REPORT

2023

Norwegian National Advisory Unit on Arthroplasty and Hip Fractures

Norwegian Arthroplasty Register
Norwegian Hip Fracture Register
Norwegian Knee Ligament Register
Norwegian Paediatric Hip Register

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https://helse-bergen.no/nrl

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ANNUAL REPORT 2023

The annual report presents results and descriptive statistics for operations up to 2022 from our 4 registries. In 2022, it appears that surgery has been carried out more normally, following the pandemic years of 2020 and 2021. For details, please refer to the preface of each individual register's report.

This year, we are attempting a reader-friendly summary of the annual report for the Joint Register (hip, knee, and shoulder prostheses), Hip Fracture Register, Knee Ligament Register, and Pediatric Hip Register. This will be sent to each orthopedic surgeon and posted on our website.

Results tailored for the public are continuously published from June 15th each year on the National Service Environment for Medical Quality Registries' website, www.kvalitetsregistre.no. Some of these results are also included in this annual report.

The annual report is sent electronically to all Norwegian orthopedic surgeons. Printed copies can be obtained by contacting the registry. On our website (http://www.helse-bergen.no/nrl), all our annual reports are available in Norwegian and English, along with references to scientific articles and presentations. Most of the articles are also electronically accessible from this website. We publish most of our results for implants and surgical methods in scientific journals. There, we can explain our materials and methods, discuss weaknesses and strengths, as well as the significance of our findings. Please see the reference lists at the end of the report.

Quality- and advisory unit

The Advisory unit has changed its name to the National Quality and Competence Network for Joint Prostheses and Hip Fractures. This is defined as a professional, interregional collaboration where the participants share a collective responsibility for knowledge dissemination, and where one professional community coordinates the activities. The network aims to contribute to equitable healthcare services with high quality, and with the goal of reducing variations in practice. The primary task should be knowledge dissemination by assisting in the implementation of existing and new research and quality registry findings in all regions. The network should also assist owners and national health authorities in clarifying professional questions. We are receiving fewer funds for this network than previously for the competence service, and this will inevitably affect our service to hospitals and researchers.

Register randomized studies (R-RCT)

We would like to remind you about our ongoing Registry Randomized Controlled Trials (R-RCTs). These studies are organized in such a way that once patients are included and operated on, the registry takes over the follow-up, and there is no additional work for either the patient or the healthcare provider. The ALBA study (R-RCT in which patients undergoing primary total knee replacement are randomized to bone cement with or without antibiotics) started enrolling patients in January 2021, and as of June 1, 2023, 2075 patients have been included. The goal is to include 9,172 knee replacements, so we encourage all hospitals to begin the inclusion process.

The Norwegian Knee Ligament Register (NKLR) is currently conducting an R-RCT where patients are randomized between early surgery or active rehabilitation. All major hospitals in Norway are participating in this study. A new R-RCT is also planned to study graft choice once the current study is completed. Participation in R-RCTs requires web-based registration in the Medical Registration System (MRS) where randomization takes place.

Quality improvement
The Pediatric Hip Register has initiated a quality improvement project to identify where delays in diagnosis occur for patients with Calvé-Legg-Perthes disease and Hip Epiphysis Slip. All the data has been analyzed, and for Calvé-Legg-Perthes disease, it's found that it takes about 14 weeks before patients seek primary healthcare services, and approximately 17 weeks until the diagnosis is established. Hospitals have effective procedures for promptly assessing referrals and scheduling patient consultations. For hip epiphysis slip, it's observed that it takes 10 weeks from the onset of symptoms until patients seek primary healthcare services, and about 19 weeks until the diagnosis is made. Here, too, a delay between primary and specialist healthcare services exists, which is important to reduce.

The challenge lies in how to effectively reach parents, patients, and primary healthcare providers with information so that patients promptly consult a doctor when experiencing symptoms and are quickly referred for diagnosis and treatment.

Annual report to hospitals
Hospital-specific annual reports, containing data from each individual hospital, will be sent electronically to our contacts at the hospitals and to the CEOs of each healthcare organization during October, as done in previous years. We encourage the designated contacts to share these reports with their administration and staff, and to verify the accuracy of the recorded surgeries and data. The reports should be utilized for local improvement initiatives. If you identify any errors in the hospital-specific reports, please contact us.

Completeness of reporting
The completeness of reporting is published for each of the registries, these analyses are performed every two years. No new analyses have been conducted this year. This year, we are presenting figures for 2019 and 2020. Hospitals with low reporting rates must review their reporting procedures. Some hospitals exhibit low reporting rates for revision surgeries.

Electronic reporting in MRS
The ACL Registry has decided to phase out paper reporting forms starting from January 1, 2024. In 2022, 70% of the surgeries were reported via the Medical Registration System (MRS). For the Joint Registry, over 40% of the surgeries are now reported through MRS, with a slight lead for shoulder prostheses. We encourage hospitals to adopt this system.

Electronic registration of Patient-Reported Outcome Measures (PROMs) for hip, knee, and shoulder prostheses is in use at 40 hospitals, while 6 hospitals have their own solutions to export data to us. We ask hospitals to facilitate the collection of preoperative PROM data from patients receiving hip, knee, or shoulder prostheses. The goal is for patients at all hospitals to complete PROM forms before surgery, and patients will automatically receive PROM forms through Helsenorge.no 1, 6, and 10 years after the operation. The reference group has approved that achieving an 80% preoperative PROM registration rate is a good achievement for each hospital, which will be published as a quality indicator.
For patients receiving prostheses in other joints, we are working on implementing PROMs and surgeon reporting.

In the Pediatric Hip Register, all patients are electronically registered by the surgeons. We remind you that adult hip surgeries (osteotomies and arthroscopic-assisted procedures) should also be registered in the Pediatric Hip Register.

For the Hip Fracture Registry, the electronic registration form has been in use during 2022, and 12.3% of the patients were electronically registered in 2022. There were 28 hospitals that reported electronically. We encourage all hospitals to transition to electronic registration. PROM forms for hip fracture patients are sent out by the registry 4 months, 1 year, and 3 years after the operation. Patients who are digitally active can also fill out electronic PROM forms through Helsenorge.no. We have engaged a consultant responsible for training the hospital staff. Instructions can be found on our website.

We remind surgeons working at multiple hospitals to request access for each hospital when setting up their user profiles, ensuring that the operation forms are registered at the hospital where the surgery was performed.

