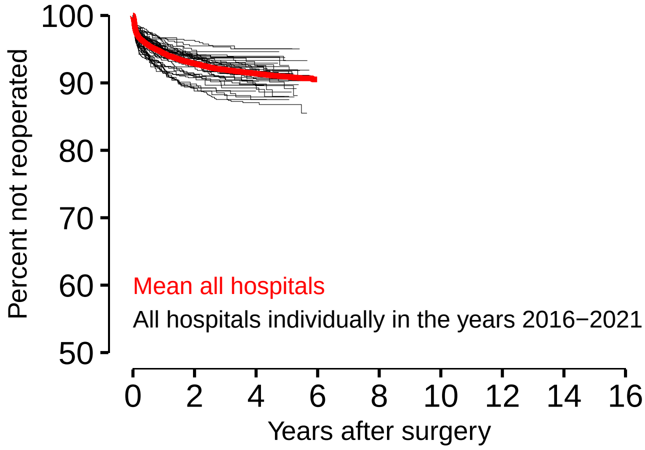
Kaplan−Meier estimated survival curves (unadjusted). Survival is calculated as long as the number of implants at risk of reoperation is greater than 50.
Rate Ratio (RR) is adjusted for age and gender.

Hospital results after hip fractures
Endpoint: All reoperations

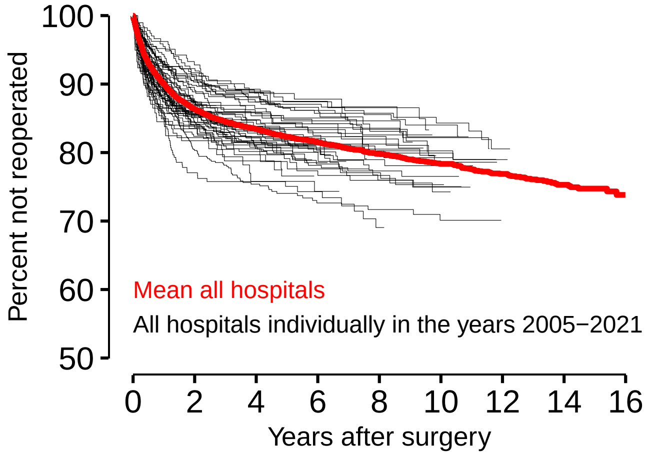
D.7) All hip fractures 2005−2021



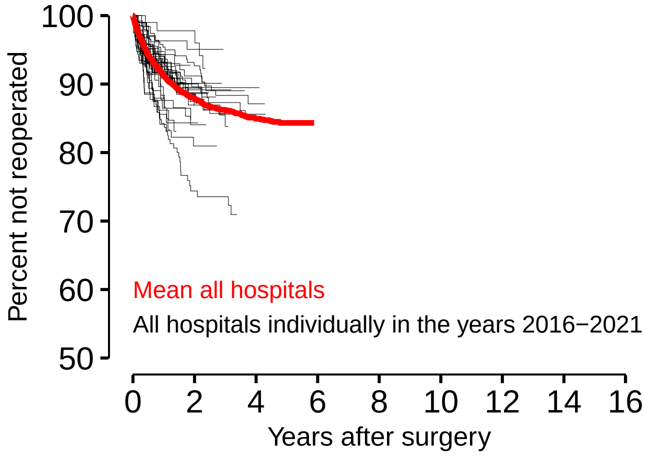
D.8) All hip fractures 2016−2021



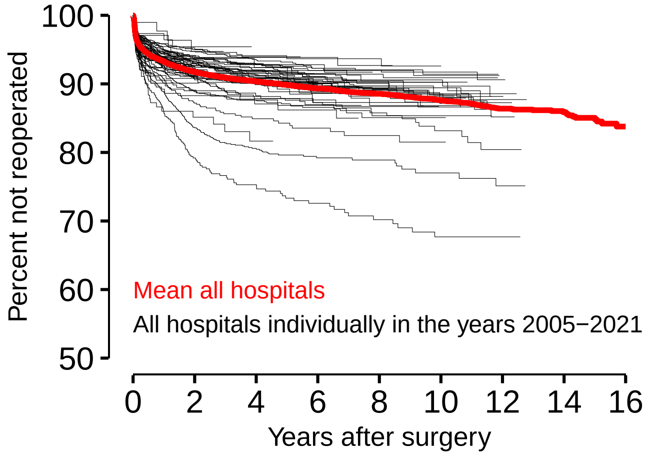
D.9) Undisplaced femoral neck fractures 2005−2021



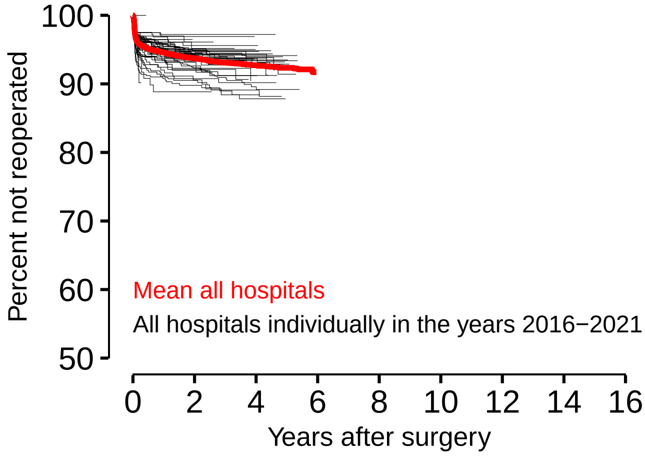
D.10) Undisplaced femoral neck fractures 2016−2021



D.11) Displaced femoral neck fractures 2005−2021

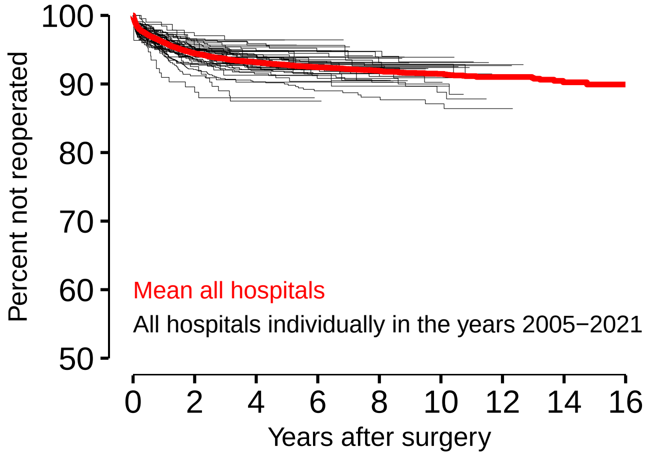


D.12) Displaced femoral neck fractures 2016−2021

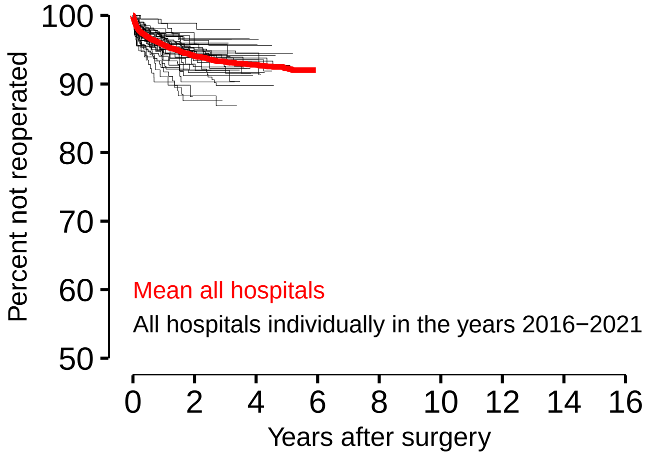


Hospital results after hip fractures
Endpoint: All reoperations

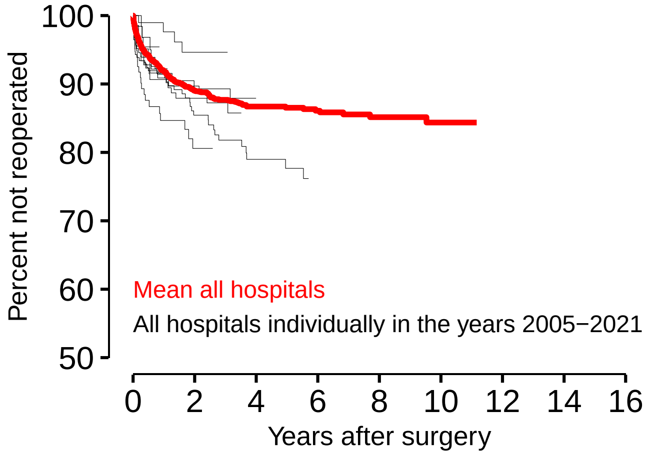
D.13) Trochanteric fractures (AO/OTA A1+A2) 2005−2021



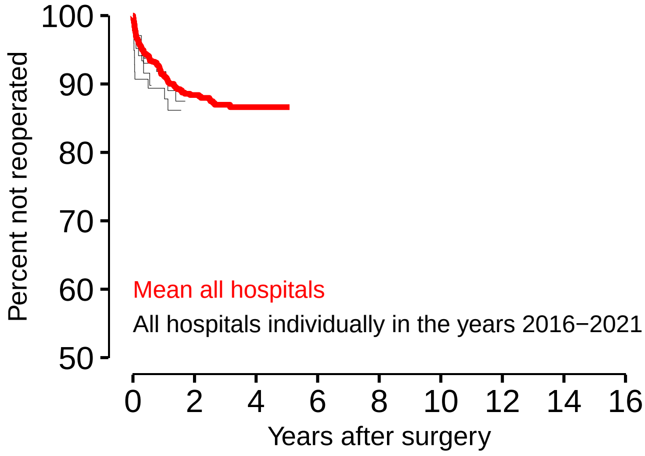
D.14) Trochanteric fractures (AO/OTA A1+A2) 2016−2021



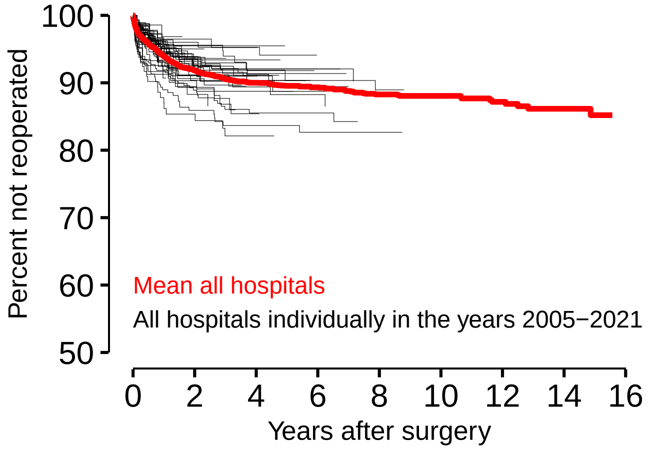
D.15) Intertrochanteric fractures (AO/OTA A3) 2005−2021



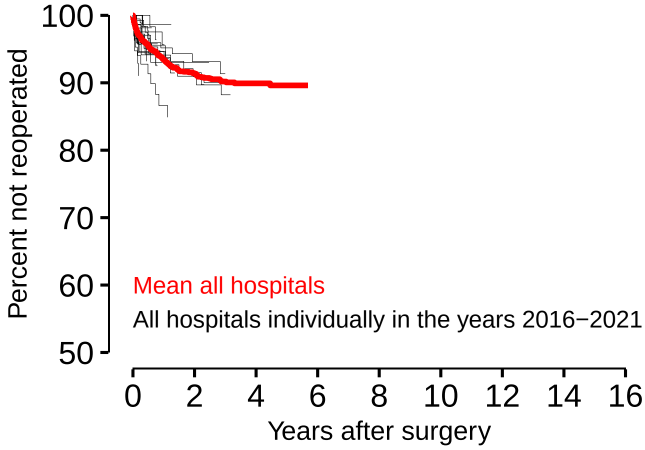
D.16) Intertrochanteric fractures (AO/OTA A3) 2016−2021



D.17) Subtrochanteric fractures 2005−2021

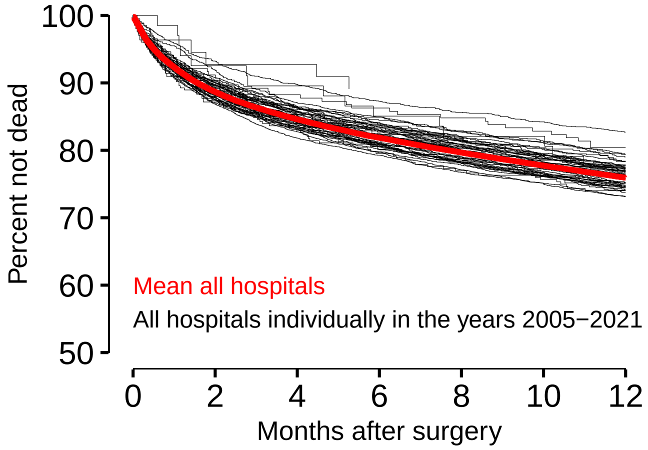


D.18) Subtrochanteric fractures 2016−2021

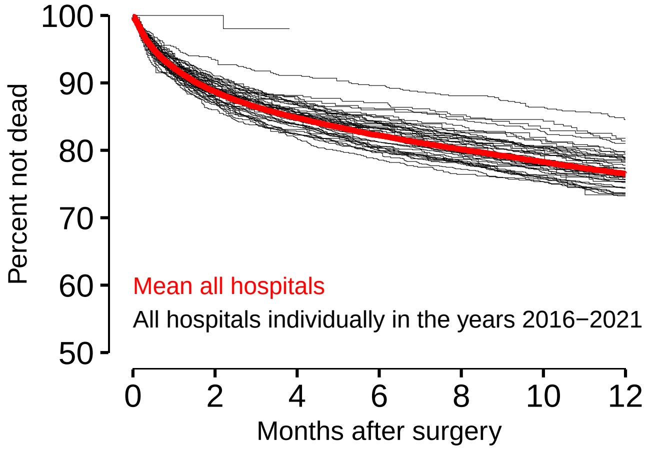


Hospital results after hip fractures
Endpoint: 1 year mortality

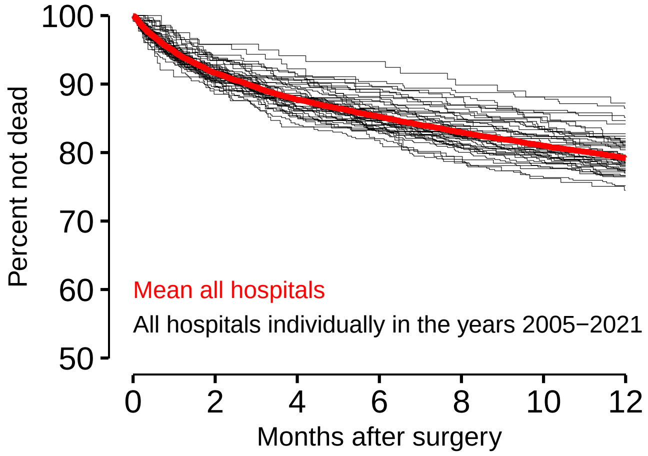
D.19) All hip fractures 2005−2021



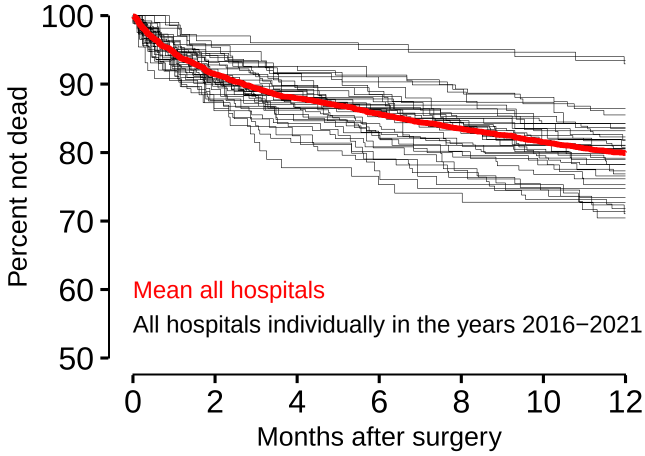
D.20) All hip fractures 2016−2021



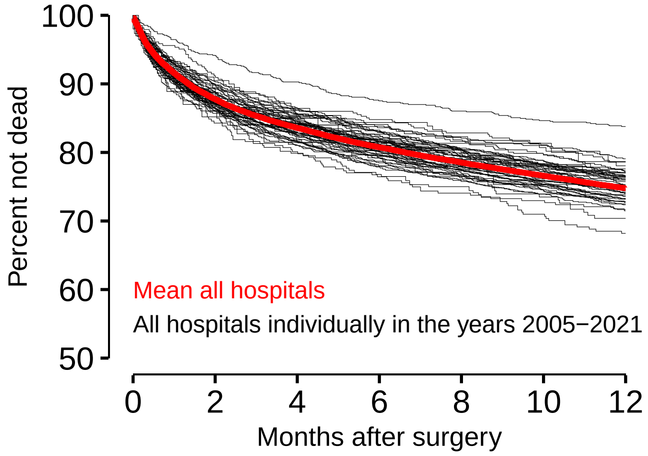
D.21) Undisplaced femoral neck fractures 2005−2021



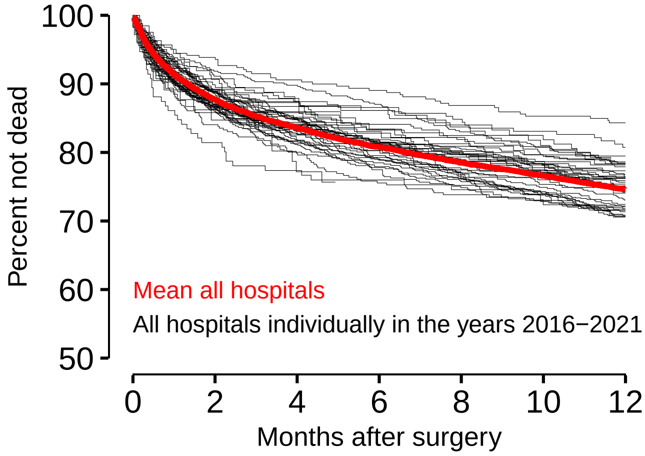
D.22) Undisplaced femoral neck fractures 2016−2021



D.23) Displaced femoral neck fractures 2005−2021

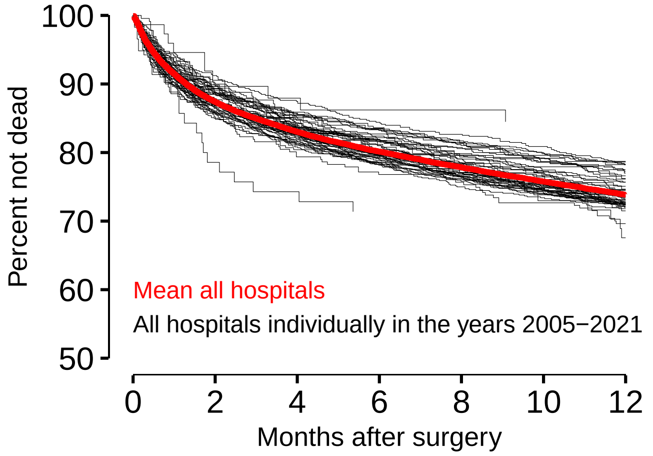


D.24) Displaced femoral neck fractures 2016−2021

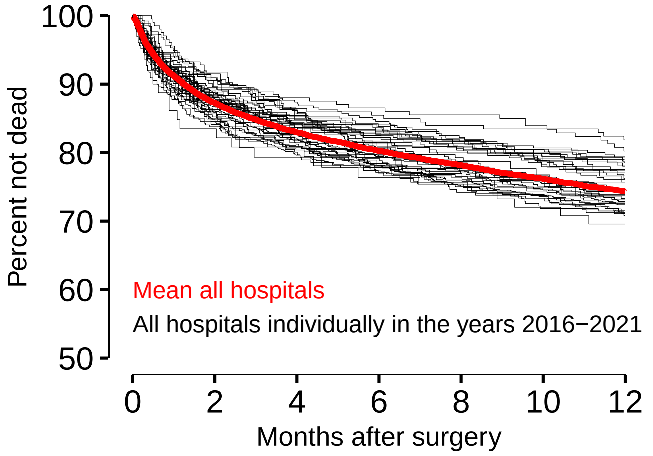


Hospital results after hip fractures
Endpoint: 1 year mortality

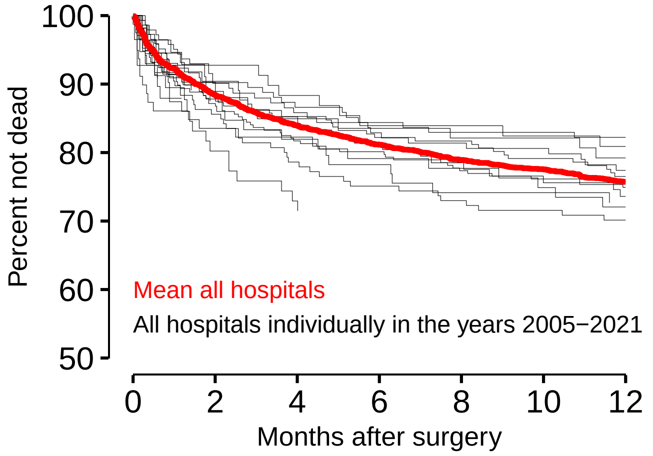
D.25) Trochanteric fractures (AO/OTA A1+A2) 2005−2021



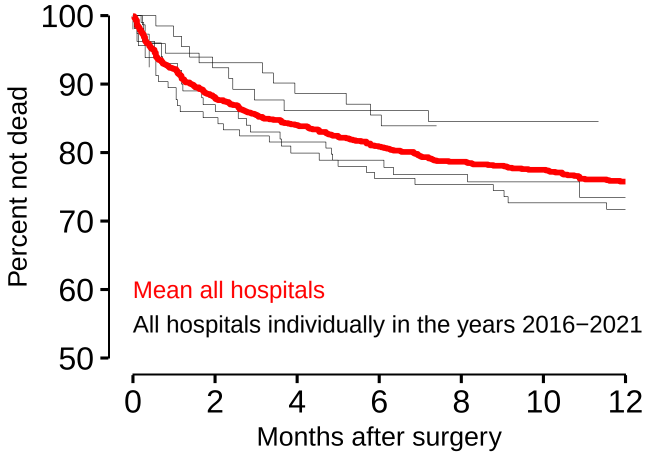
D.26) Trochanteric fractures (AO/OTA A1+A2) 2016−2021



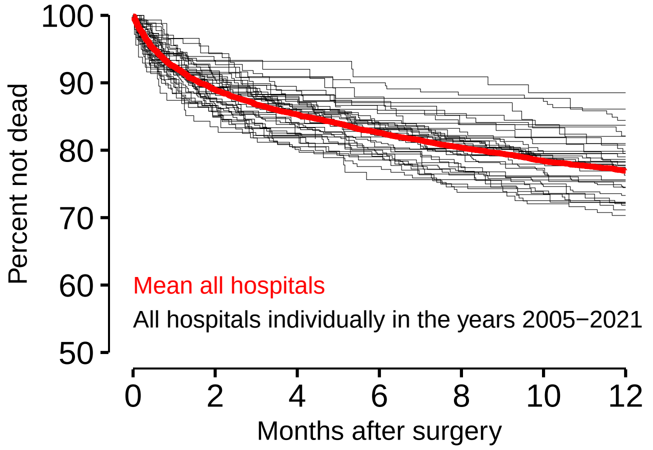
D.27) Intertrochanteric fractures (AO/OTA A3) 2005−2021



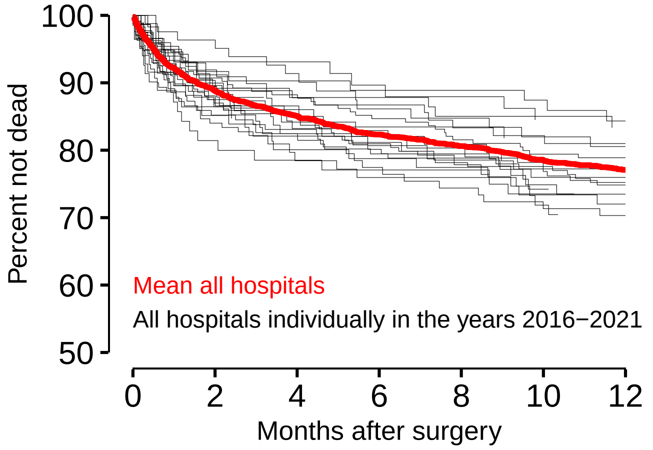
D.28) Intertrochanteric fractures (AO/OTA A3) 2016−2021



D.29) Subtrochanteric fractures 2005−2021



D.30) Subtrochanteric fractures 2016−2021



HIP FRACTURES

Numbers of operations

Table 1: Annual numbers of operations

Year	Primary operation		Reoperation		Total
2021	8 165	(91,5%)	757	(8,5%)	**8 922**
2020	7 754	(91,4%)	731	(8,6%)	**8 485**
2019	8 169	(89,9%)	918	(10,1%)	**9 087**
2018	8 428	(90,0%)	940	(10,0%)	**9 368**
2017	8 352	(90,3%)	901	(9,7%)	**9 253**
2016	8 503	(89,6%)	987	(10,4%)	**9 490**
2015	8 410	(90,0%)	939	(10,0%)	**9 349**
2014	8 183	(91,2%)	793	(8,8%)	**8 976**
2013	8 310	(90,2%)	899	(9,8%)	**9 209**
2012	8 437	(90,4%)	896	(9,6%)	**9 333**
2011	8 604	(90,3%)	925	(9,7%)	**9 529**
2010	8 363	(90,7%)	861	(9,3%)	**9 224**
2009	8 258	(89,5%)	970	(10,5%)	**9 228**
2008	8 362	(89,9%)	942	(10,1%)	**9 304**
2005-07	21 268	(89,5%)	2 490	(10,5%)	**23 758**
Total	**137 566**	**(90,2%) ***	**14 949**	**(9,8%) ****	**152 515**

49% of primary operations were on the right side. 69% of primary operations were performed on women. Mean age at primary surgery was 80 years: 82 years for women and 77 years for men.
* 5 203 (4%) were primary operations with total hip prostheses from the Norwegian Arthroplasty Register
** 5 536 (37%) were reoperations with total hip prostheses from the Norwegian Arthroplasty Register.

Figure 1: Annual numbers of operations

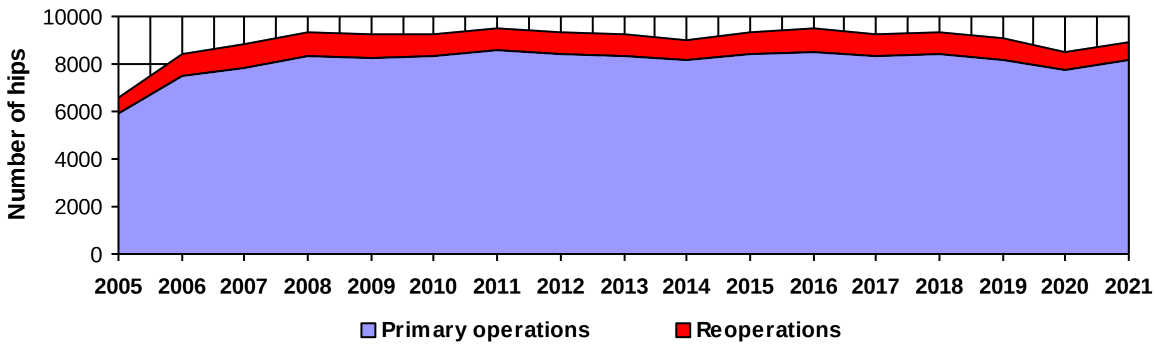
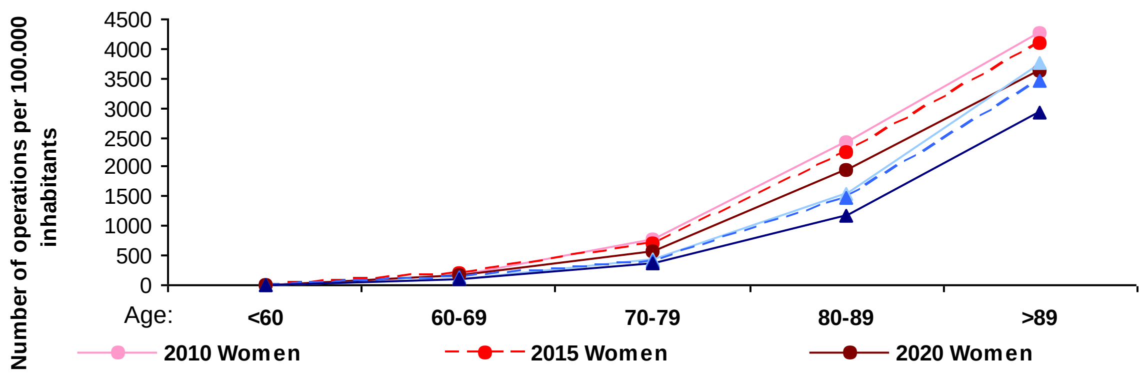


Figure 2: Incidence of primary operation (in 2010, 2015 and 2020)



Time from fracture to operation in hours - primary operations

Table 2: Time from fracture to operation in hours*

	0 - 6	>6 - 12	>12 - 24	>24 - 48	>48	Missing	Total
2021	260 (3,4%)	959 (12,5%)	2 861 (37,4%)	2 386 (31,2%)	1 041 (13,6%)	139 (1,8%)	**7 647**
2020	242 (3,4%)	975 (13,5%)	2 768 (38,4%)	2 134 (29,6%)	953 (13,2%)	142 (2,0%)	**7 214**
2019	225 (3,0%)	892 (11,8%)	2 699 (35,8%)	2 513 (33,3%)	1 071 (14,2%)	139 (1,8%)	**7 539**
2018	279 (3,6%)	957 (12,2%)	2 719 (34,7%)	2 418 (30,8%)	1 290 (16,4%)	184 (2,3%)	**7 847**
2017	298 (3,8%)	1 113 (14,0%)	2 775 (34,9%)	2 378 (29,9%)	1 207 (15,2%)	169 (2,1%)	**7 940**
2016	299 (3,7%)	1 107 (13,6%)	2 897 (35,5%)	2 426 (29,7%)	1 235 (15,1%)	192 (2,4%)	**8 156**
2015	309 (3,8%)	1 086 (13,4%)	3 054 (37,8%)	2 330 (28,8%)	1 105 (13,7%)	203 (2,5%)	**8 087**
2014	326 (4,1%)	1 157 (14,7%)	2 996 (38,0%)	2 189 (27,7%)	1 045 (13,2%)	181 (2,3%)	**7 894**
2013	314 (3,9%)	1 129 (14,1%)	2 932 (36,6%)	2 261 (28,2%)	1 198 (15,0%)	179 (2,2%)	**8 013**
2012	316 (3,8%)	1 167 (14,2%)	2 936 (35,7%)	2 309 (28,1%)	1 326 (16,1%)	175 (2,1%)	**8 229**
2011	313 (3,7%)	1 207 (14,3%)	2 845 (33,8%)	2 420 (28,8%)	1 421 (16,9%)	208 (2,5%)	**8 414**
2010	355 (4,3%)	1 218 (14,9%)	2 882 (35,1%)	2 216 (27,0%)	1 340 (16,3%)	191 (2,3%)	**8 202**
2009	354 (4,4%)	1 290 (15,9%)	2 857 (35,3%)	2 128 (26,3%)	1 306 (16,1%)	166 (2,0%)	**8 101**
2008	385 (4,7%)	1 321 (16,1%)	2 834 (34,5%)	2 201 (26,8%)	1 292 (15,7%)	179 (2,2%)	**8 212**
2005-0	1 362 (6,5%)	4 216 (20,2%)	7 232 (34,7%)	4 702 (22,5%)	2 980 (14,3%)	376 (1,8%)	**20 868**
Total	**5 637 (4,3%)**	**19 794 (15,0%)**	**47 287 (35,7%)**	**37 011 (28,0%)**	**19 810 (15,0%)**	**2 823 (2,1%)**	**132 363**

* Total hip prostheses are not counted

Figure 3: Time from fracture to operation - grouped in hours (n=132 363)

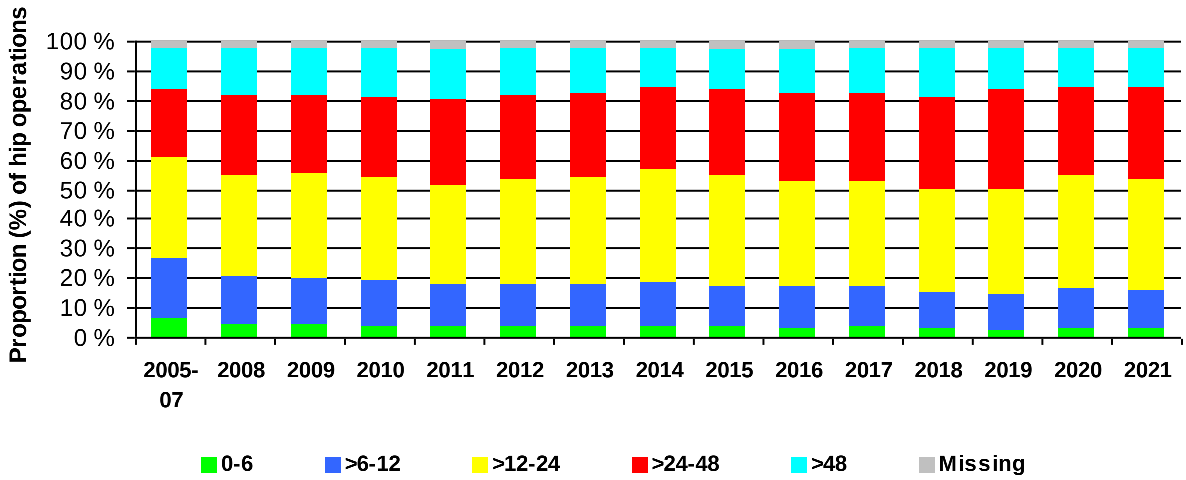
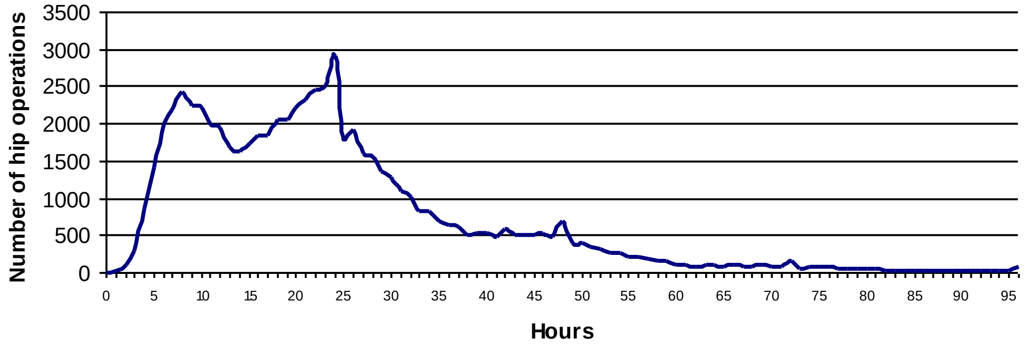


Figure 4: Time from fracture to operation - continuous (n=69 381)



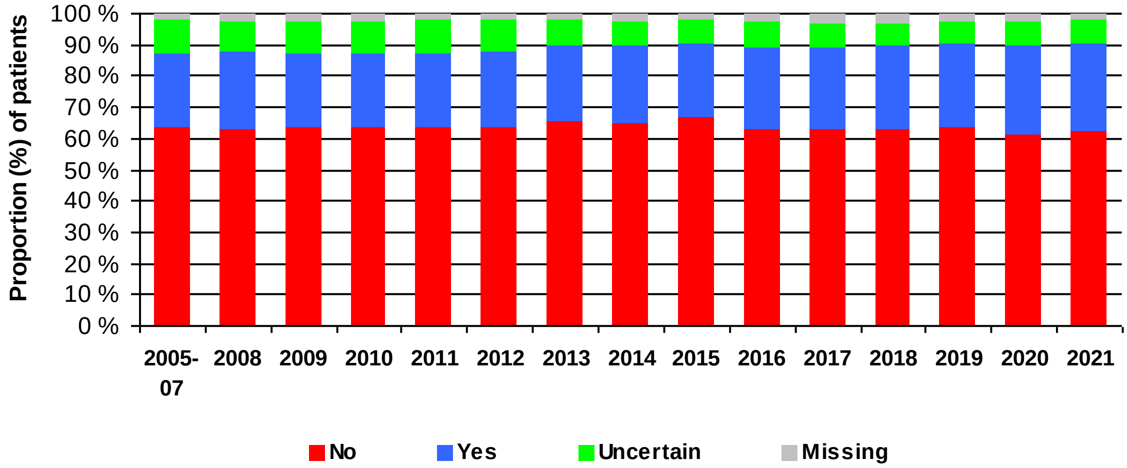
Mean time from fracture to operation was 24 hours (median 21 hours).

Cognitive impairment

Table 3: Cognitive impairment - primary operations*

	No		Yes		Uncertain		Missing		Total
2021	4 778	(62,5%)	2 136	(27,9%)	563	(7,4%)	170	(2,2%)	**7 647**
2020	4 404	(61,0%)	2 060	(28,6%)	565	(7,8%)	185	(2,6%)	**7 214**
2019	4 810	(63,8%)	2 021	(26,8%)	528	(7,0%)	180	(2,4%)	**7 539**
2018	4 971	(63,3%)	2 072	(26,4%)	561	(7,1%)	243	(3,1%)	**7 847**
2017	4 983	(62,8%)	2 084	(26,2%)	637	(8,0%)	236	(3,0%)	**7 940**
2016	5 159	(63,3%)	2 139	(26,2%)	636	(7,8%)	222	(2,7%)	**8 156**
2015	5 387	(66,6%)	1 919	(23,7%)	601	(7,4%)	180	(2,2%)	**8 087**
2014	5 136	(65,1%)	1 933	(24,5%)	642	(8,1%)	183	(2,3%)	**7 894**
2013	5 236	(65,3%)	1 938	(24,2%)	675	(8,4%)	164	(2,0%)	**8 013**
2012	5 222	(63,5%)	2 007	(24,4%)	821	(10,0%)	179	(2,2%)	**8 229**
2011	5 350	(63,6%)	1 991	(23,7%)	901	(10,7%)	172	(2,0%)	**8 414**
2010	5 220	(63,6%)	1 917	(23,4%)	834	(10,2%)	231	(2,8%)	**8 202**
2009	5 157	(63,7%)	1 890	(23,3%)	832	(10,3%)	222	(2,7%)	**8 101**
2008	5 186	(63,2%)	2 026	(24,7%)	794	(9,7%)	206	(2,5%)	**8 212**
2005-07	13 290	(63,7%)	4 933	(23,6%)	2 205	(10,6%)	440	(2,1%)	**20 868**
Total	**84 289**	**(63,7%)**	**33 066**	**(25,0%)**	**11 795**	**(8,9%)**	**3 213**	**(2,4%)**	**132 363**

Figure 5: Cognitive impairment - primary operations*



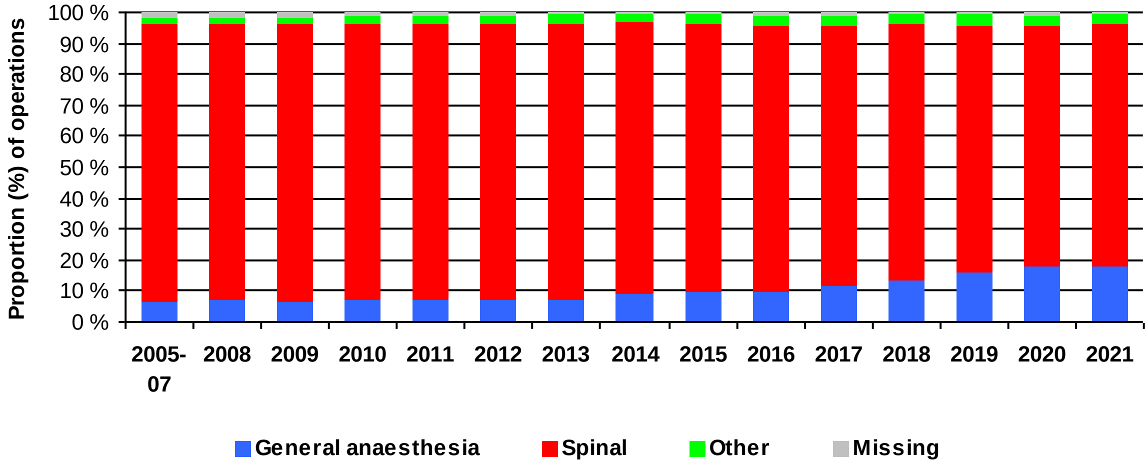
* Total hip prostheses are not counted

Type of anaesthesia

Table 4: Type of anaesthesia - primary operations*

	General anaesthesia		Spinal		Other		Missing		Total
2021	1 392	(18,2%)	5 978	(78,2%)	223	(2,9%)	54	(0,7%)	**7 647**
2020	1 296	(18,0%)	5 607	(77,7%)	238	(3,3%)	73	(1,0%)	**7 214**
2019	1 185	(15,7%)	6 025	(79,9%)	263	(3,5%)	66	(0,9%)	**7 539**
2018	1 062	(13,5%)	6 484	(82,6%)	230	(2,9%)	71	(0,9%)	**7 847**
2017	929	(11,7%)	6 671	(84,0%)	259	(3,3%)	81	(1,0%)	**7 940**
2016	810	(9,9%)	6 977	(85,5%)	282	(3,5%)	87	(1,1%)	**8 156**
2015	758	(9,4%)	7 040	(87,1%)	226	(2,8%)	63	(0,8%)	**8 087**
2014	732	(9,3%)	6 890	(87,3%)	203	(2,6%)	69	(0,9%)	**7 894**
2013	588	(7,3%)	7 095	(88,5%)	256	(3,2%)	74	(0,9%)	**8 013**
2012	560	(6,8%)	7 364	(89,5%)	219	(2,7%)	86	(1,0%)	**8 229**
2011	586	(7,0%)	7 509	(89,2%)	219	(2,6%)	100	(1,2%)	**8 414**
2010	565	(6,9%)	7 321	(89,3%)	194	(2,4%)	122	(1,5%)	**8 202**
2009	520	(6,4%)	7 246	(89,4%)	188	(2,3%)	147	(1,8%)	**8 101**
2008	591	(7,2%)	7 297	(88,9%)	182	(2,2%)	142	(1,7%)	**8 212**
2005-07	1 345	(6,4%)	18 708	(89,6%)	447	(2,1%)	368	(1,8%)	**20 868**
Total	**12 919**	**(9,8%)**	**114 212**	**(86,3%)**	**3 629**	**(2,7%)**	**1 603**	**(1,2%)**	**132 363**

Figure 6: Type of anaesthesia in primary operations*



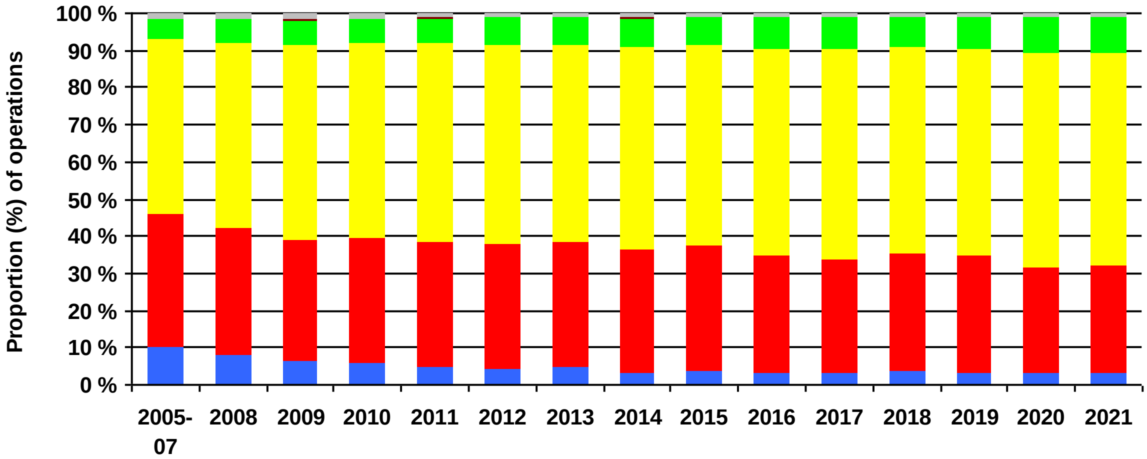
* Total hip prostheses are not counted

ASA classification

Table 5: ASA classification - primary operations

	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2021	272 (3,3%)	2 362 (28,9%)	4 649 (56,9%)	785 (9,6%)	7 (0,1%)	90 (1,1%)	**8 165**
2020	239 (3,1%)	2 215 (28,6%)	4 472 (57,7%)	740 (9,5%)	11 (0,1%)	77 (1,0%)	**7 754**
2019	283 (3,5%)	2 566 (31,4%)	4 540 (55,6%)	689 (8,4%)	6 (0,1%)	85 (1,0%)	**8 169**
2018	319 (3,8%)	2 655 (31,5%)	4 698 (55,7%)	646 (7,7%)	13 (0,2%)	97 (1,2%)	**8 428**
2017	282 (3,4%)	2 553 (30,6%)	4 731 (56,6%)	679 (8,1%)	15 (0,2%)	92 (1,1%)	**8 352**
2016	264 (3,1%)	2 694 (31,7%)	4 732 (55,7%)	708 (8,3%)	10 (0,1%)	94 (1,1%)	**8 502**
2015	303 (3,6%)	2 850 (33,9%)	4 525 (53,8%)	624 (7,4%)	12 (0,1%)	96 (1,1%)	**8 410**
2014	256 (3,1%)	2 732 (33,4%)	4 471 (54,6%)	608 (7,4%)	14 (0,2%)	102 (1,2%)	**8 183**
2013	378 (4,5%)	2 840 (34,2%)	4 382 (52,7%)	609 (7,3%)	17 (0,2%)	84 (1,0%)	**8 310**
2012	356 (4,2%)	2 833 (33,6%)	4 548 (53,9%)	595 (7,1%)	8 (0,1%)	97 (1,1%)	**8 437**
2011	437 (5,1%)	2 879 (33,5%)	4 613 (53,6%)	558 (6,5%)	6 (0,1%)	111 (1,3%)	**8 604**
2010	493 (5,9%)	2 805 (33,5%)	4 411 (52,7%)	498 (6,0%)	16 (0,2%)	140 (1,7%)	**8 363**
2009	509 (6,2%)	2 720 (32,9%)	4 309 (52,2%)	564 (6,8%)	10 (0,1%)	146 (1,8%)	**8 258**
2008	677 (8,1%)	2 858 (34,2%)	4 172 (49,9%)	527 (6,3%)	9 (0,1%)	119 (1,4%)	**8 362**
2005-07	2 127 (10,0%)	7 681 (36,1%)	9 936 (46,7%)	1 139 (5,4%)	33 (0,2%)	352 (1,7%)	**21 268**
Total	**7 195** (5,2%)	**45 243** (32,9%)	**73 189** (53,2%)	**9 969** (7,2%)	**187** (0,1%)	**1 782** (1,3%)	**137 566**

Figure 7: ASA classification - primary operations



ASA = American Society of Anesthesiologists

- **ASA 1**: Healthy patients who smoke less than 5 cigarettes a day..
- **ASA 2**: Patients with an asymptomatic condition who are kept under medical control (f.ex. hypertension), or with diet (f. ex. diabetes mellitus type 2), and otherwise healthy patients who smoke five cigarettes or more daily.
- **ASA 3**: Patients having a condition that can cause symptoms. However, patients are kept under medical control (f. ex. moderate angina pectoris and mild asthma).
- **ASA 4**: Patients with a condition that is out of control (f. ex. heart failure and asthma).
- **ASA 5**: A moribund patient who is not expected to survive the operation.
- **Missing**

Primary operations

Table 6: Type of fracture (reason for primary operation)

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 9	Type 6	Type 7	Type 8	Annet	Missing	Total
2021	821	3 489	190	1 079	1 386	188	396	506	12	79	19	**8 165**
	10,1%	42,7%	2,3%	13,2%	17,0%	2,3%	4,8%	6,2%	0,1%	1,0%	0,2%	
2020	813	3 275	153	1 009	1 284	182	406	528	12	86	6	**7 754**
	10,5%	42,2%	2,0%	13,0%	16,6%	2,3%	5,2%	6,8%	0,2%	1,1%	0,1%	
2019	888	3 437	196	1 062	1 268	181	414	621	9	83	10	**8 169**
	10,9%	42,1%	2,4%	13,0%	15,5%	2,2%	5,1%	7,6%	0,1%	1,0%	0,1%	
2018	972	3 443	199	1 113	1 295	227	502	576	5	93	3	**8 428**
	11,5%	40,9%	2,4%	13,2%	15,4%	2,7%	6,0%	6,8%	0,1%	1,1%	0,0%	
2017	1 037	3 436	217	1 153	1 317	206	476	405	7	98	0	**8 352**
	12,4%	41,1%	2,6%	13,8%	15,8%	2,5%	5,7%	4,8%	0,1%	1,2%	0,0%	
2016	1 086	3 545	234	1 245	1 321	162	467	343	4	94	2	**8 503**
	12,8%	41,7%	2,8%	14,6%	15,5%	1,9%	5,5%	4,0%	0,0%	1,1%	0,0%	
2015	1 154	3 350	243	1 336	1 255	228	442	321	2	78	1	**8 410**
	13,7%	39,8%	2,9%	15,9%	14,9%	2,7%	5,3%	3,8%	0,0%	0,9%	0,0%	
2014	1 050	3 331	287	1 333	1 244	161	422	287	2	64	2	**8 183**
	12,8%	40,7%	3,5%	16,3%	15,2%	2,0%	5,2%	3,5%	0,0%	0,8%	0,0%	
2013	1 171	3 296	259	1 302	1 277	167	449	293	4	91	1	**8 310**
	14,1%	39,7%	3,1%	15,7%	15,4%	2,0%	5,4%	3,5%	0,0%	1,1%	0,0%	
2012	1 226	3 471	262	1 277	1 271	173	467	205	3	79	3	**8 437**
	14,5%	41,1%	3,1%	15,1%	15,1%	2,1%	5,5%	2,4%	0,0%	0,9%	0,0%	
2011	1 317	3 445	276	1 347	1 395	162	398	186	4	74	0	**8 604**
	15,3%	40,0%	3,2%	15,7%	16,2%	1,9%	4,6%	2,2%	0,0%	0,9%	0,0%	
2010	1 249	3 287	321	1 314	1 364	167	431	159	2	67	2	**8 363**
	14,9%	39,3%	3,8%	15,7%	16,3%	2,0%	5,2%	1,9%	0,0%	0,8%	0,0%	
2009	1 234	3 368	328	1 306	1 211	149	425	150	7	72	8	**8 258**
	14,9%	40,8%	4,0%	15,8%	14,7%	1,8%	5,1%	1,8%	0,1%	0,9%	0,1%	
2008	1 316	3 222	351	1 475	1 240	83	439	148	2	83	3	**8 362**
	15,7%	38,5%	4,2%	17,6%	14,8%	1,0%	5,2%	1,8%	0,0%	1,0%	0,0%	
2005-07	3 898	8 105	1 010	3 675	2 819	0	1 170	391	9	172	19	**21 268**
	18,3%	38,1%	4,7%	17,3%	13,3%	0,0%	5,5%	1,8%	0,0%	0,8%	0,1%	
Total	**19 232**	**55 500**	**4 526**	**21 026**	**20 947**	**2 436**	**7 304**	**5 119**	**84**	**1 313**	**79**	**137 566**
	14,0%	**40,3%**	**3,3%**	**15,3%**	**15,2%**	**1,8%**	**5,3%**	**3,7%**	**0,1%**	**1,0%**	**0,1%**	

Type 1: Intracapsular fracture, undisplaced
Type 2: Intracapsular fracture, displaced
Type 3: Basocervical fracture
Type 4: Trochanteric fracture (2 fragments) (AO / OTA A1)
Type 5: Trochanteric fracture (multifragment) (AO / OTA A2)
Type 9: Intertrochanteric fracture (AO / OTA A3) (The registration started in 2008)
Type 6: Subtrochanteric fracture
Type 7: Intracapsular fracture unspecified (from the Norwegian Arthroplasty Register)
Type 8: Trochanteric fracture unspecified (from the Norwegian Arthroplasty Register)

Table 7: Type of primary operations - all fractures

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	Total
2021	684	55	3 633	0	845	119	56	10	1 136	7	1 059	518	40	1	**8 165**
	8,4%	0,7%	44,5%	0,0%	10,3%	1,5%	0,7%	0,1%	13,9%	0,1%	13,0%	6,3%	0,5%	0,0%	
2020	654	58	3 416	0	849	173	62	4	1 052	9	903	540	30	2	**7 754**
	8,4%	0,7%	44,1%	0,0%	10,9%	2,2%	0,8%	0,1%	13,6%	0,1%	11,6%	7,0%	0,4%	0,0%	
2019	853	75	3 430	0	940	252	77	21	992	4	872	630	22	0	**8 169**
	10,4%	0,9%	42,0%	0,0%	11,5%	3,1%	0,9%	0,3%	12,1%	0,0%	10,7%	7,7%	0,3%	0,0%	
2018	970	63	3 418	1	1 121	316	79	13	966	18	863	581	19	0	**8 428**
	11,5%	0,7%	40,6%	0,0%	13,3%	3,7%	0,9%	0,2%	11,5%	0,2%	10,2%	6,9%	0,2%	0,0%	
2017	1 080	46	3 336	1	1 262	403	104	19	828	24	802	412	35	0	**8 352**
	12,9%	0,6%	39,9%	0,0%	15,1%	4,8%	1,2%	0,2%	9,9%	0,3%	9,6%	4,9%	0,4%	0,0%	
2016	1 160	39	3 447	2	1 386	520	97	21	817	11	617	347	39	0	**8 503**
	13,6%	0,5%	40,5%	0,0%	16,3%	6,1%	1,1%	0,2%	9,6%	0,1%	7,3%	4,1%	0,5%	0,0%	
2015	1 241	36	3 234	2	1 499	664	96	14	758	8	510	323	25	0	**8 410**
	14,8%	0,4%	38,5%	0,0%	17,8%	7,9%	1,1%	0,2%	9,0%	0,1%	6,1%	3,8%	0,3%	0,0%	
2014	1 127	31	3 190	1	1 551	689	102	17	734	8	418	289	26	0	**8 183**
	13,8%	0,4%	39,0%	0,0%	19,0%	8,4%	1,2%	0,2%	9,0%	0,1%	5,1%	3,5%	0,3%	0,0%	
2013	1 289	32	3 100	3	1 496	749	109	20	747	4	431	297	33	0	**8 310**
	15,5%	0,4%	37,3%	0,0%	18,0%	9,0%	1,3%	0,2%	9,0%	0,0%	5,2%	3,6%	0,4%	0,0%	
2012	1 455	27	3 142	5	1 632	848	97	19	635	8	332	208	28	0	**8 437**
	17,2%	0,3%	37,2%	0,1%	19,3%	10,1%	1,1%	0,2%	7,5%	0,1%	3,9%	2,5%	0,3%	0,0%	
2011	1 650	50	3 006	19	1 699	871	112	12	658	14	281	190	42	0	**8 604**
	19,2%	0,6%	34,9%	0,2%	19,7%	10,1%	1,3%	0,1%	7,6%	0,2%	3,3%	2,2%	0,5%	0,0%	
2010	1 616	83	2 782	29	1 733	899	127	17	572	4	280	161	60	0	**8 363**
	19,3%	1,0%	33,3%	0,3%	20,7%	10,7%	1,5%	0,2%	6,8%	0,0%	3,3%	1,9%	0,7%	0,0%	
2009	1 688	81	2 756	82	1 765	788	101	50	489	8	228	157	65	0	**8 258**
	20,4%	1,0%	33,4%	1,0%	21,4%	9,5%	1,2%	0,6%	5,9%	0,1%	2,8%	1,9%	0,8%	0,0%	
2008	1 943	64	2 440	70	1 784	690	128	64	686	10	266	150	65	0	**8 362**
	23,2%	0,8%	29,2%	0,8%	21,3%	8,3%	1,5%	0,8%	8,2%	0,1%	3,2%	1,8%	0,8%	0,0%	
2005-07	6 802	162	4 871	106	5 251	1 741	379	107	913	13	339	400	178	4	**21 268**
	32,0%	0,8%	22,9%	0,5%	24,7%	8,2%	1,8%	0,5%	4,3%	0,1%	1,6%	1,9%	0,8%	0,0%	
Total	**24 212**	**902**	**49 201**	**321**	**24 813**	**9 722**	**1 726**	**408**	**11 983**	**150**	**8 201**	**5 203**	**707**	**7**	**137 566**
	17,6%	**0,7%**	**35,8%**	**0,2%**	**18,0%**	**7,1%**	**1,3%**	**0,3%**	**8,7%**	**0,1%**	**6,0%**	**3,8%**	**0,5%**	**0,0%**	