Consent

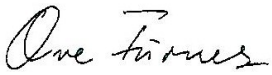
We would like to remind you that the Norwegian Data Protection Authority (Datatilsynet) requires patient consent forms to be signed before surgical procedures are reported to the registries, and these consent forms should be securely stored in an archive system. Starting from 2021, the Hip Fracture Registry has been approved as a registry with the right to opt-out, and patients are not required to provide written consent. However, it is crucial for hospitals to ensure that the opt-out option is genuine, and that patients receive information about their registration in the Hip Fracture Registry. This ensures that patients' rights and privacy are adequately upheld.

Social media

The Competence Network with Registries has its own Facebook page that we hope everyone will visit and follow. You can find it at https://www.facebook.com/leddregisteret/ or via the QR code on the back of this year's report. On this page, information about published studies and other important updates from the registry will be posted.

We extend our gratitude to all orthopedic surgeons across the country for their excellent reporting to the registries. We also want to express our appreciation for the collaboration with the various registry contacts at hospitals, the Reference Group and expert committees, the Norwegian Orthopedic Association, Helse Bergen, Helse Vest, the National Service for Medical Quality Registries at SKDE, and the center for expertise in Helse Vest, Helse Midt-Norge IT (HEMIT), Helse Vest IKT, equipment suppliers, University of Bergen, the Norwegian Patient Register (NPR), the Norwegian Institute of Public Health, the Norwegian Medicines Agency, the Norwegian Directorate of Health, and the Ministry of Health and Care Services.

Bergen, June 2023



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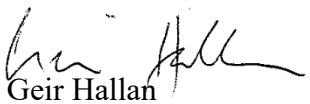

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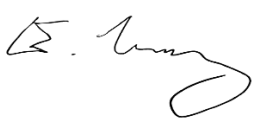

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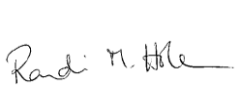

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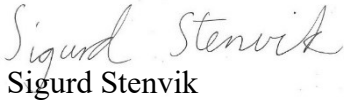

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Norwegian Arthroplasty Register

Total Hip Arthroplasty (THA)

ANNUAL REPORT HIP ARTHROPLASTY REGISTER

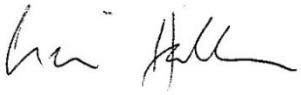
This year's report resembles reports from previous years, but in addition, we are publishing a shortened version of the report where the most important findings are described in a bit more detail. Therefore, the findings are not discussed in this preface. The small report is being sent out in paper format to all members of NOF this year and is openly available on our own website.

Hip replacement surgery has returned to pre-Corona levels, if not more; for the first time, more than 10,000 primary hip replacements were recorded in one year. The revision burden (proportion of revisions compared to primaries) is continually decreasing. Electronic registration is being adopted by an increasing number of hospitals, and PROM registration as well, although the latter is progressing slower than we had anticipated. The registry has resources to assist hospitals in getting started, and all you must do is get in touch.

We hope you like the new report format (the shortened version) and appreciate feedback so that both reports and reporting can be further improved.

Thank you for the excellent reporting!

Bergen, June 2023



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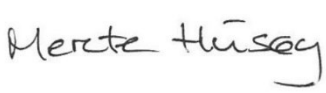
Anne Marie Fenstad
Biostatistician/Researcher



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Consultant

Irina A. Kvinnesland
IT consultant

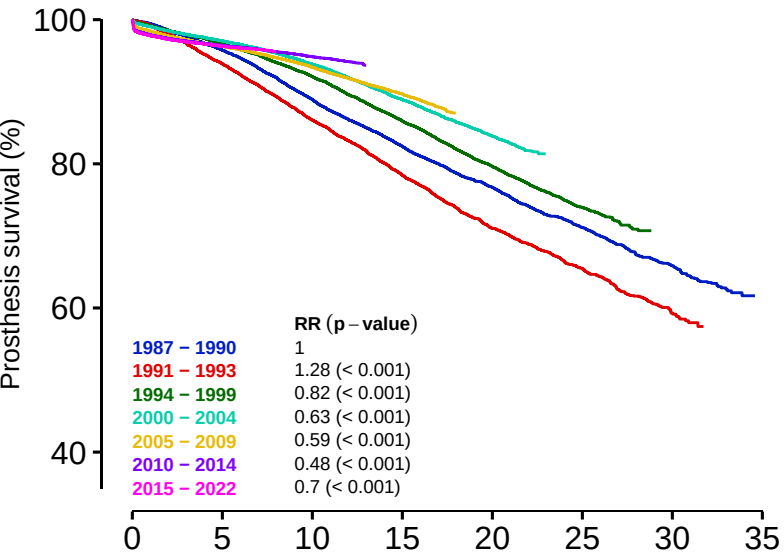
Sigurd Stenvik
Biostatistician/Researcher

Kalyana Srujana Mulpuri
IT consultant

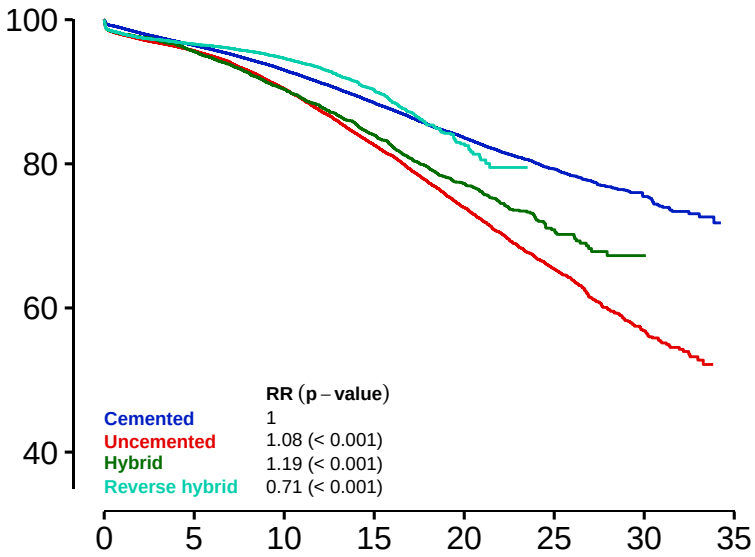
Survival of total hip prosthesis
1987−2022

Report 2023

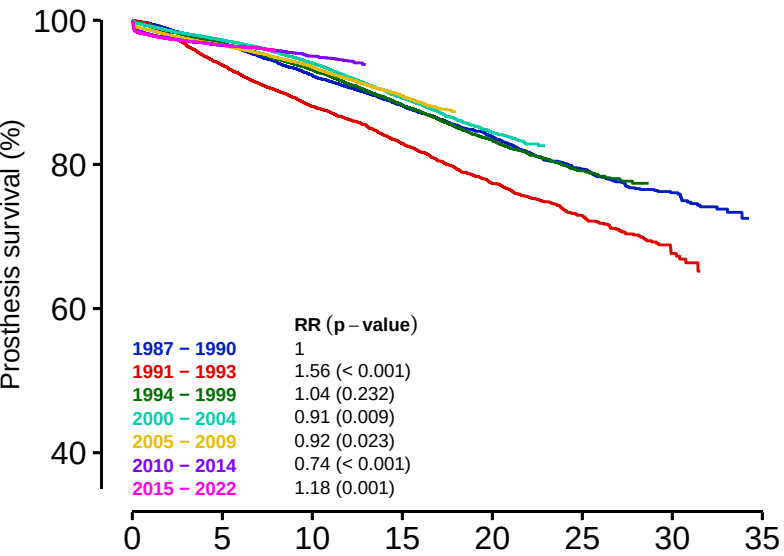
A.1) All



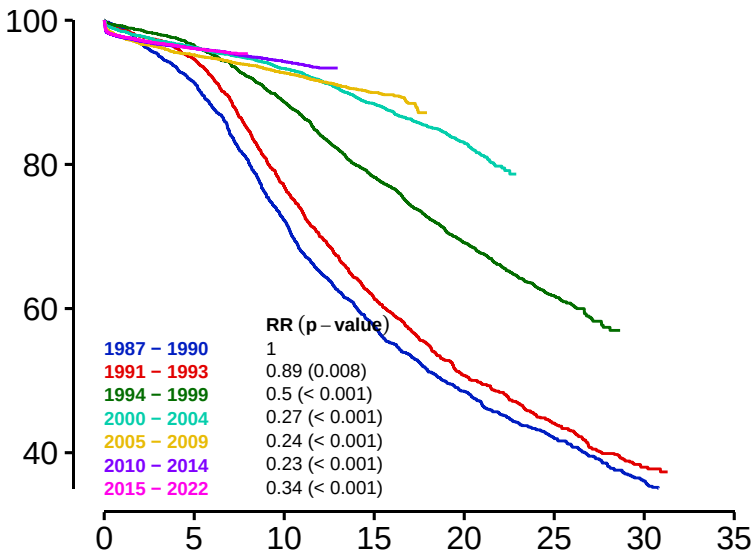
A.2) Fixation



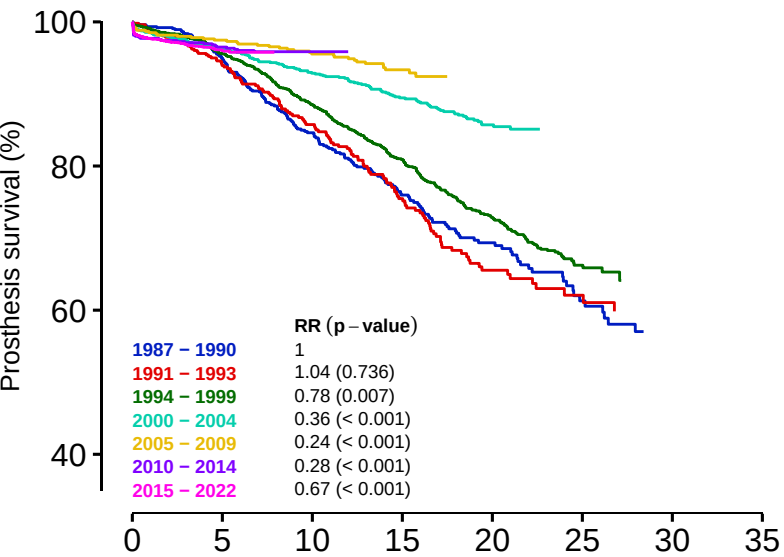
A.3) Cemented



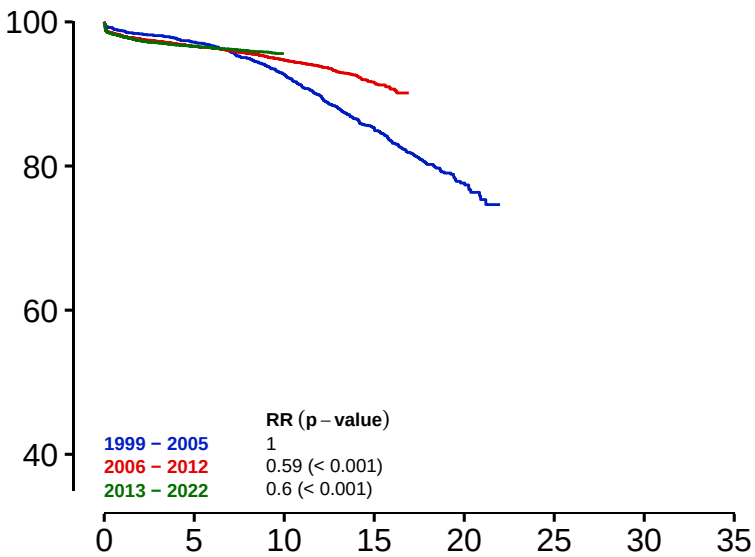
A.4) Uncemented



A.5) Hybrid



A.6) Reversed hybrid

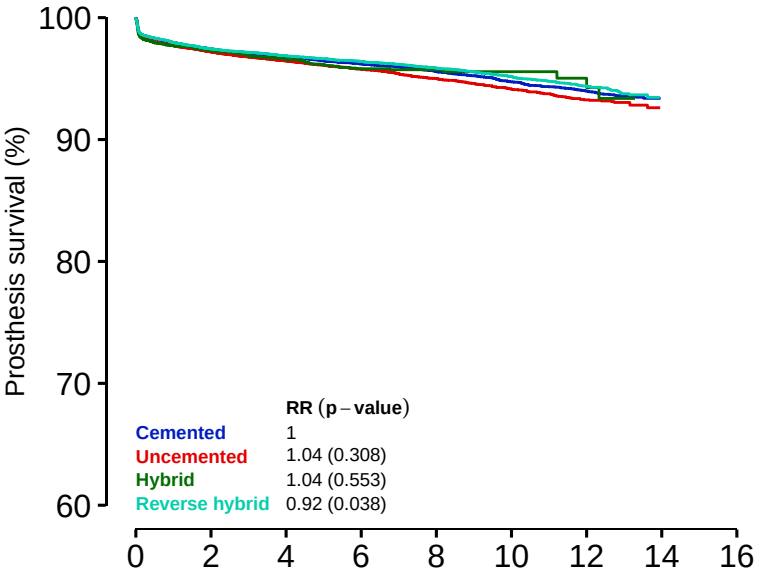


Kaplan−Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses are at risk.
There is some uncertainty tied to the risk estimates from the Cox−analyses as the assumption of proportional hazard does not hold for all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