T1: Two screws or pins
T2: Three screws or pins
T3: Bipolar hemiprosthesis
T4: Unipolar hemiprosthesis
T5: Hip compression screw
T6: Hip compression screw with lateral support plate
T7: Hip compression screw system and additional anti-rotational screw
T8: Short intramedullary nail without distal locking
T9: Short intramedullary nail with distal locking
T10: Long intramedullary nail without distal locking
T11: Long intramedullary nail with distal locking
T12: Total hip prosthesis
T13: Other
T14: Missing

Figure 8: Type of primary operations - all fractures

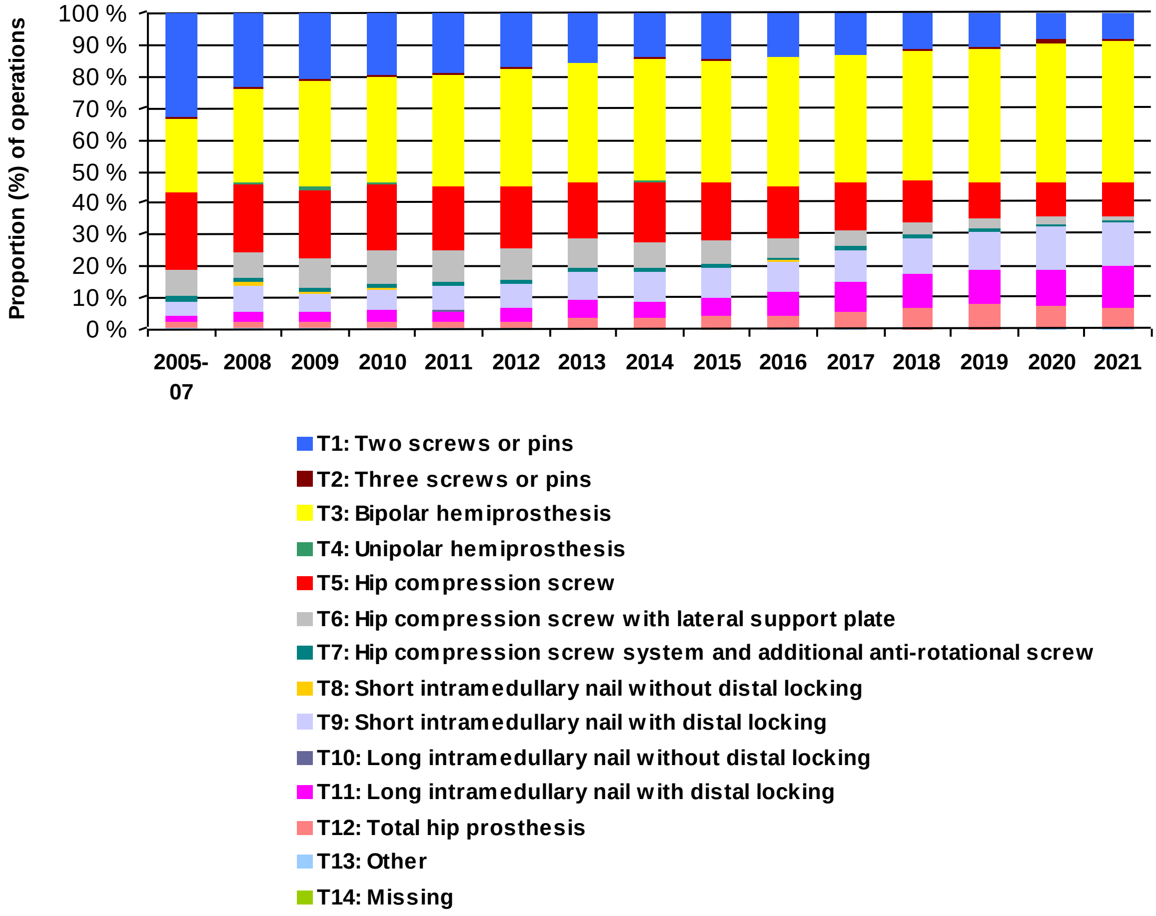


Table 8: Type of primary operation per type of primary fracture

Type of primary fracture	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	Total
Intracapsular fracture, undisplaced	16 750	364	1 513	4	403	4	121	8	37	0	5	0	20	0	**19 351**
	86,6%	1,9%	7,8%	0,0%	2,1%	0,0%	0,6%	0,0%	0,2%	0,0%	0,0%	0,0%	0,1%	0,0%	
Intracapsular fracture, displaced	7 269	529	46 535	302	395	10	195	5	54	0	16	0	189	1	**55 695**
	13,1%	0,9%	83,6%	0,5%	0,7%	0,0%	0,4%	0,0%	0,1%	0,0%	0,0%	0,0%	0,3%	0,0%	
Basocervical fracture	142	3	519	12	2 402	88	782	30	478	1	32	0	36	0	**5 308**
	2,7%	0,1%	9,8%	0,2%	45,3%	1,7%	14,7%	0,6%	9,0%	0,0%	0,6%	0,0%	0,7%	0,0%	
Trochanteric fracture (2 fragments)	13	2	74	0	13 952	1 041	368	272	4 742	15	496	0	45	3	**21 394**
	0,1%	0,0%	0,3%	0,0%	65,2%	4,9%	1,7%	1,3%	22,2%	0,1%	2,3%	0,0%	0,2%	0,0%	
Trochanteric fracture (multifragment)	4	1	161	0	6 344	6 005	173	79	5 508	44	2 406	0	219	1	**21 120**
	0,0%	0,0%	0,8%	0,0%	30,0%	28,4%	0,8%	0,4%	26,1%	0,2%	11,4%	0,0%	1,0%	0,0%	
Intertrochanteric fracture *	0	0	26	0	184	807	10	5	462	15	893	0	34	0	**2 446**
	0,0%	0,0%	1,1%	0,0%	7,5%	33,0%	0,4%	0,2%	18,9%	0,6%	36,5%	0,0%	1,4%	0,0%	
Subtrochanteric fracture	5	1	53	0	958	1 540	19	6	578	69	3 999	0	76	0	**7 323**
	0,1%	0,0%	0,7%	0,0%	13,1%	21,0%	0,3%	0,1%	7,9%	0,9%	54,6%	0,0%	1,0%	0,0%	
Intracapsular fracture, unspecified **	0	0	0	0	0	0	0	0	0	0	0	5 119	0	0	**5 119**
	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	0,0%	
Trochanteric fracture unspecified ***	0	0	0	0	0	0	0	0	0	0	0	84	0	0	**84**
	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	0,0%	
Other	23	1	277	2	164	223	55	3	120	6	350	0	88	0	**1 367**
	1,7%	0,1%	20,3%	0,1%	12,0%	16,3%	4,0%	0,2%	8,8%	0,4%	25,6%	0,0%	6,4%	0,0%	
Missing	6	1	43	1	11	4	3	0	4	0	4	0	0	2	**82**
	7,3%	1,2%	52,4%	1,2%	13,4%	4,9%	3,7%	0,0%	4,9%	0,0%	4,9%	0,0%	0,0%	2,4%	
Total	**24 212**	**902**	**49 201**	**321**	**24 813**	**9 722**	**1 726**	**408**	**11 983**	**150**	**8 201**	**5 203**	**707**	**7**	**139 289**
	17,4%	**0,6%**	**35,3%**	**0,2%**	**17,8%**	**7,0%**	**1,2%**	**0,3%**	**8,6%**	**0,1%**	**5,9%**	**3,7%**	**0,5%**	**0,0%**	

T1: Two screws or pins
T2: Three screws or pins
T3: Bipolar hemiprosthesis
T4: Unipolar hemiprosthesis
T5: Hip compression screw
T6: Hip compression screw with lateral support plate
T7: Hip compression screw system and additional anti-rotational screw
T8: Short intramedullary nail without distal locking
T9: Short intramedullary nail with distal locking
T10: Long intramedullary nail without distal locking
T11: Long intramedullary nail with distal locking
T12: Total hip prosthesis
T13: Other
T14: Missing

* The registration started in 2008

** Total hip prostheses reported to the Norwegian Arthroplasty Register

Figure 9a: Time trend for treatment of undisplaced femoral neck fractures

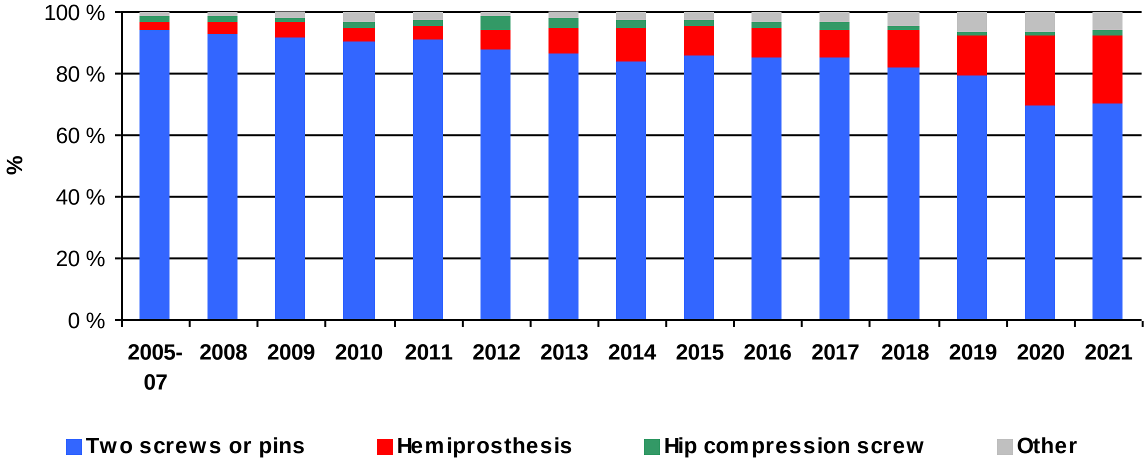
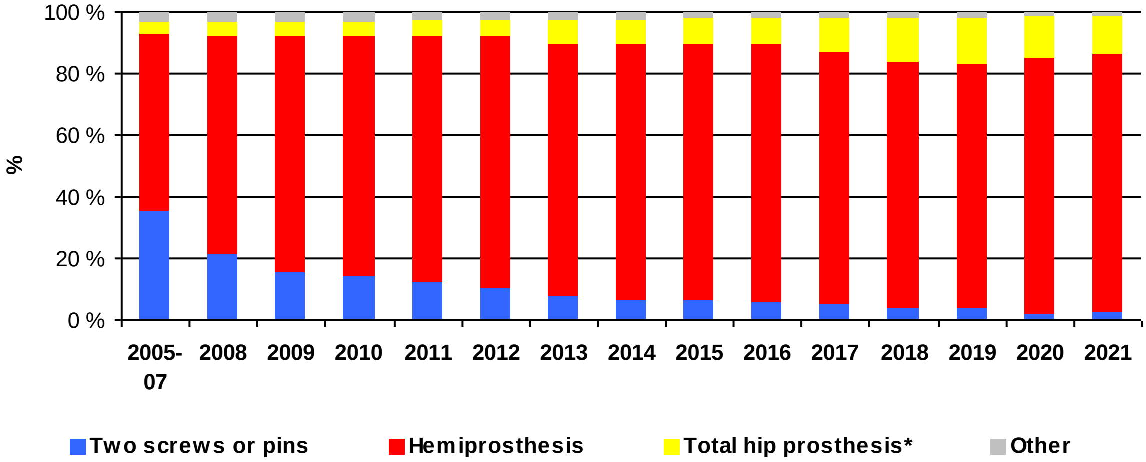


Figure 9b: Time trend for treatment of displaced femoral neck fractures



* Total hip prostheses for femoral neck fracture were reported to the Norwegian Arthroplasty Register without information about dislocation fracture

Figure 9c: Time trend for treatment of basocervical fracture

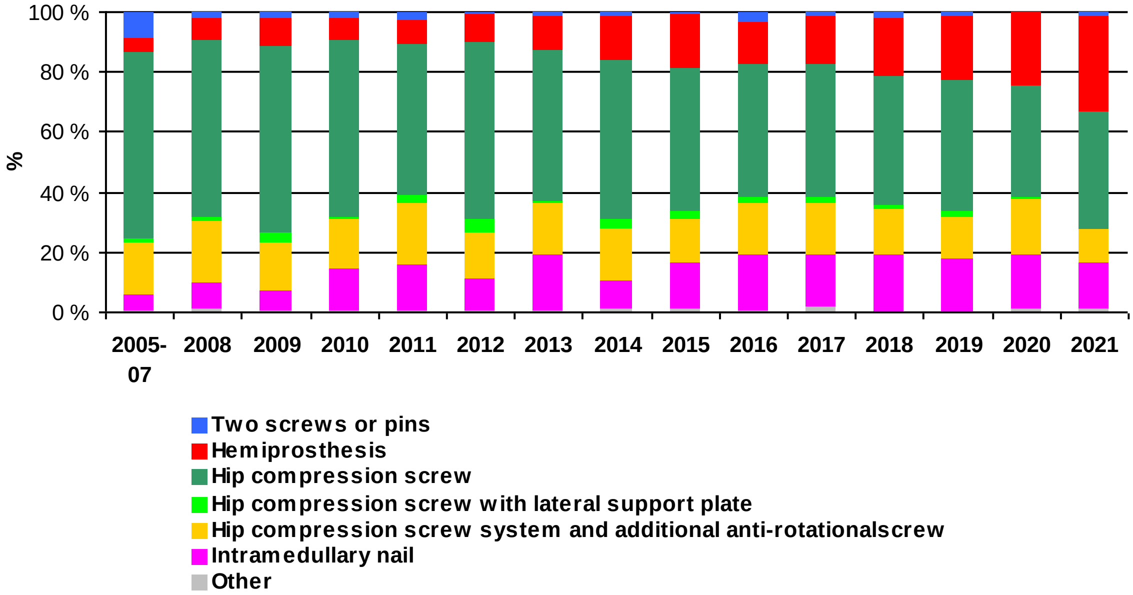


Figure 9d: Time trend for treatment of trochanteric fractures (AO / OTA type A1)

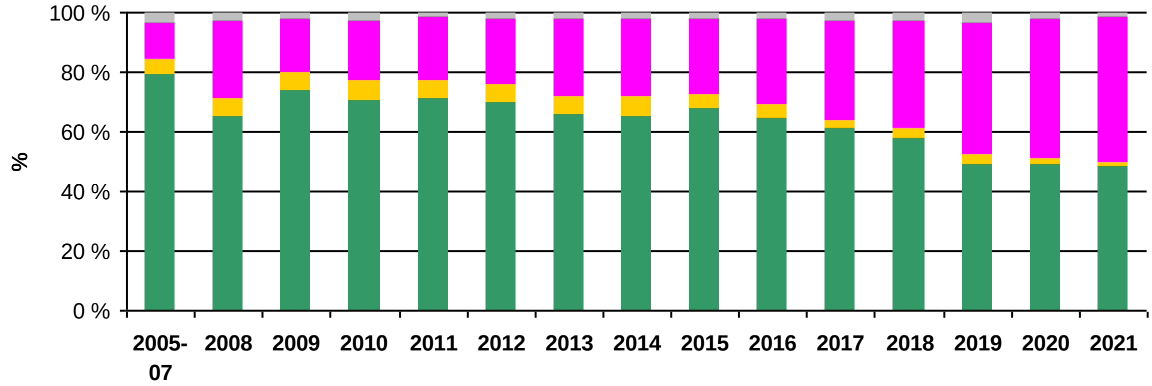


Figure 9e: Time trend for treatment of trochanteric fractures (AO / OTA type A2)

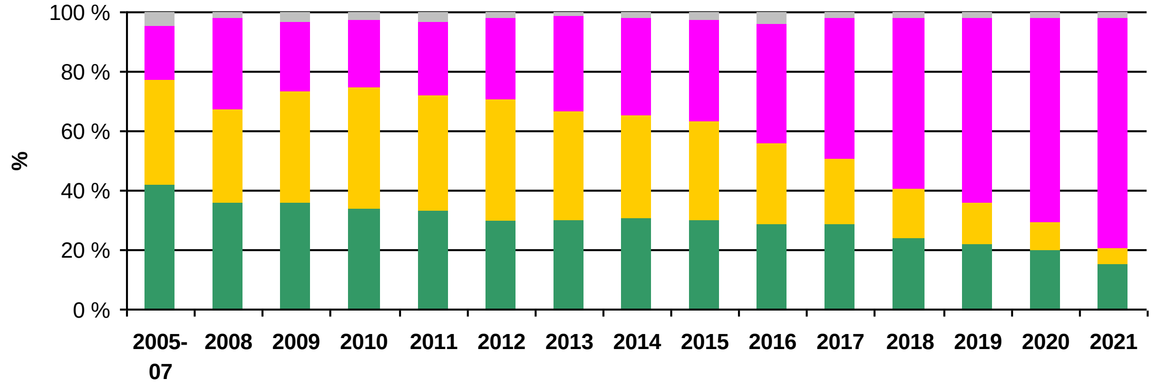
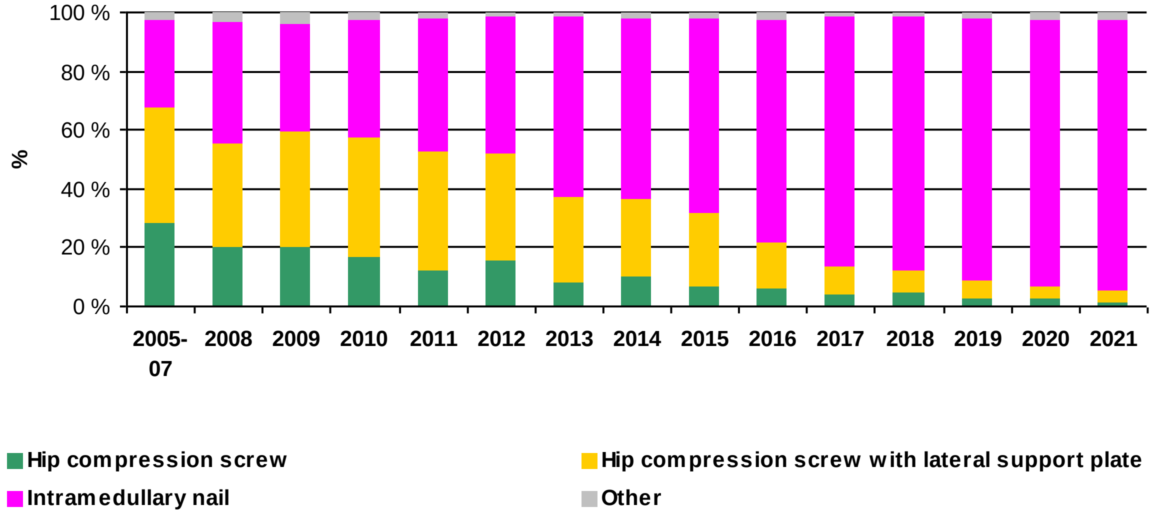


Figure 9f: Time trend for treatment of inter-* and subtrochanteric fractures



* Intertrochanteric fracture (AO / OTA type A3)

Reoperations

Table 9: Reasons for reoperation - all fracture (more than one reason is possible)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	Total
2021	72	35	16	38	1	5	155	12	51	16	61	8	45	384	**899**
	8,0%	3,9%	1,8%	4,2%	0,1%	0,6%	17,2%	1,3%	5,7%	1,8%	6,8%	0,9%	5,0%	42,7%	
2020	62	31	16	38	4	9	154	9	26	13	85	2	24	353	**826**
	7,5%	3,8%	1,9%	4,6%	0,5%	1,1%	18,6%	1,1%	3,1%	1,6%	10,3%	0,2%	2,9%	42,7%	
2019	91	48	19	74	10	9	182	12	28	19	95	7	42	447	**1 083**
	8,4%	4,4%	1,8%	6,8%	0,9%	0,8%	16,8%	1,1%	2,6%	1,8%	8,8%	0,6%	3,9%	41,3%	
2018	98	46	17	70	3	8	220	10	35	24	75	9	44	418	**1 077**
	9,1%	4,3%	1,6%	6,5%	0,3%	0,7%	20,4%	0,9%	3,2%	2,2%	7,0%	0,8%	4,1%	38,8%	
2017	107	47	17	60	10	8	199	14	37	16	82	5	52	378	**1 032**
	10,4%	4,6%	1,6%	5,8%	1,0%	0,8%	19,3%	1,4%	3,6%	1,6%	7,9%	0,5%	5,0%	36,6%	
2016	141	49	17	86	11	9	200	17	32	36	74	13	43	437	**1 165**
	12,1%	4,2%	1,5%	7,4%	0,9%	0,8%	17,2%	1,5%	2,7%	3,1%	6,4%	1,1%	3,7%	37,5%	
2015	161	71	35	72	9	10	180	18	35	33	83	11	47	384	**1 149**
	14,0%	6,2%	3,0%	6,3%	0,8%	0,9%	15,7%	1,6%	3,0%	2,9%	7,2%	1,0%	4,1%	33,4%	
2014	111	58	31	52	7	4	156	14	20	21	67	18	23	367	**949**
	11,7%	6,1%	3,3%	5,5%	0,7%	0,4%	16,4%	1,5%	2,1%	2,2%	7,1%	1,9%	2,4%	38,7%	
2013	141	57	33	75	5	10	166	15	28	22	76	7	47	389	**1 071**
	13,2%	5,3%	3,1%	7,0%	0,5%	0,9%	15,5%	1,4%	2,6%	2,1%	7,1%	0,7%	4,4%	36,3%	
2012	153	65	38	75	19	9	187	15	34	22	63	4	43	349	**1 076**
	14,2%	6,0%	3,5%	7,0%	1,8%	0,8%	17,4%	1,4%	3,2%	2,0%	5,9%	0,4%	4,0%	32,4%	
2011	158	75	59	83	12	5	152	12	41	23	67	8	33	352	**1 080**
	14,6%	6,9%	5,5%	7,7%	1,1%	0,5%	14,1%	1,1%	3,8%	2,1%	6,2%	0,7%	3,1%	32,6%	
2010	177	79	48	79	11	11	132	14	44	26	58	10	37	292	**1 018**
	17,4%	7,8%	4,7%	7,8%	1,1%	1,1%	13,0%	1,4%	4,3%	2,6%	5,7%	1,0%	3,6%	28,7%	
2009	216	96	59	95	8	18	155	7	38	36	49	9	57	301	**1 144**
	18,9%	8,4%	5,2%	8,3%	0,7%	1,6%	13,5%	0,6%	3,3%	3,1%	4,3%	0,8%	5,0%	26,3%	
2008	245	104	63	102	10	10	110	20	39	42	57	10	33	269	**1 114**
	22,0%	9,3%	5,7%	9,2%	0,9%	0,9%	9,9%	1,8%	3,5%	3,8%	5,1%	0,9%	3,0%	24,1%	
2005-07	886	364	220	297	26	30	215	49	78	96	114	18	75	536	**3 004**
	29,5%	12,1%	7,3%	9,9%	0,9%	1,0%	7,2%	1,6%	2,6%	3,2%	3,8%	0,6%	2,5%	17,8%	
Total	**2 819**	**1 225**	**688**	**1 296**	**146**	**155**	**2 563**	**238**	**566**	**445**	**1 106**	**139**	**645**	**5 656**	**17 687**
	15,9%	**6,9%**	**3,9%**	**7,3%**	**0,8%**	**0,9%**	**14,5%**	**1,3%**	**3,2%**	**2,5%**	**6,3%**	**0,8%**	**3,6%**	**32,0%**	

R1: Osteosynthesis failure
R2: Nonunion
R3: Avascular necrosis (segmental collaps)
R4: Local pain due to osteosynthesis material
R5: Malunion
R6: Infection - superficial
R7: Infection - deep
R8: Haematoma
R9: Dislocation of hemiprosthesis
R10: Penetration of osteosynthesis material through caput
R11: New fracture around implant
R12: Loosening of hemiprosthesis
R13: Other
R14: Reported reoperations to the Arthroplasty Register except ”Deep infection” which is included in R7: Infection – deep.

Table 10a: Reasons for reoperation per type of primary fracture (more than one reason is possible) *

Type of primary fracture	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	Total
Intracapsular fracture, undisplaced	660	265	223	337	34	7	157	17	26	63	231	7	125	**2 152**
	30,7%	12,3%	10,4%	15,7%	1,6%	0,3%	7,3%	0,8%	1,2%	2,9%	10,7%	0,3%	5,8%	
Intracapsular fracture, displaced	670	265	171	304	26	86	1 476	138	459	55	353	91	135	**4 229**
	15,8%	6,3%	4,0%	7,2%	0,6%	2,0%	34,9%	3,3%	10,9%	1,3%	8,3%	2,2%	3,2%	
Basocervical fracture	136	64	31	71	8	2	54	5	16	32	21	2	26	**468**
	29,1%	13,7%	6,6%	15,2%	1,7%	0,4%	11,5%	1,1%	3,4%	6,8%	4,5%	0,4%	5,6%	
Trochanteric fracture (2 fragments)	181	64	26	78	16	13	111	16	7	66	86	0	69	**733**
	24,7%	8,7%	3,5%	10,6%	2,2%	1,8%	15,1%	2,2%	1,0%	9,0%	11,7%	0,0%	9,4%	
Trochanteric fracture (multifragment)	396	168	37	148	24	18	291	32	10	114	110	5	103	**1 456**
	27,2%	11,5%	2,5%	10,2%	1,6%	1,2%	20,0%	2,2%	0,7%	7,8%	7,6%	0,3%	7,1%	
Intertrochanteric fracture**	74	33	7	30	5	2	47	8	5	17	11	0	19	**258**
	28,7%	12,8%	2,7%	11,6%	1,9%	0,8%	18,2%	3,1%	1,9%	6,6%	4,3%	0,0%	7,4%	
Subtrochanteric fracture	190	118	7	73	6	7	135	12	5	26	46	3	66	**694**
	27,4%	17,0%	1,0%	10,5%	0,9%	1,0%	19,5%	1,7%	0,7%	3,7%	6,6%	0,4%	9,5%	
Other	32	12	2	9	2	3	32	2	5	8	13	2	13	**135**
	23,7%	8,9%	1,5%	6,7%	1,5%	2,2%	23,7%	1,5%	3,7%	5,9%	9,6%	1,5%	9,6%	
Missing	3	0	0	0	0	0	3	0	0	0	0	0	0	**6**
	50,0%	0,0%	0,0%	0,0%	0,0%	0,0%	50,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	
Total	**2 342**	**989**	**504**	**1 050**	**121**	**138**	**2 306**	**230**	**533**	**381**	**871**	**110**	**556**	**10 131**
	23,1%	**9,8%**	**5,0%**	**10,4%**	**1,2%**	**1,4%**	**22,8%**	**2,3%**	**5,3%**	**3,8%**	**8,6%**	**1,1%**	**5,5%**	

R1: Osteosynthesis failure
R2: Nonunion
R3: Avascular necrosis (segmental collaps)
R4: Local pain due to osteosynthesis material
R5: Malunion
R6: Infection - superficial
R7: Infection - deep
R8: Haematoma
R9: Dislocation of hemiprosthesis
R10: Penetration of osteosynthesis material through caput
R11: New fracture around implant
R12: Loosening of hemiprosthesis
R13: Other

* Total hip prostheses are not counted

** The registration started in 2008

Table 10b: Reasons for reoperation per type of primary operation (more than one reason is possible) *

Type of primary operation	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	Total
T1	1 248	482	374	620	52	18	168	22	33	110	291	7	162	**3 587**
	34,8%	13,4%	10,4%	17,3%	1,4%	0,5%	4,7%	0,6%	0,9%	3,1%	8,1%	0,2%	4,5%	
T2	46	22	11	17	2	1	10	1	2	3	12	1	3	**131**
	35,1%	16,8%	8,4%	13,0%	1,5%	0,8%	7,6%	0,8%	1,5%	2,3%	9,2%	0,8%	2,3%	
T3	10	5	3	6	3	73	1 478	132	466	1	290	92	87	**2 646**
	0,4%	0,2%	0,1%	0,2%	0,1%	2,8%	55,9%	5,0%	17,6%	0,0%	11,0%	3,5%	3,3%	
T4	0	0	0	0	0	5	13	1	9	0	1	1	0	**30**
	0,0%	0,0%	0,0%	0,0%	0,0%	16,7%	43,3%	3,3%	30,0%	0,0%	3,3%	3,3%	0,0%	
T5	431	172	51	140	24	21	198	23	12	98	85	3	91	**1 349**
	31,9%	12,8%	3,8%	10,4%	1,8%	1,6%	14,7%	1,7%	0,9%	7,3%	6,3%	0,2%	6,7%	
T6	235	92	16	106	10	8	257	20	4	58	37	3	57	**903**
	26,0%	10,2%	1,8%	11,7%	1,1%	0,9%	28,5%	2,2%	0,4%	6,4%	4,1%	0,3%	6,3%	
T7	56	27	17	22	6	0	23	1	1	7	6	0	11	**177**
	31,6%	15,3%	9,6%	12,4%	3,4%	0,0%	13,0%	0,6%	0,6%	4,0%	3,4%	0,0%	6,2%	
T8	3	3	3	1	3	0	2	0	0	2	7	0	3	**27**
	11,1%	11,1%	11,1%	3,7%	11,1%	0,0%	7,4%	0,0%	0,0%	7,4%	25,9%	0,0%	11,1%	
T9	155	73	19	65	12	5	52	10	3	59	94	2	51	**600**
	25,8%	12,2%	3,2%	10,8%	2,0%	0,8%	8,7%	1,7%	0,5%	9,8%	15,7%	0,3%	8,5%	
T10	2	0	1	3	0	1	2	0	0	0	1	0	2	**12**
	16,7%	0,0%	8,3%	25,0%	0,0%	8,3%	16,7%	0,0%	0,0%	0,0%	8,3%	0,0%	16,7%	
T11	143	105	8	65	9	6	99	20	3	41	46	1	58	**604**
	23,7%	17,4%	1,3%	10,8%	1,5%	1,0%	16,4%	3,3%	0,5%	6,8%	7,6%	0,2%	9,6%	
T13	12	8	1	5	0	0	4	0	0	2	1	0	31	**64**
	18,8%	12,5%	1,6%	7,8%	0,0%	0,0%	6,3%	0,0%	0,0%	3,1%	1,6%	0,0%	48,4%	
T14	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
	100,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	
Total	**2 342**	**989**	**504**	**1 050**	**121**	**138**	**2 306**	**230**	**533**	**381**	**871**	**110**	**556**	**10 131**
	23,1%	**9,8%**	**5,0%**	**10,4%**	**1,2%**	**1,4%**	**22,8%**	**2,3%**	**5,3%**	**3,8%**	**8,6%**	**1,1%**	**5,5%**	

R1: Osteosynthesis failure
R2: Nonunion
R3: Avascular necrosis (segmental collaps)
R4: Local pain due to osteosynthesis material
R5: Malunion
R6: Infection - superficial
R7: Infection - deep
R8: Haematoma
R9: Dislocation of hemiprosthesis
R10: Penetration of osteosynthesis material through caput
R11: New fracture around implant
R12: Loosening of hemiprosthesis
R13: Other

T1: Two screws or pins
T2: Three screws or pins
T3: Bipolar hemiprosthesis
T4: Unipolar hemiprosthesis
T5: Hip compression screw
T6: Hip compression screw with lateral support plate
T7: Hip compression screw system and additional anti-rotational screw
T8: Short intramedullary nail without distal locking
T9: Short intramedullary nail with distal locking
T10: Long intramedullary nail without distal locking
T11: Long intramedullary nail with distal locking
T13: Other
T14: Missing

* Total hip prostheses are not counted

** The registration started in 2008

Table 11: Type of reoperation (more than one reason is possible)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2021	30 3,2%	15 1,6%	118 12,6%	0 0,0%	76 8,1%	136 14,5%	42 4,5%	5 0,5%	160 17,1%	354 37,8%	**936**
2020	34 3,9%	17 2,0%	87 10,0%	0 0,0%	77 8,9%	122 14,1%	12 1,4%	3 0,3%	155 17,9%	360 41,5%	**867**
2019	70 6,5%	22 2,0%	131 12,1%	0 0,0%	86 8,0%	147 13,6%	16 1,5%	4 0,4%	176 16,3%	428 39,6%	**1 080**
2018	71 6,3%	27 2,4%	114 10,2%	0 0,0%	108 9,6%	167 14,9%	16 1,4%	7 0,6%	189 16,8%	423 37,7%	**1 122**
2017	70 6,7%	33 3,2%	138 13,2%	0 0,0%	115 11,0%	153 14,6%	18 1,7%	6 0,6%	145 13,8%	369 35,2%	**1 047**
2016	90 8,0%	36 3,2%	151 13,3%	0 0,0%	100 8,8%	151 13,3%	14 1,2%	7 0,6%	161 14,2%	422 37,3%	**1 132**
2015	75 6,9%	36 3,3%	182 16,8%	0 0,0%	114 10,5%	131 12,1%	19 1,8%	4 0,4%	148 13,7%	372 34,4%	**1 081**
2014	48 5,4%	26 2,9%	159 17,9%	0 0,0%	81 9,1%	112 12,6%	7 0,8%	4 0,5%	99 11,1%	352 39,6%	**888**
2013	71 7,0%	32 3,2%	159 15,8%	0 0,0%	117 11,6%	116 11,5%	14 1,4%	6 0,6%	118 11,7%	376 37,3%	**1 009**
2012	73 7,3%	42 4,2%	189 18,8%	0 0,0%	91 9,1%	137 13,6%	14 1,4%	9 0,9%	109 10,8%	341 33,9%	**1 005**
2011	72 7,0%	34 3,3%	215 21,0%	0 0,0%	97 9,5%	105 10,2%	19 1,9%	13 1,3%	113 11,0%	358 34,9%	**1 026**
2010	86 8,9%	40 4,2%	221 23,0%	2 0,2%	89 9,3%	106 11,0%	15 1,6%	11 1,1%	104 10,8%	288 29,9%	**962**
2009	120 11,4%	40 3,8%	254 24,0%	0 0,0%	97 9,2%	129 12,2%	10 0,9%	11 1,0%	94 8,9%	302 28,6%	**1 057**
2008	112 11,0%	40 3,9%	317 31,1%	1 0,1%	84 8,2%	83 8,1%	10 1,0%	15 1,5%	91 8,9%	266 26,1%	**1 019**
2005-07	297 11,4%	93 3,6%	1 064 40,8%	42 1,6%	206 7,9%	170 6,5%	22 0,8%	23 0,9%	163 6,3%	525 20,2%	**2 605**
Total	**1 319** **7,8%**	**533** **3,2%**	**3 499** **20,8%**	**45** **0,3%**	**1 538** **9,1%**	**1 965** **11,7%**	**248** **1,5%**	**128** **0,8%**	**2 025** **12,0%**	**5 536** **32,9%**	**16 836**

R1: Removal of implant (when only procedure)
R2: Girdlestone (= Removal of implant/hemiprosthesis and caput)
R3: Bipolar hemiprosthesis
R4: Unipolar haemiprosthesis
R5: Re-osteosynthesis
R6: Drainage of haematoma or infection
R7: Closed reduction of dislocated hemiprosthesis
R8: Open reduction of dislocated hemiprosthesis
R9: Other
R10: Total hip prosthesis

Table 12: Reoperation with primary screw osteosynthesis (reasons are not mutually exclusive)

	R1	R2	R3	R4	R5	R6	R9	R10	Total
2021	9	0	31	0	18	2	5	83	**148**
	6,1%	0,0%	20,9%	0,0%	12,2%	1,4%	3,4%	56,1%	
2020	12	0	20	0	16	1	3	98	**150**
	8,0%	0,0%	13,3%	0,0%	10,7%	0,7%	2,0%	65,3%	
2019	32	0	42	0	10	3	6	104	**197**
	16,2%	0,0%	21,3%	0,0%	5,1%	1,5%	3,0%	52,8%	
2018	27	1	30	0	25	3	7	130	**223**
	12,1%	0,4%	13,5%	0,0%	11,2%	1,3%	3,1%	58,3%	
2017	24	4	37	0	21	2	2	124	**214**
	11,2%	1,9%	17,3%	0,0%	9,8%	0,9%	0,9%	57,9%	
2016	36	3	53	0	27	3	4	157	**283**
	12,7%	1,1%	18,7%	0,0%	9,5%	1,1%	1,4%	55,5%	
2015	29	3	66	0	22	3	6	128	**257**
	11,3%	1,2%	25,7%	0,0%	8,6%	1,2%	2,3%	49,8%	
2014	17	0	70	0	25	3	3	135	**253**
	6,7%	0,0%	27,7%	0,0%	9,9%	1,2%	1,2%	53,4%	
2013	35	2	72	0	35	1	2	139	**286**
	12,2%	0,7%	25,2%	0,0%	12,2%	0,3%	0,7%	48,6%	
2012	31	10	99	0	27	4	3	131	**305**
	10,2%	3,3%	32,5%	0,0%	8,9%	1,3%	1,0%	43,0%	
2011	38	9	113	0	23	2	7	139	**331**
	11,5%	2,7%	34,1%	0,0%	6,9%	0,6%	2,1%	42,0%	
2010	43	11	114	1	26	2	4	124	**325**
	13,2%	3,4%	35,1%	0,3%	8,0%	0,6%	1,2%	38,2%	
2009	65	8	126	0	15	7	5	137	**363**
	17,9%	2,2%	34,7%	0,0%	4,1%	1,9%	1,4%	37,7%	
2008	54	12	161	0	21	3	3	135	**389**
	13,9%	3,1%	41,4%	0,0%	5,4%	0,8%	0,8%	34,7%	
2005-07	102	19	515	18	42	7	11	314	**1 028**
	9,9%	1,8%	50,1%	1,8%	4,1%	0,7%	1,1%	30,5%	
Total	**554**	**82**	**1 549**	**19**	**353**	**46**	**71**	**2 078**	**4 752**
	11,7%	**1,7%**	**32,6%**	**0,4%**	**7,4%**	**1,0%**	**1,5%**	**43,7%**	

R1: Removal of implant (when only procedure)
R2: Girdlestone (= Removal of implant/hemiprosthesis and caput)
R3: Bipolar hemiprosthesis
R4: Unipolar hemiprosthesis
R5: Re-osteosynthesis
R6: Drainage of haematoma or infection
R9: Other
R10: Total hip prosthesis

Table 13: Reoperation with primary uni/bipolar hemiprosthesis (reasons are not mutually exclusive)

	R2	R3	R6	R7	R8	R9	R10	Total
2021	4	24	77	25	3	89	33	**255**
	1,6%	9,4%	30,2%	9,8%	1,2%	34,9%	12,9%	
2020	3	21	80	5	3	93	27	**232**
	1,3%	9,1%	34,5%	2,2%	1,3%	40,1%	11,6%	
2019	7	33	83	10	3	97	47	**280**
	2,5%	11,8%	29,6%	3,6%	1,1%	34,6%	16,8%	
2018	9	28	105	10	4	113	45	**314**
	2,9%	8,9%	33,4%	3,2%	1,3%	36,0%	14,3%	
2017	9	28	78	8	4	84	48	**259**
	3,5%	10,8%	30,1%	3,1%	1,5%	32,4%	18,5%	
2016	12	20	81	9	6	98	42	**268**
	4,5%	7,5%	30,2%	3,4%	2,2%	36,6%	15,7%	
2015	5	18	66	16	1	74	48	**228**
	2,2%	7,9%	28,9%	7,0%	0,4%	32,5%	21,1%	
2014	9	20	48	5	4	61	37	**184**
	4,9%	10,9%	26,1%	2,7%	2,2%	33,2%	20,1%	
2013	11	15	68	9	4	78	37	**222**
	5,0%	6,8%	30,6%	4,1%	1,8%	35,1%	16,7%	
2012	11	23	55	10	8	56	31	**194**
	5,7%	11,9%	28,4%	5,2%	4,1%	28,9%	16,0%	
2011	10	14	60	16	8	70	32	**210**
	4,8%	6,7%	28,6%	7,6%	3,8%	33,3%	15,2%	
2010	8	17	59	10	9	69	16	**188**
	4,3%	9,0%	31,4%	5,3%	4,8%	36,7%	8,5%	
2009	9	10	44	7	9	49	20	**148**
	6,1%	6,8%	29,7%	4,7%	6,1%	33,1%	13,5%	
2008	10	7	46	5	12	45	20	**145**
	6,9%	4,8%	31,7%	3,4%	8,3%	31,0%	13,8%	
2005-07	12	12	68	10	16	78	22	**218**
	5,5%	5,5%	31,2%	4,6%	7,3%	35,8%	10,1%	
Total	**129**	**290**	**1 018**	**155**	**94**	**1 154**	**505**	**3 345**
	3,9%	**8,7%**	**30,4%**	**4,6%**	**2,8%**	**34,5%**	**15,1%**	

R2: Girdlestone (= Removal of implant/hemiprosthesis and caput)
R3: Bipolar hemiprosthesis
R6: Drainage of haematoma or infection
R7: Closed reduction of dislocated hemiprosthesis
R8: Open reduction of dislocated hemiprosthesis
R9: Other
R10: Total hip prosthesis

Table 14: Specification of R9 - Others

	2005 -12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
							4	10	8	9	**31**
Cable Ready plate + cerclage	3		2			1	1		2		**9**
Cement spacer	5	3	3	4	4	3	1	2	1	3	**29**
Cerclage	7	3	2	3	2	2		4	5		**28**
Dall Miles plate + cerclage	8		4	4	3	2	2	1	2	1	**27**
DCP plate + possibly cerclage					3	4	4	2		2	**15**
Drainage of haematoma	25				1	1				1	**28**
Exchange of caput/bipolar head	289	67	43	55	77	67	95	71	74	70	**908**
Exchange of caput/bipolar head + osteosynthesis with plate/cerclage	2	1	1	1			1				**6**
Fixation of trochanter (Dall Miles)	3				1			1			**5**
Suture of muscle/fascie	6			1	2	1	1	2			**13**
Unspecified plate + cerclage	7	2	2	5	1	2	2	2			**23**
Other (n<5)	12	2	4	1	4	1	2	2	1	3	**32**
Total	**367**	**78**	**61**	**74**	**98**	**84**	**113**	**97**	**93**	**89**	**1 154**

Implants

Table 15: Cemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	2005 -13	2014	2015	2016	2017	2018	2019	2020	2021	Total
Charnley		Hastings bipolar head	2 634	61								**2 695**
Charnley Modular	Elite	Hastings bipolar head	1 268	1								**1 269**
Charnley Modular	Elite	Landos bipolar cup	24									**24**
Charnley Modular	Elite	Self-centering bipolar	176	241	258	71	45					**791**
Corail	Articul/Eze CoCr	Self-centering bipolar	91	72	117	93	80	86	62			**601**
Corail	Articul/Eze CoCr	Vario-Cup	24	35	48	64	7					**178**
Corail	Cobalt chrome (DePuy)	Self-centering bipolar	49									**49**
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	23									**23**
CPT	Protasul/Metasul	Multipolar					764	350	98			**1 212**
CPT	Protasul/Metasul	Self-centering bipolar					67	92	88			**247**
CPT	Protasul/Metasul	UHR					22	3				**25**
C-Stem	Articul/Eze CoCr	Self-centering bipolar			5	86	69	165	389	685	746	**2 145**
C-Stem	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar			12	99	97			2		**210**
ETS			294	2	2	1						**299**
Exeter/V40	Exeter/V40	Multipolar					28	113	80	24		**245**
Exeter/V40	Exeter/V40	Self-centering bipolar	175	240	228	218	46					**907**
Exeter/V40	Exeter/V40	UHR	7 014	1318	1 456	1 568	884	1 347	1 542	1 390	1 251	**17 770**
Lubinus SPII	Articul/Eze CoCr	Self-centering bipolar	1	17	8		1					**27**
Lubinus SPII	CoCrMo (Link)	Multipolar								60	71	**131**
Lubinus SPII	CoCrMo (Link)	Self-centering bipolar	7	49	70	98	17					**241**
Lubinus SPII	CoCrMo (Link)	UHR	62	204	218	257	258	261	234	241	449	**2 184**
Lubinus SPII	CoCrMo (Link)	Vario-Cup	1 672	73	90	113	178	270	324	541	625	**3 886**
MS-30	Protasul/Metasul	Multipolar					106	265	227	101	91	**790**
MS-30	Protasul/Metasul	Self-centering bipolar								33	55	**88**
MS-30	Protasul/Metasul	UHR	21									**21**
MS-30	Versys	Multipolar							61	92	142	**295**
MS-30	Versys	Self-centering bipolar			11	45	38	11				**105**
MS-30	Versys	UHR						21	35	41	48	**145**
MS-30	Zimmer hoder	Multipolar					6	4		7	6	**23**
Spectron EF Primary	Cobalt Chrom (S&N)	Biarticular cup	33									**33**
Spectron EF Primary	Cobalt Chrom (S&N)	HIP Bipolar Cup	64	21	19	15	15	13	10	8	3	**168**
Spectron EF Primary	Cobalt Chrom (S&N)	Landos bipolar cup	112									**112**
Spectron EF Primary	Cobalt Chrom (S&N)	Self-centering bipolar	20									**20**
Spectron EF Primary	Cobalt Chrom (S&N)	Tandem	1 067									**1 067**
Spectron EF Primary	Cobalt Chrom (S&N)	Vario-Cup	82									**82**
Titan	Cobalt chrome (DePuy)	Landos bipolar cup	648									**648**
Titan	Cobalt chrome (DePuy)	Self-centering bipolar	227									**227**
Other	(n < 20)		576	37	20	42	157	93	52	61	48	**1 086**
Unknown			30	1	2	1	1	2	1	2		**40**
Total			**16 394**	**2 372**	**2 564**	**2 771**	**2 886**	**3 096**	**3 203**	**3 288**	**3 535**	**40 109**

Table 16: Uncemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	2005 -12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Accolade II	Exeter/V40	Vario-Cup		2	8	11	4	2		2	2		**31**
Arcos	Modular Head (Biomet)	Multipolar						5	2	2		1	**10**
Corail	Alumina Biolox (DePuy)	Vario-Cup	10										**10**
Corail	Articul/Eze CoCr	Bipolar Ball Head	56	8									**64**
Corail	Articul/Eze CoCr	Landos bipolar cup	102										**102**
Corail	Articul/Eze CoCr	Multipolar								3	9	10	**22**
Corail	Articul/Eze CoCr	Self-centering bipolar	1 273	532	470	429	486	295	165	106	39	22	**3 817**
Corail	Articul/Eze CoCr	UHR	106	40	82	74	67	33	39	27	10	3	**481**
Corail	Articul/Eze CoCr	Vario-Cup	90	47	17	4	1						**159**
Corail	Articul/Eze Ultamet (M-Spec)	Multipolar							6	4			**10**
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar	164	146	80	9	6	1					**406**
Corail	Cobalt Chrom (S&N)	Self-centering bipolar	37										**37**
Corail	Cobalt Chrom (S&N)	Vario-Cup	13										**13**
Corail	Cobalt chrome (DePuy)	Landos bipolar cup	757										**757**
Corail	Cobalt chrome (DePuy)	Self-centering bipolar	1 127										**1 127**
Corail	Cobalt chrome (DePuy)	Tandem	11										**11**
Corail	Cobalt chrome (DePuy)	UHR	11										**11**
Corail	Metal Ball Head	Bipolar Ball Head	25										**25**
Corail	Modular Cathcart (Fracture head hip ball)		14										**14**
Filler	Biotechni fem. head	Biarticular cup	24										**24**
Filler	Cobalt Chrom (S&N)	Biarticular cup	19										**19**
Filler	Hipball Premium	Biarticular cup	190										**190**
Filler	Hipball Premium	HIP Bipolar Cup	374	99	37	44	36	35	63	50	55	46	**839**
Filler	Hipball Premium	UHR		10	20	2							**32**
Furlong	Furlong	UHR				21	57	31					**109**
HACTIV	HACTIV head	Moonstone	22										**22**
HACTIV	HACTIV head	Tandem	18	1									**19**
HACTIV	HACTIV head	UHR			41	22		1					**64**
Polarstem	Cobalt Chrom (S&N)	Tandem	156	39	16	2							**213**
Polarstem	Cobalt Chrom (S&N)	UHR			25	33	9	12	16	13	9	10	**127**
SL-PLUS/SLR PLUS	HACTIV head	Bipolar Ball Head	16										**16**
SL-PLUS/SLR PLUS	Metal Ball Head	Bipolar Ball Head	155										**155**
Other	(n < 10)		306	15	23	22	20	40	34	23	17	23	**523**
Unknown			5		1					1			**7**
Total			**5 081**	**939**	**820**	**673**	**686**	**455**	**325**	**231**	**141**	**115**	**9 466**

Table 17: Cemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	2005 -12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Charnley		Hastings bipolar head	446	3	3								**452**
Charnley Modular	Elite	Hastings bipolar head	69	8									**77**
Charnley Modular	Elite	Self-centering bipolar	13	1	8	7							**29**
Corail	Articul/Eze CoCr	Self-centering bipolar	7			3	5	1	2	2			**20**
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	15										**15**
CPT	Protasul/Metasul	Self-centering bipolar						2	4	4			**10**
C-Stem	Articul/Eze CoCr	Self-centering bipolar					3	2	2	2	2	3	**14**
ETS			21	1									**22**
Exeter/V40	Exeter/V40	Self-centering bipolar	7	4	12	11	6	1					**41**
Exeter/V40	Exeter/V40	UHR	549	51	41	68	42	31	35	46	25	30	**918**
Lubinus SPII	CoCrMo (Link)	UHR		2	12	15	12	11	7	2	2	6	**69**
Lubinus SPII	CoCrMo (Link)	Vario-Cup	122	12	7	4	6	11	2	7	2	5	**178**
MS-30	Protasul/Metasul	Multipolar						4	1	4	1	3	**13**
Restoration Modular	Exeter/V40	Self-centering bipolar	11	1		1							**13**
Restoration Modular	Exeter/V40	UHR				1	2	4	2		2		**11**
Spectron EF Primary	Cobalt Chrom (S&N)	Landos bipolar cup	11										**11**
Spectron EF Primary	Cobalt Chrom (S&N)	Tandem	113	6	1								**120**
Titan	Cobalt chrome (DePuy)	Landos bipolar cup	125										**125**
Other	(n <10)		226	13	30	22	36	35	32	35	28	40	**497**
Unknown			5			1		2					**8**
Total			**1 740**	**102**	**114**	**133**	**112**	**104**	**87**	**102**	**62**	**87**	**2 643**

Table 18: Uncemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Arcos	Modular Head (Biomet)	Multipolar						4	2	1	2	6	**15**
Arcos	Modular Head (Biomet)	Self-centering bipolar			2	3	5						**10**
Arcos	Modular Head (Biomet)	UHR						1	2	6	4	7	**20**
Corail	Articul/Eze CoCr	Landos bipolar cup	19										**19**
Corail	Articul/Eze CoCr	Self-centering bipolar	47	14	11	13	13	6	6	1	4	4	**119**
Corail	Articul/Eze CoCr	UHR					4	1					**5**
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar	17	10	2								**29**
Corail	Cobalt chrome (DePuy)	Landos bipolar cup	81										**81**
Corail	Cobalt chrome (DePuy)	Self-centering bipolar	66										**66**
Corail Revisjon/KAR	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar	4	3									**7**
Corail Revisjon/KAR	Cobalt chrome (DePuy)	Landos bipolar cup	9										**9**
Corail Revisjon/KAR	Cobalt chrome (DePuy)	Self-centering bipolar	6										**6**
Filler	Biotechni fem. head	Biarticular cup	18										**18**
Filler	Cobalt chrome (DePuy)	Biarticular cup	5										**5**
Filler	Hipball Premium	Biarticular cup	56										**56**
Filler	Hipball Premium	HIP Bipolar Cup	37	12	11	8	7	9	5	1	7	4	**101**
HACTIV	HACTIV head	Moonstone	5										**5**
Link MP Reconstruction	CoCrMo (Link)	UHR				1	1		1	2		2	**7**
Polarstem	Cobalt Chrom (S&N)	UHR			2	1	1	2	1	2		2	**11**
REEF	Cobalt chrome (DePuy)	Self-centering bipolar	5										**5**
Restoration-HA	C-Taper Head	Landos bipolar cup	7										**7**
Revitan	Versys	Multipolar						1	1	2	2		**6**
SL-PLUS/SLR PLUS	Metal Ball Head	Bipolar Ball Head	12										**12**
TTHR	Articul/Eze CoCr	UHR			4	1	1						**6**
TTHR	CoCrMo (Link)	UHR			1	4	2			1			**8**
TTHR	TETE Inox	Self-centering bipolar	5										**5**
Other	(n < 5)		164	18	12	19	5	9	8	14	6	3	**258**
Unknown			3					1					**4**
Total			**566**	**57**	**45**	**50**	**39**	**34**	**26**	**30**	**25**	**28**	**900**

Table 19: Screws - primary operations

Product	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Asnis III	898	105	121	120	118	114	119	212	179	220	**2 206**
Cannulated screw (DePuySynthes)								4	6	3	**13**
Cannulated screw (S&N)	2						18	82	59	89	**250**
Cannulated Screw Zimmer Biomet							1			27	**28**
Hansson pin system (LIH)	1 852	60	41	60	49	79	62	55	37	12	**2 307**
Olmed LE-screw	8 517	563	448	483	433	272	196	86	71	86	**11 155**
Richards CHP	4 369	593	547	614	596	658	635	486	359	297	**9 154**
Other (n<10)					3	1	2	1			**7**
Unknown			1			1	2	3	1	3	**11**
Total	**15 638**	**1 321**	**1 158**	**1 277**	**1 199**	**1 125**	**1 035**	**929**	**712**	**737**	**25 131**

Table 20: Hip compression screws - primary operations

Product	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
DHS	4 189	8	13	25	25	29	11	5			**4 305**
LCP DHS	2 159	468	662	1 357	1 162	1 094	923	765	651	624	**9 865**
Omega	109	2									**111**
Omega 3	2	1	1		2	2			1	1	**10**
Richards CHS	13 241	1 764	1 564	773	712	534	493	409	368	337	**20 195**
Swemac CHS System				8	5	6	10	13	2		**44**
Other (n<10)	1	1								2	**4**
Total	**19 701**	**2 244**	**2 240**	**2 163**	**1 906**	**1 665**	**1 437**	**1 192**	**1 022**	**964**	**34 534**