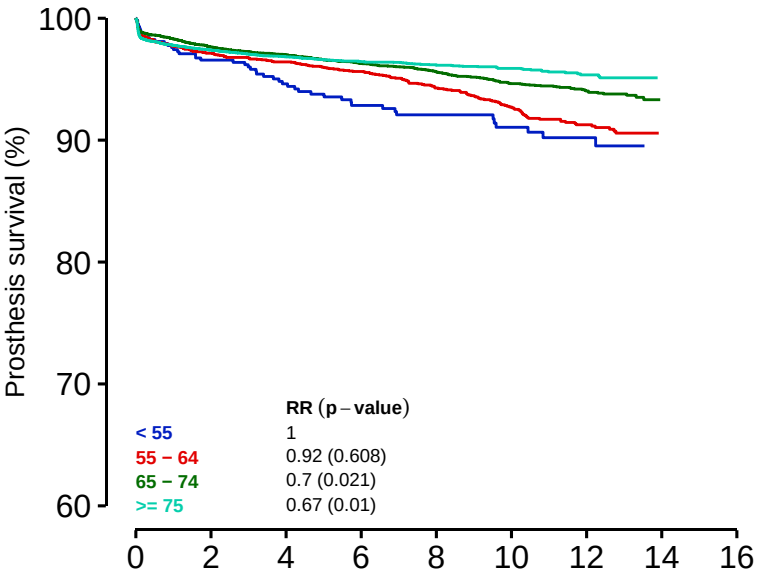
Survival of total hip prosthesis
2009−2022

Norwegian Arthroplasty Register

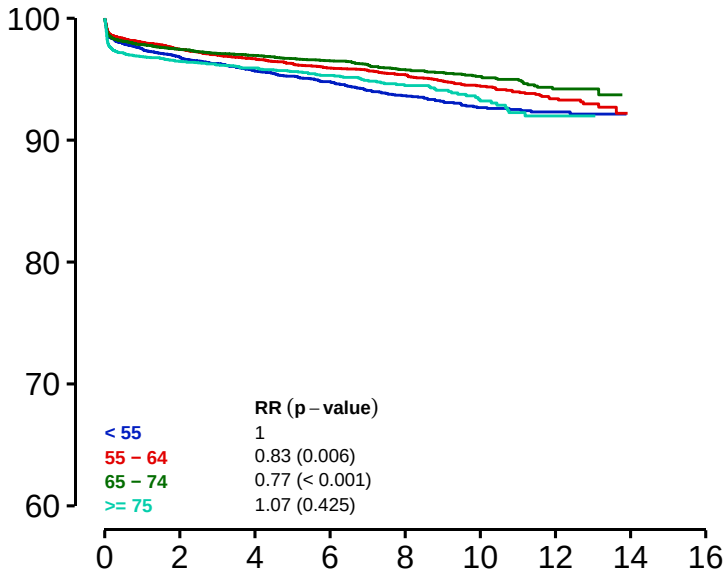
A.7) Fixation



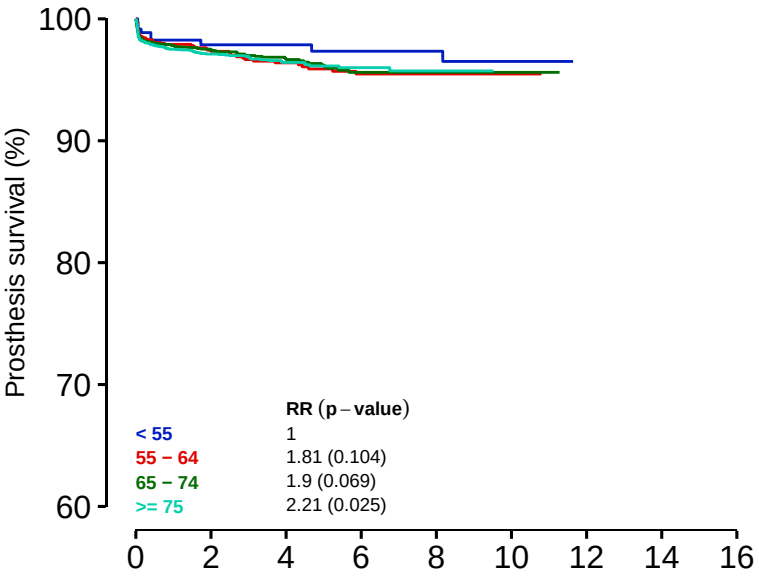
A.8) Cemented



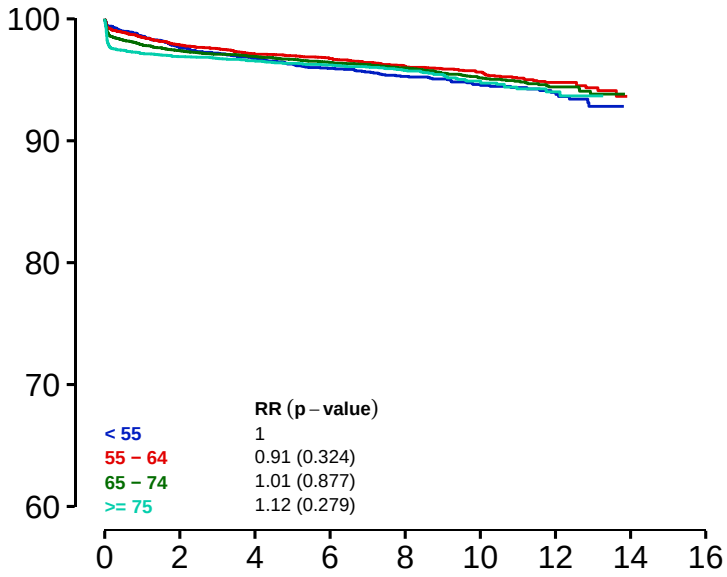
A.9) Uncemented



A.10) Hybrid



A.11) Reversed hybrid



Hip

Kaplan−Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
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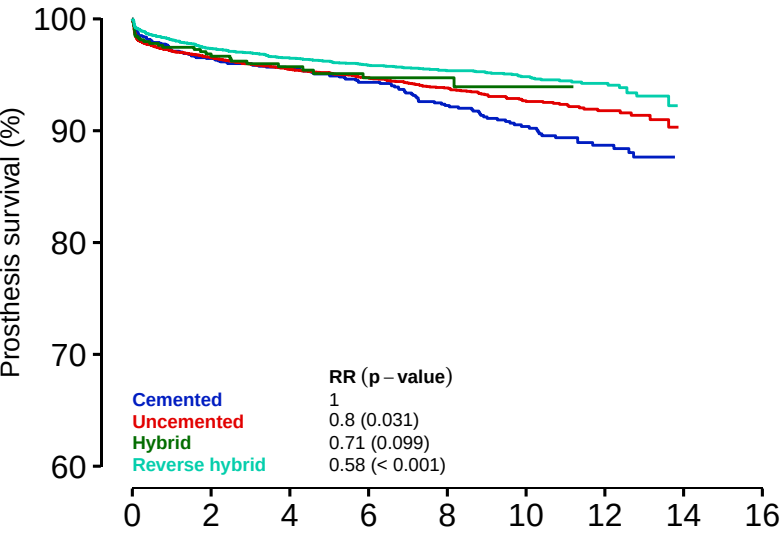
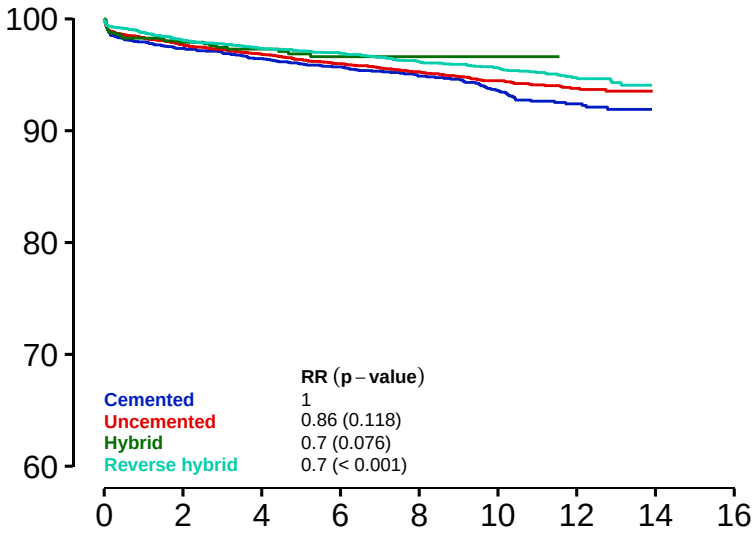
Survival of total hip prosthesis
2009−2022

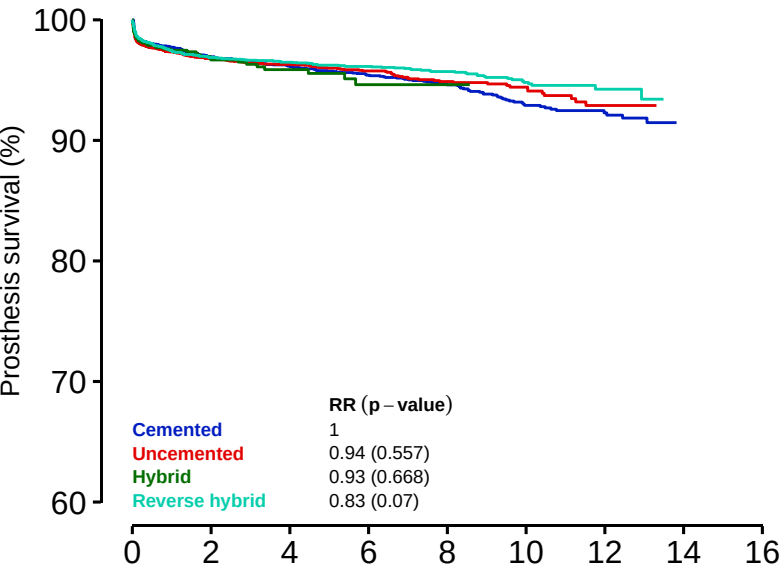
A.12) Different fixations men Under 65 years



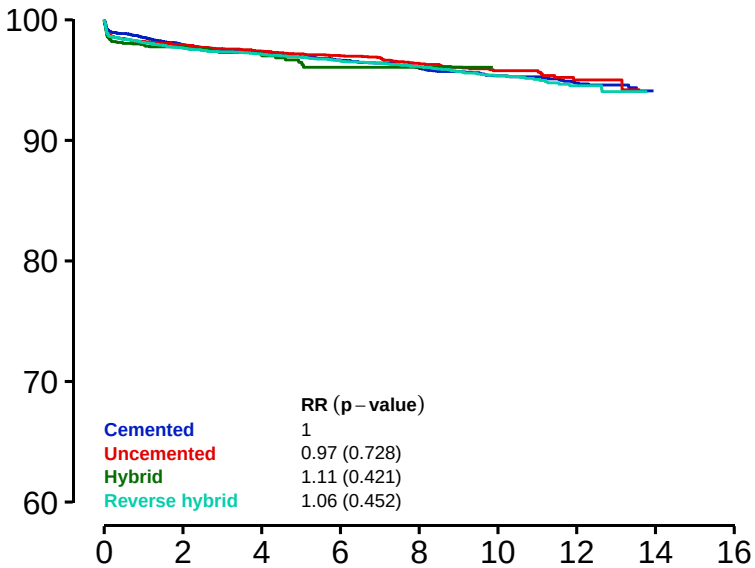
A.13) Different fixations women Under 65 years