Table 21: Intramedullary nails - primary operations

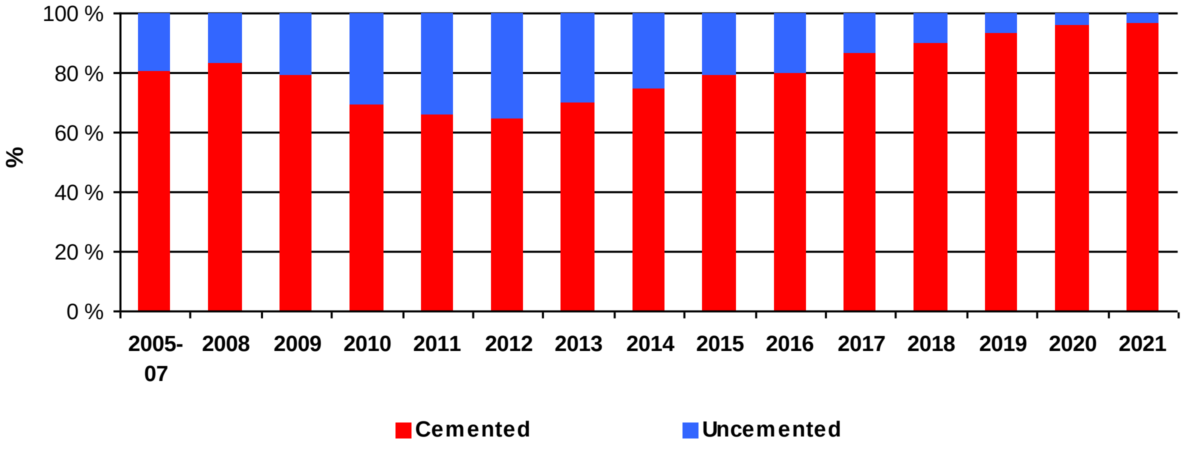
Product	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
ACE	49										**49**
AFFIXUS						5	14	23	29	43	**114**
Gamma 3	3 516	766	710	467	429	369	512	1 053	1 218	1 464	**10 504**
IMHS	27										**27**
IMHS CP	10										**10**
LFN	47	8	7	4	3	5	2	7	1	2	**86**
PFN	26										**26**
PFNA	313	136	117	174	200	186	231	129	142	118	**1 746**
T2	11		2	1				1	1	1	**17**
T2 recon	88	61	33	24	28	34	31	39	71	72	**481**
TFNA femoral nail							1	171	138	145	**455**
T-Gamma	507										**507**
Trigen Intertan	1 214	198	285	561	744	990	994	415	351	365	**6 117**
Trigen TAN/FAN	192	34	22	62	65	88	76	49	20	8	**616**
Other (n<10)	5						2	1		5	**13**
Unknown	3		2	1				1	1	3	**11**
Total	**6 008**	**1 203**	**1 178**	**1 294**	**1 469**	**1 677**	**1 863**	**1 889**	**1 972**	**2 226**	**20 779**

Fixation of hemiprostheses

Table 22: Primary operations

	Uncemented		Cement with antibiotics		Cement without antibiotics		Missing		Total
2021	117	(3,2%)	3 536	(96,7%)	1	(0,0%)	1	(0,0%)	**3 655**
2020	142	(4,1%)	3 287	(95,9%)	0	(0,0%)	0	(0,0%)	**3 429**
2019	232	(6,8%)	3 202	(93,2%)	0	(0,0%)	0	(0,0%)	**3 434**
2018	332	(9,7%)	3 080	(90,0%)	1	(0,0%)	8	(0,2%)	**3 421**
2017	455	(13,6%)	2 885	(86,4%)	0	(0,0%)	1	(0,0%)	**3 341**
2016	687	(19,9%)	2 769	(80,1%)	0	(0,0%)	1	(0,0%)	**3 457**
2015	667	(20,6%)	2 563	(79,2%)	1	(0,0%)	6	(0,2%)	**3 237**
2014	811	(25,4%)	2 362	(74,0%)	3	(0,1%)	16	(0,5%)	**3 192**
2013	921	(29,7%)	2 154	(69,4%)	0	(0,0%)	28	(0,9%)	**3 103**
2012	1 064	(33,8%)	1 963	(62,4%)	11	(0,3%)	110	(3,5%)	**3 148**
2011	987	(32,6%)	1 928	(63,7%)	6	(0,2%)	105	(3,5%)	**3 026**
2010	837	(29,8%)	1 897	(67,5%)	7	(0,2%)	71	(2,5%)	**2 812**
2009	568	(20,0%)	2 175	(76,6%)	8	(0,3%)	87	(3,1%)	**2 838**
2008	399	(15,9%)	2 011	(80,1%)	8	(0,3%)	92	(3,7%)	**2 510**
2005-07	943	(18,9%)	3 940	(79,2%)	8	(0,2%)	86	(1,7%)	**4 977**
Total	**9 162**	**(18,5%)**	**39 752**	**(80,2%)**	**54**	**(0,1%)**	**612**	**(1,2%)**	**49 580**

Figure 10: Time trend for fixation of primary hemiprostheses *



* 612 operations with missing fixation information were excluded

Table 23: Type of cement - primary operations

Product	Manufacturer	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Cemex System Genta FAST	Alere	440	84	86	29							**639**
Cemex system genta ID green	Alere	1				16	126	106	75	6	1	**331**
Cemex w/gentamicin	Alere	50	11	10	71	111			1			**254**
Copal G+ V	Heraeus			1	1	2	8	4	6	2	5	**29**
Optipac Refobacin Bonecement R	Biomet	2 291	725	911	1 248	1 040	949	769	44		1	**7 978**
Optipac Refobacin Bonecement R-3	Zimmer Bio								16			**16**
Optipac Refobacin Revision	Biomet	3	58	67								**128**
Palacos R + G	Heraeus	7 168	869	882	958	1 007	763	883	563	265	311	**13 669**
Palacos R+G pro	Heraeus	1			1	93	374	1 078	2 362	2 926	3 208	**10 043**
Palacos w/gentamicin	Heraeus/Sc	353										**353**
Refobacin Bone Cement R	Biomet	2 945	394	380	221	367	524	77				**4 908**
Refobacin-Palacos	Biomet	314										**314**
Simplex unknown	Stryker	75										**75**
Simplex w/Tobramycin	Stryker	2								10	1	**13**
SmartSet GHV Genta. Smartmix	Ortomedic	66			3	39	31	21	11	30	5	**206**
Other (n<10)					1	1	3		1		2	**8**
Missing information		205	13	25	30	93	107	142	123	48	2	**788**
Total		**13 914**	**2 154**	**2 362**	**2 563**	**2 769**	**2 885**	**3 080**	**3 202**	**3 287**	**3 536**	**39 752**

Table 24: Hydroxyapatite (HA) - uncemented prostheses

	With HA		Without HA		Missing		Total
2021	115	(98,3%)	1	(0,9%)	1	(0,9%)	**117**
2020	141	(99,3%)	0	(0,0%)	1	(0,7%)	**142**
2019	228	(98,3%)	2	(0,9%)	2	(0,9%)	**232**
2018	325	(97,9%)	3	(0,9%)	4	(1,2%)	**332**
2017	452	(99,3%)	0	(0,0%)	3	(0,7%)	**455**
2016	680	(99,0%)	5	(0,7%)	2	(0,3%)	**687**
2015	664	(99,6%)	3	(0,4%)	0	(0,0%)	**667**
2014	805	(99,3%)	5	(0,6%)	1	(0,1%)	**811**
2013	920	(99,9%)	1	(0,1%)	0	(0,0%)	**921**
2012	1 062	(99,8%)	2	(0,2%)	0	(0,0%)	**1 064**
2011	986	(99,9%)	1	(0,1%)	0	(0,0%)	**987**
2010	824	(98,4%)	13	(1,6%)	0	(0,0%)	**837**
2009	524	(92,3%)	44	(7,7%)	0	(0,0%)	**568**
2008	362	(90,7%)	37	(9,3%)	0	(0,0%)	**399**
2005-07	827	(87,7%)	116	(12,3%)	0	(0,0%)	**943**
Total	**8 915**	**(97,3%)**	**233**	**(2,5%)**	**14**	**(0,2%)**	**9 162**

Pathological fractures

Table 25: Pathological fracture (osteoporotic fracture not included) - primary operations *

	No		Yes		Missing		Total
2021	6 651	(87,0%)	105	(1,4%)	885	(11,6%)	**7 641**
2020	6 240	(86,5%)	86	(1,2%)	888	(12,3%)	**7 214**
2019	6 486	(86,1%)	105	(1,4%)	946	(12,6%)	**7 537**
2018	6 790	(86,5%)	109	(1,4%)	948	(12,1%)	**7 847**
2017	6 853	(86,3%)	118	(1,5%)	969	(12,2%)	**7 940**
2016	7 065	(86,6%)	118	(1,4%)	973	(11,9%)	**8 156**
2015	7 077	(87,5%)	117	(1,4%)	893	(11,0%)	**8 087**
2014	6 919	(87,6%)	81	(1,0%)	894	(11,3%)	**7 894**
2013	6 987	(87,2%)	133	(1,7%)	893	(11,1%)	**8 013**
2012	7 191	(87,4%)	106	(1,3%)	932	(11,3%)	**8 229**
2011	7 488	(89,0%)	135	(1,6%)	791	(9,4%)	**8 414**
2010	7 611	(92,8%)	93	(1,1%)	498	(6,1%)	**8 202**
2009	7 307	(90,2%)	107	(1,3%)	687	(8,5%)	**8 101**
2008	7 388	(90,0%)	104	(1,3%)	720	(8,8%)	**8 212**
2005-07	18 746	(89,8%)	251	(1,2%)	1 871	(9,0%)	**20 868**
Total	**116 799**	**(88,2%)**	**1 768**	**(1,3%)**	**13 788**	**(10,4%)**	**132 355**

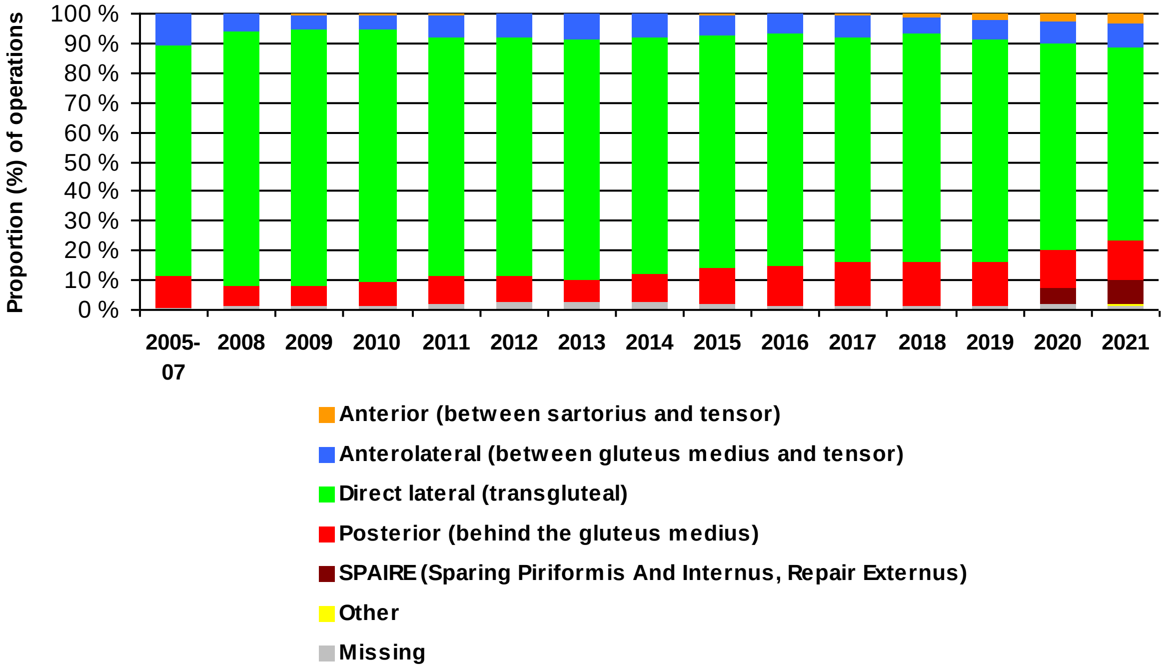
* Patients operated with total hip prostheses were excluded

Surgical approach used in hemiarthroplasty

Table 26: Surgical approach used in hemiarthroplasty

	Anterior		Anterolateral		Direct lateral		Posterior		SPAIRE		Other		Missing		Total
2021	113	(3,1%)	300	(8,2%)	2 390	(65,4%)	484	(13,2%)	306	(8,4%)	4	(0,1%)	58	(1,6%)	**3 655**
2020	102	(3,0%)	250	(7,3%)	2 385	(69,6%)	442	(12,9%)	186	(5,4%)	0	(0,0%)	64	(1,9%)	**3 429**
2019	67	(2,0%)	230	(6,7%)	2 577	(75,0%)	514	(15,0%)	4	(0,1%)	1	(0,0%)	41	(1,2%)	**3 434**
2018	45	(1,3%)	196	(5,7%)	2 632	(76,9%)	501	(14,6%)	0	(0,0%)	0	(0,0%)	47	(1,4%)	**3 421**
2017	24	(0,7%)	247	(7,4%)	2 541	(76,1%)	493	(14,8%)	0	(0,0%)	0	(0,0%)	36	(1,1%)	**3 341**
2016	11	(0,3%)	210	(6,1%)	2 714	(78,5%)	487	(14,1%)	0	(0,0%)	0	(0,0%)	35	(1,0%)	**3 457**
2015	14	(0,4%)	232	(7,2%)	2 544	(78,6%)	388	(12,0%)	0	(0,0%)	1	(0,0%)	58	(1,8%)	**3 237**
2014	3	(0,1%)	252	(7,9%)	2 562	(80,3%)	291	(9,1%)	0	(0,0%)	1	(0,0%)	83	(2,6%)	**3 192**
2013	8	(0,3%)	255	(8,2%)	2 538	(81,8%)	224	(7,2%)	0	(0,0%)	0	(0,0%)	78	(2,5%)	**3 103**
2012	6	(0,2%)	239	(7,6%)	2 538	(80,6%)	278	(8,8%)	0	(0,0%)	1	(0,0%)	86	(2,7%)	**3 148**
2011	11	(0,4%)	228	(7,5%)	2 446	(80,8%)	290	(9,6%)	0	(0,0%)	0	(0,0%)	51	(1,7%)	**3 026**
2010	14	(0,5%)	142	(5,0%)	2 391	(85,0%)	230	(8,2%)	0	(0,0%)	0	(0,0%)	35	(1,2%)	**2 812**
2009	14	(0,5%)	147	(5,2%)	2 442	(86,0%)	200	(7,0%)	0	(0,0%)	0	(0,0%)	35	(1,2%)	**2 838**
2008	1	(0,0%)	155	(6,2%)	2 144	(85,4%)	176	(7,0%)	0	(0,0%)	0	(0,0%)	34	(1,4%)	**2 510**
2005-07	1	(0,0%)	537	(10,8%)	3 866	(77,7%)	526	(10,6%)	0	(0,0%)	0	(0,0%)	47	(0,9%)	**4 977**
Total	**434**	**(0,9%)**	**3 620**	**(7,3%)**	**38 710**	**(78,1%)**	**5 524**	**(11,1%)**	**496**	**(1,0%)**	**8**	**(0,0%)**	**788**	**(1,6%)**	**49 580**

Figure 11: Surgical approach used in hemiarthroplasty



Intraoperative complications

Table 27: Intraoperative complications - primary operations

	Yes		No		Missing		Total
2021	213	(2,6%)	7 724	(94,6%)	228	(2,8%)	**8 165**
2020	212	(2,7%)	7 305	(94,2%)	237	(3,1%)	**7 754**
2019	226	(2,8%)	7 709	(94,4%)	234	(2,9%)	**8 169**
2018	268	(3,2%)	7 911	(93,9%)	249	(3,0%)	**8 428**
2017	268	(3,2%)	7 863	(94,2%)	221	(2,7%)	**8 352**
2016	335	(3,9%)	7 908	(93,0%)	260	(3,1%)	**8 503**
2015	305	(3,6%)	7 811	(92,9%)	294	(3,5%)	**8 410**
2014	308	(3,8%)	7 586	(92,7%)	289	(3,5%)	**8 183**
2013	306	(3,7%)	7 746	(93,2%)	258	(3,1%)	**8 310**
2012	340	(4,0%)	7 772	(92,1%)	325	(3,9%)	**8 437**
2011	354	(4,1%)	7 961	(92,5%)	289	(3,4%)	**8 604**
2010	322	(3,9%)	7 761	(92,8%)	280	(3,4%)	**8 363**
2009	302	(3,7%)	7 684	(93,1%)	272	(3,3%)	**8 258**
2008	365	(4,4%)	7 726	(92,4%)	271	(3,2%)	**8 362**
2005-07	705	(3,3%)	19 938	(93,8%)	625	(2,9%)	**21 268**
Total	**4 829**	**(3,5%)**	**128 405**	**(93,3%)**	**4 332**	**(3,1%)**	**137 566**

Antibiotic prophylaxis

Table 28: Antibiotic prophylaxis in primary screw fixation

	Yes		No		Missing		Total
2021	726	(98,2%)	8	(1,1%)	5	(0,7%)	**739**
2020	697	(97,9%)	12	(1,7%)	3	(0,4%)	**712**
2019	904	(97,4%)	16	(1,7%)	8	(0,9%)	**928**
2018	995	(96,3%)	30	(2,9%)	8	(0,8%)	**1 033**
2017	1 063	(94,4%)	54	(4,8%)	9	(0,8%)	**1 126**
2016	1 129	(94,2%)	63	(5,3%)	7	(0,6%)	**1 199**
2015	1 166	(91,3%)	102	(8,0%)	9	(0,7%)	**1 277**
2014	988	(85,3%)	162	(14,0%)	8	(0,7%)	**1 158**
2013	1 008	(76,3%)	307	(23,2%)	6	(0,5%)	**1 321**
2012	1 016	(68,6%)	455	(30,7%)	11	(0,7%)	**1 482**
2011	1 000	(58,8%)	682	(40,1%)	18	(1,1%)	**1 700**
2010	952	(56,0%)	721	(42,4%)	26	(1,5%)	**1 699**
2009	885	(50,0%)	859	(48,6%)	25	(1,4%)	**1 769**
2008	930	(46,3%)	1 050	(52,3%)	27	(1,3%)	**2 007**
2005-07	2 250	(32,3%)	4 590	(65,9%)	124	(1,8%)	**6 964**
Total	**15 709**	**(62,6%)**	**9 111**	**(36,3%)**	**294**	**(1,2%)**	**25 114**

Table 29: Antibiotic prophylaxis in primary hemiprosthesis operations

	Yes		No		Missing		Total
2021	3 626	(99,8%)	2	(0,1%)	5	(0,1%)	**3 633**
2020	3 395	(99,4%)	1	(0,0%)	20	(0,6%)	**3 416**
2019	3 415	(99,6%)	1	(0,0%)	14	(0,4%)	**3 430**
2018	3 400	(99,4%)	4	(0,1%)	15	(0,4%)	**3 419**
2017	3 321	(99,5%)	2	(0,1%)	14	(0,4%)	**3 337**
2016	3 431	(99,5%)	3	(0,1%)	15	(0,4%)	**3 449**
2015	3 229	(99,8%)	2	(0,1%)	5	(0,2%)	**3 236**
2014	3 184	(99,8%)	0	(0,0%)	7	(0,2%)	**3 191**
2013	3 090	(99,6%)	4	(0,1%)	9	(0,3%)	**3 103**
2012	3 138	(99,7%)	7	(0,2%)	2	(0,1%)	**3 147**
2011	3 012	(99,6%)	4	(0,1%)	9	(0,3%)	**3 025**
2010	2 803	(99,7%)	4	(0,1%)	4	(0,1%)	**2 811**
2009	2 827	(99,6%)	8	(0,3%)	3	(0,1%)	**2 838**
2008	2 488	(99,1%)	13	(0,5%)	9	(0,4%)	**2 510**
2005-07	4 945	(99,4%)	18	(0,4%)	14	(0,3%)	**4 977**
Total	**49 304**	**(99,6%)**	**73**	**(0,1%)**	**145**	**(0,3%)**	**49 522**

Table 30: Antibiotic prophylaxis in primary hip compression screw operations

	Yes		No		Missing		Total
2021	957	(99,3%)	0	(0,0%)	7	(0,7%)	**964**
2020	1 015	(99,3%)	0	(0,0%)	7	(0,7%)	**1 022**
2019	1 187	(99,6%)	0	(0,0%)	5	(0,4%)	**1 192**
2018	1 423	(99,0%)	2	(0,1%)	12	(0,8%)	**1 437**
2017	1 659	(99,6%)	2	(0,1%)	4	(0,2%)	**1 665**
2016	1 896	(99,5%)	1	(0,1%)	9	(0,5%)	**1 906**
2015	2 155	(99,6%)	3	(0,1%)	5	(0,2%)	**2 163**
2014	2 227	(99,4%)	7	(0,3%)	6	(0,3%)	**2 240**
2013	2 238	(99,7%)	4	(0,2%)	3	(0,1%)	**2 245**
2012	2 461	(99,2%)	14	(0,6%)	5	(0,2%)	**2 480**
2011	2 529	(98,4%)	28	(1,1%)	13	(0,5%)	**2 570**
2010	2 583	(98,1%)	37	(1,4%)	12	(0,5%)	**2 632**
2009	2 490	(97,5%)	53	(2,1%)	10	(0,4%)	**2 553**
2008	2 376	(96,0%)	82	(3,3%)	16	(0,6%)	**2 474**
2005-07	6 525	(93,3%)	420	(6,0%)	47	(0,7%)	**6 992**
Total	**33 721**	**(97,6%)**	**653**	**(1,9%)**	**161**	**(0,5%)**	**34 535**

Table 31: Antibiotic prophylaxis in primary Intramedullary nail operations

	Yes		No		Missing		Total
2021	2 205	(99,7%)	0	(0,0%)	7	(0,3%)	**2 212**
2020	1 956	(99,4%)	1	(0,1%)	11	(0,6%)	**1 968**
2019	1 873	(99,2%)	3	(0,2%)	13	(0,7%)	**1 889**
2018	1 846	(99,2%)	1	(0,1%)	13	(0,7%)	**1 860**
2017	1 667	(99,6%)	2	(0,1%)	4	(0,2%)	**1 673**
2016	1 458	(99,5%)	1	(0,1%)	7	(0,5%)	**1 466**
2015	1 280	(99,2%)	6	(0,5%)	4	(0,3%)	**1 290**
2014	1 160	(98,6%)	5	(0,4%)	12	(1,0%)	**1 177**
2013	1 182	(98,3%)	15	(1,2%)	5	(0,4%)	**1 202**
2012	935	(94,1%)	53	(5,3%)	6	(0,6%)	**994**
2011	864	(89,5%)	96	(9,9%)	5	(0,5%)	**965**
2010	796	(91,3%)	68	(7,8%)	8	(0,9%)	**872**
2009	712	(91,9%)	58	(7,5%)	5	(0,6%)	**775**
2008	914	(89,1%)	105	(10,2%)	7	(0,7%)	**1 026**
2005-07	1 206	(87,9%)	158	(11,5%)	8	(0,6%)	**1 372**
Total	**20 054**	**(96,7%)**	**572**	**(2,8%)**	**115**	**(0,6%)**	**20 741**

Table 32: Antibiotic prophylaxis in reoperation

	Yes		No		Missing		Total
2021	646	(85,3%)	98	(12,9%)	11	(1,5%)	**757**
2020	637	(87,1%)	85	(11,6%)	9	(1,2%)	**731**
2019	798	(86,9%)	110	(12,0%)	10	(1,1%)	**918**
2018	797	(84,8%)	127	(13,5%)	16	(1,7%)	**940**
2017	771	(85,6%)	121	(13,4%)	9	(1,0%)	**901**
2016	859	(87,0%)	115	(11,7%)	13	(1,3%)	**987**
2015	857	(91,3%)	65	(6,9%)	17	(1,8%)	**939**
2014	746	(94,1%)	45	(5,7%)	2	(0,3%)	**793**
2013	822	(91,4%)	67	(7,5%)	10	(1,1%)	**899**
2012	814	(90,8%)	76	(8,5%)	6	(0,7%)	**896**
2011	816	(88,2%)	95	(10,3%)	14	(1,5%)	**925**
2010	739	(85,8%)	110	(12,8%)	12	(1,4%)	**861**
2009	801	(82,6%)	151	(15,6%)	18	(1,9%)	**970**
2008	794	(84,3%)	131	(13,9%)	17	(1,8%)	**942**
2005	2 102	(84,4%)	355	(14,3%)	33	(1,3%)	**2 490**
Total	**12 999**	**(87,0%)**	**1 751**	**(11,7%)**	**197**	**(1,3%)**	**14 949**

Table 33: Type of antibiotics - primary operations

Antibiotics (generic name)	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Cefalotin (Keflin)	44 929	6 745	6 947	7 305	7 837	7 032	5 831	828	848	1 225	89 527
	83,6%	83,3%	85,8%	87,1%	92,0%	84,5%	69,5%	10,1%	11,0%	15,0%	70,2%
Cefazolin (Cephazolin)	3		1		2	748	2 073	6 388	6 264	6 471	21 950
	0,0%		0,0%		0,0%	9,0%	24,7%	78,2%	80,9%	79,2%	17,2%
Klindamycin (Dalacin, Clindamycin)	1 437	325	338	366	397	394	377	391	362	380	4 767
	2,7%	4,0%	4,2%	4,4%	4,7%	4,7%	4,5%	4,8%	4,7%	4,7%	3,7%
Kloksacillin (Ekvacillin)	1 651	511	532	510	80	15	9	445	181	13	3 947
	3,1%	6,3%	6,6%	6,1%	0,9%	0,2%	0,1%	5,4%	2,3%	0,2%	3,1%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	2 588	193	87	31	27	21	6	30	9	10	3 002
	4,8%	2,4%	1,1%	0,4%	0,3%	0,3%	0,1%	0,4%	0,1%	0,1%	2,4%
Dikloksacillin (Diclocil, Dicillin)	2 091	141	18	18	14	3	12	13	8	7	2 325
	3,9%	1,7%	0,2%	0,2%	0,2%	0,0%	0,1%	0,2%	0,1%	0,1%	1,8%
Other *	827	139	133	121	130	75	68	70	61	49	1 673
	1,5%	1,7%	1,6%	1,4%	1,5%	0,9%	0,8%	0,9%	0,8%	0,6%	1,3%
Missing information	195	41	38	34	28	30	12	3	10	13	404
	0,4%	0,5%	0,5%	0,4%	0,3%	0,4%	0,1%	0,0%	0,1%	0,2%	0,3%
Total	**53 721**	**8 095**	**8 094**	**8 385**	**8 515**	**8 318**	**8 388**	**8 168**	**7 743**	**8 168**	**127 595**

* Drugs used less than 1% of operations last year or less than 1% of total surgery

Pharmacological antithrombotic prophylaxis

Table 34: Primary operation

	Yes		No		Missing		Total
2021	7 859	(96,3%)	273	(2,9%)	29	(0,8%)	**8 165**
2020	7 489	(96,6%)	239	(2,7%)	25	(0,7%)	**7 754**
2019	7 939	(97,2%)	194	(2,0%)	36	(0,8%)	**8 169**
2018	8 210	(97,4%)	190	(2,0%)	28	(0,6%)	**8 428**
2017	8 149	(97,6%)	182	(1,9%)	21	(0,5%)	**8 352**
2016	8 281	(97,4%)	186	(1,9%)	35	(0,7%)	**8 503**
2015	8 209	(97,6%)	168	(1,8%)	33	(0,6%)	**8 410**
2014	7 966	(97,3%)	191	(1,9%)	26	(0,7%)	**8 183**
2013	8 163	(98,2%)	139	(1,3%)	8	(0,4%)	**8 310**
2012	8 310	(98,5%)	125	(1,1%)	2	(0,4%)	**8 437**
2011	8 491	(98,7%)	92	(1,0%)	21	(0,3%)	**8 604**
2010	8 237	(98,5%)	94	(1,1%)	32	(0,4%)	**8 363**
2009	8 150	(98,7%)	78	(0,9%)	30	(0,4%)	**8 258**
2008	8 218	(98,3%)	112	(1,3%)	32	(0,4%)	**8 362**
2005-07	20 719	(97,4%)	449	(2,1%)	100	(0,5%)	**21 268**
Total	**134 390**	**(97,7%)**	**2 712**	**(2,0%)**	**458**	**(0,3%)**	**137 566**

Table 35: Number of drugs in antithrombotic prophylaxis

	One drug		Two drugs		Total
2021	7 569	(96,3%)	295	(3,8%)	**7 859**
2020	7 282	(97,2%)	206	(2,8%)	**7 489**
2019	7 714	(97,2%)	225	(2,8%)	**7 939**
2018	8 026	(97,8%)	184	(2,2%)	**8 210**
2017	7 965	(97,7%)	184	(2,3%)	**8 149**
2016	8 098	(97,8%)	183	(2,2%)	**8 281**
2015	7 962	(97,0%)	247	(3,0%)	**8 209**
2014	7 749	(97,3%)	217	(2,7%)	**7 966**
2013	7 903	(96,8%)	260	(3,2%)	**8 163**
2012	8 136	(97,9%)	174	(2,1%)	**8 310**
2011	8 405	(99,0%)	86	(1,0%)	**8 491**
2010	8 203	(99,6%)	34	(0,4%)	**8 237**
2009	8 132	(99,8%)	18	(0,2%)	**8 150**
2008	8 202	(99,8%)	16	(0,2%)	**8 218**
2005-07	20 664	(99,7%)	51	(0,2%)	**20 719**
Total	**132 010**	**(98,2%)**	**2 380**	**(1,8%)**	**134 390**

Table 36: Antithrombotic prophylaxis if one drug - primary operation (n=131 996)

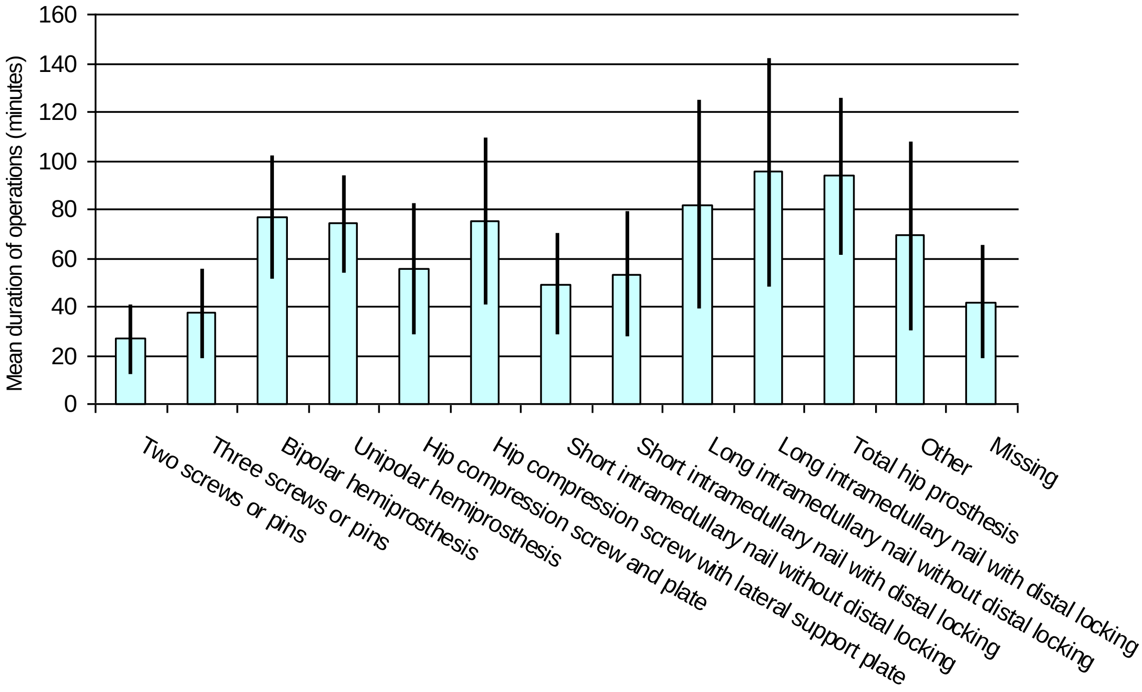
	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021
Dalteparin (Fragmin)	57,7%	53,4%	51,1%	59,8%	64,8%	70,5%	71,6%	59,3%	56,6%	57,4%
Enoksaparin (Klexane)	42,0%	45,7%	48,0%	39,1%	34,3%	28,2%	27,5%	39,7%	42,0%	41,2%
Other	0,1%	0,3%	0,4%	0,5%	0,4%	0,5%	0,5%	0,7%	1,0%	1,1%
Missing information	0,3%	0,7%	0,6%	0,6%	0,6%	0,7%	0,4%	0,3%	0,3%	0,4%
Totalt	**61 741**	**7 900**	**7 748**	**7 962**	**8 098**	**7 964**	**8 025**	**7 704**	**7 278**	**7 562**

Table 37: Time of first dose in antithrombotic prophylaxis - primary operation

	Preoperatively		Postoperatively		Missing		Total
2021	1 865	(23,8%)	5 035	(64,1%)	959	(12,2%)	**7 859**
2020	1 888	(25,2%)	4 735	(63,2%)	867	(11,5%)	**7 490**
2019	2 154	(27,1%)	4 954	(62,4%)	832	(10,4%)	**7 940**
2018	2 408	(29,3%)	4 937	(60,2%)	865	(10,5%)	**8 210**
2017	2 346	(28,9%)	4 847	(59,5%)	956	(11,7%)	**8 149**
2016	2 595	(31,4%)	4 761	(57,5%)	926	(11,2%)	**8 282**
2015	2 633	(32,1%)	4 697	(57,2%)	879	(10,7%)	**8 209**
2014	2 618	(32,9%)	4 477	(56,2%)	871	(11,0%)	**7 966**
2013	2 818	(34,5%)	4 353	(53,3%)	992	(12,1%)	**8 163**
2012	3 109	(37,4%)	4 133	(49,8%)	1 068	(12,9%)	**8 310**
2011	3 324	(39,2%)	4 060	(47,8%)	1 107	(9,8%)	**8 491**
2010	3 309	(40,2%)	3 584	(43,5%)	1 344	(10,5%)	**8 237**
2009	3 760	(46,2%)	3 046	(37,4%)	1 344	(12,1%)	**8 150**
2008	3 509	(42,7%)	2 973	(36,2%)	1 736	(16,3%)	**8 218**
2005-07	8 044	(39,0%)	5 070	(24,5%)	7 605	(20,9%)	**20 719**
Total	**46 380**	**(34,5%)**	**65 662**	**(48,9%)**	**22 351**	**(16,6%)**	**134 393**

DURATION OF SURGERY

Figure 13: Duration of surgery for the different types of operations



The vertical bars indicate the mean duration ± a standard deviation.

Table 38: Duration of surgery for the different types of operations

Type of operations	Total	Mean duration of operations (minutes)	Standard deviation
Two screws or pins	23 085	27	14
Three screws or pins	842	37	19
Bipolar hemiprosthesis	47 486	77	25
Unipolar hemiprosthesis	301	74	20
Hip compression screw and plate	23 727	56	27
Hip compression screw with lateral support plate	9 331	75	34
Short intramedullary nail without distal locking	377	49	21
Short intramedullary nail with distal locking	11 438	53	26
Long intramedullary nail without distal locking	141	82	43
Long intramedullary nail with distal locking	7 875	95	47
Total hip prosthesis	5 078	94	32
Other	2 327	69	39
Missing	6	42	23

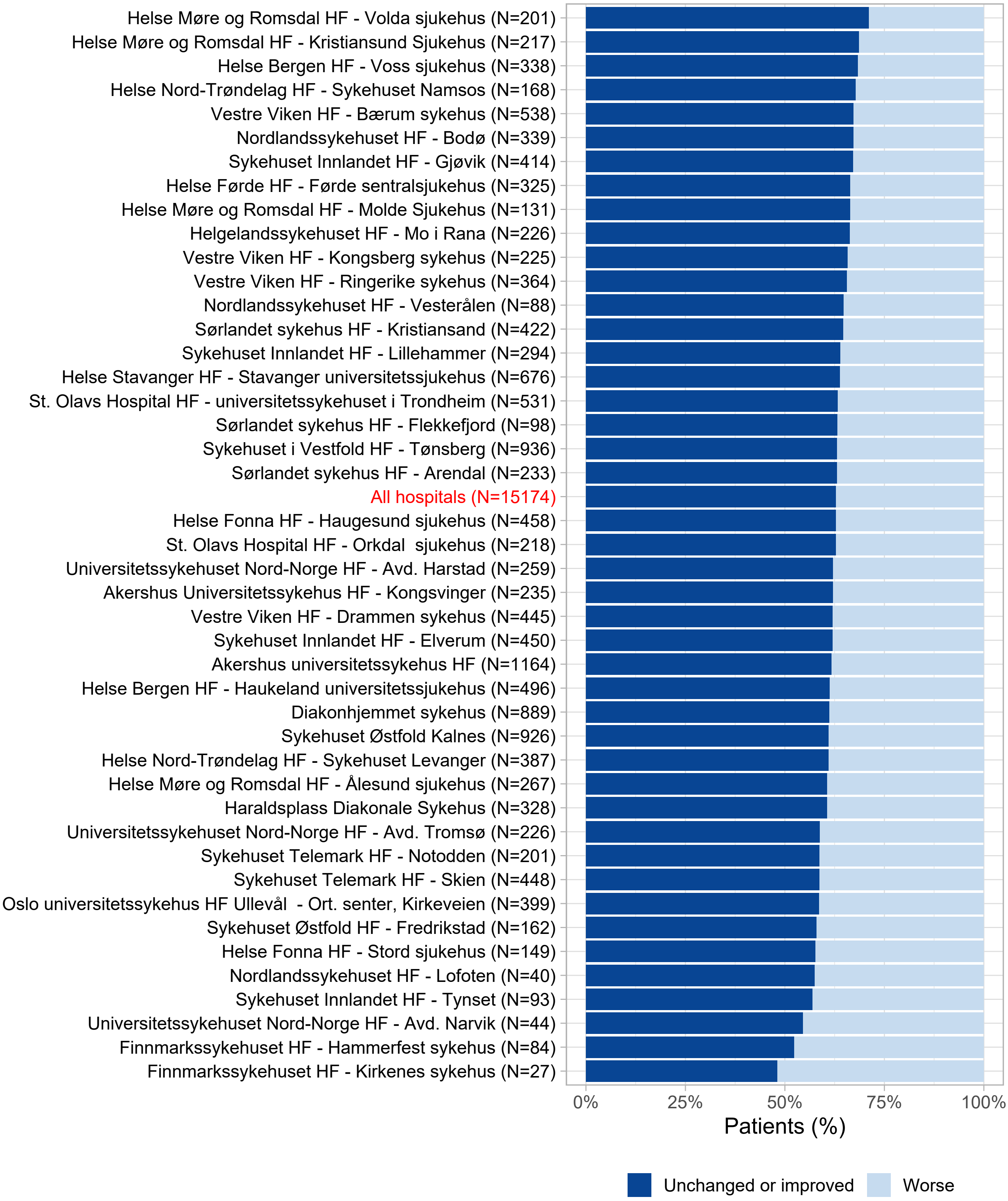
PROM (Patient Reported Outcome Measures)

Table 39: Number of issued and answered patient questionnaires

	4 months *			12 months *			36 months *			Total		
	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)
2021	6 550	3 587	(54,8%)	5 465	2 940	(53,8%)	4 258	2 140	(50,3%)	**16 273**	**8 667**	(53,3%)
2020	6 372	3 651	(57,3%)	5 433	3 079	(56,7%)	4 270	2 258	(52,9%)	**16 075**	**8 988**	(55,9%)
2019	6 748	3 731	(55,3%)	5 836	3 350	(57,4%)	4 241	2 224	(52,4%)	**16 825**	**9 305**	(55,3%)
2018	7 330	4 171	(56,9%)	5 996	3 438	(57,3%)	4 346	2 380	(54,8%)	**17 672**	**9 989**	(56,5%)
2017	7 009	4 060	(57,9%)	5 952	3 420	(57,5%)	4 091	2 255	(55,1%)	**17 052**	**9 735**	(57,1%)
2016	7 010	3 961	(56,5%)	6 077	3 520	(57,9%)	4 206	2 326	(55,3%)	**17 293**	**9 807**	(56,7%)
2015	6 918	3 979	(57,5%)	5 844	3 346	(57,3%)	4 384	2 393	(54,6%)	**17 146**	**9 718**	(56,7%)
2014	6 816	3 823	(56,1%)	6 003	3 272	(54,5%)	4 332	2 350	(54,2%)	**17 151**	**9 445**	(55,1%)
2013	6 901	3 954	(57,3%)	6 095	3 516	(57,7%)	4 442	2 439	(54,9%)	**17 438**	**9 909**	(56,8%)
2012	7 575	4 202	(55,5%)	6 784	3 816	(56,3%)	1 788	1 049	(58,7%)	**16 147**	**9 067**	(56,2%)
2011	6 456	3 554	(55,0%)	5 551	3 117	(56,2%)	1 410	816	(57,9%)	**13 417**	**7 487**	(55,8%)
2010	4 985	2 826	(56,7%)	2 263	1 308	(57,8%)	3 752	2 134	(56,9%)	**11 000**	**6 268**	(57,0%)
2009	2 552	1 482	(58,1%)	2 356	1 360	(57,7%)	4 095	2 207	(53,9%)	**9 003**	**5 049**	(56,1%)
2008	2 273	1 305	(57,4%)	1 902	1 084	(57,0%)	3 180	1 817	(57,1%)	**7 355**	**4 206**	(57,2%)
2007	3 503	1 967	(56,2%)	5 067	2 835	(56,0%)				**8 570**	**4 802**	(56,0%)
2006	6 160	3 607	(58,6%)	4 847	2 784	(57,4%)				**11 007**	**6 391**	(58,1%)
2005	2 817	1 640	(58,2%)							**2 817**	**1 640**	(58,2%)
Total	**97 975**	**55 500**	**(56,6%)**	**81 471**	**46 185**	**(56,7%)**	**52 795**	**28 788**	**(54,5%)**	**232 241**	**130 473**	**(56,2%)**

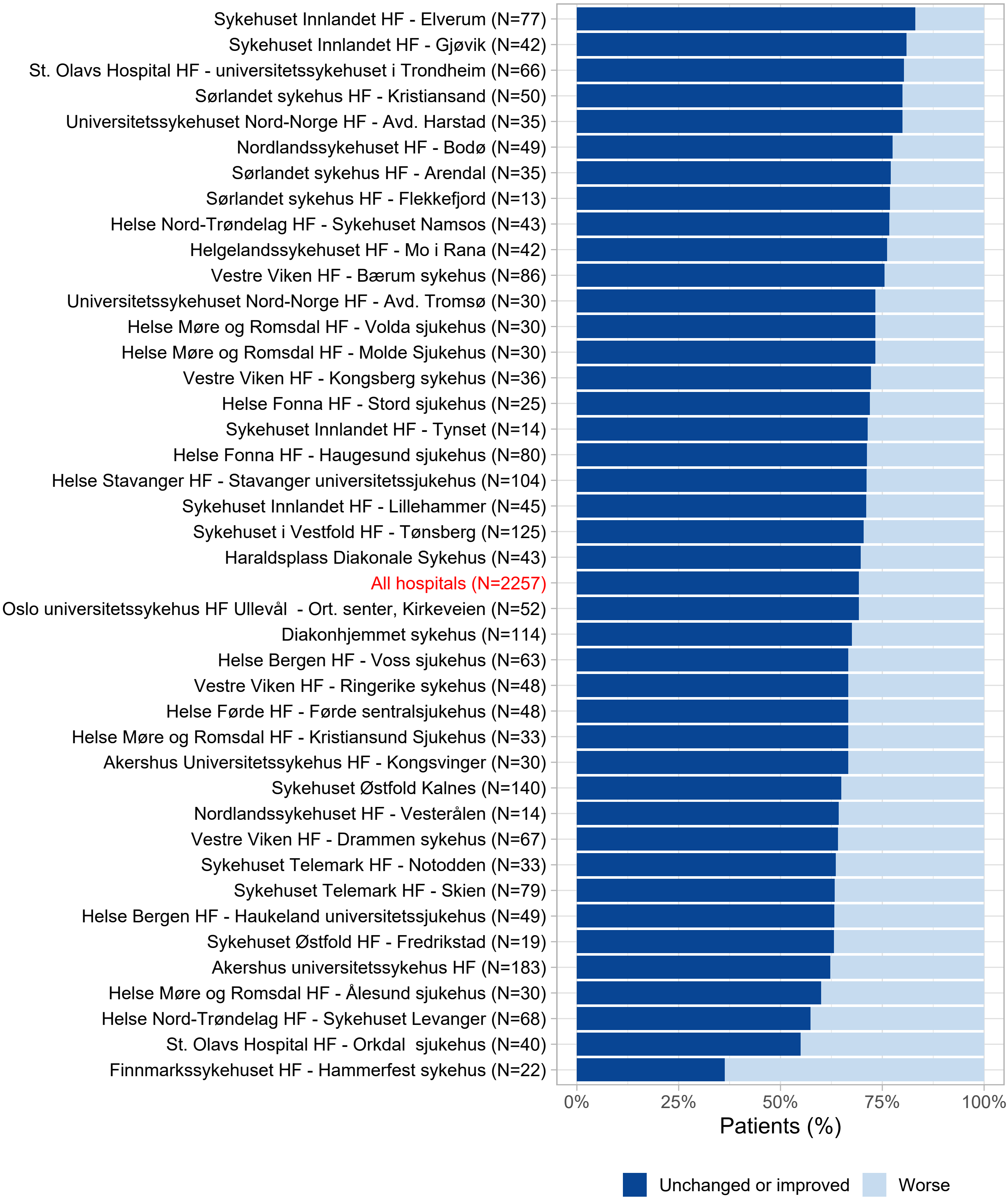
* The register sends questionnaires to patients 4, 12 and 36 months post-operatively

Figure D.31: Walking ability after hip fracture, 2015-2020 - all hip fractures



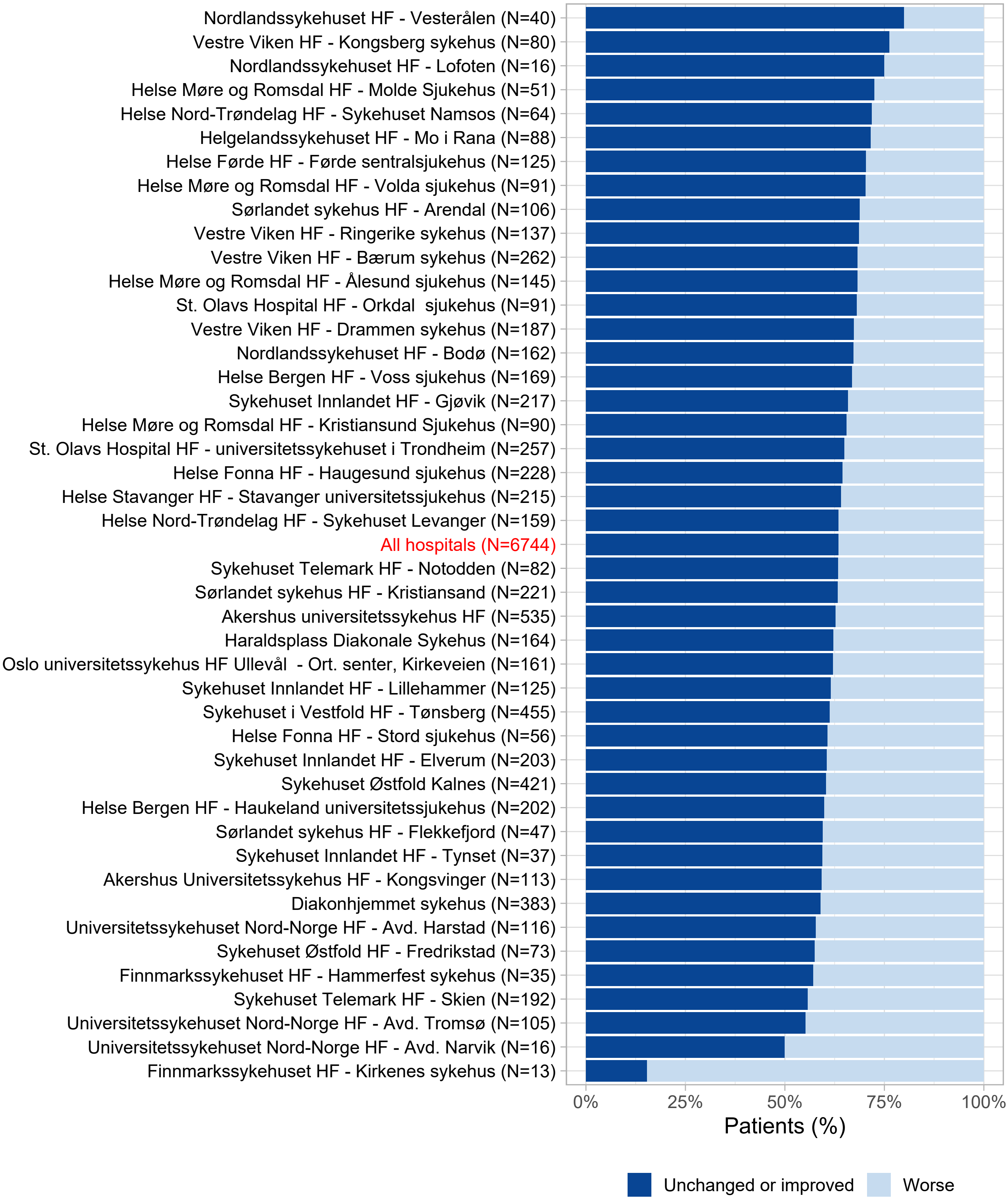
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.32: Walking ability after hip fracture, 2015-2020 - undisplaced femoral neck fractures



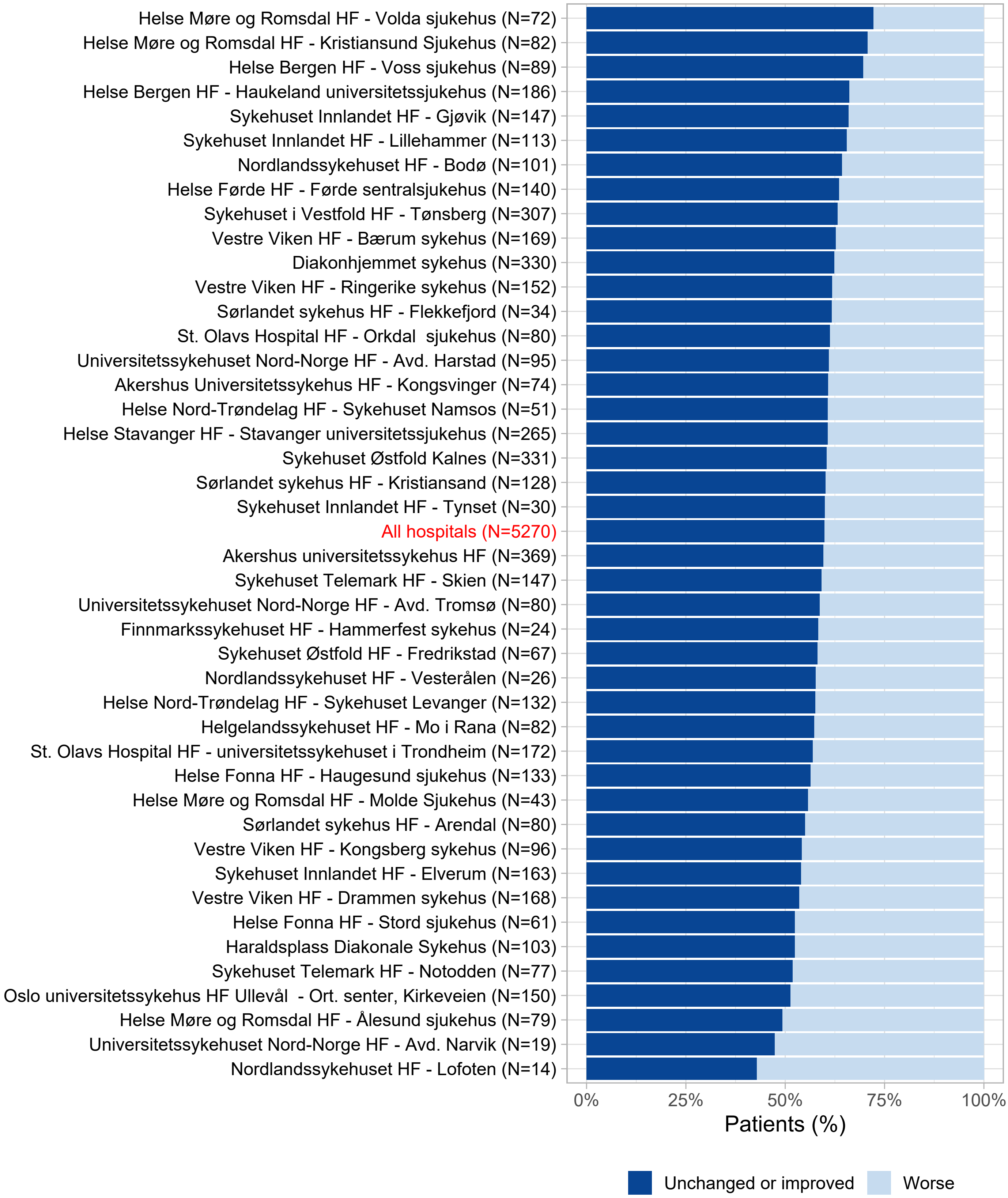
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.33: Walking ability after hip fracture, 2015-2020 - displaced femoral neck fractures



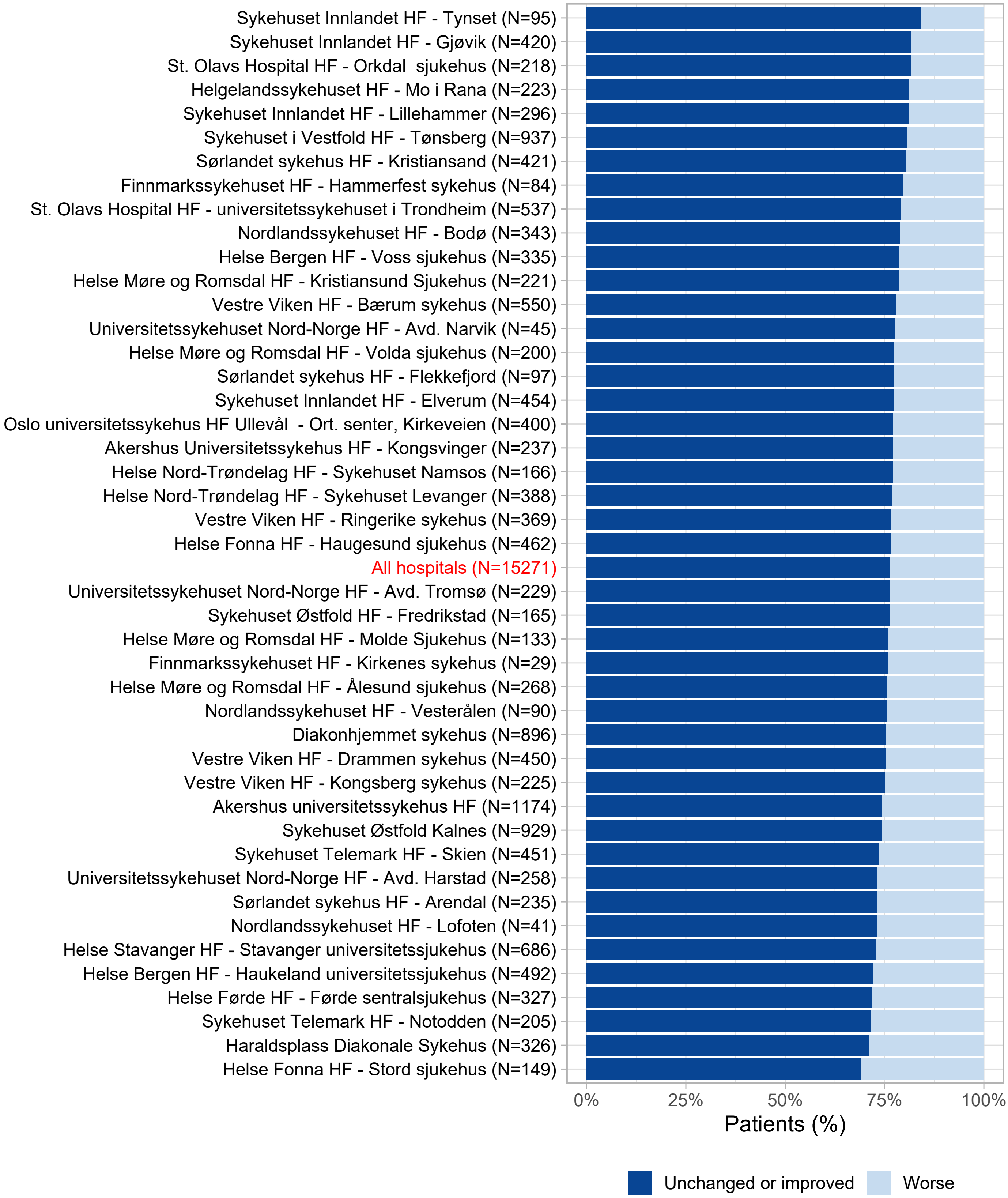
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.34: Walking ability after hip fracture, 2015-2020 - trochanteric/subtrochanteric fractures