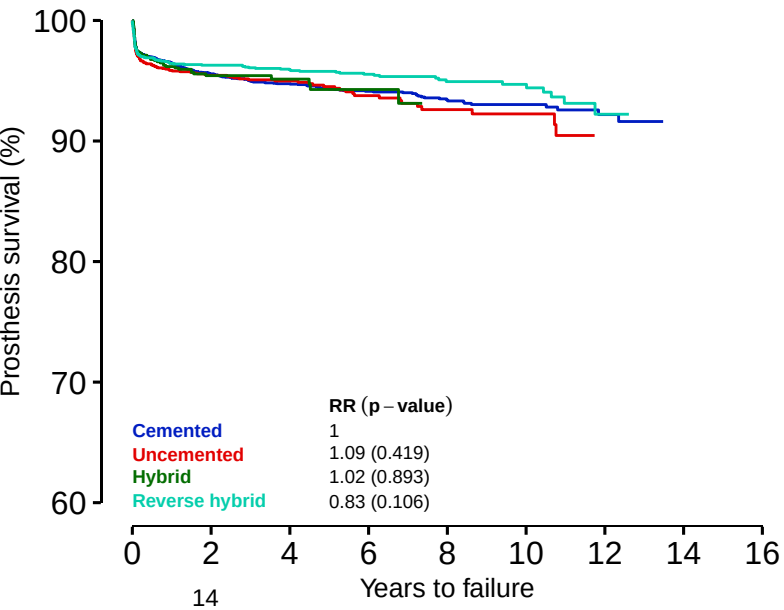
A.14) 65 − 74 years



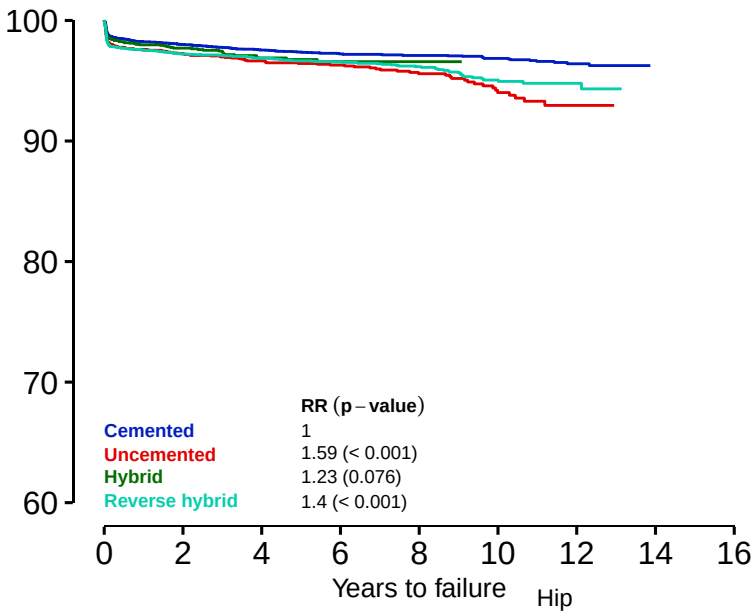
A.15) 65 − 74 years



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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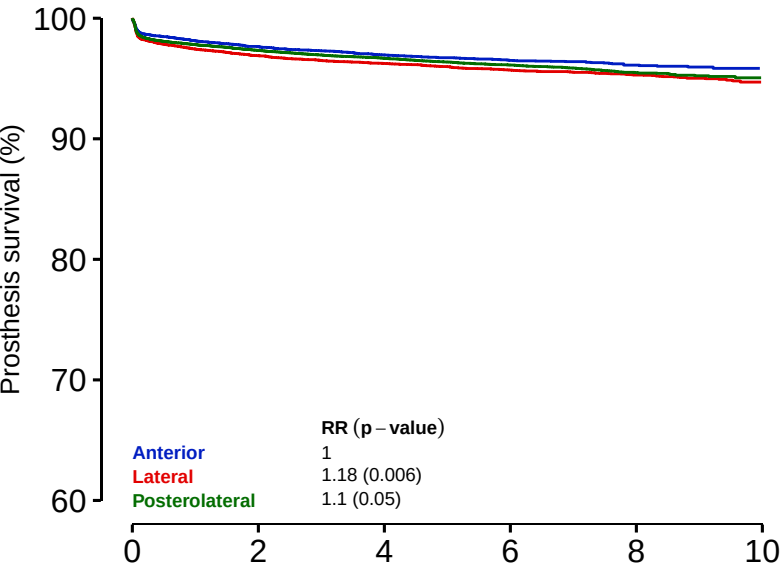
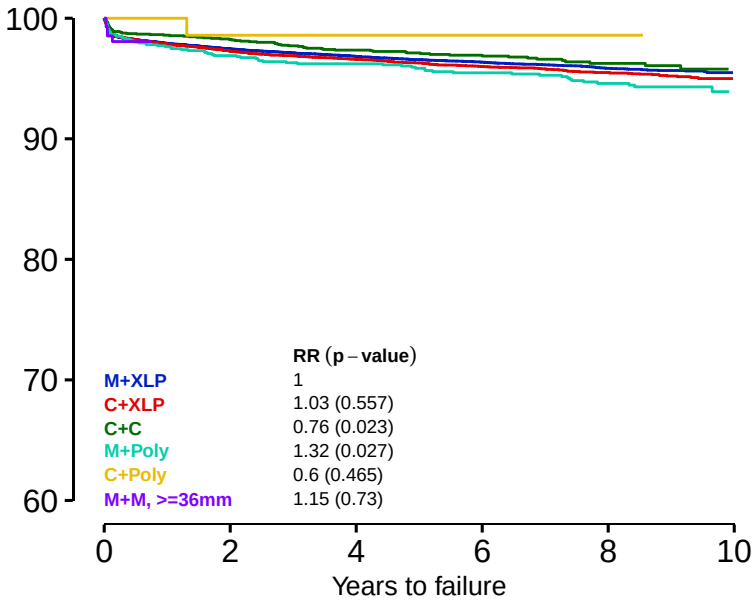
Survival of total hip prosthesis
2012−2022

Norwegian Arthroplasty Register

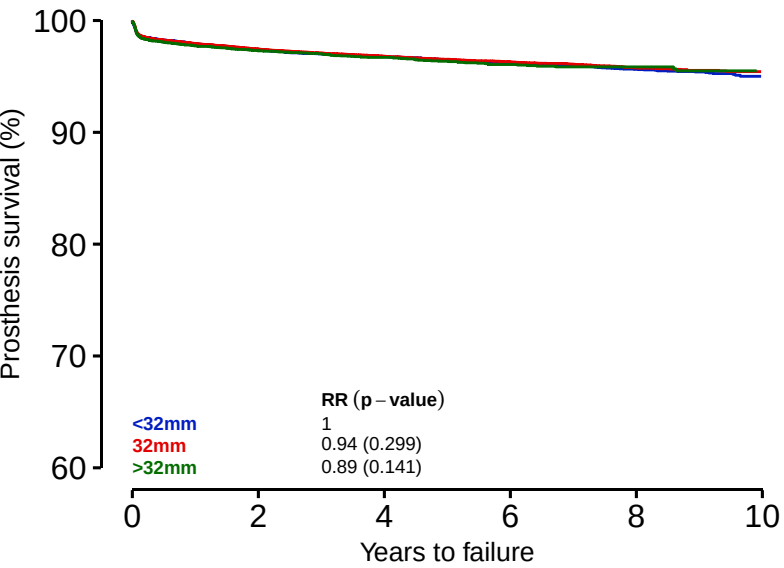
A.18) Approach



A.19) Articulation (without dual mobility)



A.20) Head size (without dual mobility or metal on metal)