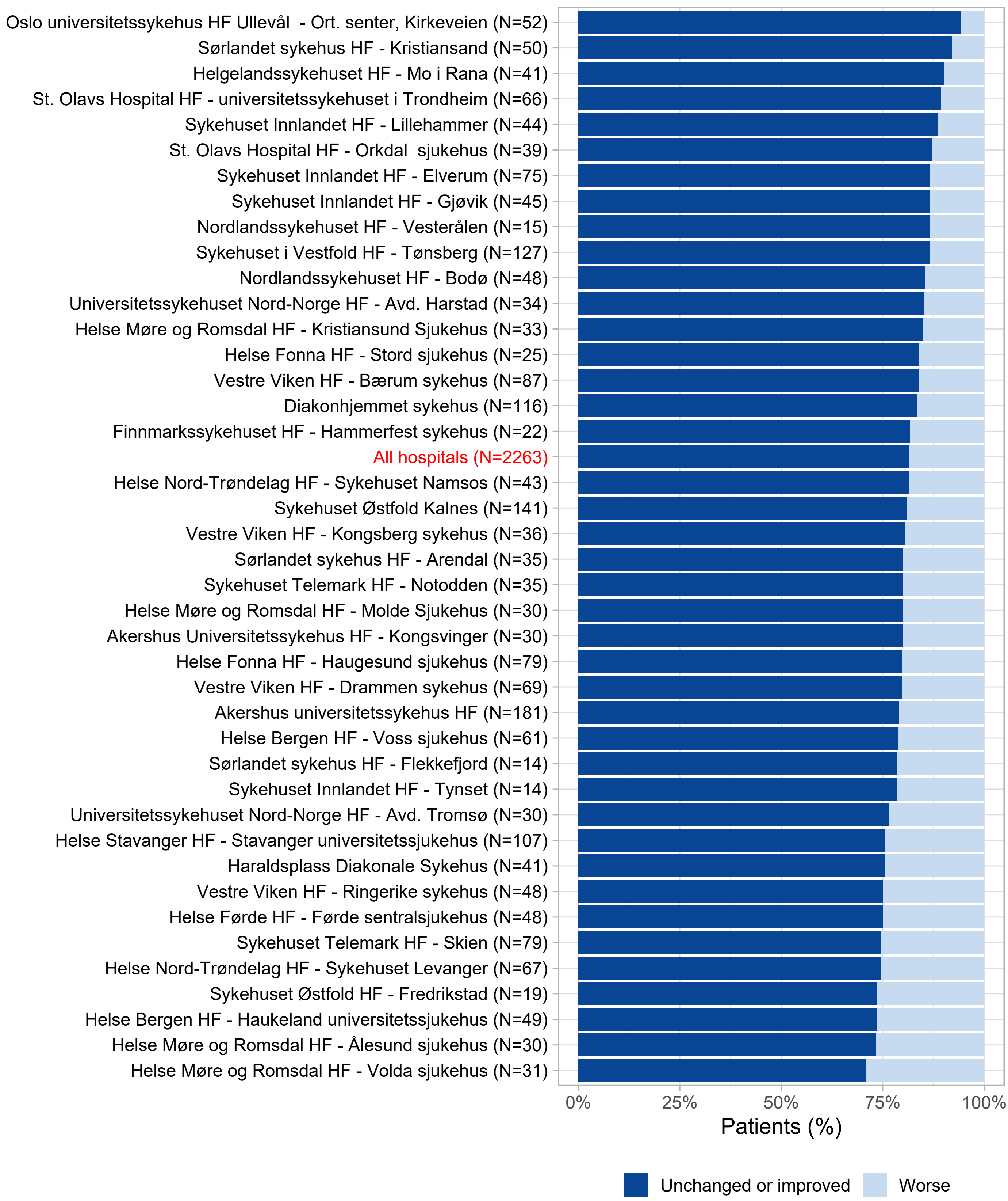
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.35: Self-care after hip fracture, 2015-2020 - all hip fractures



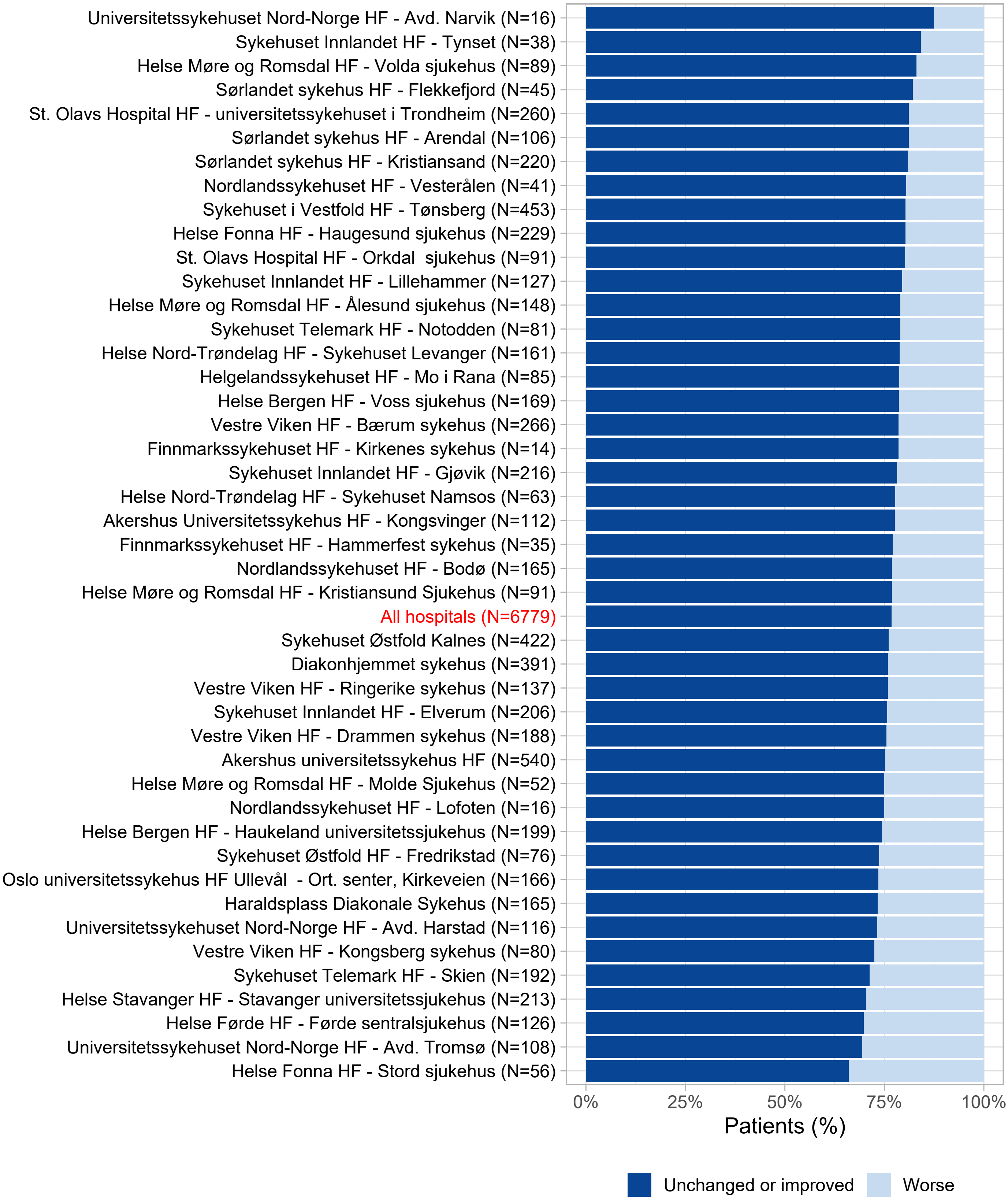
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.36: Self-care after hip fracture, 2015-2020 - undisplaced femoral neck fractures



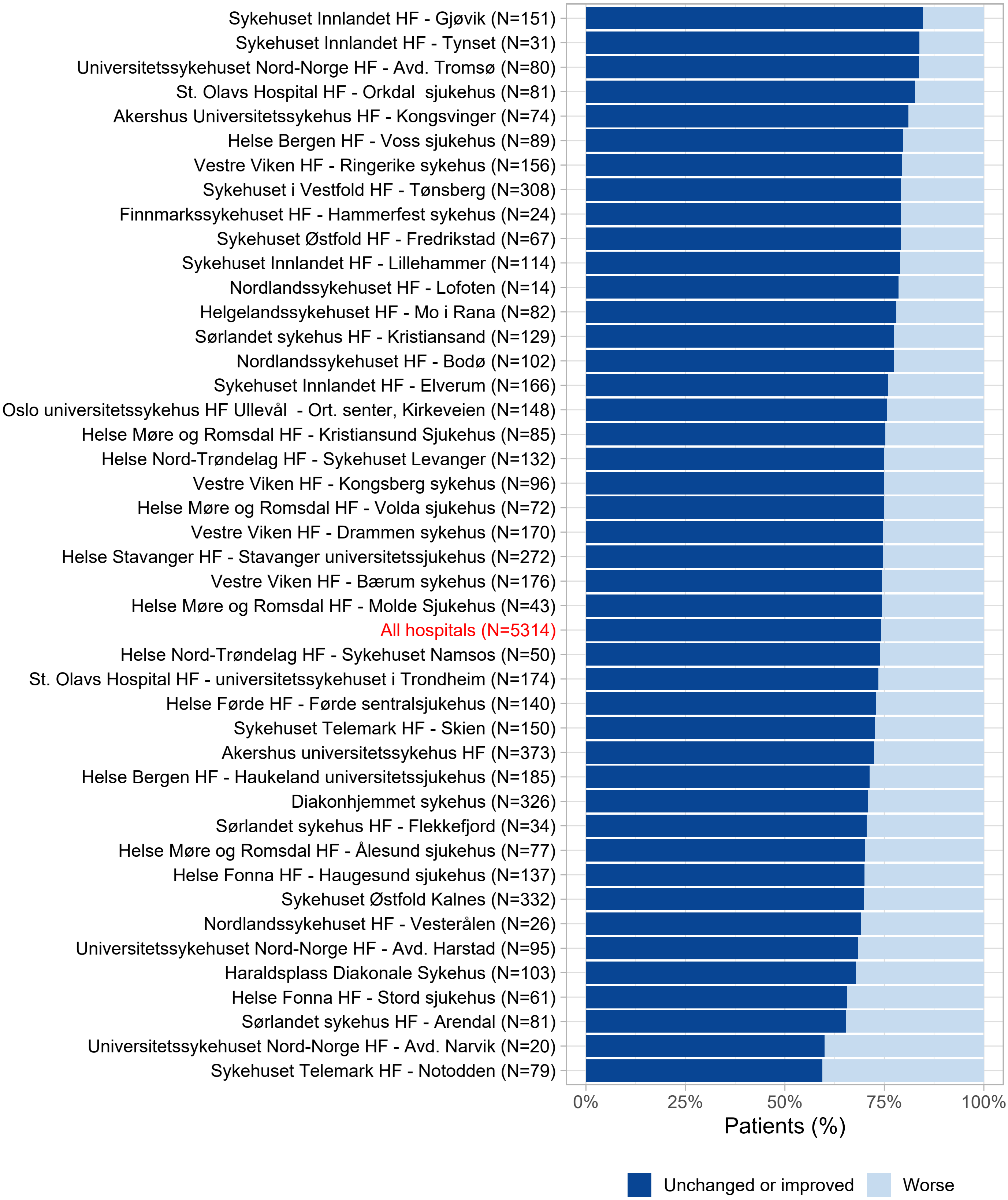
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.37: Self-care after hip fracture, 2015-2020 - displaced femoral neck fractures



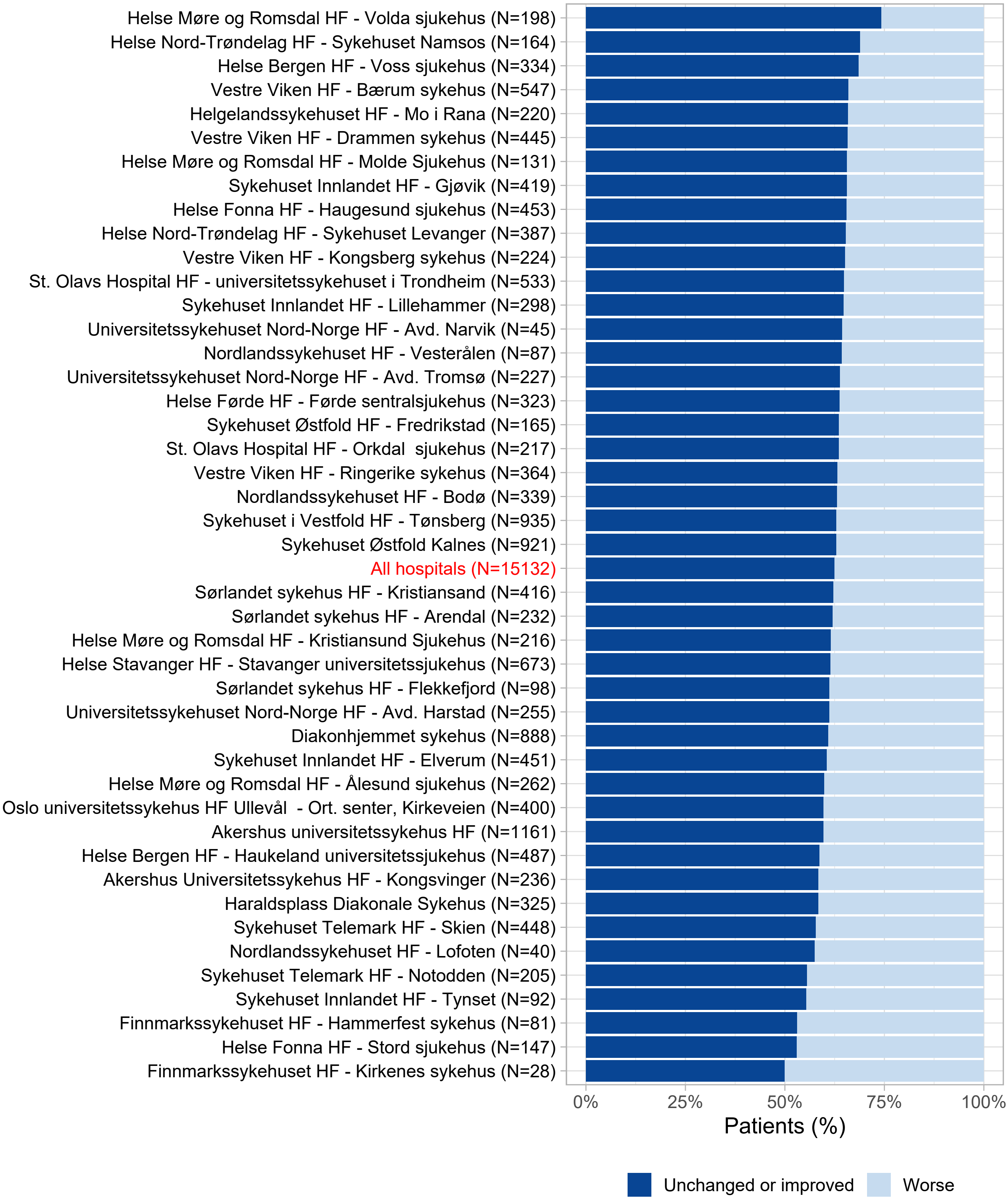
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.38: Self-care after hip fracture, 2015-2020 - trochanteric/subtrochanteric fractures



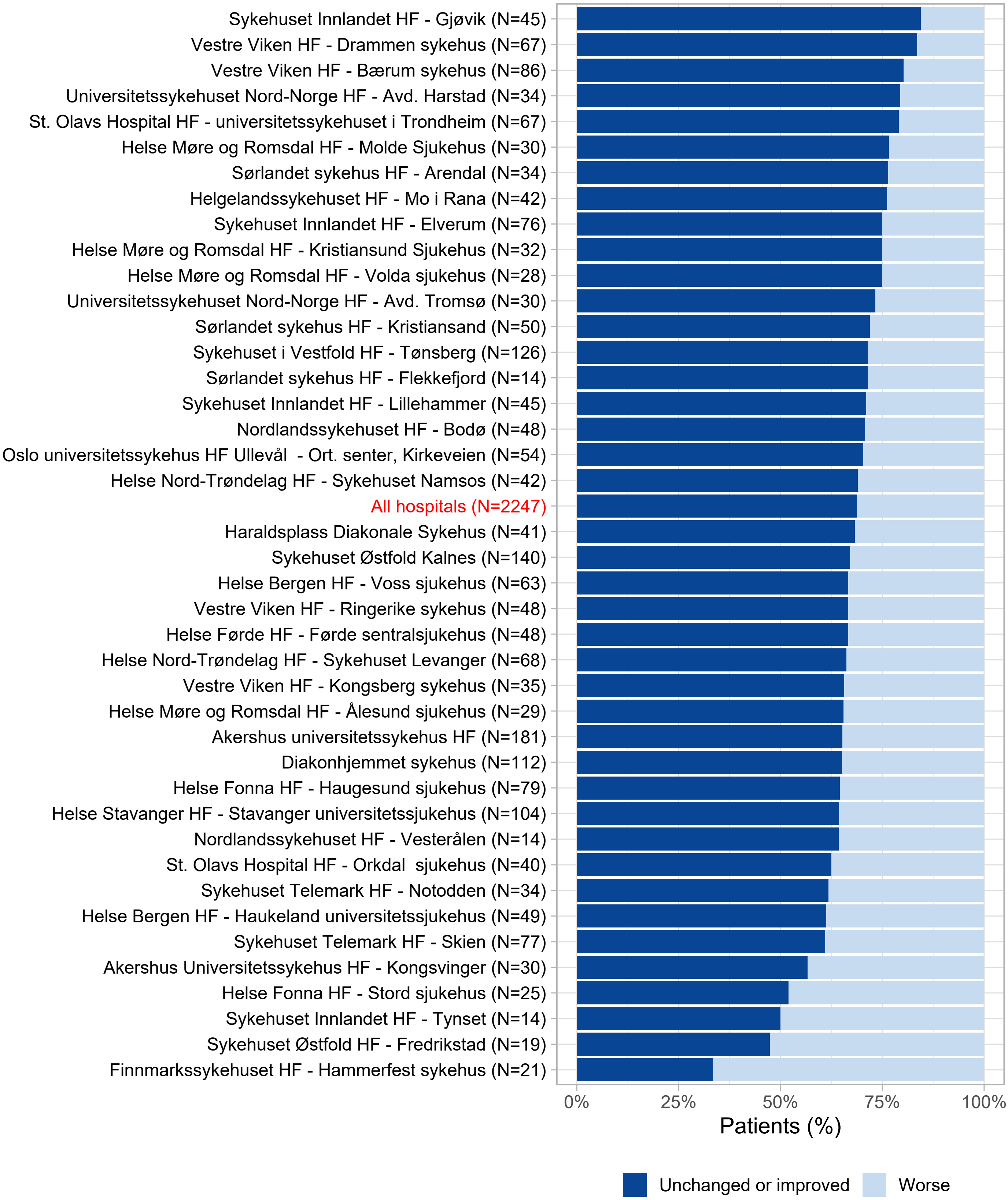
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.39: Usual activities after hip fracture, 2015-2020 - all hip fractures



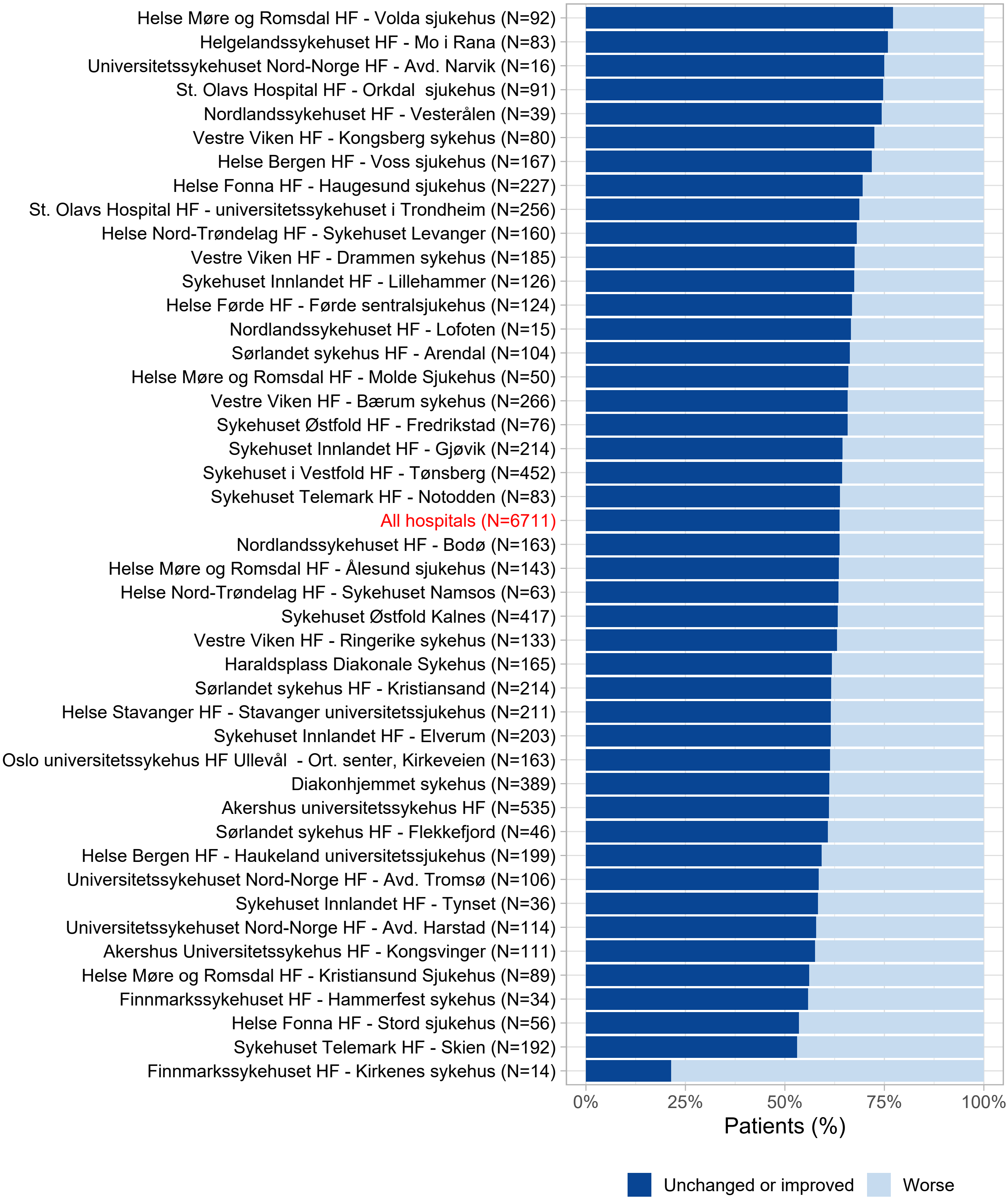
The figure shows the proportion of patients who report unchanged or improved ability to perform usual activities from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.40: Usual activities after hip fracture, 2015-2020 - undisplaced femoral neck fractures



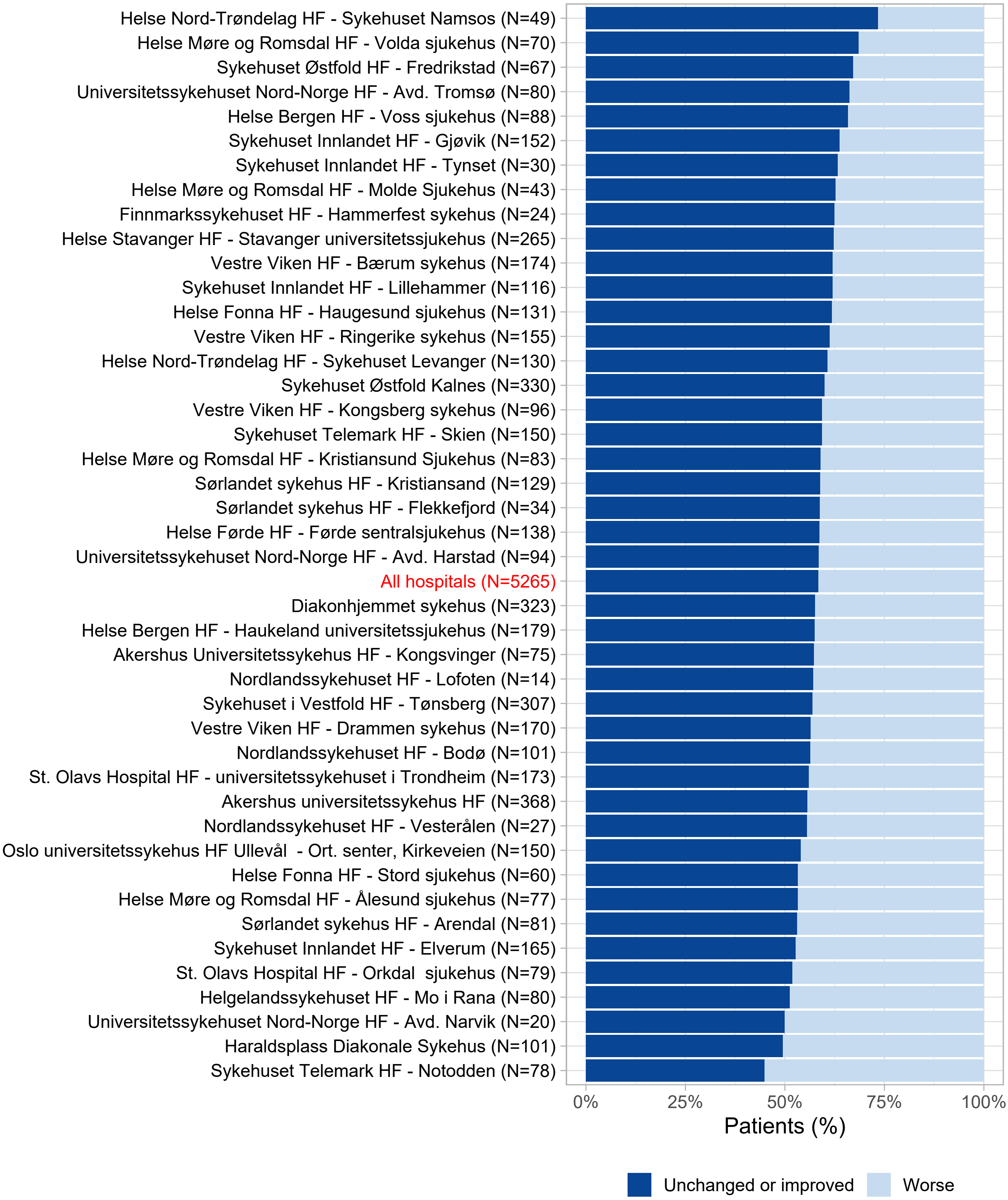
The figure shows the proportion of patients who report unchanged or improved ability to perform usual activities from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.41: Usual activities after hip fracture, 2015-2020 - displaced femoral neck fractures



The figure shows the proportion of patients who report unchanged or improved ability to perform usual activities from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.42: Usual activities after hip fracture, 2015-2020 - trochanteric/subtrochanteric fractures



The figure shows the proportion of patients who report unchanged or improved ability to perform usual activities from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Hospital data

The Norwegian Hip Fracture Register is required to publish hospital data. These data are presented in the annual report to SKDE which is available at www.kvalitetsregistre.no. Figures D.44 to D.48 present updated results for the different hospitals for operations performed in the period 2019-2021.

Figure D.43: Number of primary operations in 2021 at each hospital

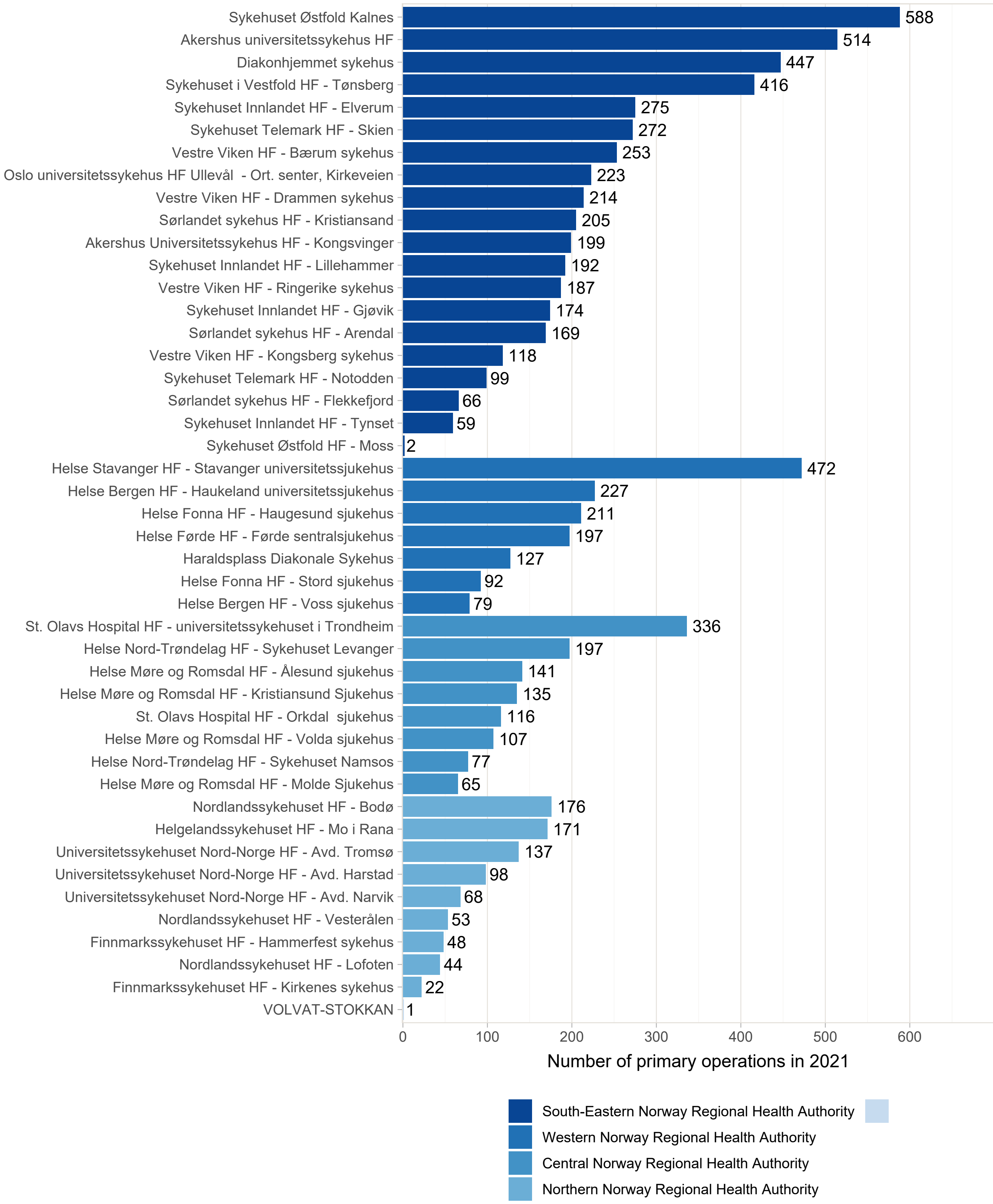


Figure D.44: Treatment of displaced femoral neck fractures in patients over 70 years of age

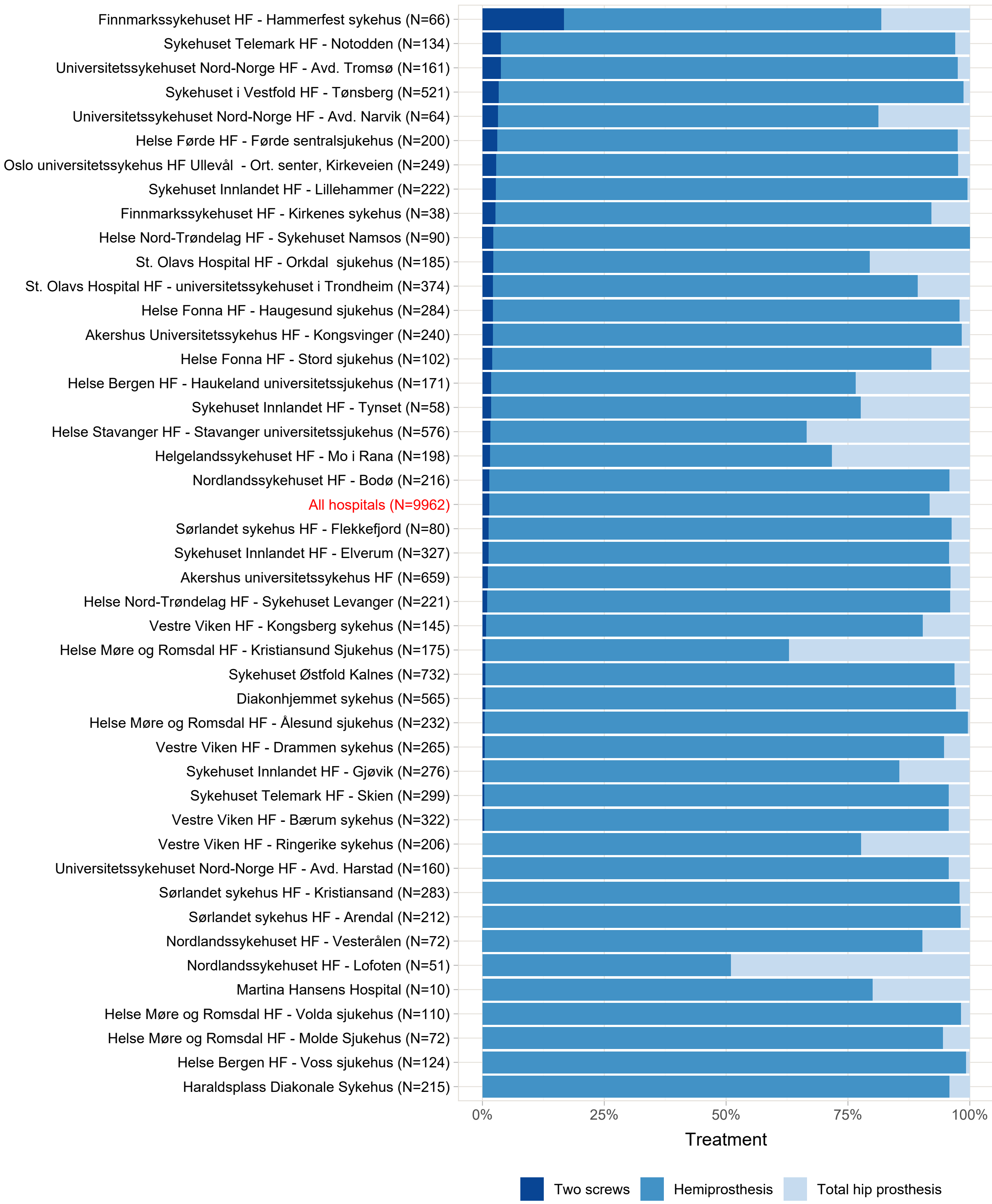


Figure D.44 shows the proportion of patients treated with screw osteosynthesis/hemi-prosthesis/total hip prosthesis at each hospital in the period 2019-2021. Hospitals with n<10 have been excluded.

Figure D.45: Fixation of hemiprosthesis in patients over 70 years of age

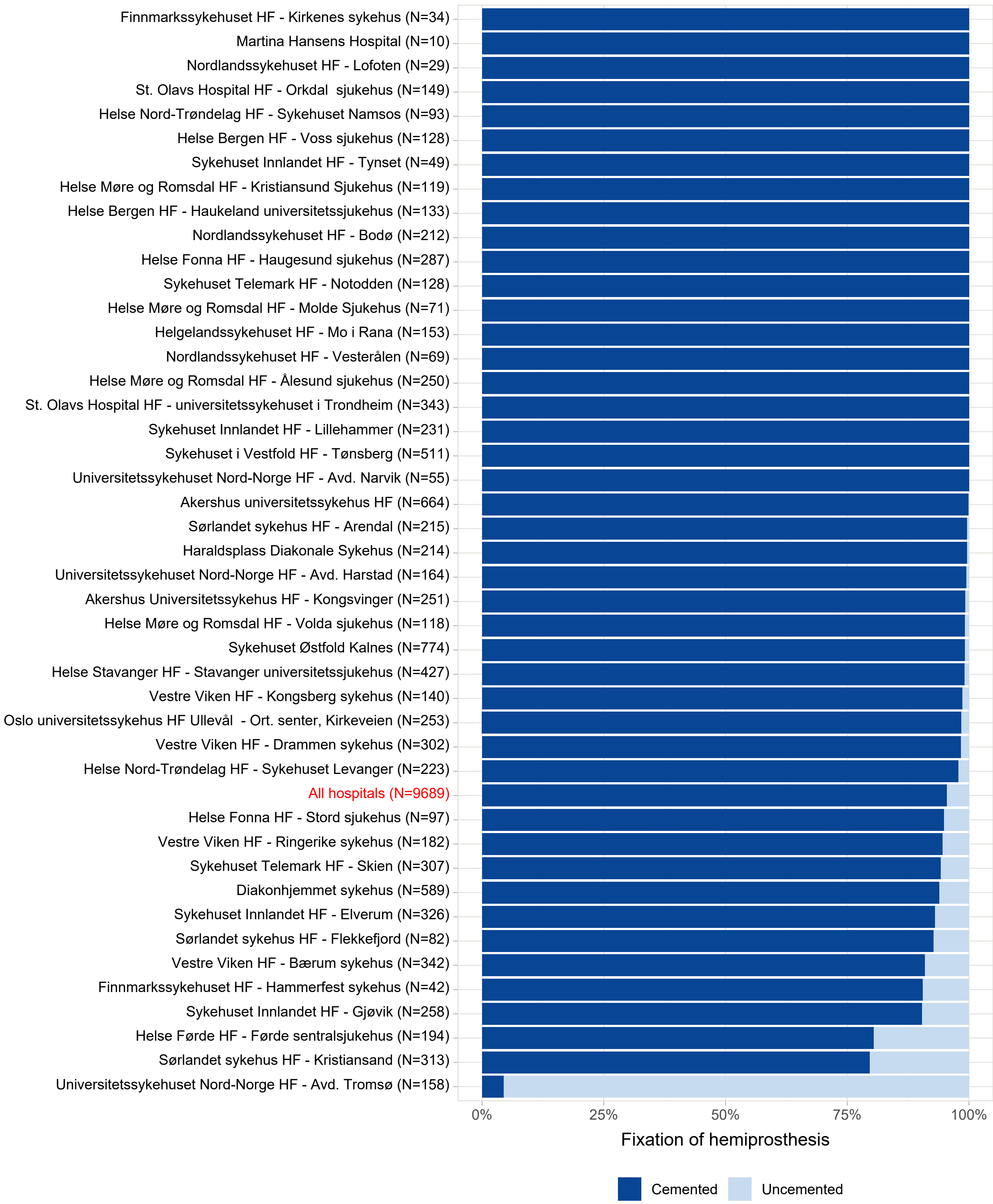


Figure D.45 shows the proportion of patients treated with cemented/uncemented hemiprosthesis, sorted by proportion of cemented hemiarthroplasties at each hospital in the period 2019-2021. Hospitals with n<10 have been excluded.

Figure D.46: Waiting time from fracture to surgery

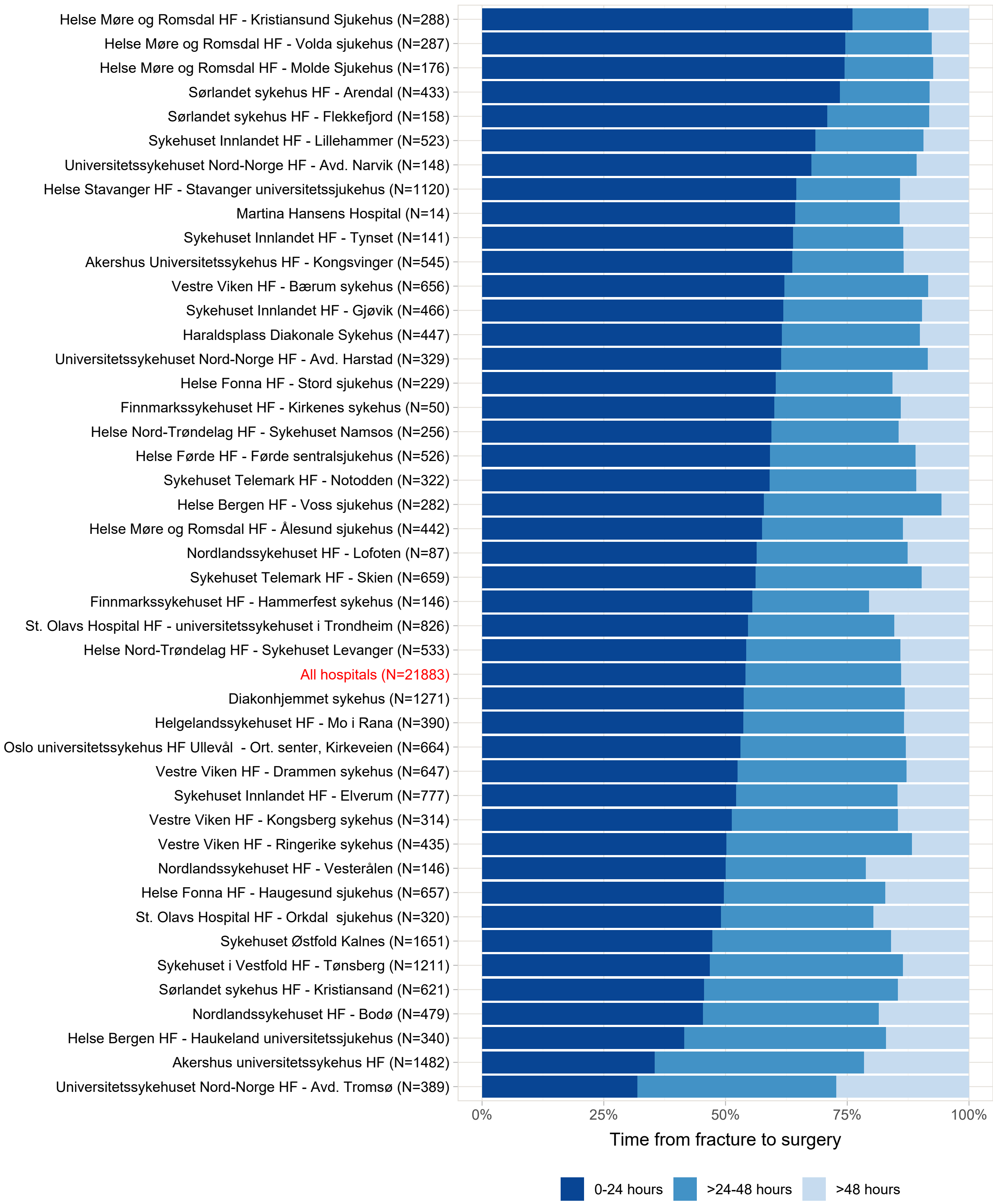


Figure D.46 shows waiting time, sorted by proportion of fractures treated within 24 hours after the fracture at the different hospitals in the period 2019-2021. Hospitals with n<10 have been excluded.

Figure D.47: Reoperations in the period 2019-2021. All hip fractures.

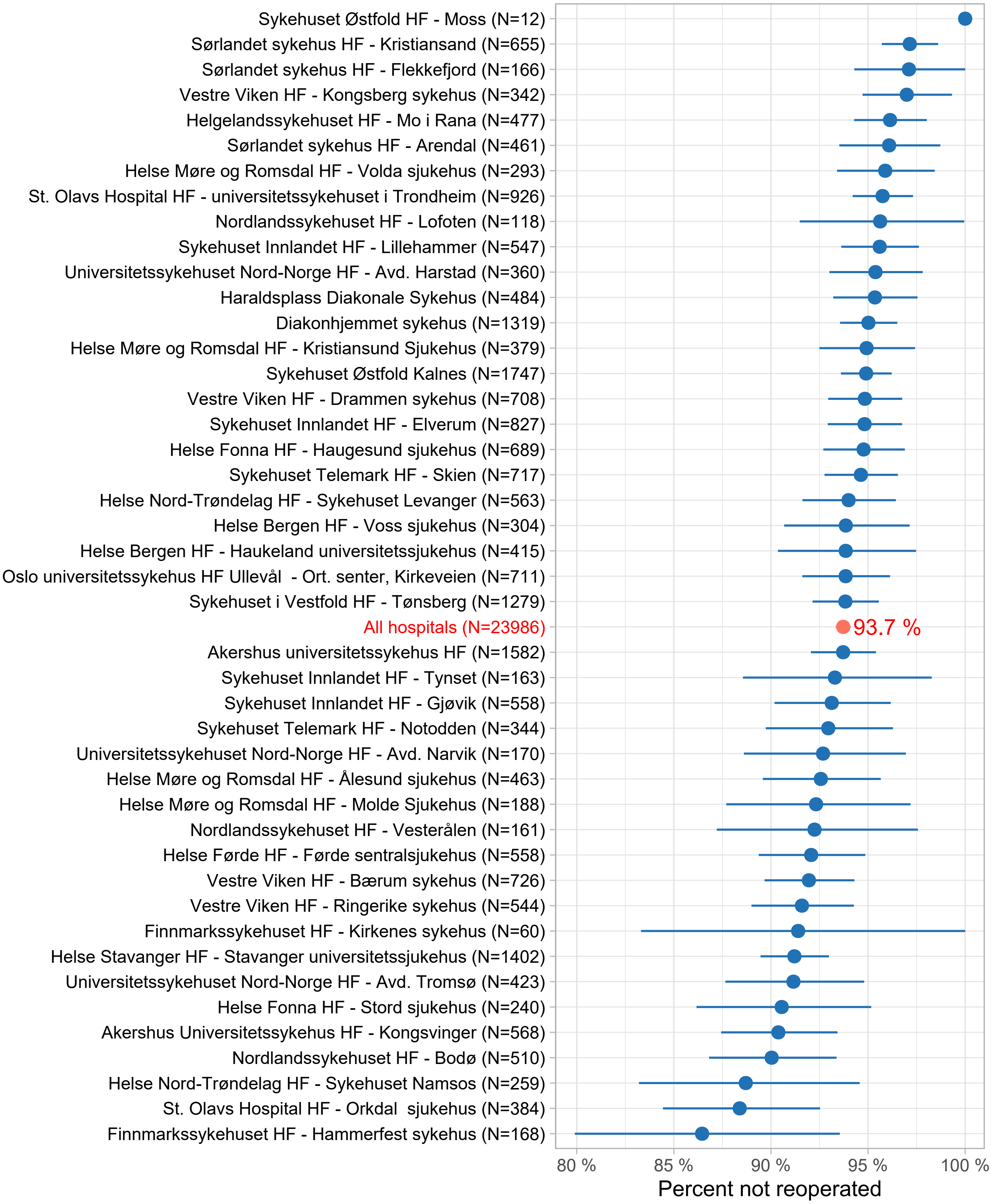


Figure D.47 shows proportion of patients not reoperated at each hospital. Hospitals with n<10 have been excluded.

Figure D.48: Reoperations in the period 2019-2021. Displaced femoral neck fractures in patients over 70 years of age, regardless of type of primary operation.

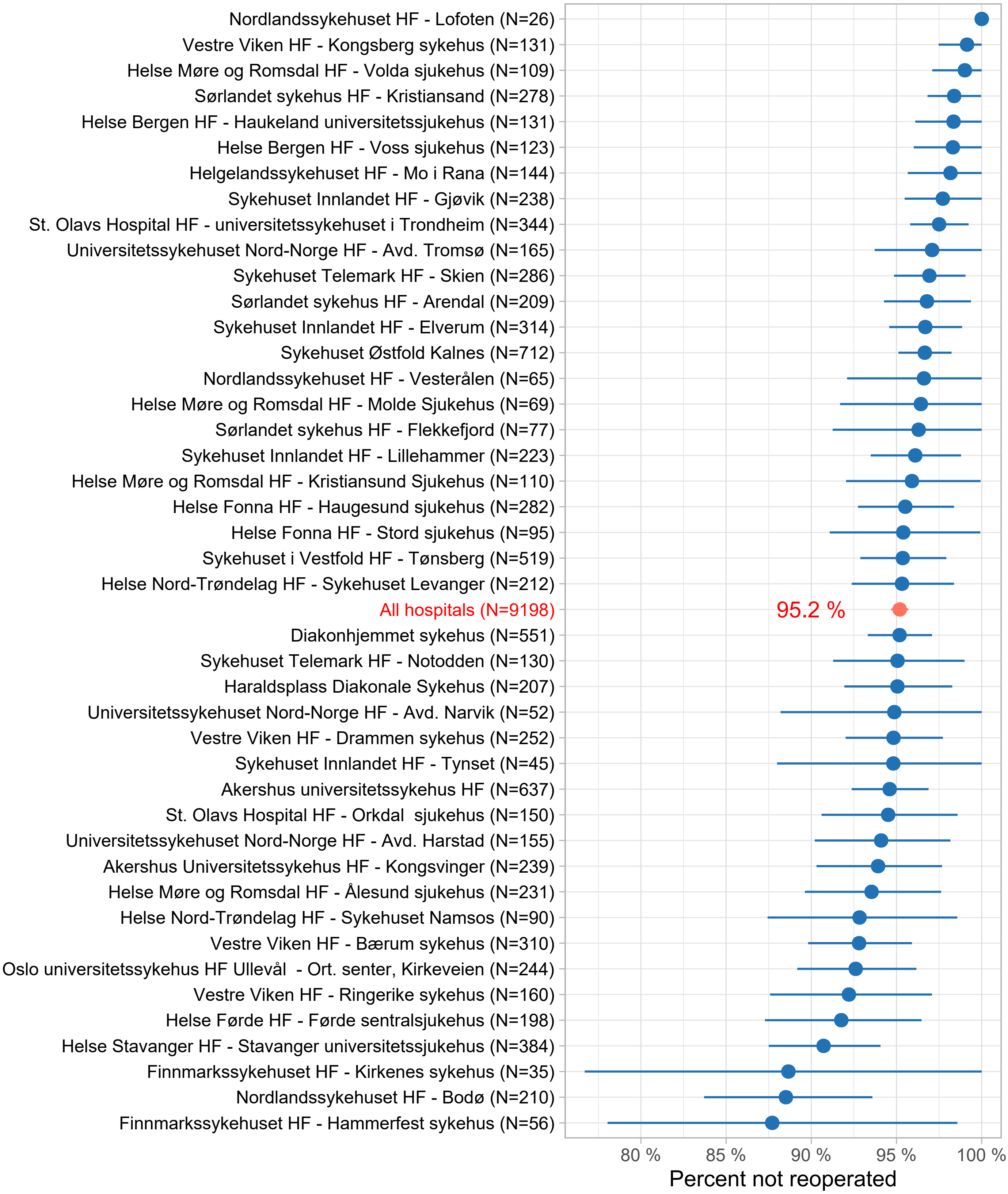


Figure D.48 shows proportion of patients not reoperated at each hospital. Hospitals with n<10 have been excluded.

Completeness analysis for the Norwegian Hip Fracture Register, 2019-2020

A completeness analysis has been conducted for the Norwegian Hip Fracture Register (NHFR) for primary operations (osteosynthesis, partial and total arthroplasty) and reoperations (following primary osteosynthesis, partial and total arthroplasty for hip fractures) performed in the period 2019-2020. A report and analysis have been prepared by the Norwegian Patient Register (NPR) in cooperation with the NHFR. A report on the implementation and results will be published at www.helsedirektoratet.no.

Formulae for completeness rates:

$$\text{Completeness rate NHFR} = \frac{\text{only NHFR} + \text{inclusion both registers}}{\text{only NPR} + \text{only NHFR} + \text{inclusion both registers}}$$

$$\text{Dekningsgrad NPR} = \frac{\text{only NPR} + \text{inclusion both registers}}{\text{only NPR} + \text{only NHFR} + \text{inclusion both registers}}$$

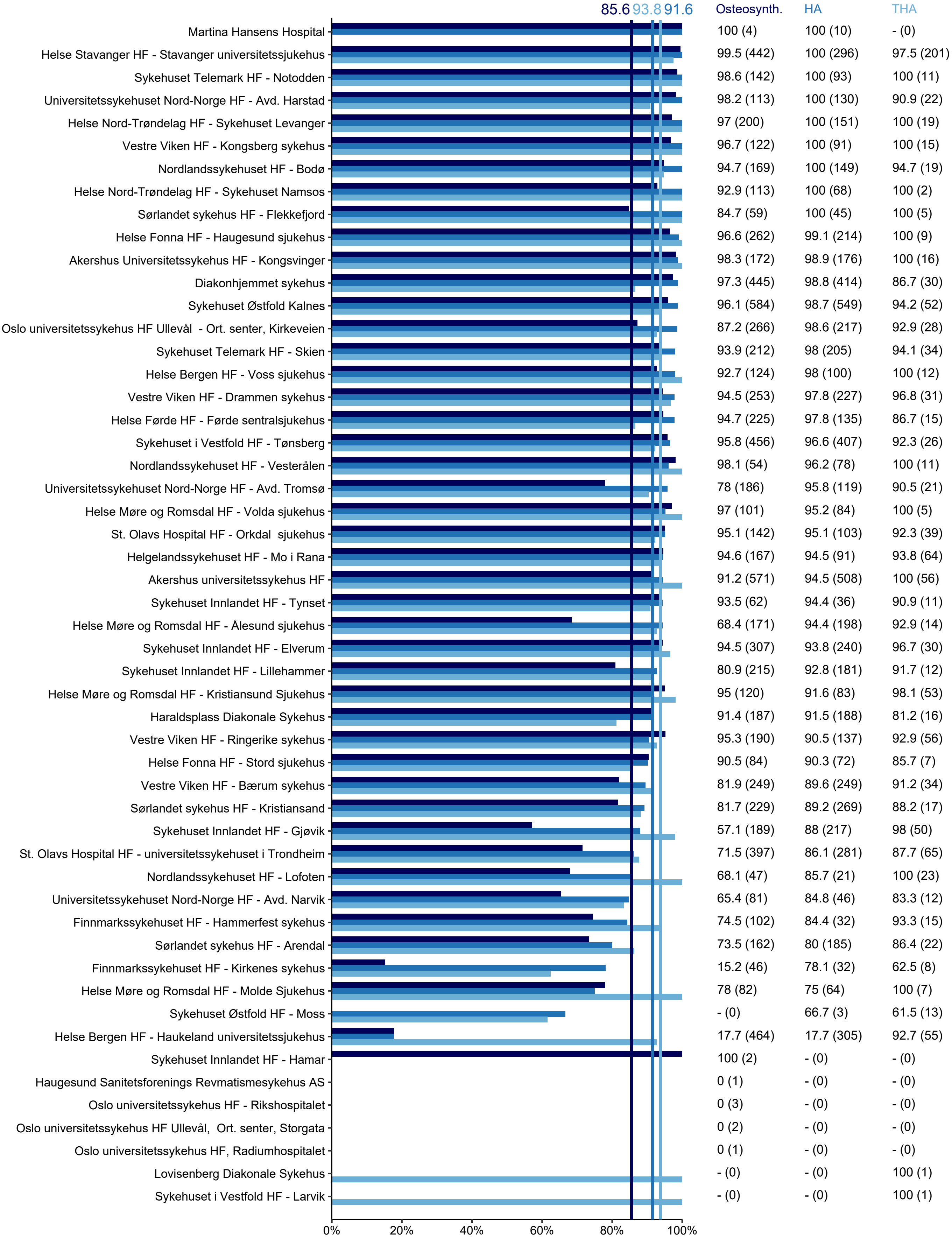
For details of the NSCP and ICD-10 codes used when extracting data from the NPR for comparison of primary operations and reoperations in the NHFR and for the complete results, please consult the Completeness Analysis Report, which will be published atwww.helsedirektoratet.no.

Primary hip fracture surgery. Information in the NHFR showed a high degree of agreement with the information in the NPR. Completeness for osteosynthesis was 86,00 %, for hemiarthroplasty 92,00 % and for total arthroplasty 94,00 %. However, there are considerable variations in completeness between hospitals. Many of the hospitals have completeness under 80 %, which we consider very low. One explanation for low completeness rates in NHFR may be patients not giving consent to registration of the data. The differences between rates for primary osteosynthesis, hemiarthroplasty and total arthroplasty show that this cannot be the only cause and that hospitals must improve their reporting of primary hip fracture surgery with the correct diagnostic and procedure codes. Completeness for primary total hip arthroplasty for fractures is lower than completeness for all total arthroplasties reported to the Norwegian Arthroplasty Register (NAR). We believe that part of the reason is coding practices and we are currently investigating this further.