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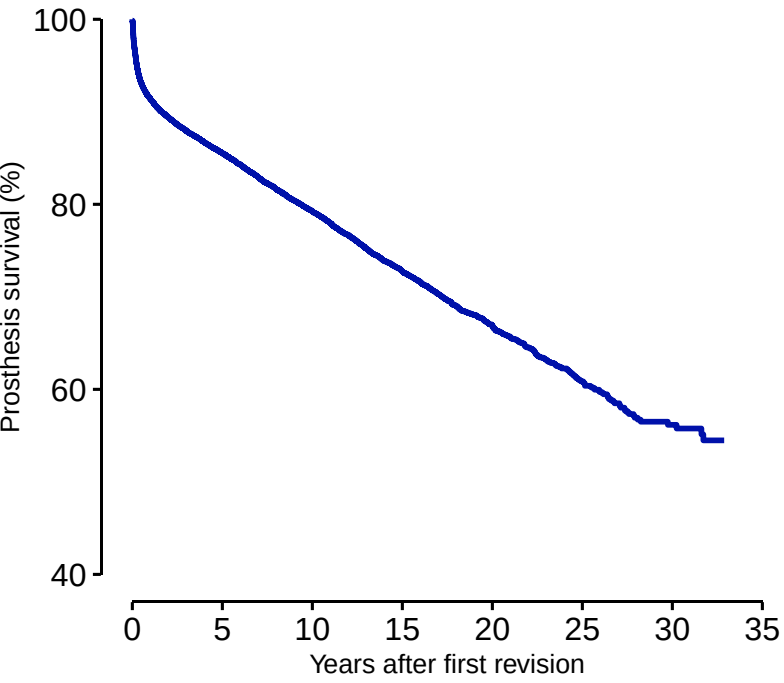
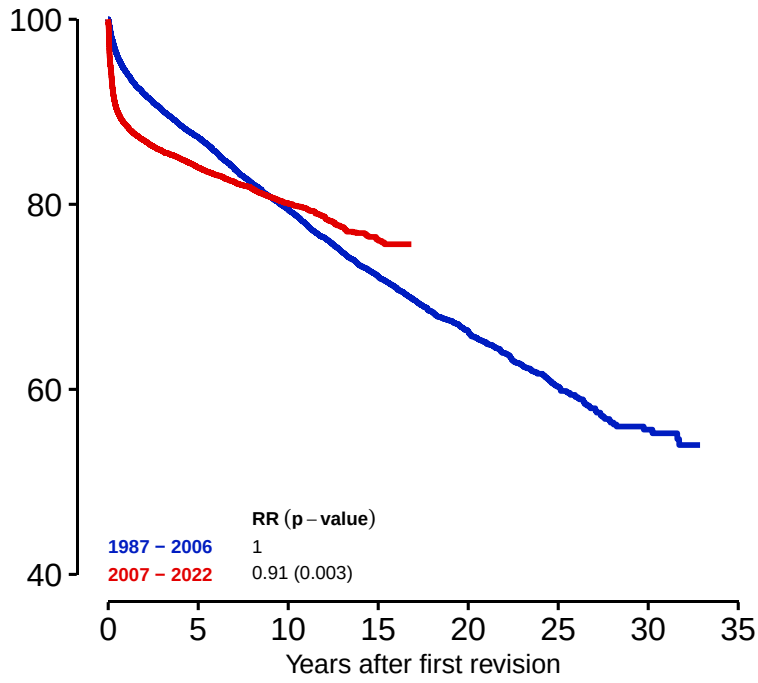
Survival curves for first time revisions
1987 − 2022

A.21) All



A.22) Two time−periods



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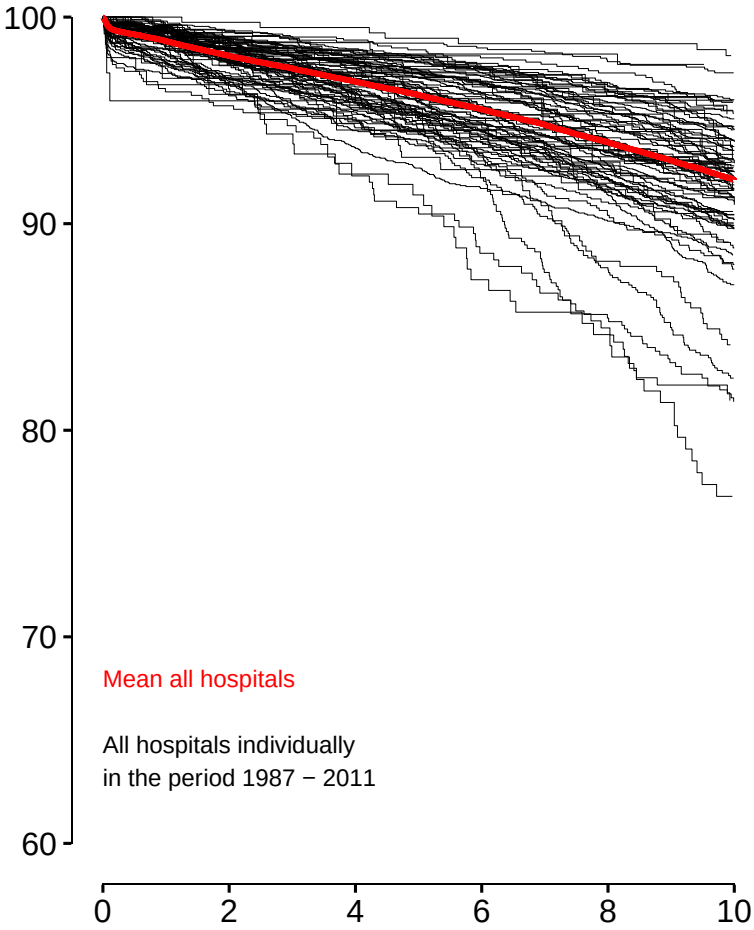
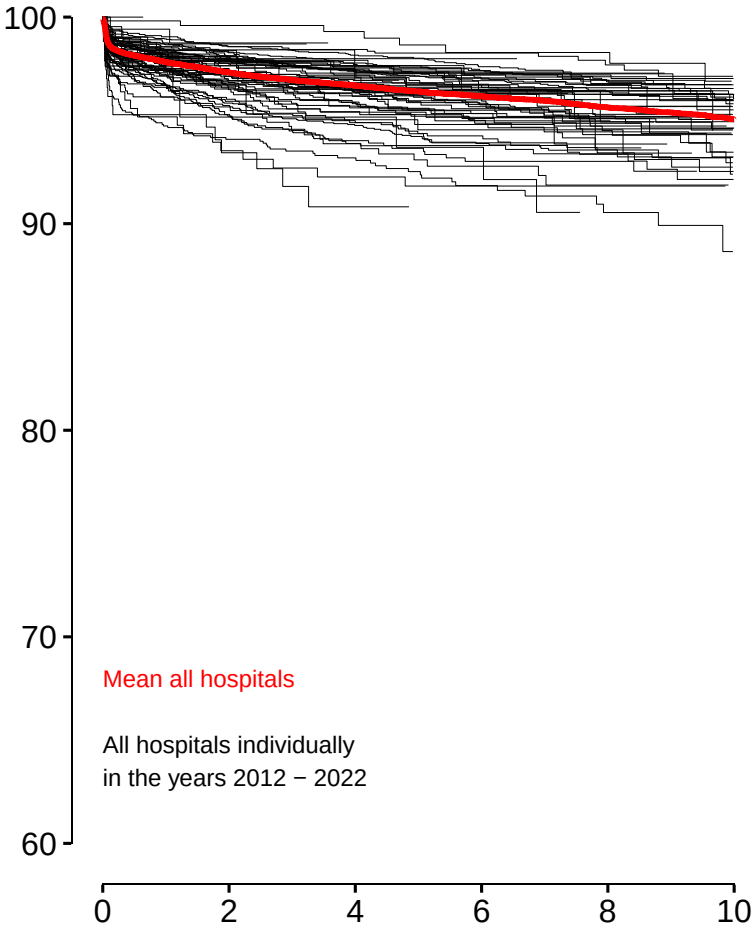
Survival curves for all hospitals individually