Reoperations. The information in the NHFR did not agree with NPR data as well as for primary surgery. Completeness for reoperations after osteosynthesis was 72,00 %, after hemiarthroplasty 88,00 %, and after total arthroplasty 96,00 %. It has been particularly challenging to perform completeness analyses for reoperations. The fact that the NPR does not specify left or right side leads to some uncertainty in the analysis. Furthermore, coding of reoperations reported to the NPR is often imprecise or incorrect. Low completeness may mean that the reoperation form was not sent to the NHFR or that the surgery was incorrectly coded in the NPR. We would like to point out that all reoperations of partial and total arthroplasty due to infection (including those where prosthetic parts are not changed or removed) must be reported on a form to the NHFR or NRL. These must be given the codes NFS 19, NFS 49 or NFW 69.

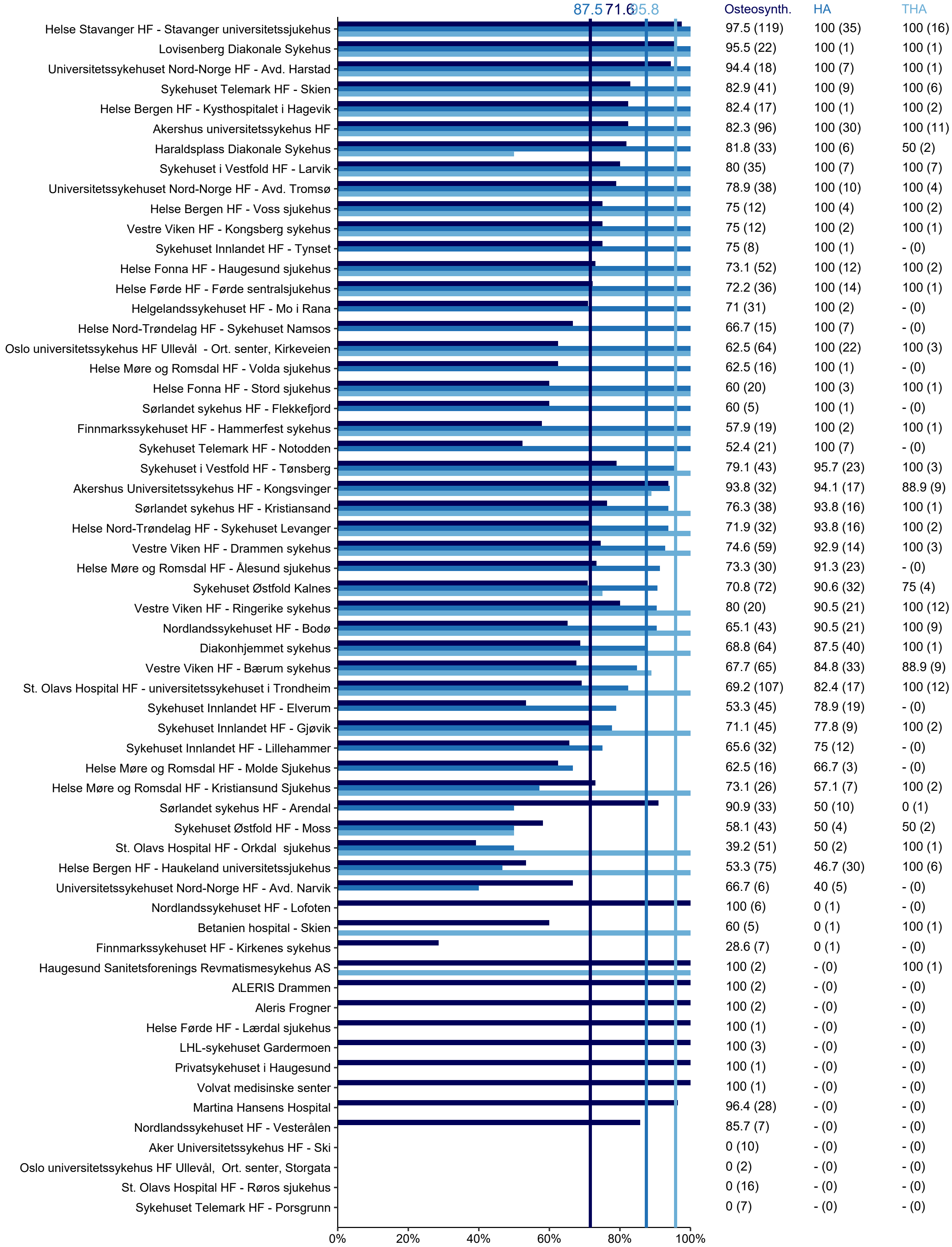
The following pages show the hospital-based completeness analysis for primary operations and reoperations. We urge hospitals with low completeness to review their coding practices and routines in reporting to the registers.

Completeness of reporting, primary operations of hip fractures 2019-2020



Dark blue bars and first number to the right of the bars gives completensess of reporting for osteosynthesis. Medium blue bars and second number to the right of the bars gives completensess of reporting for hemiprosthesis. Light blue bars and third number to the right of the bars gives completensess of reporting for total prosthesis. The numbers in paranthesis gives the number of operations registered at both NHFR and NPR. Vertical lines shows the national averages.

Completeness of reporting, reoperations of hip fractures 2019-2020



Dark blue bars and first number to the right of the bars gives completensess of reporting for osteosynthesis. Medium blue bars and second number to the right of the bars gives completensess of reporting for hemiprosthesis. Light blue bars and third number to the right of the bars gives completensess of reporting for total prosthesis. The numbers in paranthesis gives the number of operations registered at both NHFR and NPR. Vertical lines shows the national averages.

CONTENTS

Norwegian Knee Ligament Register

THE NORWEGIAN KNEE LIGAMENT REGISTER: ANNUAL REPORT 2022

The management and administration of the Norwegian Knee Ligament Register (NKLR) are proud to present this year's report from the register. Data from the NKLR are also presented in a report by SKDE (the Centre for Clinical Documentation and Evaluation) every autumn, where the aim is to simplify the terminology to make it easier to read for patients as well.

We are very pleased to note the enthusiasm for ACL surgery and all the research in this field.

We are proud to report that the RRCT with randomisation between early surgery and active rehabilitation is now well underway. The technology is working and our goal is for this study design to be used for other studies. Patients are included weekly and the RRCT is currently taking place in the following hospitals: Ullevål, St. Olav's, Haukeland, Akershus, Kristiansand and Bærum.

The Norwegian ACL community largely agrees with our work on "Best Clinical Practice for the Treatment of ACL Injuries" in recent years. However, it is still worth mentioning that about 50% of patients receive thrombosis prophylaxis in connection with ACL surgery; this is probably more closely related to hospital practice than individual risk assessments. The health authorities want national medical quality registers to take an active role in measuring the quality of treatment in Norway by agreeing on quality indicators. In the NKLR, we have so far used the revision rate after eight years and the use of antibiotic prophylaxis as our quality indicators. A new quality indicator this year is that elective patients should have undergone physiotherapy before surgery.

In 2021, only 1462 primary ACL surgeries and 168 revisions were recorded. The past two years have seen a decline of about 25%. It is unknown whether the figures reflect a long waiting list for surgery due to COVID-19, fewer injuries due to the lack of organised sports, or more non-operative treatment.

A new surgical trend is local treatment of grafts with antibiotics, which was administered 255 times in 2021. Lateral extra-articular tenodesis (LET) has been widely discussed internationally as an additional procedure during surgery to reduce the risk of rerupture of the ACL graft. In Norway, this was only used 60 times in 2021, but that is still twice as much as in the previous year.

Use of the patellar tendon graft is stable, and now comprises 73% of surgeries. Hamstring grafts are declining, while other types, including the quadriceps tendon graft, show a stable trend.

In primary ACL reconstructions with meniscus repair, it has in recent years become more common to suture the damaged meniscus (Figure 7). In 2011, just over 20% were sutured, but this has gradually increased to reach 62% in 2021. The numbers are increasing from year to year. The effects of this change have so far been difficult to measure, but it may result in a decrease in osteoarthritis in the long term. In the new electronic form, more details of root damage and ramp lesions of the meniscus can be recorded, this will be a natural area for future research.

It is obligatory to submit the ACL form to the Norwegian Knee Ligament Register. We have a member of staff responsible for helping hospitals with the changeover to electronic registration and providing instruction to surgeons and commercial actors, so please contact us if you need assistance.

The 2019 and 2020 coverage analyses show that 87.7% of surgeries were reported to the NKLR. This figure is stable and acceptable, but still well below the figure of 97% of the Arthroplasty Register. We conducted a data quality improvement project in 2020 that showed that there were no other sources of error than lack of reporting by surgeons. New NOMESCO codes for surgical procedures were introduced on 1 January 2021. The advantage of this is separate and more accurate codes for revisions. In the next coverage analysis, primary ACL surgery will therefore be distinguished from revision surgery.

The NKLR is intended to be of benefit to surgeons. We hope that surgeons will see the benefits of electronic registration; variables that the patient can enter, such as height, weight, use of tobacco or snuff, date of injury and activity at the time of injury are now imported into the surgery form. Each hospital will receive its own figures, and we will be happy to answer any questions you may have. In 2021, the members of the Steering Committee were Jon Olav Drogset, Lars Engebretsen, Stig Heir, Mette Andersen, Ove Furnes, Jonas Meling Fevang and patient representative Jostein Bildøy.

Research is important and 2021 was another good year. We have produced several articles related to artificial intelligence and machine learning. At our autumn meeting in 2021, a patient calculation tool was presented that makes it possible to calculate the average risk of revision and patient satisfaction. We are also pleased to report the publication of an article by Midttun et al. that revealed good quality of the data in our register.

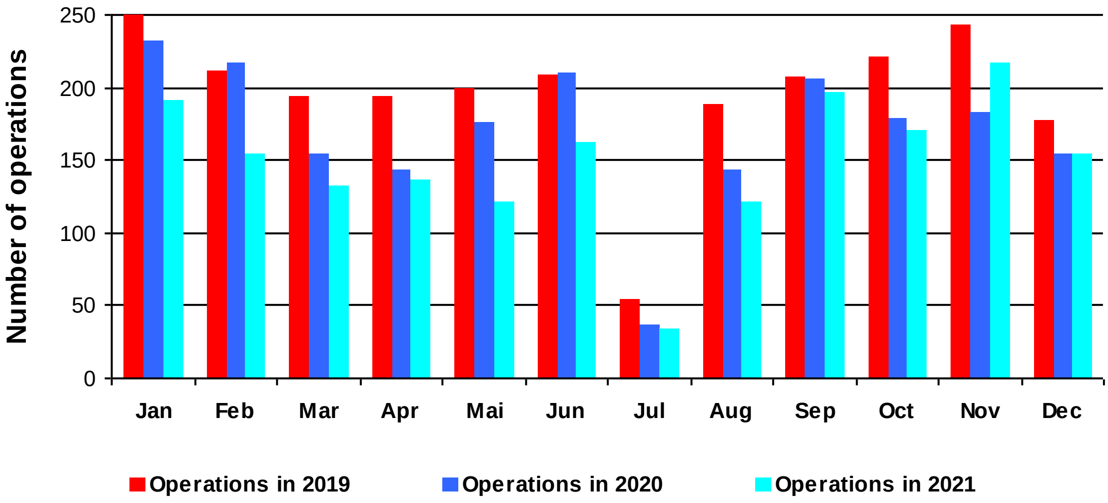
- Midttun E, Andersen MT, Engebretsen L, Visnes H, Fenstad AM, Gjertsen JE, Persson A. Good validity in the Norwegian knee ligament register: assessment of data quality for key variables in primary and revision cruciate ligament reconstructions from 2004 to 2013. BMC Musculoskelet Disord. 2022 Mar 9;23(1):231.
- Martin RK, Wastvedt S, Pareek A, Persson A, Visnes H, Fenstad AM, Moatshe G, Wolfson J, Engebretsen L. Predicting anterior cruciate ligament reconstruction revision: A machine learning analysis utilizing the Norwegian knee ligament register. J Bone Joint Surg Am. 2022 Jan 19;104(2):145-153.
- Martin RK, Persson A, Moatshe G, Fenstad AM, Engebretsen L, Drogset JO, Visnes H. Low annual hospital volume of anterior cruciate ligament reconstruction is not associated with higher revision rates. Knee Surg Sports Traumatol Arthrosc. 2021 Jul.
- Krogsgaard MR, Brodersen J, Christensen KB, Siersma V, Jensen J, Hansen CF, Engebretsen L, Visnes H, Forssblad M, Comins JD. How to translate and locally adapt a PROM. Assessment of cross-cultural differential item functioning. Scand J Med Sci Sports. 2021 May;31(5):999-1008.

A special thanks to all surgeons and patients who complete the ACL forms.

Jon Olav Drogset	Håvard Visnes	Sigurd Stenvik	Irina Kvinnesland
Chair of the Steering Committee	Head of Register	Biostatistician	IT Consultant

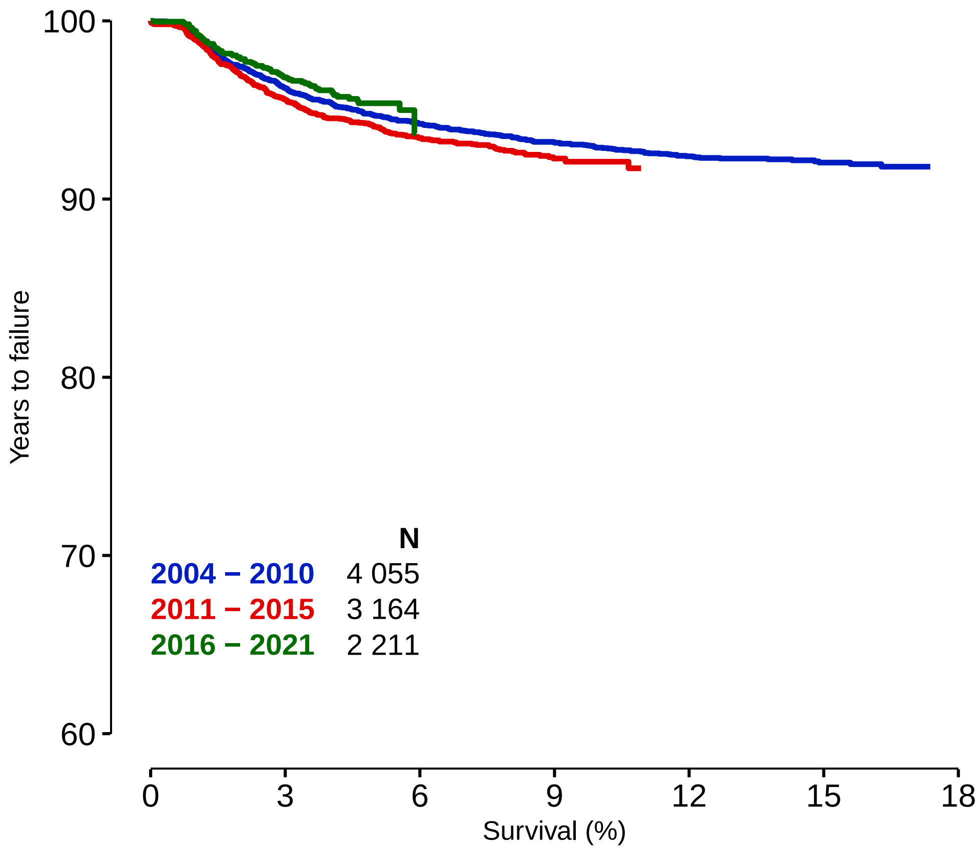
COVID-19

Figure: Monthly number of operations in 2019 - 2021

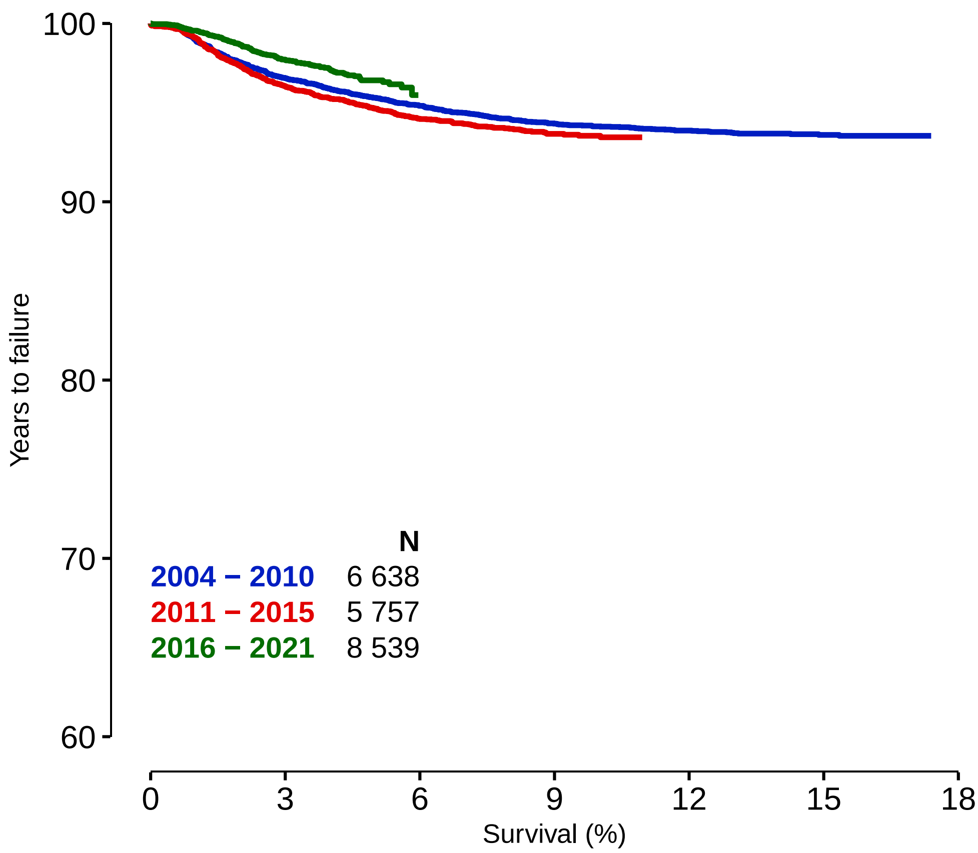


Survival of cruciate ligament operations 2004−2021

E.1) ACL reconstruction without additional injuries



E.2) ACL reconstruction with additional injuries



Survival estimate is given as long as >20 reconstructions remain at risk.

FIGURE E.3: KOOS with primary ACL reconstruction without additional injury

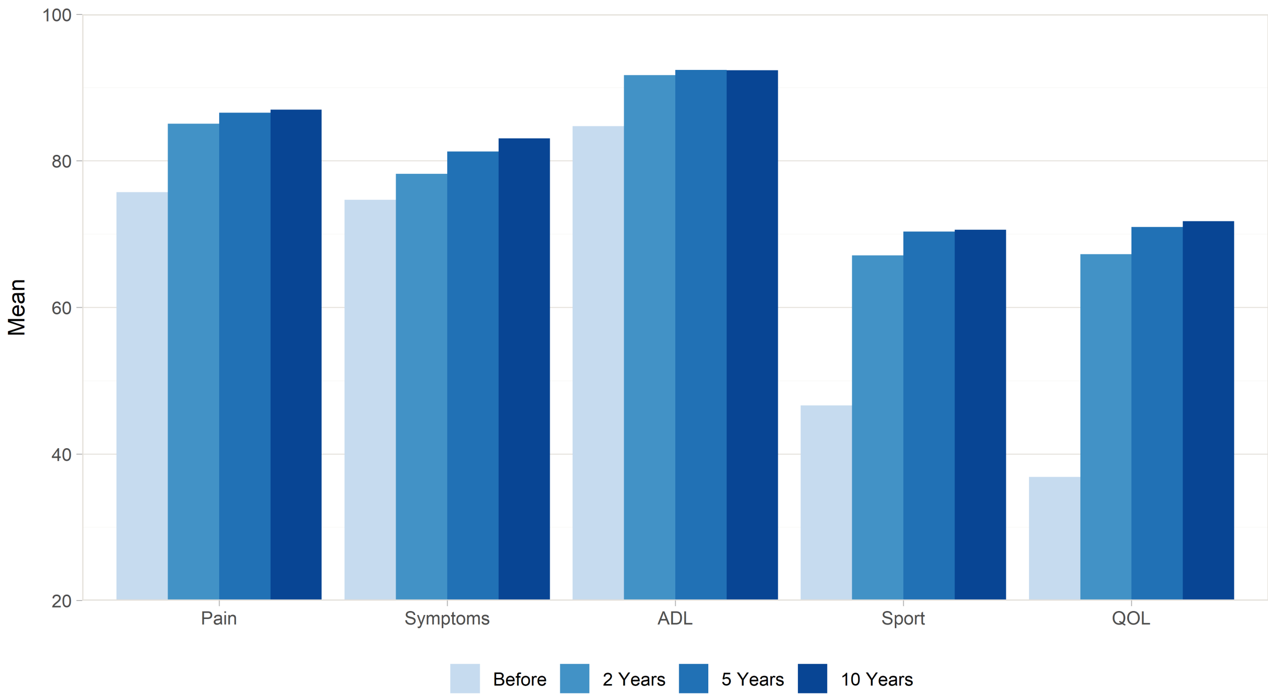


FIGURE E.4: KOOS with primary ACL reconstruction with additional injury

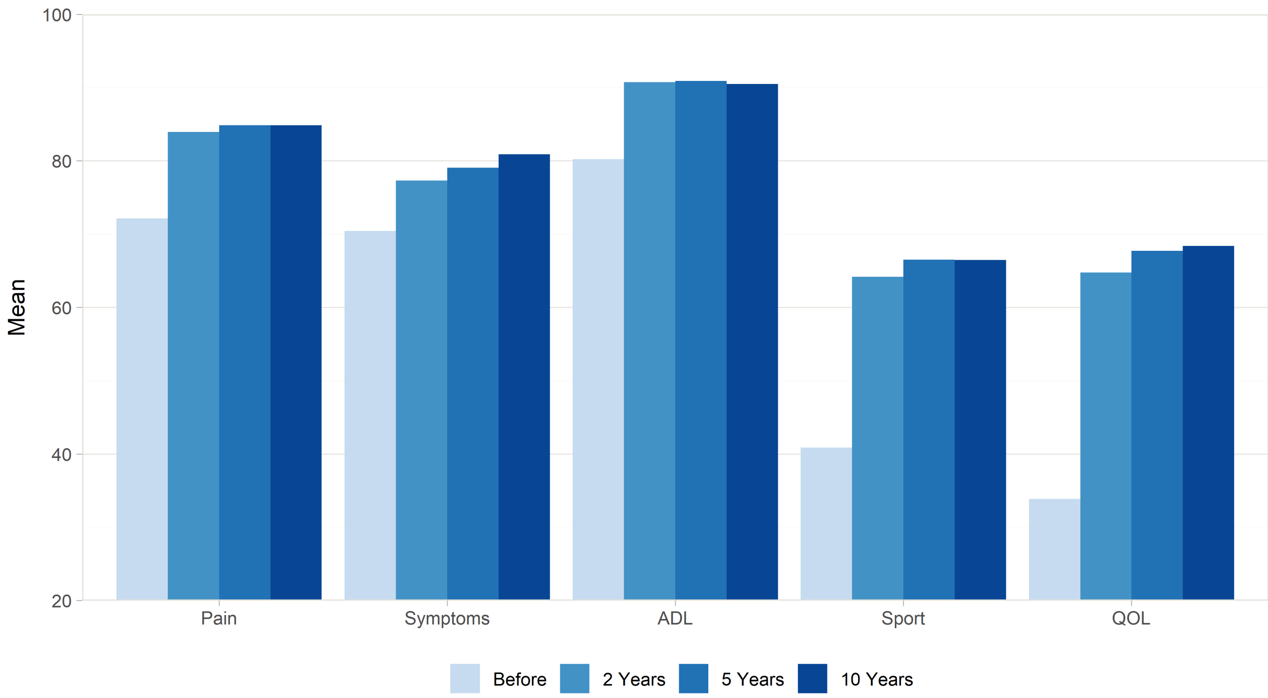


FIGURE E.5: Annual number of cruciate ligament primary reconstructions in 2021

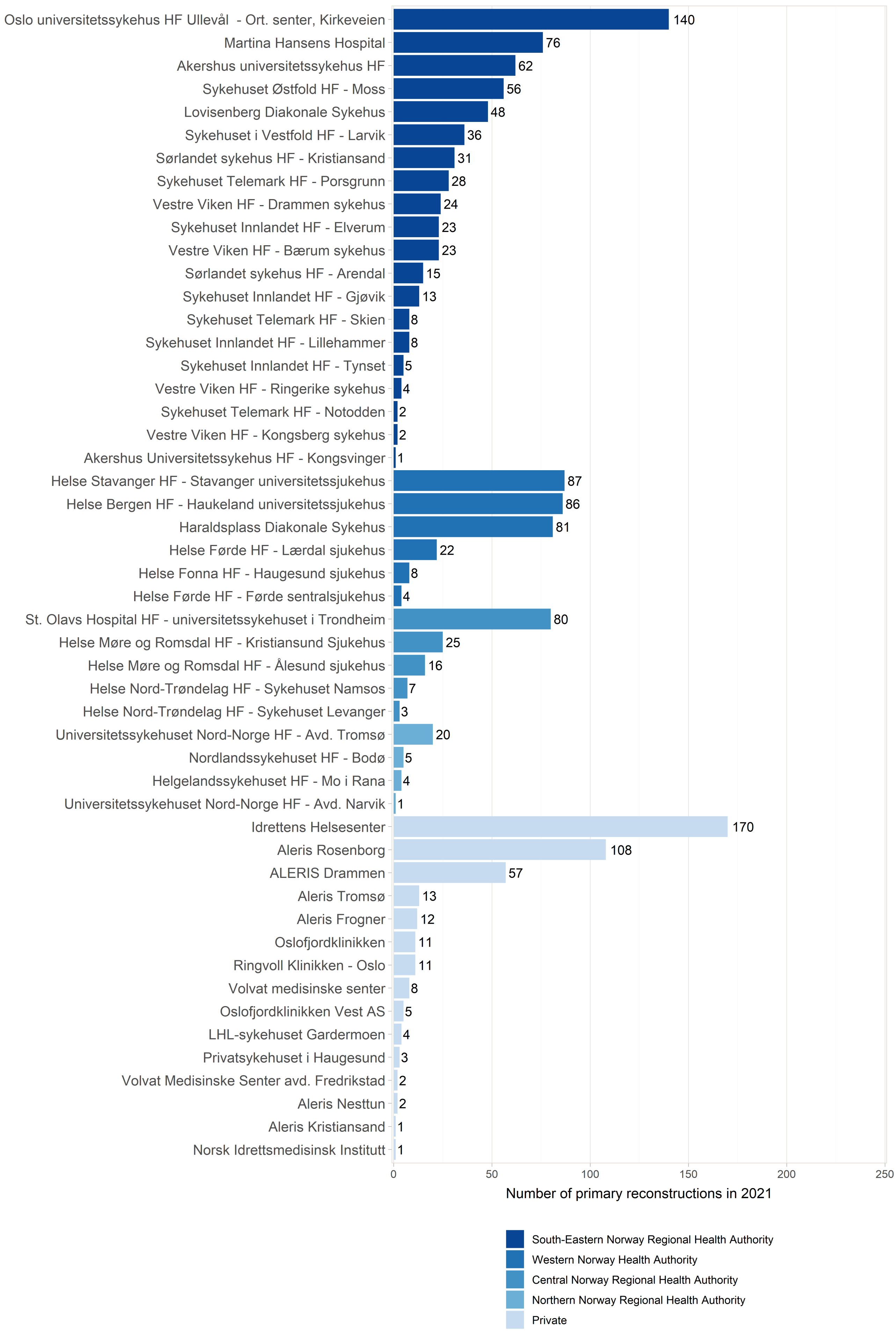


Figure E.6: Form registration by format in 2021

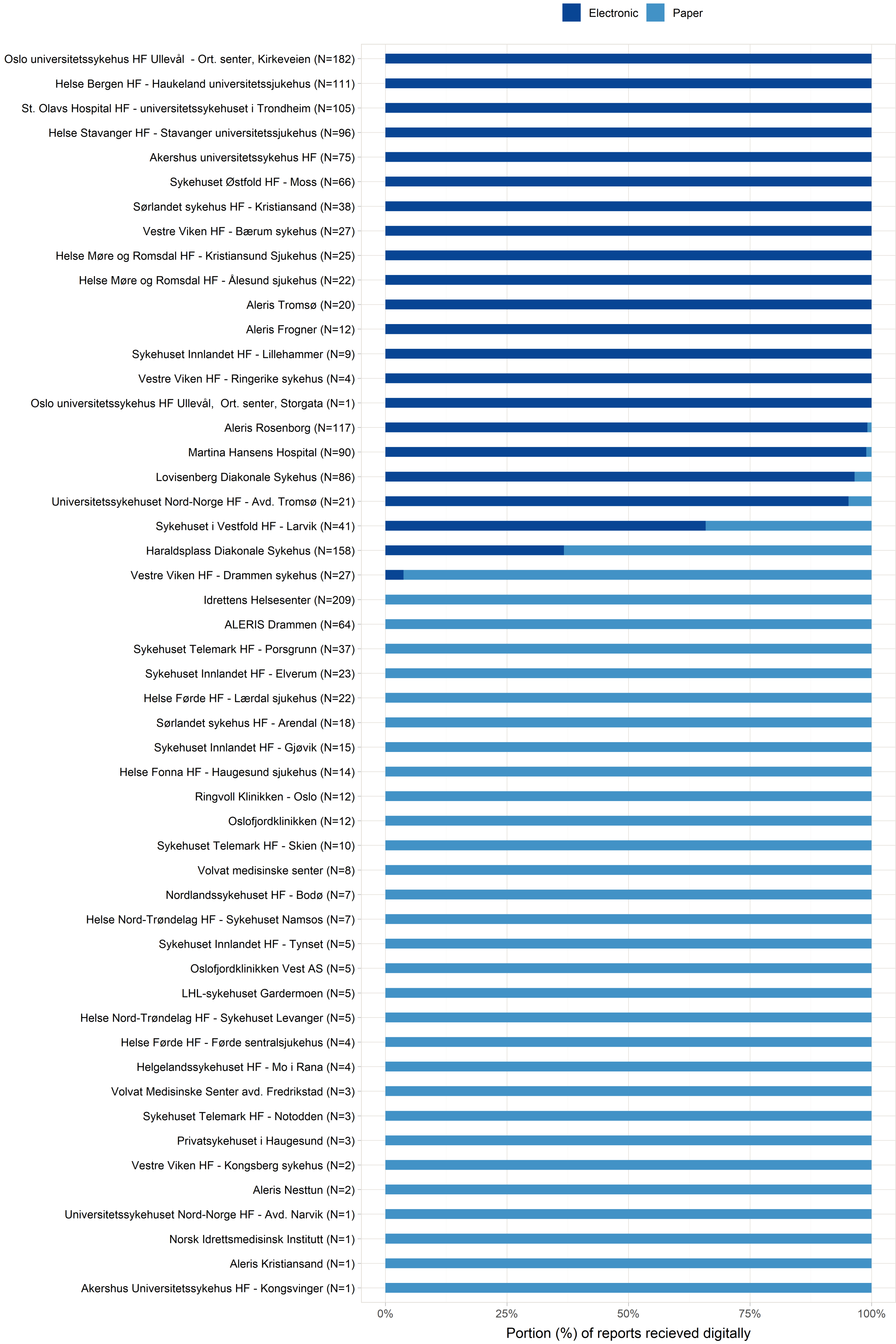
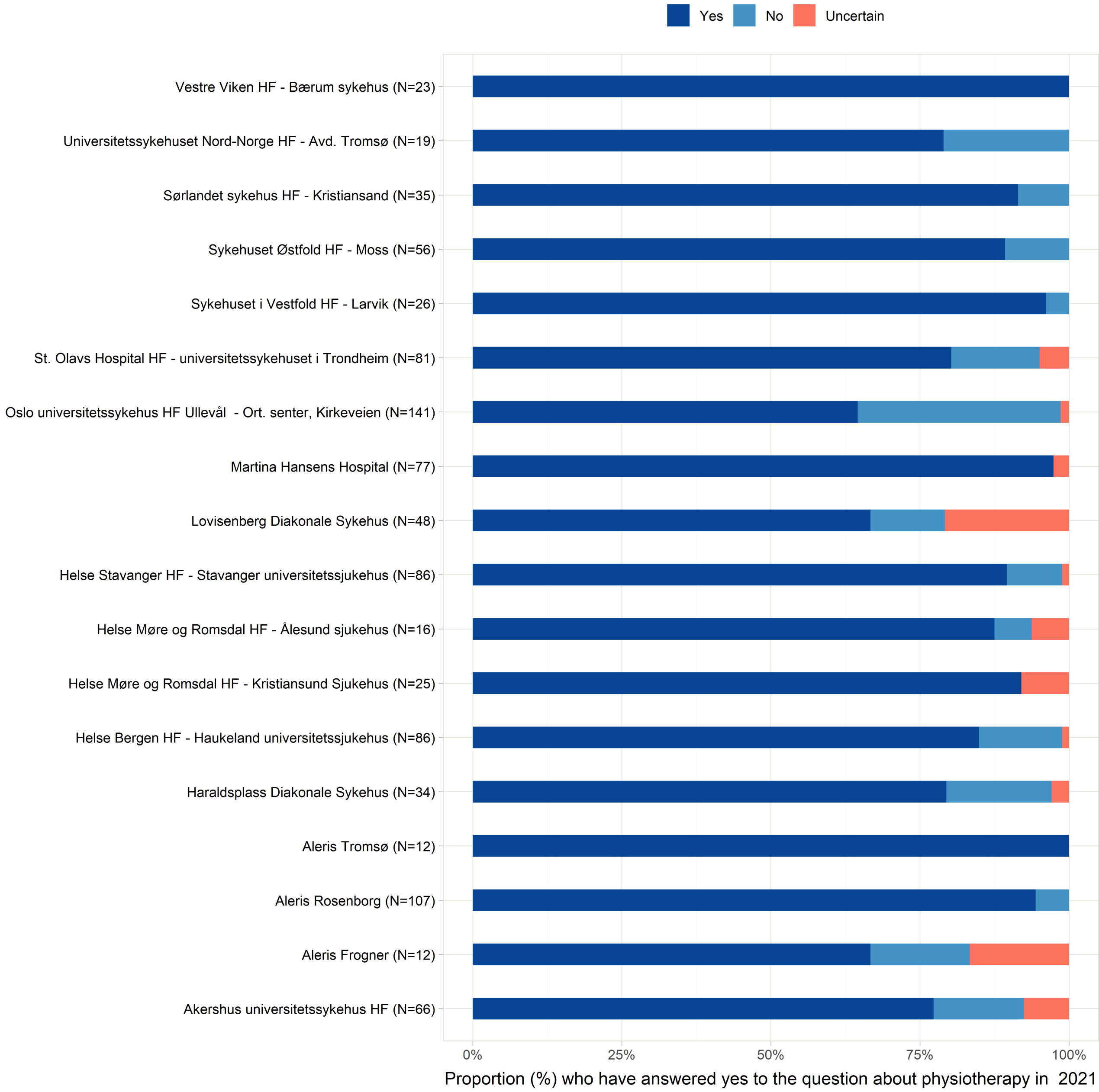


FIGURE E.7: Number of answers about physiotherapy in 2021



From 2020, it is registered in MRS if the elective patients had undergone physiotherapy before surgery. This was defined as a new quality indicator in 2021. If the patient answers no, a follow up question for the reason has to be answered. Including this year, 864 patients have undergone physiotherapy before surgery. This constitutes 83% of the registered patients in MRS for this period.

Cruciate Ligament

All categories of operations

Table 1: Annual numbers of operations

	Primary reconstruction		Revision reconstruction		Only other procedures		Total
2021	1 462	(81,5%)	168	(9,4%)	164	(9,1%)	**1 794**
2020	1 672	(82,2%)	157	(7,7%)	206	(10,1%)	**2 035**
2019	1 969	(83,8%)	188	(8,0%)	193	(8,2%)	**2 350**
2018	1 895	(81,3%)	217	(9,3%)	219	(9,4%)	**2 331**
2017	1 895	(82,4%)	215	(9,4%)	189	(8,2%)	**2 299**
2004-16	21 474	(85,5%)	2 078	(8,3%)	1 567	(6,2%)	**25 119**
Total	**30 367**	**(84,5%)**	**3 023**	**(8,4%)**	**2 538**	**(7,1%)**	**35 928**

Registration complete from 2005. 49,3% of the operations were performed on the right side. 44,9% of the operations were performed on females. 7,6% of the patients had a previous ACL/PCL-injury in the opposite knee. (9,4% was missing). Mean age was 28,2 years, 26,8 years for women and 29,3 years for men. Standard deviation of age was 10,6 years, 11,2 years for women and 10,0 years for men.
Median value for duration of primary ACL reconstruction was 74 minutes.

Figure 1: Distribution of hospitals by surgery volume, primary ACL reconstructions

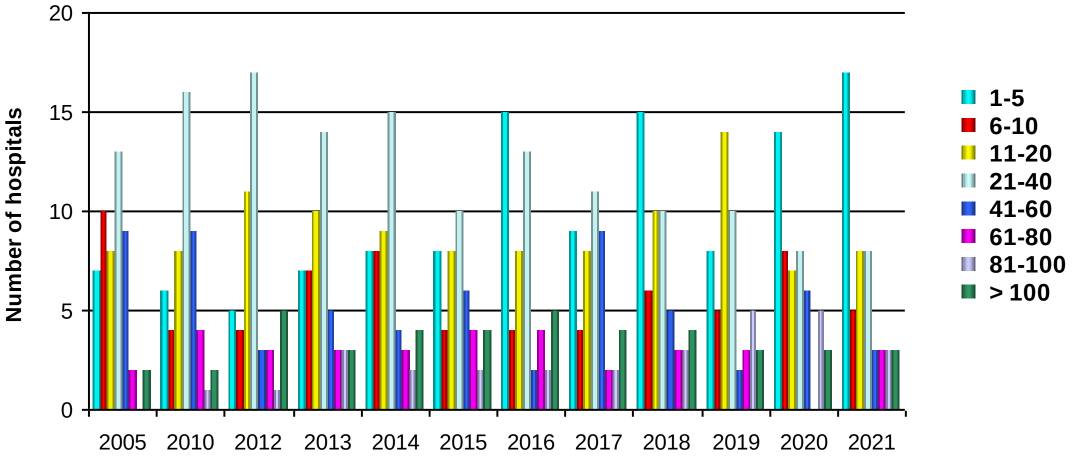


Figure 2: Distribution of hospitals by surgery volumes, revision reconstructions ACL

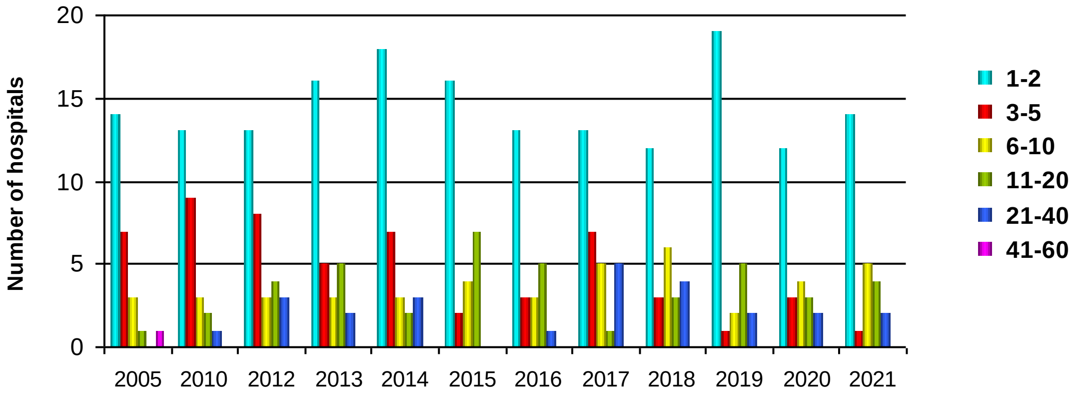
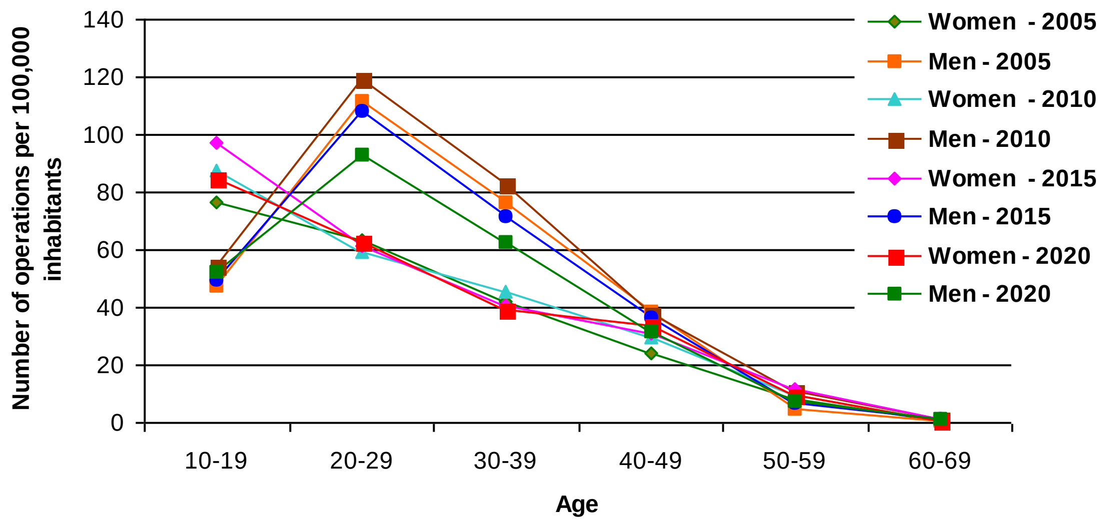


Figure 3: Incidence of primary reconstruction of cruciate ligament for 2005,2010,2015,2020



Distribution of other procedures

Table 2: The number of other procedures for all categories of surgeries

	Meniscus surgery	Cartilage surgery	Synovectomy	Arthroscopic debridement	Mobilizing in narcosis	Surgery due to infection	Removal of implants	Bone transplantation	Osteotomy	Bone resection (Notch plasty)	Osteosynthesis	Artrodesis	Osteosynthesis patella fracture	Suture of the patellar or quadriceps tendons	Lateral extraarticular tenodesis
2021	414	20	26	37	6	11	39	22	17	19	3	0	1	4	60
2020	483	21	21	44	5	6	48	21	8	28	1	1	1	5	33
2019	845	30	32	52	4	4	50	20	8	110	2	0	0	1	15
2018	1 083	23	44	69	8	6	47	28	5	99	0	0	2	0	0
2017	1 087	24	32	54	12	5	57	26	3	25	6	0	0	0	0
2004-16	10 765	980	460	775	93	77	543	301	24	565	30	0	0	0	0
Total	**14 677**	**1 098**	**615**	**1 031**	**128**	**109**	**784**	**418**	**65**	**846**	**42**	**1**	**4**	**10**	**108**

Table 3: Distribution of other procedures in combination with primary reconstruction of cruciate ligament

	Meniscus surgery	Cartilage surgery	Synovectomy	Arthroscopic debridement	Removal of implants	Bone resection (Notch plasty)	Lateral extraarticular tenodesis
11 521	x						
440	x	x					
259		x					
254						x	
253	x					x	
94				x			
92	x		x				
87			x				
79	x			x			
59							x
30	x	x		x			
22					x		
22	x			x		x	
21				x		x	
16		x		x			
15	x	x				x	
13		x				x	
11	x		x			x	
10	x	x	x				
10	x		x	x			

X indicates applied procedure and each row gives the number of operations that is carried out with this combination of procedures. The table shows only combinations that have a number of ten or more.

Table 4: Distribution of other procedures in combination with primary reconstruction of cruciate ligament

	Meniscus surgery	Cartilage surgery	Removal of implants	Bone transplantation	Bone resection (Notch plasty)	Lateral extraarticular tenodesis
735	x					
147			x			
115			x	x		
106				x		
60	x		x			
52		x				
42						x
39					x	
35	x			x		
32	x		x	x		
31	x	x				
21	x				x	
19			x		x	
15	x		x		x	
10		x	x			

X indicates applied procedure and each row gives the number of operations that is carried out with this combination of procedures. The table shows only combinations that have a number of ten or more.

Table 5: Distribution of other procedures when this is the only procedure

	Meniscus surgery	Cartilage surgery	Synovectomy	Arthroscopic debridement	Mobilizing in narcosis	Surgery due to infection	Removal of implants	Bone transplantation
919	x							
246				x				
164							x	
99	x			x				
96			x					
70		x						
61						x		
55	x		x					
44				x	x			
39	x	x						
36			x	x				
28				x			x	
27	x						x	
24							x	x
23	x		x	x				
23			x		x			
20		x		x				
18				x			x	x
18					x			
17			x	x	x			
14				x		x		
12	x	x	x					
12								x
11	x	x		x				
11	x						x	x

X indicates applied procedure and each row gives the number of operations that is carried out with this combination of procedures. The table shows only combinations that have a number of 11 or more.

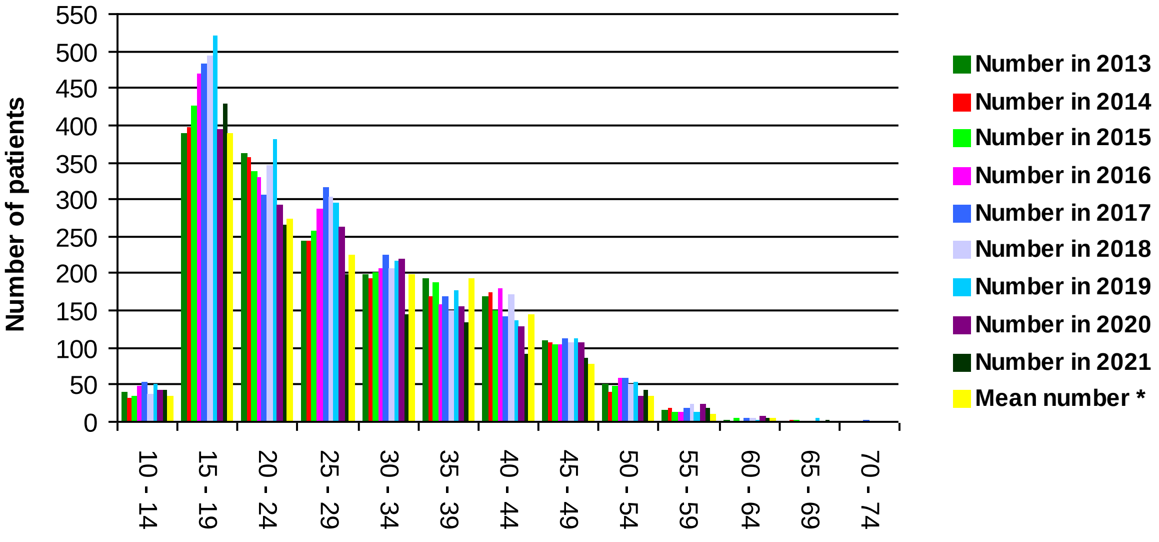
Intraoperative complications

Table 6: Intraoperative complications for all categories of surgeries

	Yes		No		Missing		Total
2021	39	(2,2%)	1 730	(96,4%)	25	(1,4%)	**1 794**
2020	39	(1,9%)	1 973	(97,0%)	23	(1,1%)	**2 035**
2019	46	(2,0%)	2 266	(96,4%)	37	(1,6%)	**2 350**
2018	46	(2,0%)	2 228	(95,6%)	57	(2,4%)	**2 331**
2017	64	(2,8%)	2 184	(95,0%)	50	(2,2%)	**2 299**
2004-16	744	(3,0%)	23 773	(94,6%)	601	(2,4%)	**25 119**
Total	**978**	**(2,7%)**	**34 154**	**(95,1%)**	**793**	**(2,2%)**	**35 928**

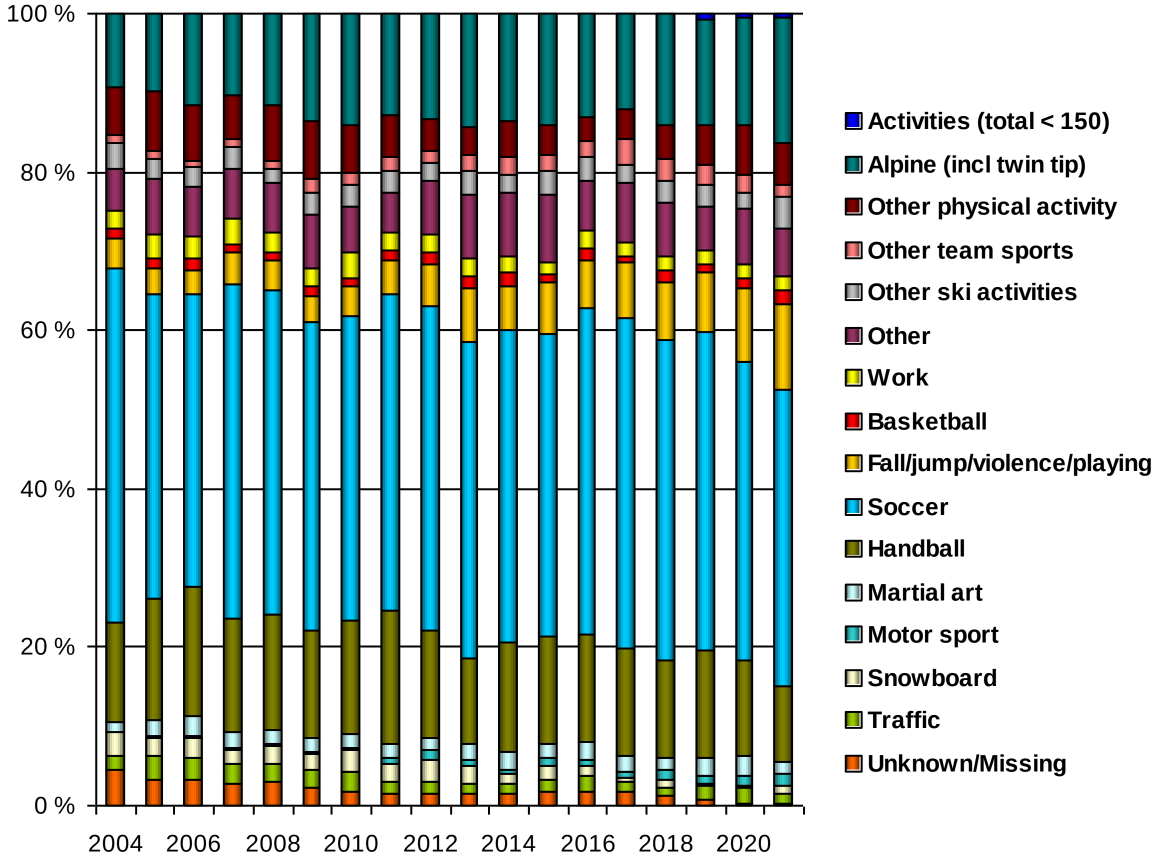
Primary reconstruction of cruciate ligament

Figure 4: Age by primary operation



* Mean number of primary operations for 2004 - 2012

Figure 5: Activity that lead to injury



Actual injury

Table 7: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2021	1 447	40	105	36	14	406	959
2020	1 650	43	104	25	11	442	1 095
2019	1 938	61	202	52	29	485	1 277
2018	1 870	62	231	58	24	510	1 193
2017	1 879	34	180	39	17	446	1 124
2004-16	21 241	567	1 645	391	243	5 026	10 914
Total	**30 025**	**807**	**2 467**	**601**	**338**	**7 315**	**16 562**

* More than one type of injury can be given for each form

Additional injuries

Table 8: ACL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
10 612	x					x	
10 130	x						
4 374	x					x	x
1 879	x						x
723	x		x				
665	x		x			x	
432	x		x			x	x
206	x		x				x
121	x			x			
106	x	x	x				
60	x			x	x		
55	x	x	x				x
36	x	x					
35	x			x			x
31	x			x		x	
28	x				x		
22	x	x		x	x		

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where ACL where the only injury. The table shows only combinations that have a number of 20 or more.

Table 9: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
138		x					
106	x	x	x				
55	x	x	x				x
43		x					x
42	x	x	x			x	
36	x	x					
35	x	x	x			x	x
33		x	x				
25	x	x				x	
22	x	x		x	x		
19		x				x	
19	x	x				x	x
18	x	x		x	x	x	
15	x	x			x		
14	x	x		x	x		x
14		x				x	x
13		x	x				x
13	x	x		x	x	x	x
12		x			x		
11		x		x	x		

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where PCL where the only injury. The table shows only combinations that have a number of 11 or more.

Choice of graft for injuries registered in primary reconstructions

Table 10: BPTB

	ACL	PCL	MCL	LCL	PLC
2021	1 059	0	1	0	0
2020	1 217	0	0	1	0
2019	1 359	0	1	0	0
2018	1 315	4	1	1	0
2017	1 137	0	0	0	0
2004-16	7 472	27	1	0	0
Total	**13 559**	**31**	**4**	**2**	**0**

Table 11: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2021	256	3	35	9	2
2020	328	10	31	3	0
2019	426	13	48	8	6
2018	429	6	34	6	2
2017	595	5	11	9	2
2004-16	13 472	325	191	50	31
Total	**15 506**	**362**	**350**	**85**	**43**

Table 12: ALLOGRAFT

	ACL	PCL	MCL	LCL	PLC
2021	19	30	6	11	8
2020	10	25	5	6	8
2019	4	34	0	9	10
2018	8	28	2	7	10
2017	3	15	5	1	5
2004-16	48	101	25	67	83
Total	**92**	**233**	**43**	**101**	**124**

Table 13: Suture

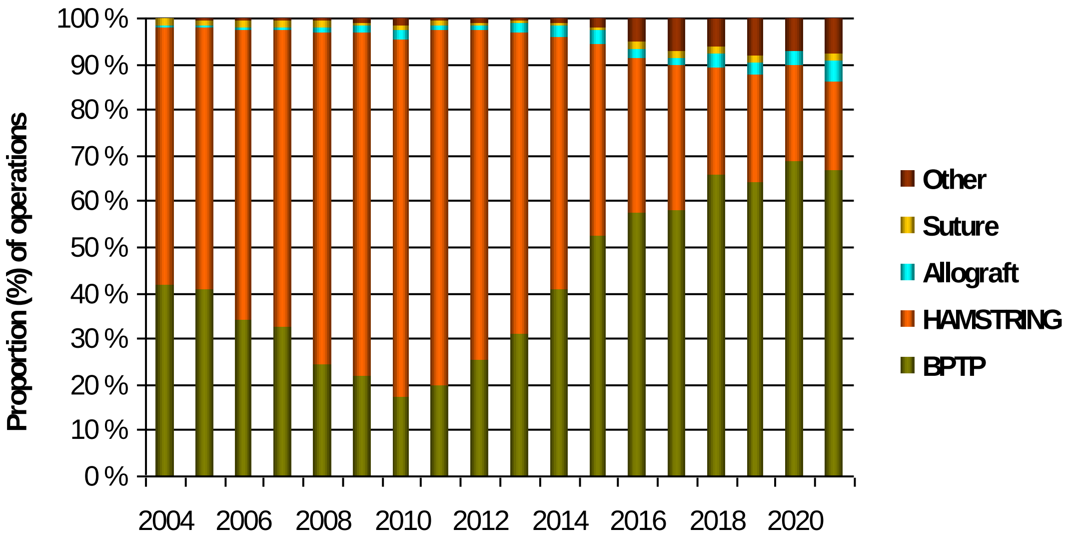
	ACL	PCL	MCL	LCL	PLC
2021	4	0	14	5	1
2020	0	0	2	3	0
2019	5	4	7	7	6
2018	4	7	10	4	6
2017	19	4	9	3	1
2004-16	14	10	98	66	53
Total	**46**	**25**	**140**	**88**	**67**

Table 14: Other

	ACL	PCL	MCL	LCL	PLC
2021	109	3	10	1	1
2020	95	6	18	6	0
2019	143	7	20	3	1
2018	113	8	4	1	0
2017	125	1	9	1	1
2004-16	211	36	12	8	6
Total	**796**	**61**	**73**	**20**	**9**

There are 22 forms where there are registered product for ACL and 23 forms for PCL but not checked for choice of graft.

Figure 6: Choice of graft for all injuries in primary reconstructions



Fixation

Table 15: Femur ACL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
Endobutton CL Ultra	6 529	403	282	253	196	112	**7 775**
SoftSilk	2 601	420	445	469	352	367	**4 654**
Endobutton CL BTB	844	227	218	345	271	164	**2 069**
Sheated Cannulated Int	264	174	212	173	127	109	**1 059**
ACL TightRope	245	75	87	94	67	120	**688**

Table 16: Tibia ACL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
SoftSilk	3 004	511	541	762	670	582	**6 070**
RCI Screw	4 105	231	183	171	154	72	**4 916**
Soft Screw	906	82	90	116	72	88	**1 354**
Peek Interference Scre	300	103	109	117	109	88	**826**
Full Thread Interference	25	120	130	142	180	150	**747**

Table 17: Femur PCL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
Endobutton CL Ultra	203	7	7	6	4	2	**229**
SoftSilk	70	4	21	27	17	17	**156**
RCI Screw	48	4	7	6	2		**67**
ACL TightRope	2	2	4	7	5	5	**25**
Ultrabutton					10	9	**19**

Table 18: Tibia PCL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
RCI Screw	242	2	23	18	14	16	**315**
Biosure HA Interferenc	23	6	3	6	1	1	**40**
Peek Interference Scre	3		3	5	4	9	**24**
BioComposite SwiveLo		2	4	6	2	2	**16**
Biosure PK	7				4	3	**14**
Biosure Regenesorb Int				2	3	2	**7**

Table 19: Femur and tibia ACL (The 5 most common for the last 5 years)

Femur	Tibia	2004-16	2017	2018	2019	2020	2021	Total
SoftSilk	SoftSilk	2 280	335	370	405	290	304	**3 984**
Endobutton CL Ultra	RCI Screw	2 081	161	131	112	103	36	**2 624**
Endobutton CL BTB	SoftSilk	572	134	129	265	252	144	**1 496**
Peek Interference Screw	Peek Interference Screw	166	68	96	81	83	81	**575**
Sheated Cannulated Interference Screw	Sheated Cannulated Interference Screw	212	84	124	66	50	32	**568**

Meniscal lesion

Table 20: Actual treatment of meniscal lesion

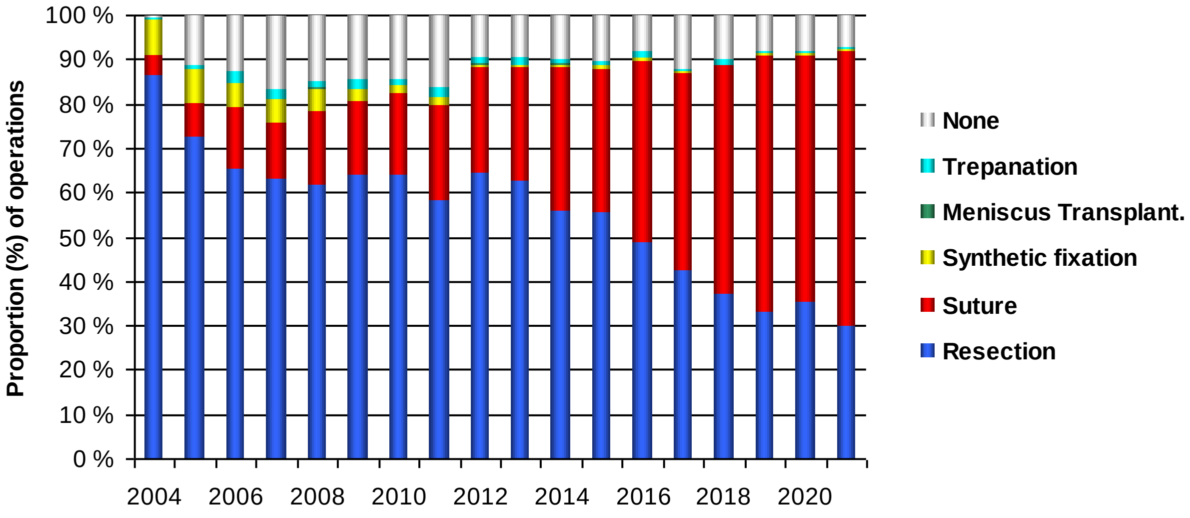
		Resection				Synthetic	Meniscus			
		OLD	**Total**	**Partial**	**Suture**	**fixation**	**Transplant.**	**Trepanation**	**None**	**Total**
2021	Lateral		2	150	310	2		5	44	**513**
2021	Medial		6	177	383	4			34	**604**
2020	Lateral			214	284	1		8	54	**561**
2020	Medial		5	241	434	2		1	48	**731**
2019	Lateral		1	242	365		1	3	62	**674**
2019	Medial		12	239	505	2	1	4	58	**821**
2018	Lateral		1	274	309			10	80	**674**
2018	Medial		8	248	430		1	10	62	**759**
2017	Lateral		2	311	256	1		4	81	**655**
2017	Medial		5	289	382	3	1	3	92	**775**
2004-16	Lateral	2 040	12	1 714	1 023	83	5	113	809	**5 799**
2004-16	Medial	2 371	37	1 853	1 928	262	4	92	734	**7 281**
Total		**4 411**	**91**	**5 952**	**6 609**	**360**	**13**	**253**	**2 158**	**19 847**

It became possible to register "Trepanation" and "None" from 01.01.2005. There have been forms where this has been an additional information. This information have been registered, but the registration is not complete before 2005.

In table 7: Actual injury has less. The reason for this is that we distinguish between the lateral and medial injury and some injuries are registreded in both groups.

The value in OLD Resection are the forms that are registered before the new forms were introduced in autumn 2011. Total and Partial Resection values are the new forms were introduced in autumn 2011.

Figure 7: Treatment of meniscal lesions in primary reconstructions



Meniscal fixation

Table 21: Synthetic

Product	2004-09	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Contour Meniscus arrow	142	1												**143**
FAST-FIX		1	6	3		1		4	1			1	3	**20**
Meniscal Dart	19													**19**
Meniscal Dart Stick	23		1											**24**
Meniscus arrow	27	1	2		1									**31**
TRUESPAN Meniscal Repair System PEEK 12											1			**1**
Unknown	16		11	4	4	7	10	9						**61**
Total	**227**	**3**	**20**	**7**	**5**	**8**	**10**	**13**	**1**		**1**	**1**	**3**	**299**

Table 22: Suture

Product	2004-09	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
2-0 ORTHOCORD w/Double-Armed Meniscal Needles										1	29	11	24	**65**
2-0 FiberStitch Implant SUTURE												11	9	**20**
BioComposite SwiveLock C w Fiber Tape									9	7	11	7	12	**46**
Bio-Tenodesis Screw System												1		**1**
Coated Braided Polyester Polyester suture													3	**3**
ENDOBUTTON (BOX OF 1) STR										1	14	5	13	**33**
Endobutton CL Ultra											4	2	3	**9**
ENDOBUTTON TAPE POLYESTER												1		**1**
FAST-FIX	351	126	192	208	203	280	319	405	459	538	624	527	499	**4 731**
Gastro-urological guidewire													1	**1**
MENISCAL CINCH											7	5	1	**13**
Meniscal Dart Stick		1								1				**2**
Meniscal Root Repair System													2	**2**
Meniscus arrow		3	4											**7**
PDS II (polydioxanone) sutur									8			1		**9**
Rapidloc	72				2									**74**
SCR SOFTSLK												1		**1**
SUTUR VICRYL										1				**1**
SUTURE WASHER STER. BOX OF 1										4	11	7	6	**28**
SutureButton											12	6	1	**19**
SutureTape											1		2	**3**
TIGHTROPE ABS BUTTON ROUND 11MM CONCAVE											2	2	5	**9**
TRUESPAN Meniscal Repair System PEEK 12											21	28	14	**63**
Unknown	7	3	48	40	43	49	54	65	23	12	1	3	4	**352**
XTENDOBUTTON FIXATION DEVICE													1	**1**
Total	**430**	**133**	**244**	**248**	**248**	**329**	**373**	**470**	**499**	**565**	**737**	**618**	**600**	**5 494**

Cartilage lesion all localizations

Table 23: ICRS Grade

Definition of ICRS Grade:
1. Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks.
2. Abnormal: Lesions extending down to <50% of cartilage depth.
3. Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer.
4. Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.

	Code 1	Code 2	Code 3	Code 4	Missing
2021	30,9%	48,6%	16,5%	3,5%	0,5%
2020	40,5%	41,3%	15,2%	2,3%	0,7%
2019	42,7%	38,8%	15,1%	2,1%	1,2%
2018	44,3%	38,0%	13,5%	2,7%	1,5%
2017	43,9%	36,3%	15,8%	2,5%	1,6%
2004-16	35,4%	42,7%	16,3%	4,5%	1,2%

Table 24: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2021	7,9%	0,7%	86,5%	0,9%	4,0%
2020	5,7%	0,9%	87,5%	1,0%	5,0%
2019	5,3%	0,7%	87,9%	0,5%	5,7%
2018	6,4%	1,3%	84,6%	0,5%	7,3%
2017	6,9%	1,1%	81,6%	0,4%	10,0%
2004-16	11,8%	3,2%	65,3%	1,0%	18,7%

Cartilage injuries registered in primary reconstructions

Figure 8: All Cartilage injuries (total)

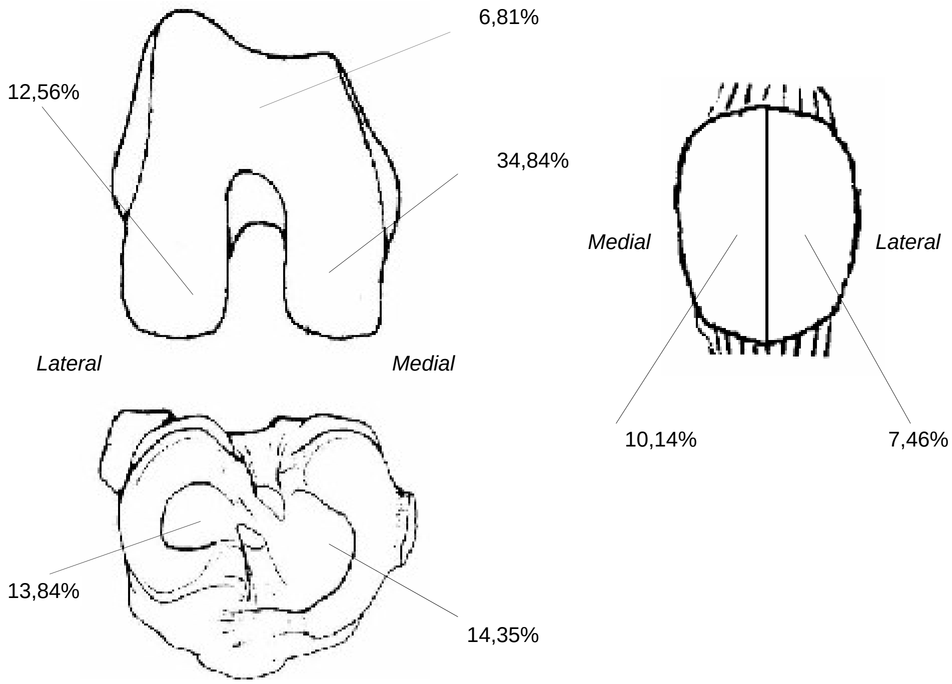
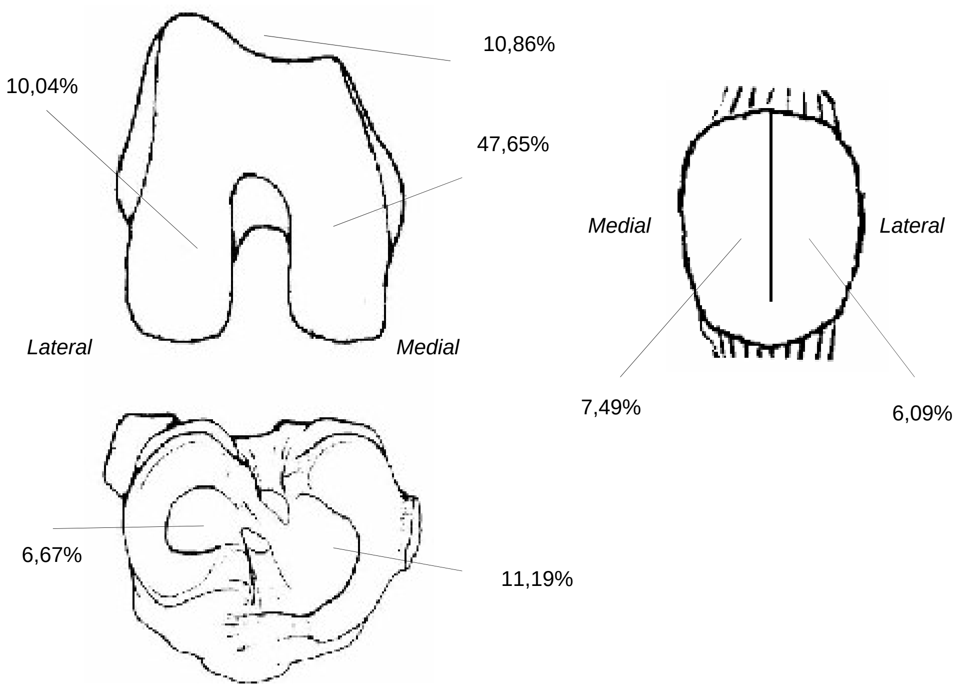


Figure 9: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 25: Outpatient surgery

	Yes		No		Missing		Total
2021	1 209	(82,7%)	251	(17,2%)	1	(0,1%)	**1 462**
2020	1 383	(82,7%)	279	(16,7%)	10	(0,6%)	**1 672**
2019	1 449	(73,6%)	513	(26,1%)	7	(0,4%)	**1 969**
2018	1 395	(73,6%)	494	(26,1%)	6	(0,3%)	**1 895**
2017	1 433	(75,6%)	458	(24,2%)	4	(0,2%)	**1 895**
2004-16	11 884	(55,3%)	9 476	(44,1%)	114	(0,5%)	**21 474**
Total	**18 753**	**(61,8%)**	**11 471**	**(37,8%)**	**142**	**(0,5%)**	**30 367**

Intraoperative complications

Table 26: Intraoperative complications

	Yes		No		Missing		Total
2021	31	(2,1%)	1 411	(96,5%)	20	(1,4%)	**1 462**
2020	34	(2,0%)	1 616	(96,7%)	22	(1,3%)	**1 672**
2019	37	(1,9%)	1 901	(96,5%)	30	(1,5%)	**1 969**
2018	43	(2,3%)	1 811	(95,6%)	41	(2,2%)	**1 895**
2017	50	(2,6%)	1 808	(95,4%)	36	(1,9%)	**1 895**
2004-16	668	(3,1%)	20 331	(94,7%)	475	(2,2%)	**21 474**
Total	**863**	**(2,8%)**	**28 878**	**(95,1%)**	**624**	**(2,1%)**	**30 367**

Systemic antibiotic prophylaxis

Table 27: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2021	1 452	(99,3%)	7	(0,5%)	3	(0,2%)	**1 462**
2020	1 663	(99,5%)	8	(0,5%)	1	(0,1%)	**1 672**
2019	1 963	(99,7%)	5	(0,3%)	1	(0,1%)	**1 969**
2018	1 884	(99,4%)	7	(0,4%)	4	(0,2%)	**1 895**
2017	1 890	(99,7%)	2	(0,1%)	3	(0,2%)	**1 895**
2004-16	21 320	(99,3%)	102	(0,5%)	52	(0,2%)	**21 474**
Total	**30 172**	**(99,4%)**	**131**	**(0,4%)**	**64**	**(0,2%)**	**30 367**

Table 28: Drug

	2004-16	2017	2018	2019	2020	2021
Benzylpenicillin (Penicillin G)	0,01%	0,05%				
Cefaleksin (Keflex, Cefalexin)	0,01%					
Cefalotin (Keflin)	91,66%	92,54%	68,15%	19,61%	11,79%	11,02%
Cefazolin (Cephazolin)		4,13%	28,98%	69,94%	83,04%	86,85%
Cefotaksim (Claforan)	0,01%					
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1,30%			0,46%		
Ciprofloksasin (Ciproxin)	0,01%					
Dikloksacillin (Diclocil, Dicillin)	2,62%	0,16%		0,05%	0,12%	
Doksysyklin (Vibramycin, Dumoxin, Doxylin)	0,00%					
Erytromycin (Ery-max, Abboticin)	0,01%					
Gentamicin (Garamycin, Gensumycin)	0,02%	0,16%				
Klindamycin (Dalacin, Clindamycin)	2,35%	2,49%	2,23%	1,94%	2,65%	1,45%
Kloksacillin (Ekvacillin)	1,68%	0,26%		7,49%	2,29%	0,48%
Linkomycin (Lincocin)	0,00%			0,05%		
Oxacillin (Unspecified)	0,03%					
Piperacillin\Tazobactam (Tazocin)			0,05%			
Tobramycin (Nebcina, Nebcin, Tobi)	0,01%					
Missing	0,25%	0,21%	0,58%	0,46%	0,12%	0,21%

Thrombosis prophylaxis

Table 29: Thrombosis prophylaxis

	Yes		No		Missing		Total
2021	711	(48,6%)	746	(51,0%)	5	(0,3%)	**1 462**
2020	931	(55,7%)	738	(44,1%)	3	(0,2%)	**1 672**
2019	1 292	(65,6%)	672	(34,1%)	5	(0,3%)	**1 969**
2018	1 442	(76,1%)	451	(23,8%)	2	(0,1%)	**1 895**
2017	1 485	(78,4%)	407	(21,5%)	3	(0,2%)	**1 895**
2005-16	16 871	(81,6%)	3 575	(17,3%)	259	(1,3%)	**20 705**
Total	**22 732**	**(76,8%)**	**6 589**	**(22,3%)**	**277**	**(0,9%)**	**29 598**

There are 33 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.

Table 30: Use of drugs

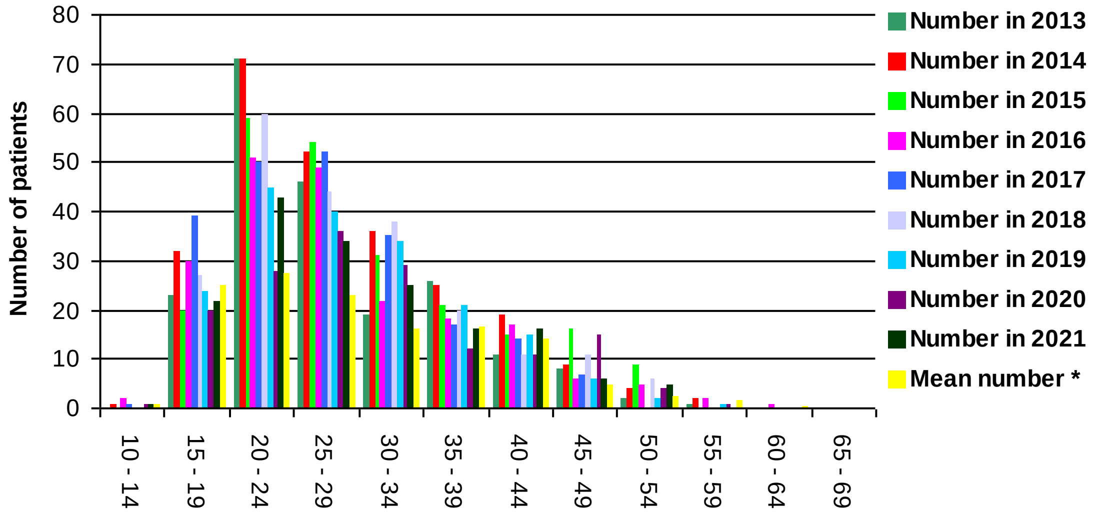
	One drug		Two drugs		Total
2021	592	(83,3%)	119	(16,7%)	**711**
2020	732	(78,6%)	199	(21,4%)	**931**
2019	1 211	(93,7%)	81	(6,3%)	**1 292**
2018	1 416	(98,2%)	26	(1,8%)	**1 442**
2017	1 477	(99,5%)	8	(0,5%)	**1 485**
2005-16	16 753	(99,3%)	118	(0,7%)	**16 871**
Total	**22 181**	**(97,6%)**	**551**	**(2,4%)**	**22 732**

Table 31: Drug

	2004-16	2017	2018	2019	2020	2021
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)	0,01%			0,23%	0,43%	0,98%
Apixiban (Eliquis)			0,14%	0,23%	0,21%	0,56%
Dabigatranetixalat (Re-Novate, Pradaxa)	0,01%		0,07%			
Dalteparin (Fragmin)	60,78%	59,60%	57,98%	54,64%	49,95%	51,20%
Dekstran (Macrodex, Dextran)	0,10%	0,07%				
Enoksaparin (Klexane)	35,69%	39,12%	39,46%	37,77%	27,60%	29,68%
Heparin (Heparin)	0,01%					
Rivaroksaban (Xarelto)	0,05%	0,07%	0,07%	0,15%	0,11%	
Ticagrelor (Brilique)			0,07%			
Warfarin (Marevan)	0,04%	0,07%			0,11%	0,14%
Ximelagatran (Exanta, Malagatran)	0,18%					
Unknown	0,01%					
No drugs	2,16%					
Missing	0,26%	0,54%	0,42%	0,70%	0,21%	0,70%
Two drugs	0,70%	0,54%	1,80%	6,27%	21,37%	16,74%

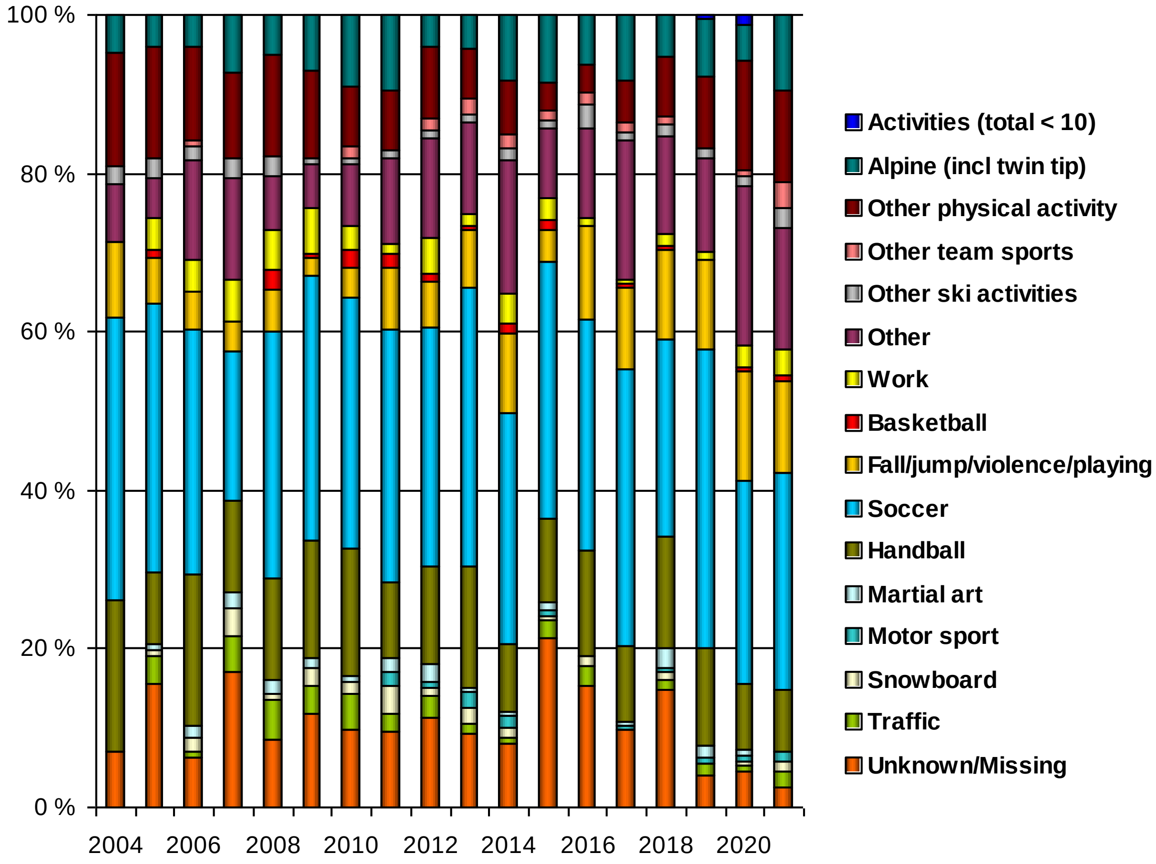
Revision reconstruction

Figure 10: Age by revision reconstruction



* Mean number of revision reconstructions for 2004 - 2012

Figure 11: Activity that lead to injury



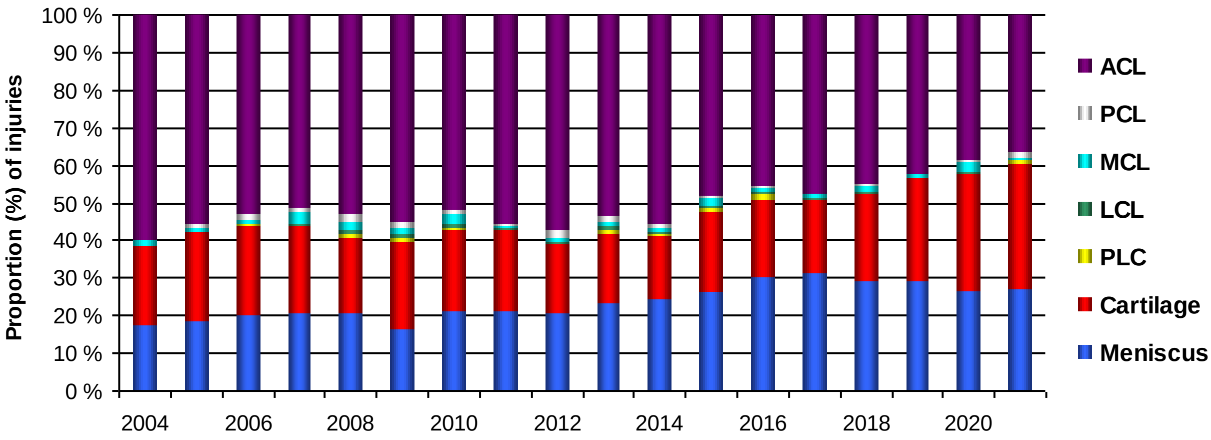
Actual injury

Table 32: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2021	153	7	3	1	3	88	114
2020	150	3	9	2	1	67	103
2019	181	1	5			89	125
2018	207	3	8	1	1	95	135
2017	205	1	5	1	1	79	135
2004-16	1 819	42	51	21	22	715	770
Total	**2 715**	**57**	**81**	**26**	**28**	**1 133**	**1 382**

* More than one type of injury can be given for each form

Figure 12: Actual injury



Additional injuries

Table 33: ACL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
987	x						
637	x					x	
589	x					x	x
385	x						x
19	x		x				
9	x		x				x
7	x		x			x	x
7	x		x			x	

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where ACL where the only injury. The total number will be identical to the total number of registered ACL injuries. The table shows only combinations that have a number of more than 5.

Table 34: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
15		x					
8		x					x
5	x	x					x
5	x	x					
4	x	x	x				x

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where PCL where the only injury. The total number will be identical to the total number of registered PCL injuries. The table shows only combinations that have a number of more than 2.

Reason for revision reconstruction

Table 35: Reason for revision reconstruction

	Cause 1	Cause 2	Cause 3	Cause 4	Cause 5	Cause 6	Cause 7	Cause 8	Other	Total
2021		8	2	74	81	6	9	19		199
2020	1	6	1	54	83	2	5	12		164
2019	2	5	2	74	93	10	7	6		199
2018	3	9	3	95	94	5	6	3		218
2017	3	7	1	106	97	8				222
2004-16	31	78	20	791	699	25			35	1 679
Total	**40**	**113**	**29**	**1 194**	**1 147**	**56**	**27**	**40**	**35**	**2 681**

Cause 1: Infection
Cause 2: Fixation failure
Cause 3: Untreated ligamentinjury
Cause:4: Graft failure
Cause 5: New trauma
Cause 6: Pain

Cause 7: Tibial duct misplacement Cause 8: Femoral duct misalignment

Choice of graft for injuries registered in revision reconstructions

Table 36: BPTB

	ACL	PCL	MCL	LCL	PLC
2021	75	0	0	0	0
2020	70	0	0	0	0
2019	82	0	0	0	0
2018	95	0	0	0	0
2017	106	0	0	0	0
2004-16	843	2	0	0	0
Total	**1 271**	**2**	**0**	**0**	**0**

Table 37: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2021	34	1	1	0	0
2020	41	1	4	0	0
2019	47	0	1	0	0
2018	41	0	2	0	0
2017	39	1	1	0	1
2004-16	738	8	16	4	2
Total	**940**	**11**	**25**	**4**	**0**

Table 38: ALLOGRAFT

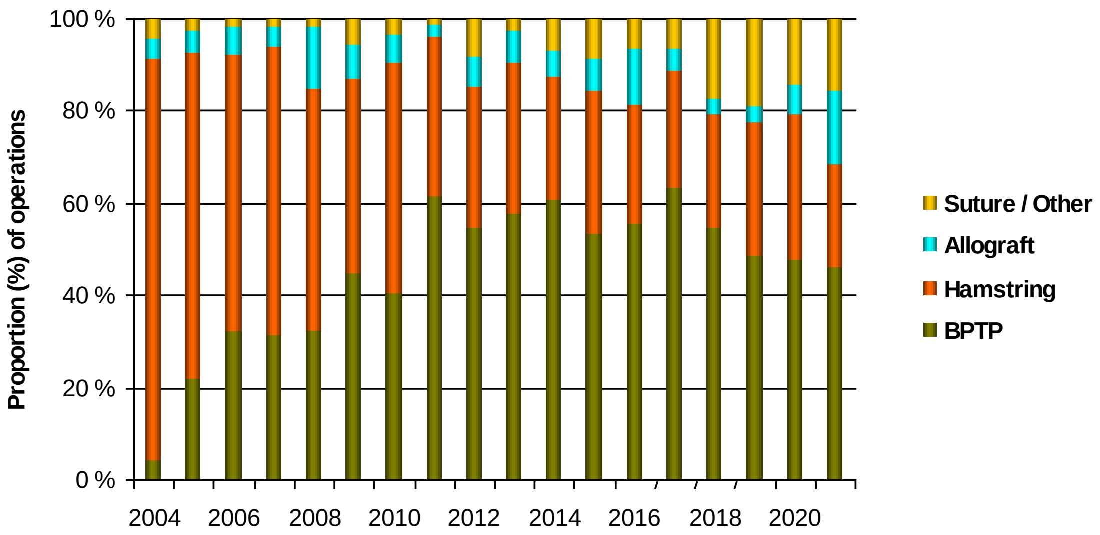
	ACL	PCL	MCL	LCL	PLC
2021	15	5	2	1	3
2020	7	2	0	0	0
2019	4	1	1	0	0
2018	6	0	0	0	0
2017	6	0	2	0	0
2004-16	65	25	10	10	14
Total	**103**	**33**	**15**	**11**	**17**

Table 39: Suture / Other

	ACL	PCL	MCL	LCL	PLC
2021	24	1	0	0	0
2020	19	0	1	1	0
2019	30	0	2	0	0
2018	28	1	1	0	0
2017	11	0	0	0	0
2004-16	75	4	3	1	1
Total	**187**	**6**	**7**	**2**	**1**

There were 1 forms where it was registered product for ACL but not checked for choice of graft. It was registered direct suture for two cases (PLC, MCL).

Figure 13: Choice of graft for all injuries in revision reconstruction



Fixation

Table 40: Femur ACL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
SoftSilk	426	50	43	47	39	39	**644**
Endobutton CL Ultra	371	37	38	34	33	21	**534**
Endobutton CL BTB	82	10	14	13	13	10	**142**
Sheated Cannulated Int	53	22	20	8	1	6	**110**
Peek Interference Scre	21	7	10	13	7	16	**74**

Table 41: Femur PCL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
Endobutton CL Ultra	13				1	3	**17**
SoftSilk	7	1		1		4	**13**
RCI Screw	12						**12**
EndoButton CL	2						**2**
Propel Cannulated	2						**2**

Table 42: Tibia ACL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
SoftSilk	389	51	44	60	53	46	**643**
RCI Screw	323	16	21	18	23	21	**422**
Biosure HA Interferenc	192	17	25	11	11	1	**257**
Peek Interference Scre	24	7	11	15	9	11	**77**
Biosure PK	32	4	6	11	9	12	**74**

Table 43: Tibia PCL (The 5 most common for the last 5 years)

Product	2004-16	2017	2018	2019	2020	2021	Total
RCI Screw	24	1		1	1	2	**29**
AO Skrue	7						**7**
Biosure HA Interferenc	2				1		**3**
Propel Cannulated	3						**3**
Biosure PK						2	**2**
Tightrope ABS	2						**2**
SUTURE WASHER ST						1	**1**

Table 44: Femur and tibia ACL (The 5 most common for the last 5 years)

Femur	Tibia	2004-16	2017	2018	2019	2020	2021	Total
SoftSilk	SoftSilk	352	43	30	43	29	28	**525**
Endobutton CL Ultra	Biosure HA Interference screw	137	14	21	8	9	1	**190**
Endobutton CL Ultra	RCI Screw	119	9	14	14	17	10	**183**
Peek Interference Screw	Peek Interference Screw	20	6	10	10	7	16	**69**
Endobutton CL BTB	SoftSilk	15	3	7	7	13	8	**53**

Meniscal lesion

Table 45: Actual treatment of meniscal lesion

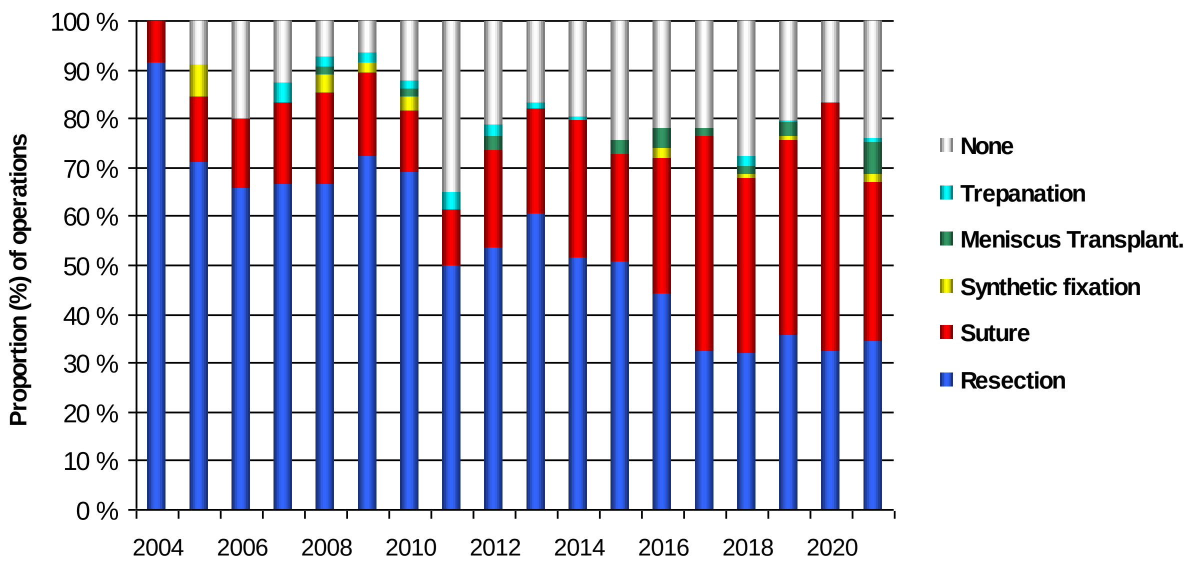
		Resection OLD	Resection Total	Resection Partial	Suture	Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
2021	Lateral			16	21			1	9	**47**
2021	Medial			27	20	2	8		21	**78**
2020	Lateral			13	25				8	**46**
2020	Medial		1	23	33				11	**68**
2019	Lateral			17	27		1	1	11	**57**
2019	Medial		1	32	28	1	3		17	**82**
2018	Lateral			22	31			2	13	**68**
2018	Medial		1	30	29	1	3	1	33	**98**
2017	Lateral		1	22	29				14	**66**
2017	Medial			29	41		3		21	**94**
2004-16	Lateral	85	1	113	67	5	3	7	78	**359**
2004-16	Medial	149	6	182	118	6	9	5	96	**571**
Total		**234**	**11**	**526**	**469**	**15**	**30**	**17**	**332**	**1 634**

It became possible to register "Trepanation" and "None" from 01.01.2005. There have been forms where this has been an additional information. This information have been registered, but the registration is not complete before 2005.

In table 32: Actual injury has less. The reason for this is that we distinguish between the lateral and medial injury and some injuries are registreded in both groups.

The value in OLD Resection are the forms that are registered before the new forms were introduced in autumn 2011. Total and Partial Resection values are the new forms were introduced in autumn 2011.

Figure 14: Treatment of meniscal lesions in revision reconstructions



Meniscal fixation

Table 46: Synthetic

Product	2004-09	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Contour Meniscus arrow	3													**3**
FAST-FIX										1	1		2	**4**
Meniscus arrow	1													**1**
Unknown	1							3						**4**
Total	**5**							**3**		**1**	**1**		**2**	**12**

Table 47: Suture

Product	2004-09	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
2-0 ORTHOCORD w/Double-Armed Meniscal Needles											1		6	**7**
BioComposite SwiveLock C w Fiber Tape									2	1	4	1		**8**
ENDOBUTTON (BOX OF 1) STR											3	2	4	**9**
FAST-FIX	24	4	5	14	16	19	16	15	41	33	38	37	24	**286**
Meniscus arrow		1												**1**
PDS II (polydioxanone) sutur									1	1				**2**
Rapidloc	4													**4**
SUTURE WASHER STER. BOX OF 1										1	1	1	1	**4**
SutureButton											2			**2**
TRUESPAN Meniscal Repair System PEEK 12											1		2	**3**
ULTRATAPE SUTURE BLUE													1	**1**
Unknown	1		4	1	5	6	9	13	1	2	2			**44**
Total	**29**	**5**	**9**	**15**	**21**	**25**	**25**	**28**	**45**	**38**	**52**	**41**	**38**	**371**

Cartilage lesion all localizations

Table 48: ICRS Grade

Definitjon av ICRS Grade:
1. Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks.
2. Abnormal: Lesions extending down to <50% of cartilage depth.
3. Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer.
4. Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.

	Code 1	Code 2	Code 3	Code 4	Missing
2021	34,6%	48,6%	14,0%	2,9%	
2020	40,6%	43,6%	12,9%	3,0%	
2019	31,3%	43,6%	17,4%	5,8%	1,9%
2018	41,7%	39,6%	11,9%	2,9%	4,0%
2017	44,1%	35,4%	12,8%	4,1%	3,6%
2004-16	22,4%	49,5%	22,0%	4,8%	1,2%

Table 49: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2021	5,8%	0,8%	91,8%		1,6%
2020	2,8%	0,5%	96,2%		0,5%
2019	5,4%		88,1%	0,8%	5,8%
2018	5,5%	1,8%	82,5%	0,7%	9,5%
2017	7,7%	1,0%	75,9%	1,0%	14,4%
2004-16	8,9%	2,2%	72,5%	1,1%	15,2%

Cartilage injuries registered in revision reconstructions

Figure 15: All Cartilage injuries (total)

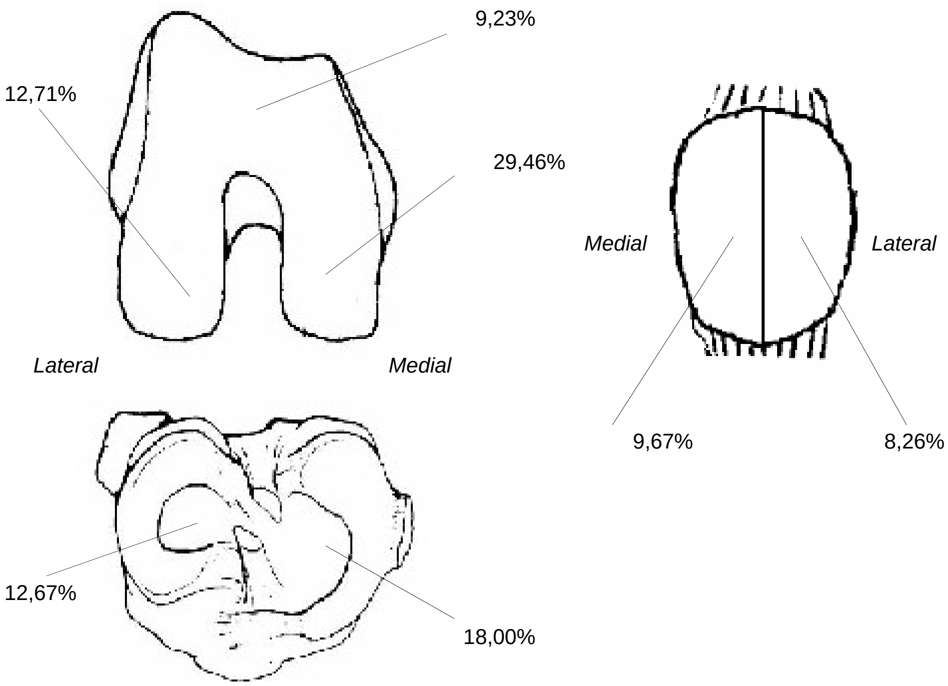


Figure 16: All Cartilage injuries with area greater than 2 cm² (total)

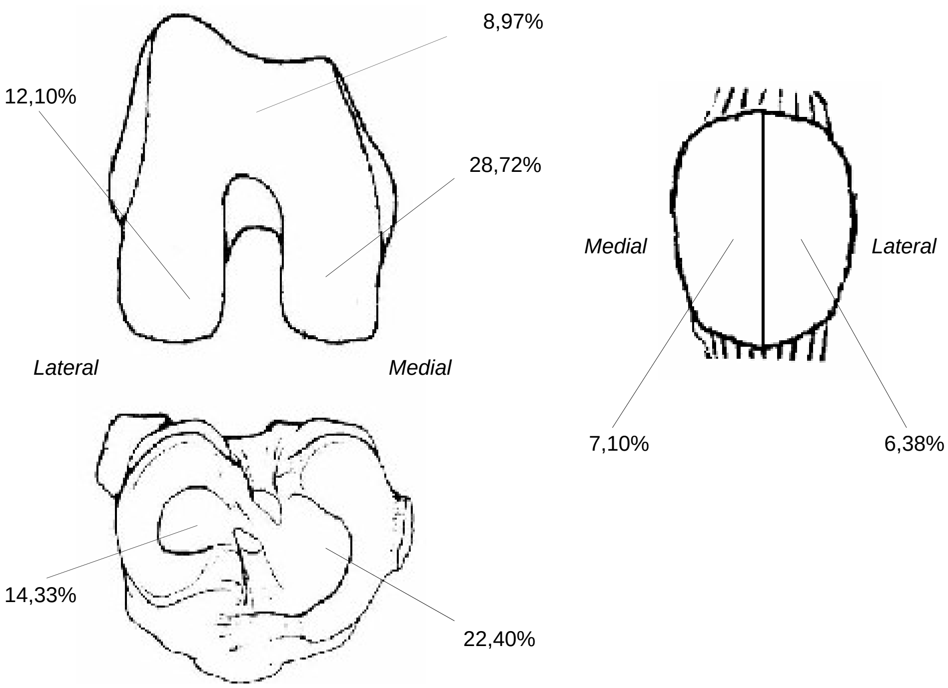
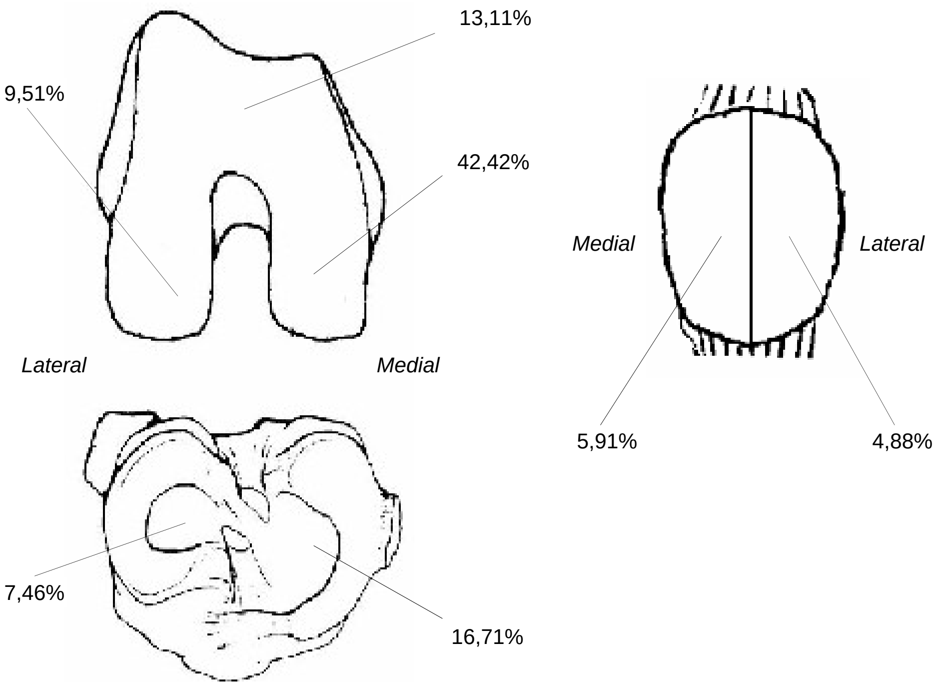


Figure 17: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 50: Outpatient surgery

	Yes		No		Missing		Total
2021	98	(58,3%)	70	(41,7%)			**168**
2020	98	(62,4%)	59	(37,6%)			**157**
2019	93	(49,5%)	93	(49,5%)	2	(1,1%)	**188**
2018	117	(53,9%)	98	(45,2%)	2	(0,9%)	**217**
2017	94	(43,7%)	118	(54,9%)	3	(1,4%)	**215**
2004-16	907	(43,6%)	1 152	(55,4%)	19	(0,9%)	**2 078**
Total	**1 407**	**(46,5%)**	**1 590**	**(52,6%)**	**26**	**(0,9%)**	**3 023**

Intraoperative complications

Table 51 : Intraoperative complications

	Yes		No		Missing		Total
2021	7	(4,2%)	159	(94,6%)	2	(1,2%)	**168**
2020	4	(2,5%)	153	(97,5%)			**157**
2019	7	(3,7%)	179	(95,2%)	2	(1,1%)	**188**
2018	3	(1,4%)	205	(94,5%)	9	(4,1%)	**217**
2017	13	(6,0%)	195	(90,7%)	7	(3,3%)	**215**
2004-16	70	(3,4%)	1 941	(93,4%)	67	(3,2%)	**2 078**
Total	**104**	**(3,4%)**	**2 832**	**(93,7%)**	**87**	**(2,9%)**	**3 023**

Systemic antibiotic prophylaxis

Table 52: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2021	164	(97,6%)	3	(1,8%)	1	(0,6%)	**168**
2020	157	(100,0%)					**157**
2019	185	(98,4%)	2	(1,1%)	1	(0,5%)	**188**
2018	214	(98,6%)	3	(1,4%)			**217**
2017	211	(98,1%)	3	(1,4%)	1	(0,5%)	**215**
2004-16	2 042	(98,3%)	27	(1,3%)	9	(0,4%)	**2 078**
Total	**2 973**	**(98,3%)**	**38**	**(1,3%)**	**12**	**(0,4%)**	**3 023**

Table 53: Drug

	2004-16	2017	2018	2019	2020	2021
Benzylpenicillin (Penicillin G)	0,05%					
Cefalotin (Keflin)	92,65%	93,36%	68,22%	14,05%	7,01%	7,32%
Cefazolin (Cephazolin)		3,32%	29,44%	77,30%	88,54%	88,41%
Ceftriakson (Rocefalin)	0,05%					
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	0,44%					
Ciprofloksasin (Ciproxin)	0,05%					
Dikloksacillin (Diclocil, Dicillin)	1,42%					
Gentamicin (Garamycin, Gensumycin)	0,05%					
Imipenem (Tienam)			0,47%			
Klindamycin (Dalacin, Clindamycin)	2,69%	2,37%	1,87%	3,24%	3,18%	3,66%
Kloksacillin (Ekvacillin)	1,96%	0,47%		5,41%	0,64%	
Oxacillin (Unspecified)	0,05%					
Vankomycin (Vancomycin, Vancocin)	0,05%					
Missing	0,54%	0,47%			0,64%	0,61%

Thrombosis prophylaxis

Table 54: Thrombosis prophylaxis

	Yes		No		Missing		Total
2021	73	(43,5%)	95	(56,5%)			**168**
2020	91	(58,0%)	66	(42,0%)			**157**
2019	117	(62,2%)	70	(37,2%)	1	(0,5%)	**188**
2018	151	(69,6%)	65	(30,0%)	1	(0,5%)	**217**
2017	163	(75,8%)	50	(23,3%)	2	(0,9%)	**215**
2005-16	1 616	(79,6%)	393	(19,4%)	24	(1,2%)	**2 033**
Total	**2 211**	**(74,2%)**	**739**	**(24,8%)**	**28**	**(0,9%)**	**2 978**

There are 2 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.
There are 40 forms with two drugs and 2171 forms with one drug.

Table 55: Drug

	2004-16	2017	2018	2019	2020	2021
Apixiban (Eliquis)	0,06%				1,10%	
Dalteparin (Fragmin)	63,92%	68,71%	62,91%	64,10%	43,96%	50,68%
Dekstran (Macrodex, Dextran)	0,12%					
Enoksaparin (Klexane)	34,03%	29,45%	35,76%	33,33%	31,87%	36,99%
Rivaroksaban (Xarelto)	0,06%					
Ticagrelor (Brilique)					1,10%	
Warfarin (Marevan)	0,06%					
Ximelagatran (Exanta, Malagatran)	0,19%					
No drugs	0,87%					
Missing	0,25%	1,23%	0,66%	0,85%		
Two drugs	0,12%	0,61%	0,66%	1,71%	21,98%	12,33%

PROM (Patient Reported Outcome Measures)

Table 56: Number of issued and answered patient questionnaires

	2 years *			5 years *			10 years *			Total		
	Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)	
2021	1 738	912	(52,5%)	1 824	829	(45,4%)	1 794	860	(47,9%)	**5 356**	**2 601**	(48,6%)
2020	1 884	1 145	(60,8%)	1 745	949	(54,4%)	1 708	934	(54,7%)	**5 337**	**3 028**	(56,7%)
2019	1 851	985	(53,2%)	1 697	886	(52,2%)	1 797	1 020	(56,8%)	**5 345**	**2 891**	(54,1%)
2018	1 863	1 024	(55,0%)	1 722	913	(53,0%)	1 646	831	(50,5%)	**5 231**	**2 768**	(52,9%)
2017	1 764	1 002	(56,8%)	1 745	943	(54,0%)	1 602	888	(55,4%)	**5 111**	**2 833**	(55,4%)
2016	1 719	1 034	(60,2%)	1 818	1 012	(55,7%)	1 426	812	(56,9%)	**4 963**	**2 858**	(57,6%)
2015	1 749	1 058	(60,5%)	1 717	966	(56,3%)	1 515	934	(61,7%)	**4 981**	**2 958**	(59,4%)
2014	1 749	1 035	(59,2%)	1 823	1 054	(57,8%)	899	554	(61,6%)	**4 471**	**2 643**	(59,1%)
2013	1 851	1 163	(62,8%)	1 688	989	(58,6%)				**3 539**	**2 152**	(60,8%)
2012	1 917	1 215	(63,4%)	1 800	959	(53,3%)				**3 717**	**2 174**	(58,5%)
2011	1 669	1 095	(65,6%)	1 303	717	(55,0%)				**2 972**	**1 812**	(61,0%)
2010	1 864	1 232	(66,1%)	1 694	1 127	(66,5%)				**3 558**	**2 359**	(66,3%)
2009	1 632	1 130	(69,2%)	762	527	(69,2%)				**2 394**	**1 657**	(69,2%)
2008	1 452	914	(62,9%)							**1 452**	**914**	(62,9%)
2007	1 351	723	(53,5%)							**1 351**	**723**	(53,5%)
2006	896	549	(61,3%)							**896**	**549**	(61,3%)
Total	26 949	16 216	(60,2%)	21 338	11 871	(55,6%)	12 387	6 833	(55,2%)	**60 674**	**34 920**	(57,6%)

* The register sends questionnaires to patients 2, 5 and 10 years post-operatively

Completeness analysis for the Norwegian Knee Ligament Register, 2019-2020

A completeness analysis for the Norwegian Knee Ligament Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Knee Ligament Register.

NCSP codes for combining data from NPR hospital stays and the Norwegian Knee Ligament Register

Code	Description
NGE 11 and S83.5/M23.5	Transcision or excision of ligament of knee; anterior cruciate, open, in connection with sprain of cruciate ligament/chronic instability of knee
NGE 12 and S83.5/M23.5	Transcision or excision of ligament of knee; posterior cruciate, open, in connection with sprain of cruciate ligament/chronic instability of knee
NGE 15	Transcision or excision of ligament of knee; anterior cruciate, arthroscopic
NGE 16	Transcision or excision of ligament of knee; posterior cruciate, arthroscopic
NGE 21	Fixation of fragment of surface of knee; anterior cruciate, open
NGE 22	Fixation of fragment of surface of knee; posterior cruciate, open
NGE 25	Fixation of fragment of surface of knee; anterior cruciate, arthroscopic
NGE 26	Fixation of fragment of surface of knee; posterior cruciate, arthroscopic
NGE 31	Transposition of ligament of knee; anterior cruciate, open
NGE 32	Transposition of ligament of knee; posterior cruciate, open
NGE 35	Transposition of ligament of knee; anterior cruciate, arthroscopic
NGE 36	Transposition of ligament of knee; posterior cruciate, arthroscopic
NGE 41	Plastic repair of ligament of knee not using prosthetic material; anterior cruciate, open
NGE 42	Plastic repair of ligament of knee not using prosthetic material; posterior cruciate, open
NGE 45	Plastic repair of ligament of knee not using prosthetic material; anterior cruciate, arthroscopic
NGE 46	Plastic repair of ligament of knee not using prosthetic material; posterior cruciate, arthroscopic
NGE 51	Plastic repair of ligament of knee using prosthetic material; anterior cruciate, open
NGE 52	Plastic repair of ligament of knee using prosthetic material; posterior cruciate, open
NGE 55	Plastic repair of ligament of knee using prosthetic material; anterior cruciate, arthroscopic
NGE 56	Plastic repair of ligament of knee using prosthetic material; posterior cruciate, arthroscopic
NGT 19 and S83.5/M23.5	Forcible manipulation of knee joint, in connection with sprain of cruciate ligament/chronic instability of knee

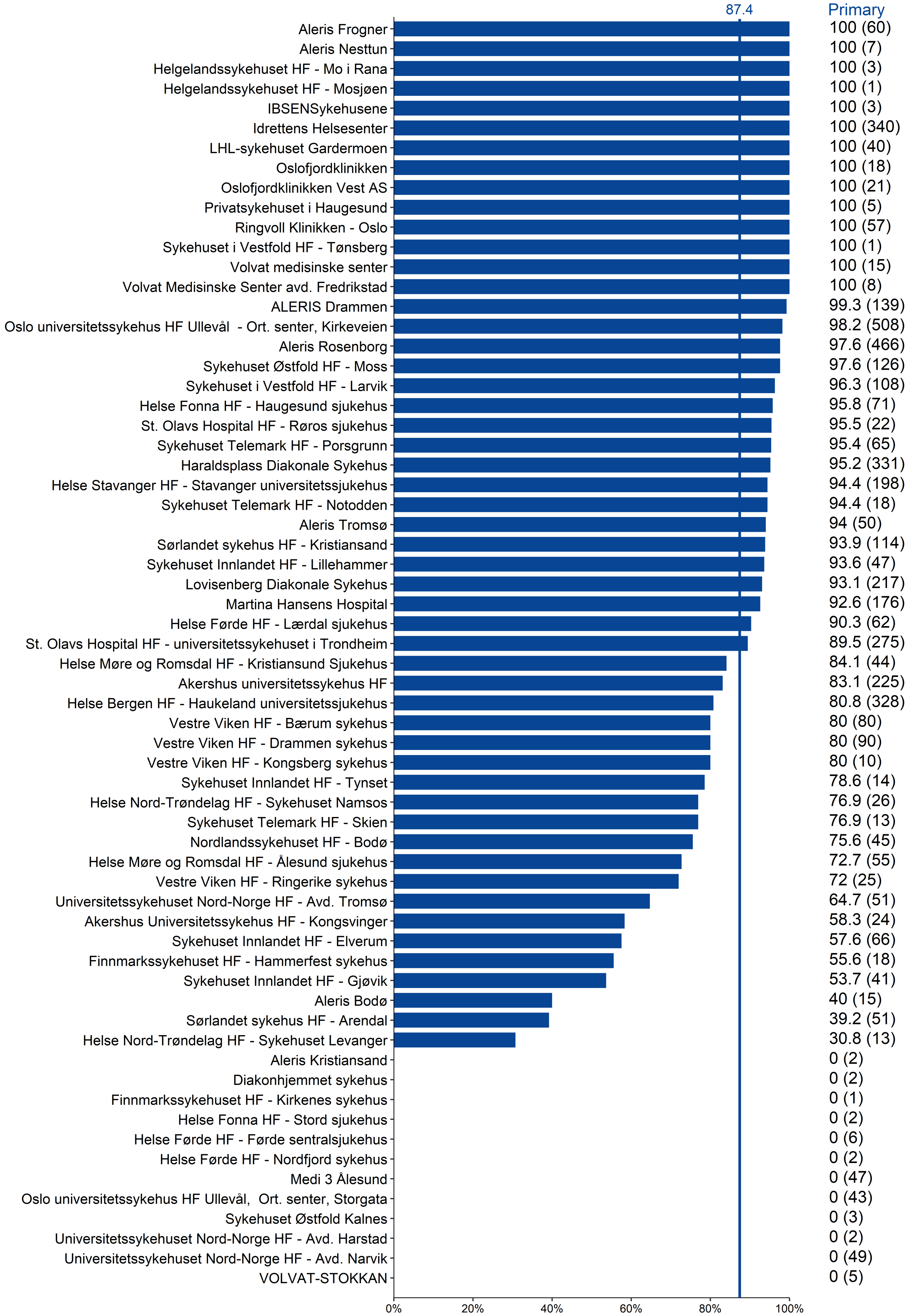
Formulae for completeness rates:

$$\text{Completeness rate NCLR} = \frac{\text{only NCLR} + \text{both registers}}{\text{only NPR} + \text{only NCLR} + \text{both registers}}$$

$$\text{Completeness rate NPR} = \frac{\text{only NPR} + \text{both registers}}{\text{only NPR} + \text{only NCLR} + \text{both registers}}$$

In 2019-2020, 4970 cruciate ligament operations were reported to one or both of the registers. 87.4% of these were reported to the Norwegian Knee Ligament Register, while 74.3% were reported to the NPR.
The coverage for the Norwegian Knee Ligament Register shows considerable variation between hospitals. In the case of hospitals with a lowcoverage rate for the Norwegian Knee Ligament Register, either the forms were not submitted or other interventionsthan cruciate ligament surgery were incorrectly coded.

Completeness of reporting for cruciate ligament operations 2019-2020



Vertical line shows the national average. The numbers in brackets gives the number of operations registered at both NAR and NPR.

CONTENTS

Norwegian Paediatric Hip Register

NORWEGIAN PAEDIATRIC HIP REGISTER: ANNUAL REPORT 2022

Now we are finally a national quality register with full electronic registration. The Paediatric Hip Register receives electronic notification forms from all relevant hospitals and in spring 2021 the PROM form was also sent to all registered children. Children diagnosed with hip dysplasia and Calvé-Legg-Perthes disease (CLP) receive the form at 10 and 18 years of age. Patients with epiphysiolysis of the femoral head receive the form one year after the first operation and at the age of 18. For children under 16, the form is sent via the parents' Bank ID, while those over 16 receive the form themselves. Forms are sent directly from the MRS, and we can retrieve the data we need at any time. As for adult hip surgery, PROMs will be included in the next update of the register as early as possible in 2022.

Fortunately, we now also seem to have put behind us most of the problems associated with COVID-19. For the Paediatric Hip Register, there does not appear to have been a clear decline in reporting related to the pandemic, but we note that reporting declined somewhat in 2021 compared with previous years. This may partly be due to random fluctuations, but we are completely dependent on good regular reporting from all relevant hospitals to enable us to provide reliable data. We ask you all to make an effort.

Regarding hip dysplasia, we see that almost three-quarters of patients reported were diagnosed after the age of three months, which is classified as late-presenting dysplasia. About half had not been screened by ultrasound at birth and over half had a subluxated or dislocated hip at diagnosis. These are important data to include upcoming studies of how screening of hip dysplasia is performed in Norwegian hospitals. Read more on our website.

In adult hip surgery, there is now steady reporting of hip arthroscopy and periacetabular osteotomy. Just over three-quarters of the procedures performed in this patient group are arthroscopies. Most patients are aged 20-40 years. When we also receive PROM data for these patients in 2022, we will be able to do interesting research on results in Norway.

Throughout the year, we have had a quality improvement project at the hospitals with the largest volume, with all four health regions represented. The aim has been to identify reasons for the time lag from symptoms to diagnosis for patients with CLP and epiphysiolysis of the hip. Preliminary results from the hospitals that have completed the survey show that the greatest delay is outside the hospital, where patients take time to see a doctor, but that it also takes some time before they are referred to radiology to confirm the diagnosis. Further work will be needed to complete the study and to communicate the findings to parents and primary healthcare. It is important that we make efforts to reduce this time lag. Read more here.

Many thanks to all the hospitals that have included patients in our register. Please remember that we now use falk.nhn.no for registration, and if you have not already received a new profile to log in, please request this as soon as possible.

Bergen, June 2022

Trude Gundersen

Trude Gundersen
Chief Physician/Associate Professor
Head of Paediatric Hip Register

COVID-19

Figure 1: Monthly total number of operations and treatment in 2019 - 2021

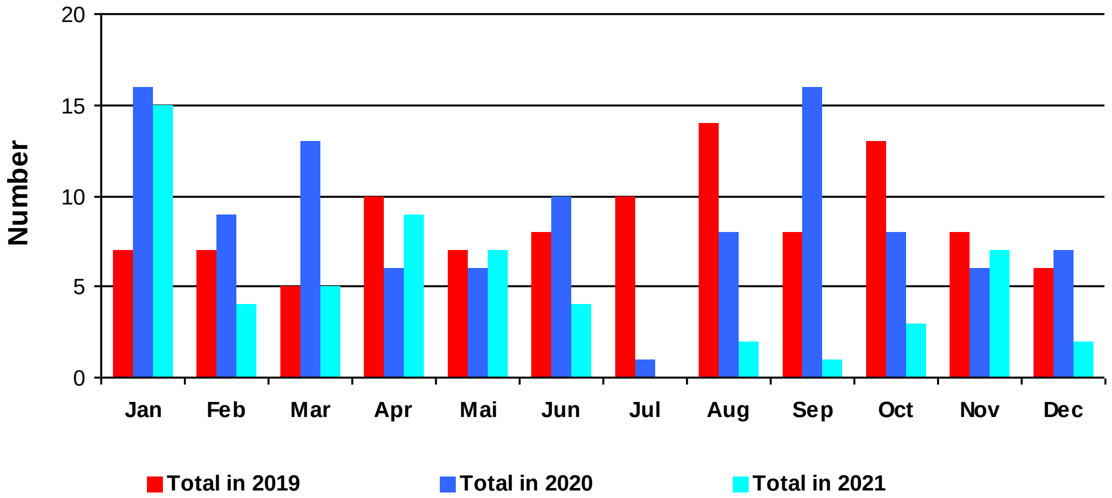


FIGURE F.1: Number of treated patients in the Pediatric Hip Register

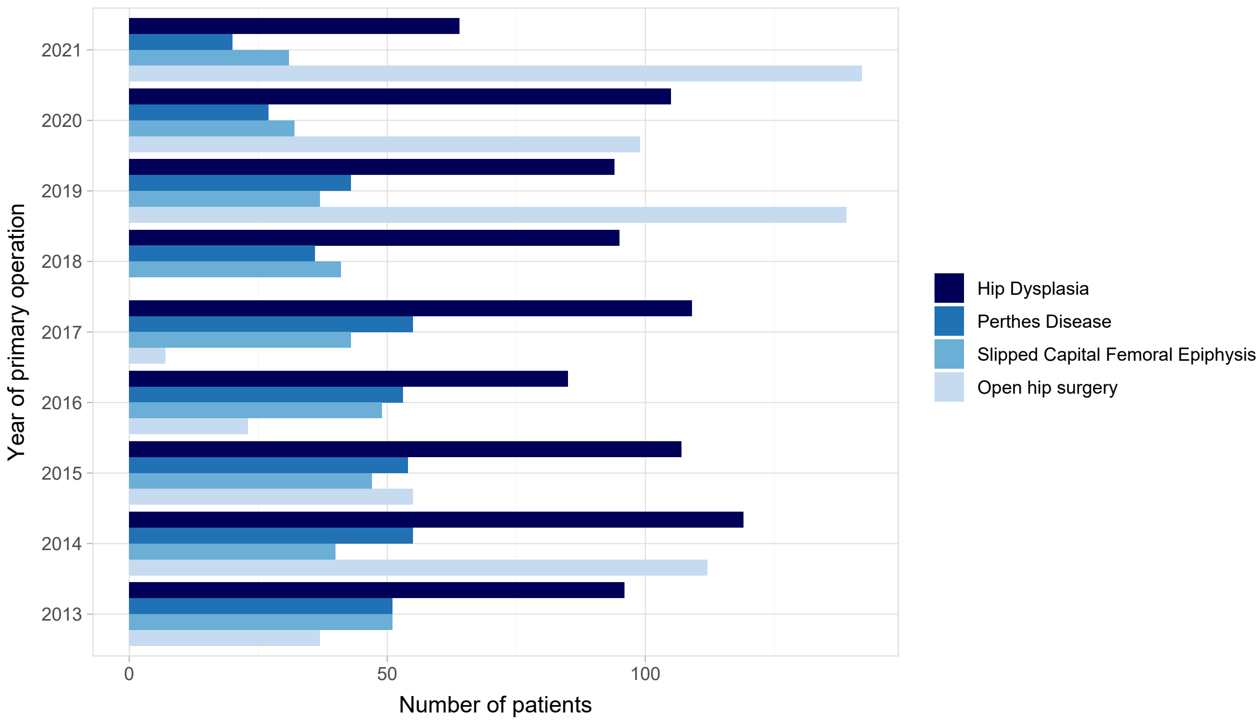
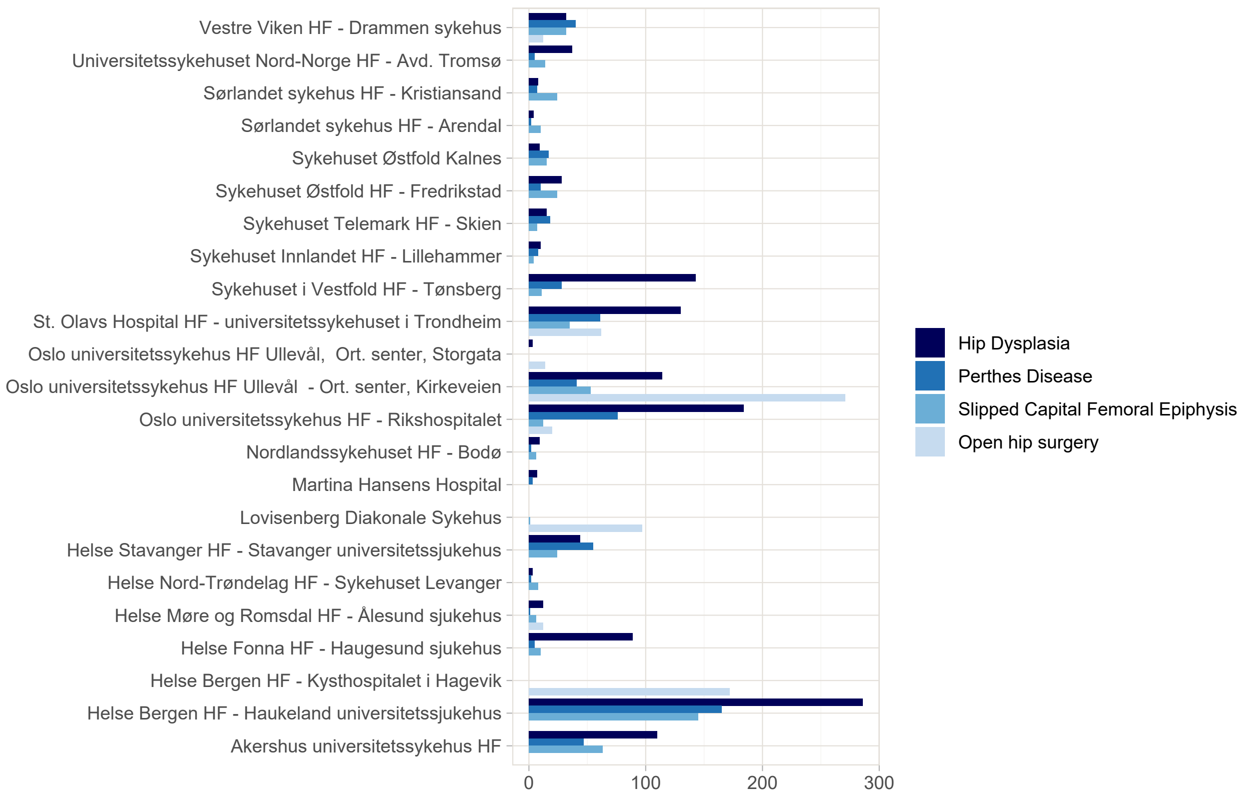


FIGURE F.2: Number of cases by diagnosis at each reporting hospital*



*Only hospitals with more than 10 operations in total are included

PAEDIATRIC HIP DISEASE

Hip Dysplasia

Table 1: HD - New cases per year

Year diagnosed	Unilateral	Bilateral	Missing	Total
2021	22	6	0	**28**
2020	32	19	0	**51**
2019	44	30	0	**74**
2018	40	16	0	**56**
2017	55	19	0	**74**
2016	42	18	0	**60**
2015	42	16	0	**58**
2014	64	26	1	**91**
2013	57	19	0	**76**
2012	78	30	0	**108**
2011	68	19	0	**87**
2010	95	20	0	**115**
Unknown	18	5	8	**31**
Total	**657**	**243**	**9**	**909**

Table 2: HD - Diagnosis duration (in months)

Year diagnosed	< 3 mth	> 3 mth	Total
2021	9	25	**34**
2020	22	49	**71**
2019	48	59	**107**
2018	31	43	**74**
2017	41	52	**93**
2016	33	49	**82**
2015	24	54	**78**
2014	48	68	**116**
2013	37	58	**95**
2012	58	81	**139**
2011	42	65	**107**
2010	46	86	**132**
Total	**439**	**689**	**1 128**

Table 3: HD - Earlier treatment

Year treated	None	Abd. orthosis	Other	Missing	Total
2021	25	21	8	4	**58**
2020	46	38	8	7	**99**
2019	49	33	8	2	**92**
2018	44	39	9	3	**95**
2017	43	46	16	4	**109**
2016	33	37	9	6	**85**
2015	39	24	16	28	**107**
2014	38	40	14	27	**119**
2013	30	16	9	41	**96**
2012	6	6	0	127	**139**
2011	1	1	0	96	**98**
2010	3	3	0	121	**127**
Total	**357**	**304**	**97**	**466**	**1 224**

More than one form for patient per side is possible.

Table 4: HD - Hip status

Year treated	Normally located	Subluxated	Dislocated	Missing	Total
2021	26	24	8	0	**58**
2020	64	25	7	3	**99**
2019	61	14	15	2	**92**
2018	73	13	5	4	**95**
2017	69	18	19	3	**109**
2016	43	13	21	8	**85**
2015	55	25	17	10	**107**
2014	67	15	35	2	**119**
2013	50	19	18	9	**96**
2012	69	21	35	14	**139**
2011	56	14	23	5	**98**
2010	65	24	29	9	**127**
Total	**698**	**225**	**232**	**69**	**1 224**

More than one form for patient per side is possible

Table 5: HD - Acetabular index

Year diagnosed	< 30°	< 40°	>= 40°	Missing	Total
2021	2	14	12	0	**28**
2020	4	23	23	1	**51**
2019	6	24	39	5	**74**
2018	5	28	15	8	**56**
2017	11	32	21	10	**74**
2016	7	20	24	9	**60**
2015	3	20	25	10	**58**
2014	13	35	29	14	**91**
2013	10	29	22	15	**76**
2012	16	38	41	13	**108**
2011	16	35	28	8	**87**
2010	33	39	27	16	**115**
Unknown	3	6	3	19	**31**
Total	**129**	**343**	**309**	**128**	**909**

Mean number used for both hips for bilateral HD,

Table 6: HD - Pelvic osteotomy

Treatment year	Salter	Dega	Other	Total
2021	1	1	0	**2**
2020	2	2	0	**4**
2019	4	4	0	**8**
2018	1	10	0	**11**
2017	3	13	1	**17**
2016	2	8	2	**12**
2015	5	7	3	**15**
2014	8	2	0	**10**
2013	7	0	0	**7**
2012	3	0	0	**3**
2011	1	1	3	**5**
2010	1	1	0	**2**
Total	**38**	**49**	**9**	**96**

Table 7: HD - Femoral osteotomy

Treatment year	Varus osteotomy	Rotational osteotomy	Shortening	Total
2021	1	0	0	**1**
2020	3	2	0	**5**
2019	4	2	1	**7**
2018	1	0	0	**1**
2017	7	5	2	**14**
2016	7	5	0	**12**
2015	6	3	2	**11**
2014	1	0	0	**1**
2013	5	4	3	**12**
2012	2	2	0	**4**
2011	3	2	1	**6**
2010	1	3	1	**5**
Total	**41**	**28**	**10**	**79**

Table 8a: HD - Ultrasound Screened at birth

Year diagnosed	Yes	No	Total
2021	14	19	**33**
2020	29	31	**60**
2019	44	55	**99**
2018	6	34	**40**
2017	16	21	**37**
2016	4	8	**12**
2015	3	3	**6**
2014		1	**1**
2012		2	**2**
Total	**116**	**174**	**290**

Table 8b: HD - Ultrasound Screened at birth

Year treated	Yes	No	Total
2021	26	29	**55**
2020	45	44	**89**
2019	28	49	**77**
2018	6	39	**45**
2017	11	12	**23**
2016	2	1	**3**
2015	1	1	**2**
Total	**119**	**175**	**294**

Slipped Capital Femoral Epiphysis (SCFE)

Table 9: SCFE - New cases per year

Year diagnosed	Unilateral	Bilateral	Total
2021	18	6	**24**
2020	16	2	**18**
2019	14	6	**20**
2018	15	7	**22**
2017	25	11	**36**
2016	26	10	**36**
2015	24	8	**32**
2014	24	3	**27**
2013	17	18	**35**
2012	18	5	**23**
2011	29	10	**39**
2010	22	6	**28**
Unknown	15	11	**26**
Total	**263**	**103**	**366**

Table 10: SCFE - Classification

Year diagnosed	Acute	Chronic	Acute on chronic	Stable (Able to bear weight)	Unstable (Unable to ambulate)
2021	8	9	7	15	8
2020	3	11	4	11	7
2019	2	13	5	15	4
2018	3	14	4	15	5
2017	5	22	5	24	10
2016	5	22	8	24	11
2015	6	23	2	26	5
2014	1	18	6	13	11
2013	4	20	5	25	5
2012	4	8	5	8	6
2011	7	16	7	23	4
2010	4	15	3	18	7
Unknown	1	10	0	10	0
Total	**53**	**201**	**61**	**227**	**83**

Table 11: SCFE - Symptoms duration

Year diagnosed	< 6 weeks	6 - 26 weeks	> 26 weeks	Total
2021	8	11	5	**24**
2020	5	8	5	**18**
2019	4	10	6	**20**
2018	5	13	3	**21**
2017	10	17	6	**33**
2016	6	22	7	**35**
2015	7	22	2	**31**
2014	3	18	4	**25**
2013	6	17	7	**30**
2012	6	9	2	**17**
2011	11	12	9	**32**
2010	8	16	2	**26**
Unknown	1	10	0	**11**
Total	**80**	**185**	**58**	**323**

Table 12: SCFE - Degree of slip

Year diagnosed	< 30°	30 - 50°	> 50°	Total
2021	8	6	10	**24**
2020	7	4	5	**16**
2019	11	7	2	**20**
2018	11	5	3	**19**
2017	13	7	9	**29**
2016	12	10	9	**31**
2015	15	9	4	**28**
2014	8	7	9	**24**
2013	17	11	4	**32**
2012	6	4	5	**15**
2011	11	10	6	**27**
2010	16	4	7	**27**
Unknown	5	1	3	**9**
Total	**140**	**85**	**76**	**301**

Table 13: SCFE - Primary operation

Year treated	Screw osteosynthesis	Femoral osteotomy	Pin osteosynthesis	Total
2021	29	2	1	**32**
2020	23	1	1	**25**
2019	27	2	4	**33**
2018	31	0	2	**33**
2017	34	1	3	**38**
2016	34	0	7	**41**
2015	26	1	10	**37**
2014	30	1	4	**35**
2013	36	0	12	**48**
2012	14	0	9	**23**
2011	26	1	15	**42**
2010	25	1	13	**39**
Total	**335**	**10**	**81**	**426**

Table 14a: SCFE - Implants that allow further growth

Year diagnosed	Yes	No	Total
2021	23	6	**29**
2020	13	3	**16**
2019	12	10	**22**
2018	2	5	**7**
2017	4	6	**10**
2016	4		**4**
2015		3	**3**
Total	**58**	**33**	**91**

Table 14b: SCFE - Implants that allow further growth

Year treated	Yes	No	Total
2021	23	6	**29**
2020	20	5	**25**
2019	13	15	**28**
2018	2	5	**7**
2017		3	**3**
2016		1	**1**
2015		1	**1**
Total	**58**	**36**	**94**

Perthes disease

Table 15: Perthes - Number of new cases per year

Year diagnosed	Unilateral	Bilateral	Total
2021	13	1	**14**
2020	15	1	**16**
2019	28	5	**33**
2018	23	6	**29**
2017	34	6	**40**
2016	29	2	**31**
2015	29	7	**36**
2014	39	1	**40**
2013	45	3	**48**
2012	44	5	**49**
2011	30	4	**34**
2010	62	12	**74**
Unknown	40	5	**45**
Total	**431**	**58**	**489**

Table 16: Perthes - Catterall classification

Year diagnosed	I/II	III/IV	Missing	Total
2021	9	5	0	**14**
2020	5	11	0	**16**
2019	10	22	1	**33**
2018	8	23	0	**31**
2017	11	25	4	**40**
2016	7	19	5	**31**
2015	11	22	4	**37**
2014	7	27	6	**40**
2013	12	28	8	**48**
2012	16	27	6	**49**
2011	11	22	1	**34**
2010	22	44	8	**74**
Unknown	1	17	33	**51**
Total	**130**	**292**	**76**	**498**

I/II = < 50 % caput necrosis III/IV = < 50 % caput necrosis

Table 17: Perthes - Symptoms duration (in months)

Year diagnosed	< 1 mth	1 - 10 mth	11 -30 mth	31-50 mth	> 50 mth	Total
2021	0	14	0	0	0	**14**
2020	0	13	3	0	0	**16**
2019	2	26	3	2	0	**33**
2018	0	24	0	2	0	**26**
2017	0	32	5	0	0	**37**
2016	0	24	2	0	0	**26**
2015	0	29	4	0	0	**33**
2014	0	31	5	1	0	**37**
2013	0	24	10	2	0	**36**
2012	2	23	10	1	0	**36**
2011	1	26	5	1	1	**34**
2010	1	48	11	0	1	**61**
Unknown	0	8	7	0	0	**15**
Total	**6**	**322**	**65**	**9**	**2**	**404**

Table 18: Perthes - Treatment

Year treated	None/ physiotherapy	Abduction orthosis	Femoral osteotomy	Pelvic osteotomy	Total
2021	15	1	1	0	**17**
2020	14	0	4	0	**18**
2019	25	0	13	0	**38**
2018	24	0	8	1	**33**
2017	38	0	10	2	**50**
2016	24	0	21	1	**46**
2015	32	0	12	2	**46**
2014	37	2	11	0	**50**
2013	36	0	14	0	**50**
2012	39	0	4	4	**47**
2011	34	0	15	1	**50**
2010	46	0	10	0	**56**
Total	**364**	**3**	**123**	**11**	**501**

Table 19: Perthes - Plates

Year treated	Prebent plate	Angel plate	Special plate
2021	0	1	0
2020	0	2	3
2019	2	2	9
2018	0	2	6
2017	0	1	9
2016	2	2	14
2015	1	2	8
2014	0	0	10
2013	2	1	10
2012	1	0	8
2011	0	0	19
2010	1	7	3
Total	**9**	**20**	**99**

Table 20: Perthes - Operated / not operated versus catterall classification

Year treated	Operated		Non Operated		
	I/II	III/IV	I/II	III/IV	Total
2021	0	3	10	6	19
2020	0	12	5	9	26
2019	1	17	11	13	42
2018	0	9	9	16	34
2017	0	10	13	23	46
2016	0	8	8	17	33
2015	0	8	11	20	39
2014	0	9	10	24	43
2013	0	11	12	20	43
2012	0	10	15	21	46
2011	1	18	16	20	55
2010	0	13	20	23	56
Ukjent	0	0	0	0	0
Total	**2**	**128**	**140**	**212**	**482**

I/II = < 50 % caput necrosis III/IV = > 50 % caput necrosis

Adult hips *

Table 21: AH - Annual numbers of all operations

Year	Primary operation		Reoperation		Total
2019	114	(82,0%)	25	(18,0%)	**139**
2020	87	(87,9%)	12	(12,1%)	**99**
2021	122	(85,9%)	20	(14,1%)	**142**
Total	**323**	**(85,0%) ***	**57**	**(15,0%) ****	**380**

Table 22: AH - Annual numbers of intervention types

Year	Open procedure		Scopy		Total
2019	59	(42,4%)	80	(57,6%)	**139**
2020	41	(41,4%)	58	(58,6%)	**99**
2021	35	(24,6%)	107	(75,4%)	**142**
Total	**135**	**(35,5%) ***	**245**	**(64,5%) ****	**380**

Table 23: AH - Annual numbers of all operations in the different age groups

Year	10-20		21-30		31-40		41-50		> 50		Total
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	
2019	28	10	21	32	22	12	7	5	2	0	**139**
2020	11	10	20	20	12	9	7	7	3	0	**99**
2021	15	10	21	25	24	22	13	4	3	5	**142**
Total	**54**	**30**	**62**	**77**	**58**	**43**	**27**	**16**	**8**	**5**	**380**

* Registration started in 2019

Completeness analysis for the Norwegian Pediatric Hip Register, 2019-2020

A completeness analysis has been conducted for the Norwegian Pediatric Hip Register (NPHR) for primary operations (osteosynthesis, partial and total arthroplasty) performed in the period 2019-2020. A report and analysis have been prepared by the Norwegian Patient Register (NPR) in cooperation with the NPHR. A report on the implementation and results will be published at www.helsedirektoratet.no.

NCSP codes for combining data from NPR hospital stays and the Norwegian Pediatric Hip Register

Operation	Code	Description
CLP	NEK 59	Angulation, rotation or displacement osteotomy of pelvis
	NFK 49	Epiphysiodesis of femur
	NFK 59	Angulation, rotation or displacement osteotomy of femur
	TNF 31	Prefabricated orthosis of hip joint or thigh
	TNF 32	Splint of malleable material on hip or thigh
	TNF 33	Circular plaster cast on hip or thigh
HD	NEK 59	Angulation, rotation or displacement osteotomy of pelvis
	NFH 00	Closed reduction of dislocation of hip joint
	NFH 02	Open reduction of dislocation of hip joint
	NFK 59	Angulation, rotation or displacement osteotomy of femur
	NFL 39	Myotomy or tenotomy of hip or thigh
	TNE 34	Large plaster dressing on pelvis
	TNF 32	Splint of malleable material on hip or thigh
	TNF 33	Circular plaster cast on hip or thigh
	TNF 34	Large plaster dressing on hip or thigh
SCFE	NEK 59	Angulation, rotation or displacement osteotomy of pelvis
	NFJ 40	Osteosynthesis of fracture of femur using wire, cerclage or pin
	NFJ 70	Osteosynthesis of fracture of femur using screws
	NFK 49	Epiphysiodesis of femur
	NFK 59	Angulation, rotation or displacement osteotomy of femur

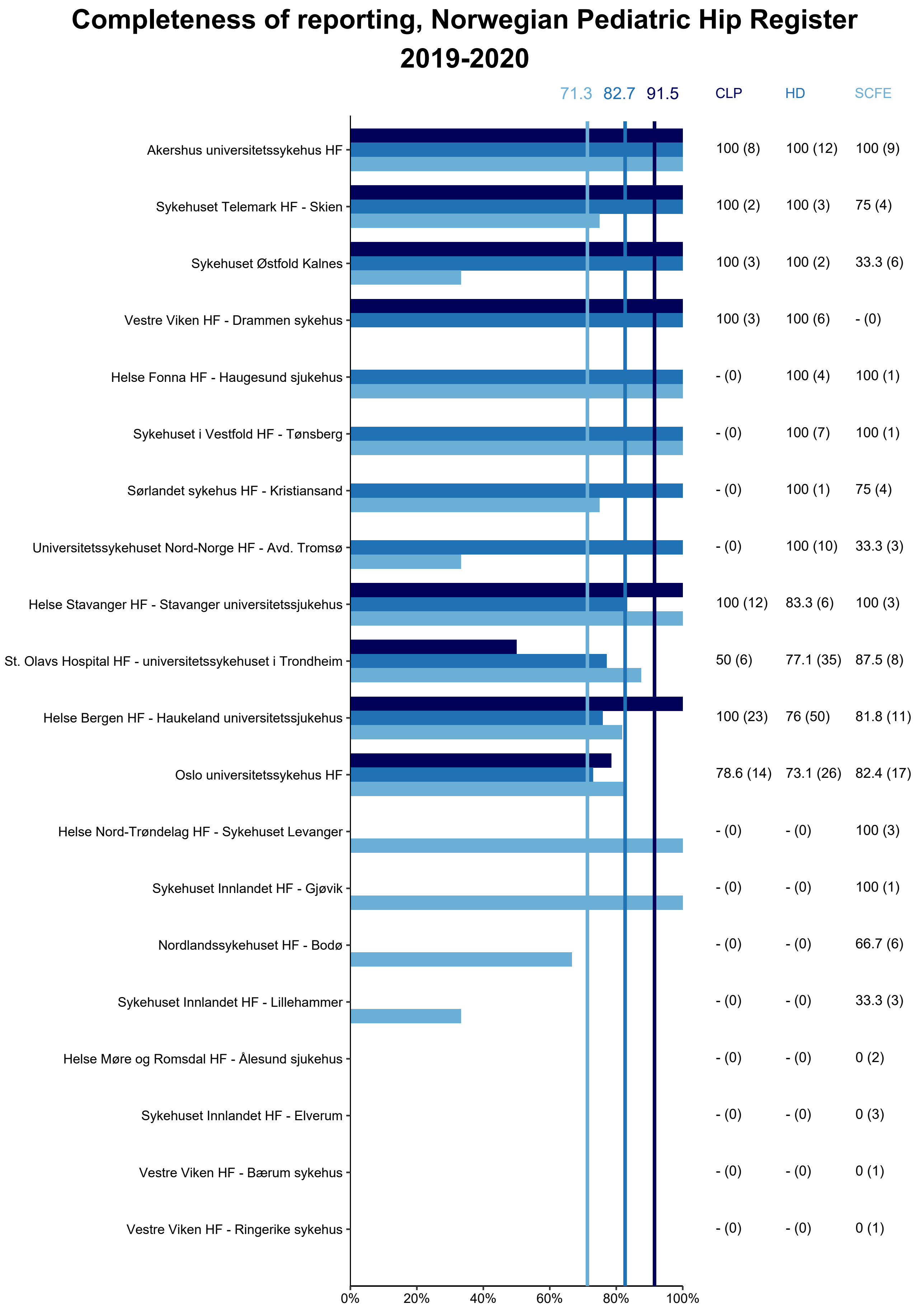
Formler for dekningsgrad (DG)

$$\text{Completeness rate NPHR} = \frac{\text{only NPHR} + \text{inclusion both registers}}{\text{only NPR} + \text{only NPHR} + \text{inclusion both registers}}$$

$$\text{Completeness rate NPR} = \frac{\text{only NPR} + \text{inclusion both registers}}{\text{only NPR} + \text{only NPHR} + \text{inclusion both registers}}$$

Information in the NPHR showed a high degree of agreement with the information in the NPR. Completeness for Perthes disease was 92 %, for Hip dysplasia 83 % and Slipped Capital Femoral Epiphysis 71 %. However, there are considerable variations in completeness between hospitals. Many of the hospitals have completeness under 80 %, which we consider very low. One explanation for low completeness rates in NPHR may be patients not giving consent to registration of the data. The differences between rates for primary CLP, HD and SCFE show that this cannot be the only cause and that hospitals must improve their reporting of primary hip fracture surgery with the correct diagnostic and procedure codes.

The following pages show the hospital-based completeness analysis for the Norwegian Pediatric Hip Register. We urge hospitals with low completeness to review their coding practices and routines in reporting to the registers.



Dark blue bars and first number to the right of the bars gives completensess of reporting for CLP. Medium blue bars and second number to the right of the bars gives completensess of reporting for HD. Light blue bars and third number to the right of the bars gives completensess of reporting for SCFE. The numbers in paranthesis gives the number of operations registered at both NPHR and NPR. Vertical lines shows the national averages.

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Oral presentations/Abstracts/Posters from 2021 to May 2022 (26)

Norwegian Arthroplasty Register (11)

Fenstad AM, Nilsen D, Kroken G, Dybvik E, Hallan G, Gjertsen JE, Furnes O. Poster presentasjon: Semtentert fiksering av lårbensprotese hos eldre pasienter- Kvalitetsforbedringsprosjekt med bruk av data fra nasjonale medisinske kvalitetsregistre. Helse- og kvalitetsregisterkonferansen; 2021 15.-16. November; Oslo

Fenstad AM, Furnes O, Hallan G, Gjertsen JE, Dybvik E, Kroken G, Lie SA. Poster presentation: A journey from implant to patient. NOFE Conference; 2021 3.-4. November; Bergen

Dybvik E, et.al. Poster presentasjon: Elektronisk registrering av operasjonsskjema. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

Dybvik E, et.al. Poster presentasjon: Elektronisk registrering av PROM. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

Omenås HN, Fenstad AM, Furnes O, Badawy M. En registeranalyse av laterale unikondylære kneproteser i Norge fra 1994-2020. Høstmøtet i Norsk Ortopedisk Forening 27.-29. oktober; Oslo

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Randsborg PH, Aae TF, Bukholm IRK, Fenstad AM, Furnes O, Jakobsen RB. Pasientskadeerstatning etter kneprotesekirurgi i Norge 2008-2018. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

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Brendsdal E, Lie SA, Furnes O, Krukhaug Y. Langtidsoverlevelse av 2997 MCP proteser rapportert til Nasjonalt Register for Leddproteser 1994-2019. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

Thoen P, Lygre SHL, Nordsletten L, Furnes O, Stigum H, Hallan G, Röhrl SM. Factors associated with revision surgery due to dislocation after primary total hip arthroplasty- A study from the Norwegian arthroplasty register. Virtual EFFORT Congress; 2021 30 June-02 July

Furnes O. Leddproteseregisteret. NORSMAN; 2021 3. mars; Lunsjwebinar

Norwegian Hip fracture Register (1)

Grønhaug K, Dybvik E, Matre K, Østman B, Gjertsen JE. Intramedullary nail versus sliding hip screw for stable and unstable trochanteric and subtrochanteric fractures. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. Oktober; Oslo

Norwegian Knee Ligament Register (8)

Martin RK, Wastvedt S, Pareek A, Persson A, Visnes H, Fenstad AM, Moatshe G, Wolfson J, Engebretsen L. ISAKOS predicting subsequent revision ACL reconstruction: A machine learning analysis of the Norwegian knee ligament register. ISAKOS 2021 27.-28. Nov; Minnesota, Minneapolis

Visnes H, Gifstad T, Persson A, Lygre SHL, Engebretsen L, Drogset JO, Furnes O. ACL reconstruction patients have increased risk of knee arthroplasty: Data from the Norwegian knee ligament register and the Norwegian arthroplasty register from 2004-2019. ISAKOS 2021 27.-28. Nov; Minnesota, Minneapolis

Visnes H, Gifstad T, Persson A, Lygre SHL, Engebretsen L, Drogset JO, Furnes O. Pasienter med fremre korsbåndrekonstruksjon har øket risiko for kneprotese etter 15 års oppfølging. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

Tveiten CK, Fenstad AM, Persson A, Visnes H, Engebretsen L, Ekås G. Incidence of pediatric anterior cruciate ligament reconstructions in Norway from 2005 to 2019. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. Oktober; Oslo

Martin RK, Wastvedt S, Pareek A, Persson A, Visnes H, Fenstad AM, Moatshe G, Wolfson J, Lind M, Engebretsen L. Predicting anterior cruciate ligament reconstruction revision: External validation of a machine learning algoritm. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. Oktober; Oslo

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Aga C, Visnes H, Fenstad AM, Heir S. Revisjonsrate for ACL-rekonstruksjoner ved Martina Hansens Hospital de siste 15 år. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

Clinical studies related to Norwegian National Advisory Unit on Arthroplasty and Hip Fractures (6)

Birkenes T. Furnes O. Årøen A, Solheim E, Knutsen G, Drogset JO, Løken S, Engebretsen L, Lygre SHL, Visnes H. Langtidsresultater etter bruskkirurgi i Norge- PROM hos pasienter uten senere kneprotese eller osteotomi. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

Sandboe EØ, Fenstad AM, Furnes O, Hole R. AC-leddsluksasjoner operert med artroskopisk assistert coracoclaviculær fiksering med og uten tilleggsstabilisering. Høstmøtet i Norsk Ortopedisk Forening. 2021 27.-29. oktober; Oslo

Ludvigsen T, Hammer OL, Fevang J, Matre K, Dybvik E, Randsborg PH. Complex regional pain syndrome following distal radius fracture. Does surgical method matter? Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

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Johannessen HG, Kadar T, Hallan G, Fenstad AM, Haugan K, Høl PJ, Badawy M, Stokke T, Jonsson B, Indrekvam K, Aamodt A, Furnes O. Stammemigrasjon etter 10 år. RSA- resultater fra studien Charnley vs Reflection/Spectron EF. Høstmøtet i Norsk Ortopedisk Forening; 2021 27.-29. oktober; Oslo

Operation forms (in Norwegian only)
Data from these forms is the basis of this report.

Operation forms are not updated, as we are in a working process of being fully electronical.

Nasjonalt Register for Leddproteser
Ortopedisk klinikk, Helse Bergen HF
Haukeland universitetssjukehus, Postboks 1400
Møllendalsbakken 11, 5021 BERGEN
Tlf 55973742/55973743

F.nr. (11 sifre)..
Navn:...
(Skriv tydelig ev. pasientklistrelapp – **spesifiser sykehus**.)
Sykehus:...

HOFTEPROTESER

Alle totale hofteproteseoperasjoner og hemiproteser på annen indikasjon enn fraktur/fraktursekvele registreres her (hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema). Alle reoperasjoner skal registreres: skifte/fjerning av protesedeler, kantplastikk, bløtdelsdebridement, og operasjoner for protesenær fraktur eller gluteal svikt.

TIDLIGERE OPERASJON I AKTUELLE HOFTE (ev. flere kryss)
☐0 Nei
☐1 Osteosyntese for fraktur i prox. femurende
☐2 Hemiprotese pga. fraktur
☐3 Osteotomi
☐4 Artrodese
☐5 Totalprotese(r)
☐6 Annen operasjon ………………………………………………

AKTUELLE OPERASJON (ett kryss)
☐1 Primæroperasjon (også hvis hemiprotese tidligere)
☐2 Reoperasjon (totalprotese tidligere)
☐3 Primær hemiprotese for annen indikasjon enn fraktur/fraktursekvele

OPERASJONSDATO (dd.mm.åå) |__|__| |__|__| |__|__|

AKTUELLE SIDE (ett kryss) (Bilateral opr.= 2 skjema)
☐1 Høyre ☐2 Venstre

ÅRSAK TIL AKTUELLE OPERASJON (KRYSS AV ENTEN I A ELLER B)

A. Primæroper. pga (ev. flere kryss)
☐1 Idiopatisk coxartrose
☐2 Rheumatoid artritt
☐3 Sekvele etter frakt. colli. fem.
☐4 Sekv. dysplasi
☐5 Sekv. dysplasi med total luksasjon
☐6 Sekv. Perthes
☐7 Sekv. epifysiolyse
☐8 Mb. Bechterew
☐9 Akutt fraktura colli femoris
☐10 Annet……………………………….
(f.eks caputnekrose, tidl. artrodese o.l)

B. Reoper. pga (ev. flere kryss)
☐1 Løs acetabularkomponent
☐2 Løs femurkomponent
☐3 Luksasjon
☐4 Dyp infeksjon
☐5 Fraktur i acetabulum
☐6 Fraktur av femur
Vancouverklassifikasjon, se bakside.
☐A ☐B1 ☐B2 ☐B3 ☐C
☐7 Smerter
☐8 Osteolyse i acetab. uten løsning
☐9 Osteolyse i femur uten løsning
☐10 Implantatfraktur femurdel
☐11 Implantatfraktur caput
☐12 Implantatfraktur kopp
☐13 Implantatfraktur liner
☐14 Implantatfraktur annet: ....
....
☐15 Gluteal svikt
☐16 Annet……………………………
(f.eks Girdlestone etter tidl. infisert protese)

REOPERASJONSTYPE (ev. flere kryss)
☐1 Bytte av femurkomponent
☐2 Bytte av acetabularkomponent
☐3 Bytte av hele protesen
☐4 Fjernet protese og satt inn sementspacer
☐5 Fjernet sementspacer og satt inn ny protese
☐6 Fjernet protese (Girdlestone eller fjerning av sementspacer)
Angi hvilke deler som ble fjernet…………………………………………………
☐7 Bytte av plastforing
☐8 Bytte av caput
☐9 Bløtdelsdebridement
☐10 Ny protese etter Girdlestone
☐11 Resutur av muskel
☐12 Transposisjon av muskel
☐13 Osteosyntese for fraktur
☐14 Konvertering til hemiprotese
☐15 Andre operasjoner ………………………………………………………………

TILGANG (ett kryss)
☐1 Fremre (Mellom sartorius og tensor)
☐2 Anterolateral (Mellom glut. medius og tensor)
☐3 Direkte lateral (Transgluteal)
☐4 Bakre (Bak gluteus medius)
☐5 Annen ………………………………………………………………………

MINIINVASIV KIRURGI (MIS) ☐0 Nei ☐1 Ja
LEIE ☐0 Sideleie ☐1 Rygg
TROCHANTEROSTEOTOMI ☐0 Nei ☐1 Ja

BENTRANSPLANTASJON (ev. flere kryss)
Acetabulum ☐0 Nei ☐1 Ja ☐2 Benpakking
Femur ☐0 Nei ☐1 Ja ☐2 Benpakking a.m. Ling/Gie

BENTAP VED REVISJON (Paprosky's klassifikasjon se baksiden)
Acetabulum ☐1 I ☐2 IIA ☐3 IIB ☐4 IIC ☐5 IIIA ☐6 IIIB
Femur ☐1 I ☐2 II ☐3 IIIA ☐4 IIIB ☐5 IV

PROTESEKOMPONENTER (Bruk klistrelapp på baksiden, eller skriv REF.NR.)

Acetabulum
Navn/Type ……………………………………………………………………………………
ev. REF.NR. … ……………………………………………………………………
☐ Med hydroksylapatitt ☐ Uten hydroksylapatitt
☐1 Sement med antibiotika – Navn ………………………………………………………
☐2 Sement uten antibiotika – Navn ………………………………………………………
☐3 Usementert

Femur (+ ev. trokanterdel)
Navn/Type ……………………………………………………………………………………
ev. REF.NR. .. ……………………………………………………………………
☐ Med hydroksylapatitt ☐ Uten hydroksylapatitt
☐1 Sement med antibiotika – Navn ………………………………………………………
☐2 Sement uten antibiotika – Navn ………………………………………………………
☐3 Usementert

Caput (+ ev. halsdel)
☐1 Fastsittende caput
☐2 Separat caput - Navn/Type ……………………………………………………………
ev. REF. NR. .. ……………………………………………………………………
Diameter ……………………………………………………………………………………

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

Navn *Dosering* *Varighet i timer*

Medikament 1…………………………………………………………… ………..timer

Medikament 2…………………………………………………………… ………..timer

Medikament 3…………………………………………………………… ………..timer

TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja: Første dose ☐1 Preoperativt ☐2 Postoperativt
Medikament 1…………………..Dosering opr.dag…………………………………
Dosering videre…..……Varighet…………..……døgn
Medikament 2…………………. Dosering………….……Varighet…………..……døgn

FAST TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: ……………………………………………………………………………

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament: ………………………………….. Dosering………………

OPERASJONSSTUE
☐1 "Green house"
☐2 Operasjonsstue med laminær luftstrøm
☐3 Vanlig operasjonsstue

OPERASJONSTID (hud til hud) ………………………..min

PEROPERATIV KOMPLIKASJON
☐0 Nei
☐1 Ja,hvilke(n) ……………………………………………………………………………………

ASA KLASSE (se baksiden for definisjon)
☐1 Frisk
☐2 Asymptomatisk tilstand som gir økt risiko
☐3 Symptomatisk sykdom
☐4 Livstruende sykdom
☐5 Moribund

Lege ………………………………………………………………………………
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

2025016 Bergen Grafisk AS 04.2016

RETTLEDNING TIL HOFTEPROTESER

Registreringen gjelder innsetting, skifting og fjerning av totalproteser i hofteledd, samt kantplastikk, bløtdelsrevisjon for infisert protese og hemiproteser på annen indikasjon enn fraktur/fraktursekvele. Hemiprotese for fraktur/ fraktursekvele registreres på Hoftebruddskjema. Ett skjema fylles ut for hver operasjon. Fødselsnummer (11sifre) og sykehusnavn må påføres. Aktuelle ruter markeres med kryss. På eget Samtykkeskjema skal pasienten gi samtykke til rapportering til Leddregisteret.

AKTUELLE OPERASJON

Primæroperasjoner: Første totalproteseoperasjon, og første hemiprotese hvis denne settes inn på annen indikasjon enn fraktur. Hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema.

Reoperasjon (totalprotese tidligere): Fjerning av protesedeler (f.eks. Girdlestone) må registreres. Kantplastikk (f. eks. PLAD), bløtdelsrevisjoner for infeksjon, osteosyntese, resutur av muskel og muskeltransposisjon registreres selv om protesedeler ikke skiftes.

ÅRSAK TIL AKTUELLE OPERASJON

Kryss av under A ved primæroperasjoner og under B ved reoperasjoner. I B må du krysse av for alle årsakene til reoperasjon, eller forklare med fritekst.

REOPERASJONSTYPE

Fjerning av protesedeler (f.eks. Girdlestone) må registreres. Kantplastikk (f. eks. PLAD), bløtdelsrevisjoner for infeksjon, osteosyntese, resutur av muskel og muskeltransposisjon registreres selv om protesedeler ikke skiftes.

BENTRANSPLANTASJON Benpropp som sementstopper regnes ikke som bentransplantat. Vi skiller mellom benpakking og transplantasjon.

PROTESEKOMPONENTER: Acetabulum - Femur - Caput - Trokanterdel og hals hvis disse er separate deler

Bruk klistrelappene som følger med protesen. Lim disse på baksiden av skjema. Alternativt, skriv inn protesenavn + REF.NR., materiale, overflatebelegg og design. Sementnavn må anføres (bruk klistrelapp).

KOMPLIKASJONER Også operasjoner hvor pasienter dør på operasjonsbordet eller rett etter operasjon skal meldes. Ved stor blødning, angi mengde**.**

ASA-KLASSE (ASA=American Society of Anesthesiologists)

ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.

ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon) eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.

ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt (f.eks moderat angina pectoris og mild astma).

ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks hjertesvikt og astma).

ASA-klasse 5: Moribund/døende pasient.

MINIINVASIV KIRURGI (MIS = Minimally Invasive Surgery**)** når det er brukt spesialinstrument laget for MIS.

ANTIBIOTIKAPROFYLAKSE Før på antibiotikum som er benyttet i forbindelse med operasjonen, f.eks.: Medikament 1: Keflin 2g x 4, med varighet 4,5 timer.

TROMBOSEPROFYLAKSE

Medikament, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere. Det skal også oppgis om pasienten står fast på tromboseprofylakse (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER Her føres det på om en benytter blødningsreduserende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

BEINTAP VED REVISJON

Femur (Paprosky`s klassifikasjon)

Type I: Minimalt tap av metafysært ben og intakt diafyse.

Type II: Stort tap av metafysært ben, men intakt diafyse.

Type IIIA: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Over 4 cm intakt corticalis i isthmusområdet.

Type IIIB: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Under 4 cm intakt corticalis i isthmusområdet.

Type IV: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Bred isthmus med liten mulighet for cortical støtte.

Acetabulum (Paprosky`s klassifikasjon)

Type I: Hemisfærisk acetabulum uten kantdefekter. Intakt bakre og fremre kolonne. Defekter i forankringshull som ikke ødelegger subchondral benplate.

Type IIA: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kolonne, men med lite metafysært ben igjen.

Type IIB: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kolonne, men med lite metafysært ben igjen og noe manglende støtte superiort.

Type IIC: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kollonne, men med defekt i medial vegg.

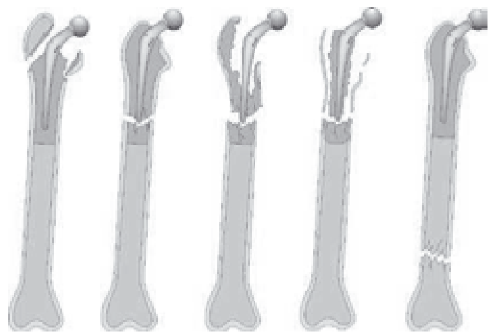
Type IIIA: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl.10 til 2.

Type IIIB: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl. 9 til 5.

Kopi beholdes til pasientjournalen, originalen sendes Haukeland universitetssjukehus.

PROTESENÆR FRAKTUR

Vancouverklassifikasjon



Type A Type B1 Type B2 Type B3 Type C

Kontaktpersoner vedrørende registreringsskjema er

Seksjonsoverlege Geir Hallan, tlf. 55 97 56 81 og overlege Ove Furnes, tlf. 55 97 56 90
Ortopedisk klinikk, Haukeland universitetssjukehus. Besøksadresse: Møllendalsbakken 11.
Sekretærer i Nasjonalt Register for Leddproteser, Ortopedisk klinikk, Helse Bergen:
Merete Husøy, tlf. 55 97 37 43 og Randi Furnes, tlf. 55 97 37 42
Epost nrl@helse-bergen.no Internett: http://nrlweb.ihelse.net/
Skjema revidert i november 2015.

HOOS
Spørreskjema for hoftepasienter

Dato: ____________________ Personnummer: _________________________

Navn: ____

Instruksjoner: Dette spørreskjemaet inneholder spørsmål om hvordan du opplever hofteleddet ditt. Informasjonen skal hjelpe til med å kartlegge hvordan du har det og hvordan du fungerer i dagliglivet. Besvar spørsmålene ved å krysse av for det alternativet du synes passer best for deg (kun ett kryss for hvert spørsmål). Er du usikker, kryss likevel av for det alternativet som føles riktigst.

Symptomer
Tenk på symptomene og vanskelighetene du har hatt fra hoften din den siste uken når du besvarer følgende spørsmål

S1. Har du kjent murringer eller hørt knepping eller andre lyder fra hoften?

Aldri	Sjelden	Iblant	Ofte	Alltid
☐	☐	☐	☐	☐

S2. Har du vanskeligheter med å spre bena langt ut til siden?

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

S3. Har du vanskeligheter med å ta steget fullt ut når du går?

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Stivhet
Følgende spørsmål omhandler leddstivhet. Stivhet innebærer vanskeligheter med å komme i gang, eller økt motstand ved bevegelser i hofteleddet. Angi graden av stivhet du har opplevd i hoften din den siste uken.

S4. Hvor stiv har hoften din vært rett etter at du har våknet om morgenen?

Ikke i det hele tatt	Noe	Moderat	Meget	Ekstremt
☐	☐	☐	☐	☐

S5. Hvor stiv har hoften din vært etter at du har sittet eller ligget og hvilt, senere på dagen?

Ikke i det hele tatt	Noe	Moderat	Meget	Ekstremt
☐	☐	☐	☐	☐

Smerter
P1. Hvor ofte har du vondt i hoften?

Aldri	Hver måned	Hver uke	Hver dag	Alltid
☐	☐	☐	☐	☐

Følgende spørsmål handler om de hoftesmertene du eventuelt har opplevd den siste uken. Angi graden av smerte du har kjent i følgende situasjoner.

P2. Strekke hoften helt

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P3. Bøye hoften helt

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P4. Gå på jevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P5. Gå opp eller ned trapper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P6. Om natten, i sengeleie (smerte som forstyrrer søvnen)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P7. Sittende eller liggende

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P8. Stående

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P9. Gå på hardt underlag f.eks. asfalt, betong

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P10. Gå på ujevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Fysisk funksjon
Følgende spørsmål handler om din fysiske funksjon. Angi graden av vanskeligheter du har opplevd den siste uken under følgende aktiviteter på grunn av dine hofteproblemer.

A1. Gå ned trapper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A2. Gå opp trapper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Angi graden av vanskeligheter du har opplevd den siste uken på grunn av dine hofteproblemer.

A3. Reise deg opp fra sittende

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A4. Stå stille

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A5. Bøye deg, for å for eksempel plukke opp noe fra gulvet

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A6. Gå på jevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A7. Gå inn og ut av en bil

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A8. Handle/ gjøre innkjøp

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A9. Ta på sokker/strømper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A10. Stå opp fra sengen

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A11. Ta av sokker/strømper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A12. Ligge i sengen (snu deg, holde hoften i samme stilling over lengre tid)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A13. Gå opp i, og ut av, et badekar/ dusj

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A14. Sitte

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A15. Sette deg og reise deg fra toalettet

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A16. Utføre tungt husarbeid (snømåking, gulvvask, støvsuging etc.)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A17. Utføre lett husarbeid (matlaging, støvtørking etc.)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Funksjon, fritid og idrett

Følgende spørsmål handler om din fysiske funksjon. Angi graden av vanskeligheter du har opplevd den siste uken under følgende aktiviteter på grunn av dine hofteproblemer.

SP1. Sitte på huk

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

SP2. Løpe

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

SP3. Snu deg på belastet ben

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

SP4. Gå på ujevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Livskvalitet

Q1. Hvor ofte gjør hoften din seg bemerket?

Aldri	Hver måned	Hver uke	Hver dag	Alltid
☐	☐	☐	☐	☐

Q2. Har du forandret levemåte for å unngå å belaste hoften?

Ikke i det hele tatt	Noe	Moderat	Meget	Ekstremt
☐	☐	☐	☐	☐

Q3. I hvor stor grad kan du stole på hoften din?

Fullstendig	I stor grad	Moderat	Delvis	Ikke i det hele tatt
☐	☐	☐	☐	☐

Q4. Hvor store problemer har du med hoften din generelt sett?

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Takk for at du tok deg tid til å besvare samtlige spørsmål!

Nasjonalt Register for Leddproteser
Ortopedisk klinikk, Helse Bergen HF
Haukeland universitetssjukehus, Postboks 1400
Møllendalsbakken 11, 5021 BERGEN
Tlf 55973742/55973743

F.nr. (11 sifre)..

Navn:..

(Skriv tydelig ev. pasientklistrelapp – **spesifiser sykehus**.)

Sykehus:...

KNEPROTESER og andre leddproteser

Innsetting, skifting eller fjerning av protese eller protesedeler, samt bløtdelsrevisjoner for infisert protese og protesenære frakturer.

LOKALISASJON, AKTUELL OPERASJON
☐1 Kne
☐2 Ankel
☐3 Tær (angi ledd) ....
☐4 Skulder
☐5 Albue
☐6 Håndledd
☐7 Fingre (angi ledd) ....
☐8 Annet ....
☐9 Rygg (angi nivå).......................

AKTUELLE SIDE (ett kryss) (Bilateral opr. = 2 skjema)
☐1 Høyre ☐2 Venstre

TIDLIGERE OPERASJON I AKTUELLE LEDD (ev. flere kryss)
☐0 Nei
☐1 Osteosyntese for intraartikulær/leddnær fraktur
☐2 Osteotomi
☐3 Artrodese
☐4 Protese
☐5 Synovectomi
☐6 Annet (f.eks menisk og leddbåndsop.)...

AKTUELLE OPERASJON (ett kryss)
☐1 Primæroperasjon ☐2 Reoperasjon (protese tidligere)

OPERASJONSDATO (dd.mm.åå) |__|__| |__|__| |__|__|

ÅRSAK TIL AKTUELLE OPERASJON (KRYSS AV ENTEN I A ELLER B)

A. Primæroper. pga (ev. flere kryss)
☐1 Idiopatisk artrose
☐2 Rheumatoid artritt
☐3 Fraktursequele..............
☐4 Mb. Bechterew
☐5 Sequele ligamentskade
☐6 Sequele meniskskade
☐7 Akutt fraktur
☐8 Infeksjonssequele
☐9 Spondylose
☐10 Sequele prolaps kirurgi
☐11 Degenerativ skivesykdom
☐12 Rotarcuff artropati
☐13 Annet ....

B. Reoper. pga (ev. flere kryss)
☐1 Løs prox.protesedel
☐2 Løs distal protesedel
☐3 Løs patellaprotese
☐4 Luksasjon av patella
☐5 Luksasjon (ikke patella)
☐6 Instabilitet
☐7 Aksefeil
☐8 Dyp infeksjon
☐9 Fraktur av bein (nær protesen)
☐10 Smerter
☐11 Slitt eller defekt plastforing
Hvilken...........................
☐12 Progresjon av artrose
☐13 Annet (f.eks tidl fjernet protese)
....

REOPERASJONSTYPE (ev. flere kryss)
☐1 Bytte el. innsetting av distal komponent
☐2 Bytte el. innsetting av proximal protesedel
☐3 Bytte el. innsetting av hele protesen
☐4 Innsetting av patellakomp.
☐5 Bytte av patellaprotese
☐6 Bytte av plastforing
☐7 Artrodese
☐8 Amputasjon
☐9 Fjernet protesedeler (inkl. sementspacer)
Angi hvilke deler ....
....
☐10 Bløtdelsdebridement for infisert protese
☐11 Osteosyntese av protesenær fraktur. Angi hvilket ben ....
☐12 Annet............................

BENTRANSPLANTASJON / BENERSTATNING (ev. flere kryss)

Proximalt	☐0 Nei	☐1 Ja	☐2 Benpakking	☐3 Kjegler (cones)
Distalt	☐0 Nei	☐1 Ja	☐2 Benpakking	☐3 Kjegler (cones)

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

	Navn	*Dosering*	*Varighet i timer*
Medikament 1	....		...........timer
Medikament 2	....		...........timer

TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja: Første dose ☐1 Preoperativt ☐2 Postoperativt
Medikament 1.......................Dosering opr.dag.......................................
Dosering videre............Varighet...........døgn
Medikament 2...................... Dosering...................Varighet...........døgn

FAST TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: ....

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament: .... Dosering............

DREN ☐0 Nei ☐1 Ja. Antatt varighet ....døgn

OPERASJONSTID (hud til hud) ....minutter

BLODTOMHET ☐0 Nei ☐1 Ja **BLODTOMHETSTID**.................. minutter
BLODTOMHET UNDER SEMENTERING ☐0 Nei ☐1 Ja

PEROPERATIV KOMPLIKASJON
☐0 Nei ☐1 Ja,hvilke(n): ....

MINI INVASIV KIRURGI (MIS) ☐0 Nei ☐1 Ja
COMPUTERNAVIGERING (CAOS) ☐0 Nei ☐1 Ja Type:......................
PASIENTTILPASSEDE INSTRUMENTER ☐0 Nei ☐1 Ja Type:......................

ASA KLASSE (se baksiden for definisjon)
☐1 Frisk
☐2 Asymptomatisk tilstand som gir økt risiko
☐3 Symptomatisk sykdom
☐4 Livstruende sykdom
☐5 Moribund

PROTESE KNE (Bruk klistrelapper på baksiden, eller spesifiser nøyaktig)

PROTESETYPE
☐1 Totalprot. m/patella . ☐4 Patellofemoralledd prot.
☐2 Totalprot. u/patella ☐5 Bi-compartmental ☐6 Hengslet protese
☐3 Unicondylær prot ☐ Medial ☐ Lateral ☐7 Annet ....

FEMURKOMPONENT
Navn/Type/Str / evt. Katalognr...
ev. katalognummer ....
Sentral stamme ☐0 Nei ☐1 Ja, ev. lengde ....mm
Sementert stamme ☐0 Nei ☐1 Ja
Metallforing (Wedge) ☐0 Nei ☐1 Ja
Stabilisering ☐0 Nei ☐1 Ja, bakre ☐2 Ja, annen
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

TIBIAKOMPONENT (metallplatå)
Navn/Type/Str / ev. katalognummer ....
Forlenget sentral stamme ☐0 Nei ☐1 Ja, ev. lengde ....mm
Sementert stamme ☐0 Nei ☐1 Ja
Metallforing (Wedge) ☐0 Nei ☐1 Ja
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

TIBIAKOMPONENT (plastkomponent)
Navn/Type/Str / ev. katalognummer...
Tykkelse .... mm
Stabilisering ☐0 Nei ☐1 Ja, bakre ☐2 Ja, annen

PATELLAKOMPONENT
Navn/Type/Str / ev. katalognummer...
Metallrygg ☐0 Nei ☐1 Ja
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

KORSBÅND

Intakt fremre korsbånd før operasjon	☐0 Nei	☐1 Ja
Intakt fremre korsbånd etter operasjon	☐0 Nei	☐1 Ja
Intakt bakre korsbånd før operasjon	☐0 Nei	☐1 Ja
Intakt bakre korsbånd etter operasjon	☐0 Nei	☐1 Ja

PROTESE ANDRE LEDD (Bruk klistrelapper på baksiden, eller spesifiser nøyaktig)

PROTESETYPE
☐1 Totalprotese ☐2 Hemiprotese ☐3 Enkomponentprotese ☐4 Annet .....

PROKSIMAL KOMPONENT
Navn/Type/Str / ev. katalognummer...
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

DISTAL KOMPONENT
Navn/Type/Str / ev. katalognummer...
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

INTERMEDIÆR KOMPONENT (f.eks. caput humeri)
Navn/Type/Str/Diameter / ev. katalognummer..

Lege ....
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

RETTLEDNING KNEPROTESER og andre leddproteser

Registreringen gjelder innsetting, skifting eller fjerning av protese i kne, skuldre og andre ledd med unntak av hofter som har eget skjema. Ett skjema fylles ut for hver operasjon. Pasientens fødselsnummer (11 sifre) og sykehus må være påført. Aktuelle ruter markeres med kryss.
På eget Samtykkeskjema skal pasienten gi samtykke til rapportering til Leddregisteret.

Kommentarer til de enkelte punktene

AKTUELLE OPERASJON
Primæroperasjon: Dette er første totalproteseoperasjon.
Kryss av enten i A eller i B. Kryss av for alle årsakene til operasjonen. Bløtdelsrevisjon for infeksjon skal registreres selv om protesedeler ikke skiftes.

REOPERASJONSTYPE
Fjerning av protesedeler må spesifiseres og føres opp, også fjerning ved infeksjon.

BENTRANSPLANTASJON
Påsmøring av benvev rundt protesen regnes ikke som bentransplantat.

ANTIBIOTIKAPROFYLAKSE
Medikament, dose og varighet av profylaksen skal angis f.eks. slik: Medikament: Keflin, Dosering: 2g x 4, med varighet 4,5 timer.

TROMBOSEPROFYLAKSE
Medikament, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere. Det skal også oppgis om pasienten står fast på tromboseprofylakse (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

PEROPERATIV KOMPLIKASJON
Dersom det foreligger komplikasjon i form av stor blødning, må mengden angis.
Dersom pasienten dør under eller like etter operasjonen, ønsker vi likevel melding om operasjonen.

ASA-KLASSE (ASA=American Society of Anesthesiologists)
ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.
ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks. hypertensjon) eller med kost (f.eks. diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.
ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt (f.eks. moderat angina pectoris og mild astma).
ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks. hjertesvikt og astma).
ASA-klasse 5: Moribund/døende pasient

PROTESETYPE
Dersom det er gjort revisjon av totalprotese uten patellakomponent og REOPERASJONSTYPE er **innsetting av patellakomponent,** skal det krysses av for pkt. 1: Totalprotese med patellakomponent (dvs. protesen har nå blitt en totalprotese med patellakomponent). Ved revisjon av unicondylær protese til totalprotese brukes enten pkt. 1 eller 2.

PROTESEKOMPONENTER
Her anføres kommersielle navn, materiale, størrelse og design. Alternativt kan en føre opp protesenavn og katalognummer eller benytte klistrelapp som følger med de fleste protesene. **Denne kan limes på baksiden av skjemaet (vennligst ikke plasser klistrelapper på markeringskryss, som brukes ved scanning av skjema).**
Navnet på sementen som evt. brukes må anføres, f.eks. Palacos R+G. (Bruk helst klistrelapp)
Under femurkomponent skal evt. påsatt **femurstamme** anføres med lengde.
Med **metallforing** under femur- og tibiakomponent menes bruk av en eller flere separate metallkiler (wedges) som erstatning for manglende benstøtte.
Stabilisering er bruk av proteser med stabilisering som kompensasjon for sviktende båndapparat.
Forlenget sentral stamme under tibiakomponent (metallplatå) skal bare anføres ved bruk av en lengre påsatt stamme enn standardkomponenten.

ANDRE LEDD. PROTESETYPE
Ved bruk av hemiprotese med bare en komponent, f.eks. resurfacing i skulder, skrives dette på DISTAL KOMPONENT. Enkomponent-protese i finger/tå, skrives på PROKSIMAL KOMPONENT.

COMPUTERNAVIGERING (CAOS = Computer Aided Orthopaedic Surgery**)**
Angi firmanavn på computersystem.

MINIINVASIV KIRURGI (MIS = Minimally Invasive Surgery**)**
Her menes at kirurgen har brukt kort snitt og at det er brukt spesialinstrument laget for MIS.

PASIENTTILPASSEDE INSTRUMENTER
Her menes kutteblokker eller instrumenter som lages etter MR eller CT bilder tatt av pasienten før operasjonen. Oppgi navn på systemet.

Kopi beholdes til pasientjournalen, originalen sendes Haukeland universitetssjukehus.

Kontaktpersoner vedrørende registreringsskjema er
Seksjonsoverlege Ove Furnes, tlf. 55 97 56 90.
Overlege Randi Hole, kontaktperson (skulder), tlf. 55 97 56 79.
Overlege Yngvar Krukhaug, kontaktperson (albue/hånd), tlf. 55 97 56 88.
Ortopedisk klinikk, Haukeland universitetssjukehus. Besøksadresse: Møllendalsbakken 11.
Sekretærer i Nasjonalt Register for Leddproteser, Ortopedisk klinikk, Helse Bergen:
Randi Furnes, tlf. 55 97 37 42.
Epost: nrl@helse-bergen.no Internett: http://nrlweb.ihelse.net/
Skjema revidert i januar 2018.

NASJONALT HOFTEBRUDDREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11
5021 BERGEN
Tlf: 55976452

F.nr. (11 sifre)..
Navn:...

(Skriv tydelig ev. pasientklistrelapp – **spesifiser sykehus**.)
Sykehus:...

HOFTEBRUDD

PRIMÆRE OPERASJONER PÅ BRUDD I PROKSIMALE FEMURENDE og ALLE REOPERASJONER, inkludert lukket reponering av hemiproteser. Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese brukes kun hofteproteseskjema. Alle produktklistrelapper settes i merket felt på baksiden av skjemaet.

AKTUELLE OPERASJON
☐1 Primæroperasjon ☐ 2 Reoperasjon

SIDE (ett kryss) (Bilateral opr.= 2 skjema)
☐1 Høyre ☐2 Venstre

OPR TIDSPUNKT (dd.mm.åå) |__|__| |__|__| |__|__| kl |__|__|

BRUDD TIDSPUNKT (dd.mm.åå) |__|__| |__|__| |__|__| kl |__|__|
Dersom det er usikkerhet om bruddtidspunkt, fyll ut neste punkt.

TID FRA BRUDD TIL OPERASJON I TIMER
☐1 0-6 ☐2 >6-12 ☐3 >12-24 ☐4 >24-48 ☐5 >48

KOGNITIV SVIKT
☐0 Nei ☐1 Ja (Se test på baksiden) ☐2 Usikker

ASA-KLASSE (se bakside av skjema for definisjon)
☐1 Frisk
☐2 Asymptomatisk tilstand som gir økt risiko
☐3 Symptomatisk sykdom
☐4 Livstruende sykdom
☐5 Moribund

TYPE PRIMÆRBRUDD (ÅRSAK TIL PRIMÆROPERASJON) (Kun ett kryss)
Se baksiden for klassifikasjon
☐1 Lårhalsbrudd udislokert (Garden 1 og 2)
☐2 Lårhalsbrudd dislokert (Garden 3 og 4)
☐3 Lateralt lårhalsbrudd
☐4 Pertrokantært tofragment (AO klassifikasjon A1)
☐5 Pertrokantært flerfragment (AO klassifikasjon A2)
☐9 Intertrokantært (AO klassifikasjon A3)
☐6 Subtrokantært
☐7 Annet, spesifiser..

TYPE PRIMÆROPERASJON (Kun ett kryss)
(Fylles ut bare ved primæroperasjon - eget skjema for totalproteser)
(Fest produktklistrelapp på baksiden eller spesifiser nøyaktig produkt)
☐1 To skruer eller pinner
☐2 Tre skruer eller pinner
☐3 Bipolar hemiprotese
☐4 Unipolar hemiprotese
☐5 Glideskrue og plate
☐6 Glideskrue og plate med trokantær støtteplate
☐7 Vinkelplate
☐8 Kort margnagle uten distal sperre
☐9 Kort margnagle med distal sperre
☐10 Lang margnagle uten distal sperre
☐11 Lang margnagle med distal sperre
☐12 Annet, spesifiser...

Navn / størrelse og katalognummer..

ÅRSAK TIL REOPERASJON (Flere enn ett kryss kan brukes)
☐1 Osteosyntesesvikt/havari
☐2 Ikke tilhelet brudd (non-union/pseudartrose)
☐3 Caputnekrose (segmentalt kollaps)
☐4 Lokal smerte pga prominerende osteosyntesemateriale
☐5 Brudd tilhelet med feilstilling
☐6 Sårinfeksjon – overfladisk
☐7 Sårinfeksjon – dyp
☐8 Hematom
☐9 Luksasjon av hemiprotese
☐10 Osteosyntesematerialet skåret gjennom caput
☐11 Nytt brudd rundt implantat
☐12 Løsning av hemiprotese
☐13 Annet, spesifiser...

TYPE REOPERASJON (Flere enn ett kryss kan brukes)
(Fest produktklistrelapp på baksiden eller spesifiser nøyaktig produkt)
☐1 Fjerning av implantat (Brukes når dette er eneste prosedyre)
☐2 Girdlestone (= fjerning av implantat og caput)
☐3 Bipolar hemiprotese
☐4 Unipolar hemiprotese
☐5 Re-osteosyntese
☐6 Debridement for infeksjon
☐7 Lukket reposisjon av luksert hemiprotese
☐8 Åpen reposisjon av luksert hemiprotese
☐9 Annet, spesifiser...

Navn / størrelse og katalognummer..

FIKSASJON AV HEMIPROTESE
(For totalprotese sendes eget skjema til hofteproteseregisteret)
☐1 Usementert ☐1 med HA ☐2 uten HA
☐2 Sement med antibiotika Navn...
☐3 Sement uten antibiotika Navn..

PATOLOGISK BRUDD (Annen patologi enn osteoporose)
☐0 Nei ☐1 Ja, type..

TILGANG TIL HOFTELEDDET VED HEMIPROTESE (Kun ett kryss)
☐1 Fremre (mellom sartorius og tensor)
☐2 Anterolateral (mellom gluteus medius og tensor)
☐3 Direkte lateral (transgluteal)
☐4 Bakre (bak gluteus medius)
☐5 Annet, spesifiser...

ANESTESITYPE
☐1 Narkose ☐2 Spinal ☐3 Annet, spesifiser...

PEROPERATIVE KOMPLIKASJONER
☐0 Nei ☐1 Ja, hvilke(n)..

OPERASJONSTID (hud til hud)......................minutter.

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

	Navn	Dosering	Varighet i timer
Medikament 1	....		...........timer
Medikament 2	....		...........timer
Medikament 3	....		...........timer

TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja: Første dose ☐1 Preoperativt ☐2 Postoperativt

Medikament 1 .... Dosering opr.dag.......................................
Dosering videre .... Varighet ...... døgn
Medikament 2 .... Dosering .... Varighet ...... døgn

FAST TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: ....

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament : .... Dosering ....

OPERATØRERFARING
Har en av operatørene mer enn 3 års erfaring i hoftebruddkirurgi? ☐0 Nei ☐1 Ja

Lege...
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

202 038 Bergen Grafisk as - 01.2016

RETTLEDNING

Registreringen gjelder alle operasjoner for hoftebrudd (lårhals, pertrokantære og subtrokantære) og alle reoperasjoner, også reposisjoner, på pasienter som er primæroperert og reoperert for hoftebrudd. **Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese sendes bare skjema til hofteproteseregisteret.**
Ett skjema fylles ut for hver operasjon. Originalen sendes Haukeland universitetssjukehus og kopien lagres i pasientens journal. Pasientens fødselsnummer (11 sifre) og sykehuset må være påført. Aktuelle ruter markeres med kryss. Pasienten skal på eget skjema gi samtykke til registrering i Nasjonalt hoftebruddregister.

Kommentarer til enkelte punkt:
OPERASJONS- OG BRUDDTIDSPUNKT
Operasjonstidspunkt (dato og klokkeslett) må føres opp på alle primæroperasjoner. Det er også sterkt ønskelig at dato og klokkeslett for *bruddtidspunkt* føres opp. Dette bl.a. for å se om tid til operasjon har effekt på prognose. (Hvis en ikke kjenner klokkeslettet for bruddtidspunkt lar en feltet stå åpent. En må da prøve å angi omtrentlig tidsrom fra brudd til operasjon på neste punkt).
Ved reoperasjon er ikke klokkeslett nødvendig.

KOGNITIV SVIKT
Kognitiv svikt kan eventuelt testes ved å be pasienten tegne klokken når den er 10 over 11. En pasient med kognitiv svikt vil ha problemer med denne oppgaven.

ASA-KLASSE (ASA=American Society of Anesthesiologists)
ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.
ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon)
eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.
ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt
(f.eks moderat angina pectoris og mild astma).
ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks hjertesvikt og astma).
ASA-klasse 5: Moribund/døende pasient

GARDENS KLASSIFISERING AV LÅRHALSBRUDD
Garden 1: Ikke komplett brudd av lårhalsen (såkalt innkilt)
Garden 2: Komplett lårhalsbrudd uten dislokasjon
Garden 3: Komplett lårhalsbrudd med delvis dislokasjon. Fragmentene er fortsatt i kontakt, men det er feilstilling av lårhalsens trabekler.
Caputfragmentet ligger uanatomisk i acetabulum.
Garden 4: Komplett lårhalsbrudd med full dislokasjon. Caputfragmentet er fritt og ligger korrekt i acetabulum slik at trabeklene er normalt orientert.

AO KLASSIFIKASJON AV TROKANTÆRE BRUDD

A1: Pertrokantært tofragment brudd A2: Pertrokantært flerfragment brudd A3: Intertrokantært brudd Subtrokantært brudd*

*Subtrokantært brudd: Bruddsentrum er mellom nedre kant av trokanter minor og 5 cm distalt for denne.

REOPERASJONSÅRSAK
Dyp infeksjon defineres som infeksjon som involverer fascie, protese, ledd eller periprotetisk vev.

IMPLANTAT
Implantattype må angis entydig. Produktklistrelapp er ønskelig for å angi katalognummer for osteosyntesematerialet eller protesen som er brukt.

PEROPERATIVE KOMPLIKASJONER
Vi ønsker også å få meldt dødsfall på operasjonsbordet og peroperativ transfusjonstrengende blødning.

ANTIBIOTIKAPROFYLAKSE
Her føres det på hvilket antibiotikum som er blitt benyttet i forbindelse med operasjonen. Det anføres dose, antall doser og profylaksens varighet. F.eks. Medkament 1: Keflin 2g x 4, med varighet 4,5 timer.

TROMBOSEPROFYLAKSE
Medikament, dose og antatt varighet av profylaksen skal angis separat for oprerasjonsdagen og senere. Det skal også oppgis om pasienten står fast på tromboseprofylakse (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

Kontaktpersoner vedrørende registreringsskjema er:
Overlege Jan-Erik Gjertsen, Ortopedisk klinikk, Haukeland universitetssjukehus. Tlf. 55 97 56 86 (email: jan-erik.gjertsen@helse-bergen.no)
Prosjektkoordinator Nasjonalt Hoftebruddregister: Lise B. Kvamsdal. Tlf. 55 97 64 52 (email: nrl@helse-bergen.no)
Internett: http://nrlweb.ihelse.net/

PRODUKTKLISTRELAPPER:

NASJONALT HOFTEBRUDDREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

PASIENTSPØRRESKJEMA NASJONALT HOFTEBRUDDREGISTER

1. Dato for utfylling av skjema: |__|__| |__|__| |__|__|

2. Spørreskjemaet er besvart av:

☐ 1 Meg selv

eller ved hjelp av….(kryss av i ruten som gjelder)

☐ 2 Slektning (ektefelle, barn)
☐ 3 God venn eller annen nærstående
☐ 4 Annen privat person
☐ 5 Hjemmesykepleier/hjemmehjelp
☐ 6 Annen person, angi hvem:___________________________

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5021 BERGEN

I de neste 5 spørsmålene ønsker vi å vite hvordan livssituasjonen din var <u>FØR</u> du fikk hofte/lårhalsbruddet som du ble operert for.

3. Hvordan opplevde du gangevnen din?

- ☐ [1] Jeg hadde ingen problemer med å gå omkring
- ☐ [2] Jeg hadde litt problemer med å gå omkring
- ☐ [3] Jeg var sengeliggende

4. Hvordan klarte du personlig stell?

- ☐ [1] Jeg hadde ingen problemer med personlig stell
- ☐ [2] Jeg hadde litt problemer med å vaske meg eller kle meg
- ☐ [3] Jeg klarte ikke å vaske meg eller kle meg

5. Hvordan klarte du dine vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- og fritidsaktiviteter)?

- ☐ [1] Jeg hadde ingen problemer med å utføre mine vanlige gjøremål
- ☐ [2] Jeg hadde litt problemer med å utføre mine vanlige gjøremål
- ☐ [3] Jeg var ute av stand til å utføre mine vanlige gjøremål

6. Smerter eller ubehag?

- ☐ [1] Jeg hadde verken smerte eller ubehag
- ☐ [2] Jeg hadde moderat smerte eller ubehag
- ☐ [3] Jeg hadde sterk smerte eller ubehag

7. Angst eller depresjon?

- ☐ [1] Jeg var verken engstelig eller deprimert
- ☐ [2] Jeg var noe engstelig eller deprimert
- ☐ [3] Jeg var svært engstelig eller deprimert

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I de 5 neste spørsmålene ønsker vi å vite hvordan livssituasjonen din er NÅ:

8. Hvordan opplever du gangevnen din?

- ☐ [1] Jeg har ingen problemer med å gå omkring
- ☐ [2] Jeg har litt problemer med å gå omkring
- ☐ [3] Jeg er sengeliggende

9. Hvordan klarer du personlig stell?

- ☐ [1] Jeg har ingen problemer med personlig stell
- ☐ [2] Jeg har litt problemer med å vaske meg eller kle meg
- ☐ [3] Jeg klarer ikke å vaske meg eller kle meg

10. Hvordan klarer du dine vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- og fritidsaktiviteter)?

- ☐ [1] Jeg har ingen problemer med å utføre mine vanlige gjøremål
- ☐ [2] Jeg har litt problemer med å utføre mine vanlige gjøremål
- ☐ [3] Jeg er ute av stand til å utføre mine vanlige gjøremål

11. Smerter eller ubehag?

- ☐ [1] Jeg har verken smerte eller ubehag
- ☐ [2] Jeg har moderat smerte eller ubehag
- ☐ [3] Jeg har sterk smerte eller ubehag

12. Angst eller depresjon?

- ☐ [1] Jeg er verken engstelig eller deprimert
- ☐ [2] Jeg er noe engstelig eller deprimert
- ☐ [3] Jeg er svært engstelig eller deprimert

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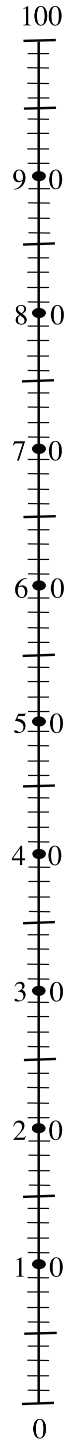
13. Din helsetilstand i dag.

For å hjelpe folk til å si hvor god eller dårlig en helsetilstand er, har vi laget en skala (omtrent som et termometer) hvor den beste tilstanden du kan tenke deg er merket 100 og den verste tilstanden du kan tenke deg er merket 0.

Vi vil gjerne at du viser på denne skalaen hvor god eller dårlig helsetilstanden din er i dag, etter din oppfatning. Vær vennlig å gjøre dette ved å trekke en linje fra boksen nedenfor til det punktet på skalaen som viser hvor god eller dårlig din helsetilstand er i dag.

Din egen helsetilstand i dag

Best tenkelige helsetilstand



Verst tenkelige helsetilstand

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Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
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SMERTE

14. Sett ett kryss på den streken som du synes tilsvarer din gjennomsnittlige smerteopplevelse fra den opererte hoften den siste måneden:

Ingen smerte   Maksimal smerte

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

lett   moderat   middels   sterk   uutholdelig

TILFREDSHET

15. Sett ett kryss på den streken som du synes tilsvarer hvor fornøyd du er med operasjonsresultatet:

Fornøyd   Misfornøyd

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

svært fornøyd   fornøyd   middels fornøyd   misfornøyd   svært misfornøyd

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16. Har du besvær fra den andre hoften?

☐[1] Ja ☐[2] Nei

17. Er det andre årsaker til at du har problemer med å gå? (For eksempel smerter fra andre ledd, ryggsmerter, hjerte-karsykdom eller andre sykdommer som påvirker gangevnen din)

☐[1] Ja ☐[2] Nei

18. Har du hatt nye operasjoner i den samme hoften som ble operert for hoftebrudd?

☐[1] Ja ☐[2] Nei

Takk for at du tok deg tid til å svare på spørsmålene. Dine svar er svært nyttige for oss. Vennligst send spørreskjemaet i retur til oss i den ferdig frankerte svarkonvolutten.

NASJONALT KORSBÅNDSREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11, 5021 BERGEN
Tlf: 55 97 64 54

F.nr. (11 sifre)...
Navn...
Sykehus...
(Skriv tydelig evt. pasientklistrelapp – **spesifiser sykehus**.)

KORSBÅND

KORSBÅNDSOPERASJONER OG ALLE REOPERASJONER på pasienter som tidligere er korsbåndsoperert.

Alle klistrelapper (med unntak av pasientklistrelapp) settes i merket felt på baksiden av skjemaet.

(Bilateral operasjon = 2 skjema)
AKTUELLE SIDE (ett kryss) ☐0 Høyre ☐1 Venstre

MOTSATT KNE ☐0 Normalt ☐1 Tidligere ACL/PCL-skade

TIDLIGERE OPERASJON I SAMME KNE
☐0 Nei ☐1 Ja

SKADEDATO FOR AKTUELL SKADE (mm.åå) |__|__| |__|__|

AKTIVITET SOM FØRTE TIL AKTUELLE SKADE
☐0 Fotball
☐1 Håndball
☐2 Snowboard
☐3 Alpint (inkl. twin tip)
☐4 Annen skiaktivitet
☐5 Kampsport
☐6 Basketball
☐98 Annet....................................
☐7 Annen lagidrett
☐8 Motor- og bilsport
☐9 Annen fysisk aktivitet
☐10 Arbeid
☐11 Trafikk
☐12 Fall/hopp/vold/lek

AKTUELLE SKADE (Registrer **alle** skader – også de som ikke opereres)
☐ ACL ☐ MCL ☐ PLC ☐ Med. menisk
☐ PCL ☐ LCL ☐ Brusk ☐ Lat. menisk
☐ Annet...

YTTERLIGERE SKADER (evt. flere kryss) ☐ Nei, hvis ja spesifiser under

☐ Karskade	Hvilken: ....
☐ Nerveskade	☐ 0 N. tibialis ☐ 1 N. peroneus
☐ Fraktur	☐ 0Femur ☐ 1Tibia ☐ 2Fibula ☐ 3Patella ☐ 4Usikker
☐ Ruptur i ekstensorapparatet	☐ 0Quadricepssenen ☐ 1Patellarsenen

OPERASJONSDATO (dd.mm.åå) |__|__| |__|__| |__|__|

AKTUELLE OPERASJON (ett kryss)
☐0 Primær rekonstruksjon av korsbånd
☐1 Revisjonskirurgi, 1. seanse
☐2 Revisjonskirurgi, 2. seanse
☐3 Annen knekirurgi (Ved kryss her skal andre prosedyrer fylles ut)

ÅRSAK TIL REVISJONSREKONSTRUKSJON (evt. flere kryss)
☐ Infeksjon
☐ Fiksasjonssvikt
☐ Ubehandlede andre ligamentskader
☐ Annet ....
☐ Graftsvikt
☐ Nytt traume
☐ Smerte

ANDRE PROSEDYRER (evt. flere kryss) ☐ Nei, hvis ja spesifiser under
☐ Meniskoperasjon
☐ Synovektomi
☐ Mobilisering i narkose
☐ Fjerning av implantat
☐ Benreseksjon (Notch plastikk)
☐ Osteotomi
☐ Annet ....
☐ Osteosyntese
☐ Bruskoperasjon
☐ Artroskopisk debridement
☐ Operasjon pga infeksjon
☐ Bentransplantasjon
☐ Artrodese

GRAFTVALG

	ACL	PCL	MCL	LCL	PLC
☐ BPTB					
☐ Hamstring					
☐ Allograft					
☐ Direkte sutur					
☐ Annet					

GRAFTDIAMETER (oppgi største diameter på graftet) .. ..mm

Ved bruk av double bundle-teknikk: AM:.........mm PL:.........mm

TILGANG FOR FEMURKANAL
☐1 Anteromedial ☐2Transtibial ☐3 Annet ....

FIKSASJON
Sett klistrelapp på merket felt på baksiden av skjemaet
Skill mellom femur og tibia

AKTUELL BEHANDLING AV MENISKLESJON

	Partiell reseksjon	Total reseksjon	Sutur	Syntetisk fiksasjon*	Menisk-transpl.	Trepanering	Ingen
Medial	☐	☐	☐	☐	☐	☐	☐
Lateral	☐	☐	☐	☐	☐	☐	☐

* Sett klistrelapp på merket felt på baksiden

BRUSKLESJON (evt. flere kryss)

	Areal (cm²) ≤2	>2	ICRS Grade* 1	2	3	4	Artrose Ja	Nei	Behandlings-kode** 1	2	3	4	Spesifiser annet
Patella MF	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	....
Patella LF	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	....
Trochlea fem.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	....
Med.fem. cond.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	....
Med. tib. plat.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	....
Lat.fem. cond.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	....
Lat. tib. plat.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	....

***ICRS Grade:** 1 Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks; 2 Abnormal: Lesions extending down to <50% of cartilage depth; 3 Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer; 4 Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.
****Behandlingskoder**: 1 Debridement; 2 Mikrofraktur; 3 Ingen behandling; 4 Annet.

DAGKIRURGISK OPERASJON ☐0 Nei ☐1 Ja

PEROPERATIVE KOMPLIKASJONER ☐0 Nei ☐1 Ja,
hvilke(n) ....

OPERASJONSTID (hud til hud).......................min

SYSTEMISK ANTIBIOTIKA
☐0 Nei ☐1 Ja ☐1 Profylakse ☐2 Behandling

Medikament 1 .... Dosering ………..... Varighet ....timer

Eventuelt i kombinasjon med medikament 2 ....

TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja: Første dose ☐1 Preoperativt ☐2 Postoperativt

Medikament 1 .... Dosering opr.dag…………………………………

Dosering videre .... Varighet ...... døgn

Medikament 2 ....

Anbefalt total varighet av tromboseprofylakse………………………………………

NSAIDs
☐0 Nei ☐1 Ja, hvilken type…………………………………………………………
Anbefalt total varighet av NSAIDs-behandling……………………………………

HØYDE ....cm

VEKT ....kg

RØYK ☐0 Nei ☐1 Av og til ☐2 Daglig

SNUS ☐0 Nei ☐1 Av og til ☐2 Daglig

Lege:...
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

202 5007 Bergen Grafisk AS - 10.2017

RETTLEDNING

- Registreringen gjelder ALLE fremre og bakre korsbåndsoperasjoner.
- Registreringen gjelder ALLE kneoperasjoner på pasienter som tidligere er korsbåndsoperert.
- Ett skjema fylles ut for hvert kne som blir operert.
- Aktuelle ruter markeres med kryss. Stiplet linje fylles ut der dette er aktuelt.
- Pasienten skal på eget skjema gi samtykke til registrering.

KOMMENTARER TIL DE ENKELTE PUNKTENE

FORKORTELSER SOM ER BRUKT PÅ SKJEMAET

- ACL: Fremre korsbånd
- PCL: Bakre korsbånd
- MCL: Mediale kollateralligament
- LCL: Laterale kollateralligament
- PLC: Popliteus kompleks/bicepssene kompleks
- BPTB; Patellarsene autograft
- AM: Anteromediale bunt av ACL
- PL: Posterolaterale bunt av ACL

SKADEDATO Skriv inn skadedatoen så eksakt som mulig.
Ved ny skade av tidligere operert korsbånd, skriv inn den nye skadedatoen.

FIKSASJON Angi hvilken fiksasjonstype som er brukt ved å feste klistrelapp på baksiden.
Husk å skille mellom femur og tibia for graftfiksasjon, og mellom medial og lateral side for meniskfiksasjon.

PEROPERATIVE KOMPLIKASJONER

Ved en ruptur/kontaminering av høstet graft e.l. skal det opprinnelige graftet anføres her.
Andre peroperative komplikasjoner skal også fylles inn her.

SYSTEMISK ANTIBIOTIKA

Her føres det på hvilket antibiotikum som er blitt benyttet i forbindelse med operasjonen. Det anføres dose, antall doser og profylaksens varighet. F.eks. Medikament 1: Keflin 2g x 4, med varighet 12 timer.

TROMBOSEPROFYLAKSE

Type, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere.

Kopi beholdes i pasientjournalen, originalen sendes til Nasjonalt Korsbåndsregister.

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GRAFTFIKSASJON		MENISKFIKSASJON	
FEMUR	TIBIA	MEDIAL	LATERAL

KOOS – Spørreskjema for knepasienter.

NASJONALT KORSBÅNDSREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11
5021 BERGEN Tlf: 55976450

DATO: ______________ **OPERASJONSDATO**: ___________

FØDSELSNR (11 siffer): ______________________________

NAVN: ____

SYKEHUS:___________________________________

Veiledning: Dette spørreskjemaet inneholder spørsmål om hvordan du opplever kneet ditt før operasjonen. Informasjonen vil hjelpe oss til å følge med i hvordan du har det og fungerer i ditt daglige liv. Besvar spørsmålene ved å krysse av for det alternativ du synes stemmer best for deg (kun ett kryss ved hvert spørsmål). Hvis du er usikker, kryss likevel av for det alternativet som føles mest riktig.

KRYSS AV FOR RIKTIG KNE (NB: Ett skjema for hvert kne): ☐1 **VENSTRE** ☐0 **HØYRE**

Røyker du? ☐0 Nei ☐1 Av og til ☐2 Daglig
Hvis du røyker daglig –
hvor mange sigaretter per dag: _____

Vekt: _______ kg

Høyde :_______ cm

Symptom

Tenk på **symptomene** du har hatt fra kneet ditt den **siste uken** når du besvarer disse spørsmålene.

S1. Har kneet vært hovent?

Aldri	Sjelden	I blant	Ofte	Alltid
☐0	☐1	☐2	☐3	☐4

S2. Har du følt knirking, hørt klikking eller andre lyder fra kneet?

Aldri	Sjelden	I blant	Ofte	Alltid
☐0	☐1	☐2	☐3	☐4

S3. Har kneet haket seg opp eller låst seg?

Aldri	Sjelden	I blant	Ofte	Alltid
☐0	☐1	☐2	☐3	☐4

S4. Har du kunnet rette kneet helt ut?

Alltid	Ofte	I blant	Sjelden	Aldri
☐0	☐1	☐2	☐3	☐4

S5. Har du kunnet bøye kneet helt?

Alltid	Ofte	I blant	Sjelden	Aldri
☐0	☐1	☐2	☐3	☐4

Stivhet

De neste spørsmålene handler om **leddstivhet.** Leddstivhet innebærer vanskeligheter med å komme i gang eller økt motstand når du bøyer eller strekker kneet. Marker graden av leddstivhet du har opplevd i kneet ditt den **siste uken.**

S6. Hvor stivt er kneet ditt når du nettopp har våknet om morgenen?

Ikke noe	Litt	Moderat	Betydelig	Ekstremt
☐0	☐1	☐2	☐3	☐4

S7. Hvor stivt er kneet ditt senere på dagen etter å ha sittet, ligget eller hvilt?

Ikke noe	Litt	Moderat	Betydelig	Ekstremt
☐0	☐1	☐2	☐3	☐4

Smerte

P1. Hvor ofte har du vondt i kneet?

Aldri	Månedlig	Ukentlig	Daglig	Hele tiden
☐0	☐1	☐2	☐3	☐4

Hvilken grad av smerte har du hatt i kneet ditt den **siste uken** ved følgende aktiviteter?

P2. Snu/vende på belastet kne

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P3. Rette kneet helt ut

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P4. Bøye kneet helt

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P5.Gå på flatt underlag

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P6. Gå opp eller ned trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P7. Om natten (smerter som forstyrrer søvnen)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P8. Sittende eller liggende

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P9. Stående

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

Funksjon i hverdagen

De neste spørsmålene handler om din fysiske funksjon. **Angi graden av vanskeligheter du har opplevd den siste uken ved følgende aktiviteter på grunn av dine kneproblemer.**

A1. Gå ned trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A2. Gå opp trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A3. Reise deg fra sittende stilling

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

Angi graden av **vanskeligheter** du har opplevd ved hver aktivitet den **siste uken.**

A4. Stå stille

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A5. Bøye deg, f.eks. for å plukke opp en gjenstand fra gulvet

Ingen	Lett	Moderat	Betydelig	Svært sto
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A6. Gå på flatt underlag

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A7. Gå inn/ut av bil

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A8. Handle/gjøre innkjøp

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A9. Ta på sokker/strømper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A10. Stå opp fra sengen

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A11. Ta av sokker/strømper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A12. Ligge i sengen (snu deg, holde kneet i samme stilling i lengre tid)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A13. Gå inn/ut av badekar/dusj

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A14. Sitte

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A15. Sette deg og reise deg fra toalettet

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A16. Gjøre tungt husarbeid (måke snø, vaske gulv, støvsuge osv.)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

A17. Gjør lett husarbeid (lage mat, tørke støv osv.)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

Funksjon, sport og fritid

De neste spørsmålene handler om din fysiske funksjon. **Angi graden av vanskeligheter du har opplevd den siste uken ved følgende aktiviteter på grunn av dine kneproblemer.**

SP1. Sitte på huk

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

SP2. Løpe

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

SP3. Hoppe

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

SP4. Snu/vende på belastet kne

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

SP5. Stå på kne

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

Livskvalitet

Q1. Hvor ofte gjør ditt kneproblem seg bemerket?

Aldri	Månedlig	Ukentlig	Daglig	Alltid
☐0	☐1	☐2	☐3	☐4

Q2. Har du forandret levesett for å unngå å overbelaste kneet?

Ingenting	Noe	Moderat	Betydelig	Fullstendig
☐0	☐1	☐2	☐3	☐4

Q3. I hvor stor grad kan du stole på kneet ditt?

Fullstendig	I stor grad	Moderat	Til en viss grad	Ikke i det hele tatt
☐0	☐1	☐2	☐3	☐4

Q4. Generelt sett, hvor store problemer har du med kneet ditt?

Ingen	Lette	Moderate	Betydelige	Svært store
☐0	☐1	☐2	☐3	☐4

Takk for at du tok deg tid og besvarte samtlige spørsmål!

BARNEHOFTEREGISTERET
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11, 5021 Bergen

F.nr. (11 sifre): ....

Navn: ....

Sykehus: ....

(Skriv tydelig eller bruk pasientklistrelapp. Husk sykehus!)

BARNEHOFTESYKDOM

HOFTEDYSPLASI (Dysplasi på rtg bekken hos barn eldre enn 3 mnd)

BEHANDLINGSDATO ..../........ 20....... **SIDE** Hø Ve *(Ett kryss. Bilateral = 2 skjema)*
FØRSTE GANG DIAGNOSTISERT ..../....... 20....... *(Fylles ut første gang det sendes inn skjema)*
TIDLIGERE BEHANDLING ☐ Ingen ☐ Pute/abduksjonsortose
☐ Annen, spesifiser: ....
BEHANDLINGSTRENGENDE DYSPLASI I FAMILIE N J
SYMPTOMVARIGHET (>12 år) .... mnd
IMPINGEMENT TEST (>12 år) Høyre: Neg. Pos. Venstre: Neg. Pos.
RØNTGEN FØR BEHANDLING
Acetabular indeks (<=12 år) Hø .... Ve .... CE vinkel (>12 år) Hø .... Ve ....
Cross-over tegn (>12 år) Hø: Neg. Pos. Ve: Neg. Pos.
Spina ischiadica projisert medialt for linea terminales? (>12 år) Hø: N J Ve: N J
Bruskhøyde (>12 år) *(mm i øvre vektbærende del av leddet i AP projeksjon)*: <2 2-3 >3
HOFTE ☐ I ledd ☐ Subluksert ☐ Luksert
LATERALE HJØRNE ☐ Normalt ☐ Avrundet/ defekt
CAPUTKJERNE ☐ Normal ☐ Forsinket ☐ Ikke tilstede ☐ Caputnekrose
BEHANDLING ☐ Ingen (obs.) ☐ Pute ☐ Abduksjonsortose ☐ Lukket repos. ☐ Hoftegips
ÅPEN REPOSISJON N J
TENOTOMI ☐ Psoastenotomi ☐ Adduktortenotomi
FEMUROSTEOTOMI ☐ Varisering ☐ Rotasjon ☐ Forkortning
PLATE ☐ Forbøyd plate ☐ Vinkelplate ☐ Spesialplate, fabrikat: ....
SKRUER ☐ Vanlige skruer ☐ Vinkelstabile skruer
BEKKENOSTEOTOMI ☐ Salter ☐ Dega ☐ Trippel ☐ Takplastikk
☐ Periacetabular osteotomi ☐ Annen: ....
TILGANG ☐ Fremre ☐ Lateral ☐ Annen: ....
POSTOPERATIV HOFTEGIPS N J Antall uker ....
POSTOPERATIV RØNTGEN (ETTER BEKKENOSTEOTOMI)
Acetabular indeks (<=12 år) Hø .... Ve .... CE vinkel (>12 år) Hø .... Ve ....
REOPERASJONSTYPE ☐ Reosteosyntese ☐ Bløtdelsrevisjon ☐ Fjerne ostemat.
☐ Annen: ....
REOPERASJONSÅRSAK ☐ Osteosyntesesvikt ☐ Infeksjon ☐ Pseudartrose
☐ Blødning ☐ Annen: ....
ANNEN OPERASJON N J Spesifiser: ....
KNIVTID FOR OPERATIV BEHANDLING: .... min.

EPIFYSIOLYSIS CAPITIS FEMORIS

OPERASJONSDATO ..../.......... 20......... **SIDE** Hø Ve *(Ett kryss. Bilateral 2 skjema)*
FØRSTE GANG DIAGNOSTISERT ..../....... 20....... *(Fylles ut første gang det sendes inn skjema)*
HØYDE OG VEKT Høyde: .... cm Vekt: .... kg
SYMPTOMVARIGHET ☐ Kronisk (> 3 uker) ☐ Akutt (< 3 uker) ☐ Akutt på kronisk
STABILITET ☐ Stabil (klarer belaste) ☐ Ustabil (klarer ikke belaste)
RØNTGEN ☐ < 30° ☐ 30-50° ☐ > 50° *(Glidningsvinkel i sideplan)*
OPERASJON ☐ Primæroperasjon ☐ Reoperasjon ☐ Profylaktisk
PRIMÆROPERASJONSTYPE Fiksasjon in-situ: N J Peroperativ reposisjon: N J
Kirurgisk hofte-dislokasjon: N J Collumosteotomi: N J
Femurosteotomi: N J Spesifiser: ....
Skrueosteosyntese: N J Antall skruer: .... Fabrikat: ....
Pinnefiksasjon: N J Antall pinner: .... Diameter: .... mm
Platefiksasjon: N J Spesifiser: ....
Annen operasjon: N J Spesifiser: ....
REOPERASJONSTYPE ☐ Reosteosyntese ☐ Bløtdelsrevisjon ☐ Fjerne ostemat.
☐ Annen, spesifiser: ....
REOPERASJONSÅRSAK ☐ Feilplass. av osteosynt. ☐ Osteosyntesesvikt ☐ Infeksjon
☐ Blødning ☐ Annen: ....
KNIVTID FOR OPERATIV BEHANDLING: .... min.

Ved operativ behandling (artroskopisk eller åpen) for impingement etter SCFE: fyll ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

Dato: .... Lege: ....
Legen som har fylt ut skjemaet (Navnet registreres ikke i databasen)

CALVÉ-LEGG-PERTHES

BEHANDLINGSDATO ..../......... 20......... **SIDE** Hø Ve *(Ett kryss. Bilateral = 2 skjema)*
FØRSTE GANG DIAGNOSTISERT ..../......... 20......... *(Fylles ut første gang det sendes inn skjema)*
SYMPTOMVARIGHET .... mnd **HALTING** N J
SMERTE ☐ Ingen ☐ Lett ☐ Betydelig **CATTERALL** ☐ I / II ☐ III / IV
BEHANDLING ☐ Ingen (fysioterapi) ☐ Abduksjonsortose
FEMUROSTEOTOMI ☐ Varisering ☐ Valgisering ☐ Rotasjon
PLATE ☐ Forbøyd plate ☐ Vinkelplate ☐ Spesialplate, fabrikat: ....
SKRUER ☐ Vanlige skruer ☐ Vinkelstabile skruer
BEKKENOSTEOTOMI ☐ Salter ☐ Dega ☐ Takplastikk
☐ Annen, spesifiser: ....
ANNEN OPERATIV BEHANDLING ☐ Trochanter transposisjon ☐ Trochanter apofysiodese
☐ Annen, spesifiser: ....
REOPERASJONSTYPE ☐ Reosteosyntese ☐ Bløtdelsrevisjon ☐ Fjerne ostemat.
☐ Annen: ....
REOPERASJONSÅRSAK ☐ Osteosyntesesvikt ☐ Blødning ☐ Infeksjon
☐ Pseudartrose ☐ Annen: ....
KNIVTID FOR OPERATIV BEHANDLING: .... min.
Ved artroskopi eller hoftedislokasjon for sequele etter CLP: fyll ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

BEHANDLINGSDATO ..../........ 20....... **SIDE** Hø Ve *(Ett kryss. Bilateral = 2 skjema)*
OPERASJON ☐ Primæroperasjon ☐ Reoperasjon ☐ Kun diagnostisk uten intervensjon
SYMPTOMVARIGHET .... mnd
TIDLIGERE HOFTELIDELSE N J ☐ SCFE ☐ CLP ☐ DDH
☐ Andre: ....
DIAGNOSE ☐ Cam impingement ☐ Pincer impingement ☐ Kombinert impingement
☐ Annen: ....
PREOPERATIVE FUNN Impingement test Høyre: Neg. Pos. Venstre: Neg. Pos.
Halting: N J Rtg Alfavinkel sideplan: Hø .... Ve .... frontplan: Hø .... Ve ....
CE-vinkel Hø .... Ve .... Cross-over tegn Hø: Neg. Pos. Ve: Neg. Pos.
Spina ischiadica projisert medialt for linea terminales? Hø: N J Ve: N J
Bruskhøyde *(mm i øvre vektbærende del av leddet i AP projeksjon)*: <2 2-3 >3
MR funn: ☐ Labrumskade ☐ Paralabral cyste ☐ Subchondral cyste
Effekt av lokalbedøvelse i leddet: N J ☐ Ikke aktuelt
KIRURGISK TILGANG ☐ Artroskopisk ☐ Kirurgisk dislokasjon ☐ Konvertering til åpen tilgang
Tilgang ved åpen kirurgi: ☐ Lateral ☐ Annen: ....
Fiksasjonsmetode ved trochanter osteotomi: ....
Portaler: ☐ Anterior ☐ Anterolateral ☐ Posterolateral ☐ Distal anterior ☐ Proximal anterior
☐ Perifere kompartment først ☐ Sentrale kompartment først
PEROPERATIVE FUNN
Labrum: ☐ Normal ☐ Degen. forandret ☐ Forbenet ☐ Partiell ruptur ☐ Gjennomgående ruptur
Bruskskade acetabulum: N J Grad: 0 1 2 3 4 Lokalisasjon: 1 2 3 4 5 6
Bruskskade caput femoris: N J Areal: .... mm² Dybde (ICRS): 1 2 3 4
Lokalisasjon: 1 2 3 4 5 6
Ligamentum teres skade: N J ☐ Partiell ruptur ☐ Total ruptur
Frie legemer: N J ☐ Perifert ☐ Sentralt
Os acetabuli: N J ☐ Som forbening av labrum ☐ Som del av leddflaten Synovitt: N J
KIRURGISK BEHANDLING Labrumruptur: ☐ Debridement ☐ Sutur. Antall ankre: ....
Type ankre: .... *(Klistrelapp på baksiden)* ☐ Labrumrekonstruksjon, spesifiser: ....
Bruskskade: ☐ Ingen beha. ☐ Debridement ☐ Mikrofraktur ☐ Annen: ....
Pincerlesjon: ☐ Ingen beha. ☐ Reseksjon. Dybde max .... mm Lengde .... mm
Camlesjon: ☐ Ingen beha. ☐ Reseksjon
Ligamentum teres: ☐ Ingen beha. ☐ Debridement ☐ Annen:
Os acetabuli: ☐ Ingen beha. ☐ Fjerning ☐ Fiksering ☐ Annen: ....
Frie legemer fjernet: N J Synovectomi: N J Knivtid .... min.
Reoperasjonsårsak, spesifiser: ....

202 5023 Bergen Grafisk as - 03.2013

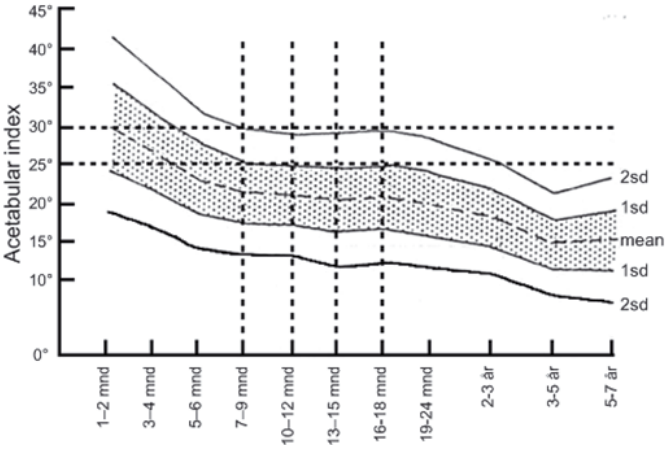
RETTLEDNING

1. HOFTEDYSPLASI

Kriterier: AI > mean + 2SD for aktuell alder (Se figur)

Alle barn som på røntgen bekken får påvist hoftedysplasi etter 3 måneders alder skal registreres. Barn som er diagnostisert før 3 måneders alder (putebehandlet) registreres hvis de fortsatt har dysplasi på røntgen bekken på kontroll etter 3 måneders alder. Barn med nevroortopediske lidelser skal ikke registreres.

- **Registreres første gang ved diagnose (røntgen bekken)/primærbehandling**
- **Registreres ved senere behandling som krever anestesi/ sedasjon** Lukket reposisjon/ hoftegips, åpen reposisjon, tenotomier, femur-/bekkenosteotomier, reoperasjoner. Operativ behandling (periacetabulære osteotomier, takplastikk og lignende) hos ungdommer og voksne skal også registreres.



CAPUTKJERNE: Ved unilateral – sammenlign med frisk side.

2. CALVÉ-LEGG-PERTHES

- **Registreres første gang ved diagnose/primærbehandling**
- **Registreres ved senere behandling som krever anestesi** (Femur-/bekkenosteotomier, reoperasjoner)

CATTERALL: I/II = <50 % caputnekrose. **III/IV** = >50 % caputnekrose

3. EPIFYSIOLYSIS CAPITIS FEMORIS

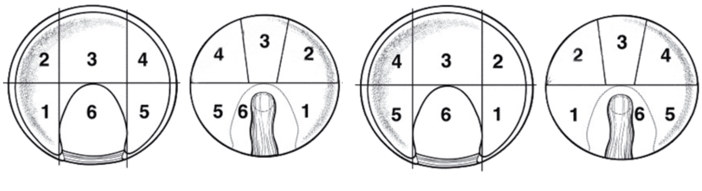
- **Registreres første gang ved diagnose/primærbehandling**
- **Registreres ved senere behandling som krever anestesi** Osteosyntese, femurosteotomier, reoperasjoner.

4. ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

Alle pasienter (uavhengig av alder) som gjennomgår åpen eller artroskopisk hofteoperasjon, unntatt fraktur-, protese- og tumor-operasjoner, skal registreres.

Bruskskade i acetabulum – Grade:
0=Normal.
1=Loss of fixation to the subchondral bone resulting in a wave sign, defined as occuring when the capsular side of the labrum is pushed inwards with the probe resulting in bulging of the adjacent articular cartilage.
2=Presence of cleavage tear with obvious separation at the chondrolabral junction.
3=Delamination of the articular cartilage.
4=Presence of exposed bone in the acetabulum.

Bruskskade i acetabulum og på caput femoris – Lokalisasjon:
1-2: Fortil, 4-5: Baktil



Venstre hofte   Høyre hofte

Bruskskade på caput femoris – Dybde (ICRS):
1=Nearly normal: Superficial lesions, soft identation and/or superficial fissures and cracks.
2=Abnormal: Lesions extending down to <50% of cartilage depth.
3=Severely abnormal: Cartilage defects extending down to >50% of cartilage depth as well as down to calcified layer.
4=Severely abnormal: Osteochondral injuries, lesions extending just through the sub chondral boneplate or deeper defects down into trabecular bone.

KONTAKTPERSONER VEDRØRENDE REGISTRERINGSSKJEMA

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Tlf. 95 16 83 80, e-post: ola.wiig@ous-hf.no
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Tlf: 92 85 38 13, e-post: trude.gundersen.lehmann@helse-bergen.no
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Versjon 20130301