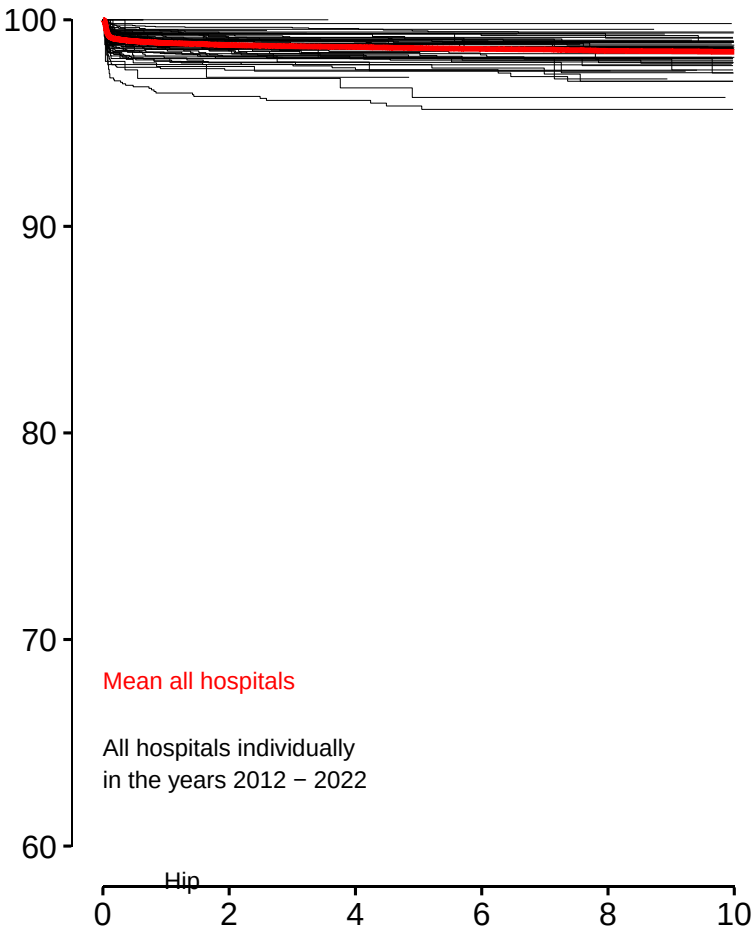
A.21) All hospitals in the years 1987 − 2011



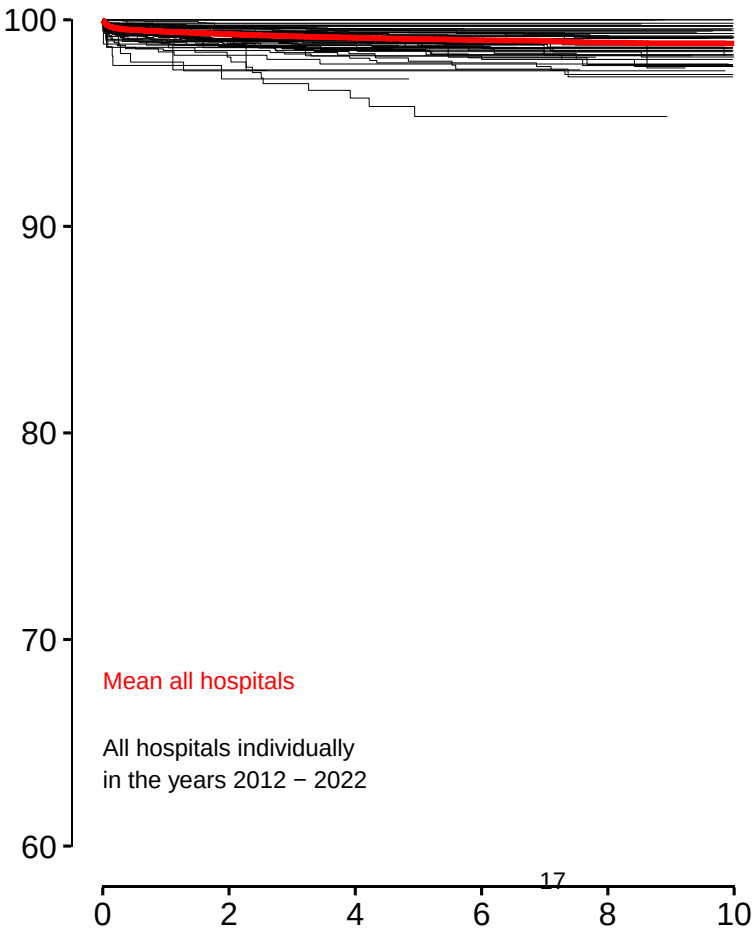
A.22) All hospitals in the years 2012 − 2022



A.23) Endpoint revision due to infection, 2012 − 2022



A.24) Endpoint revision due to dislocation, 2012 − 2022



One stage bilateral hip prosthesis operations

Year	1987-2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Sum:
Number of patients	281	23	22	28	32	47	72	70	100	96	106	877

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 2022

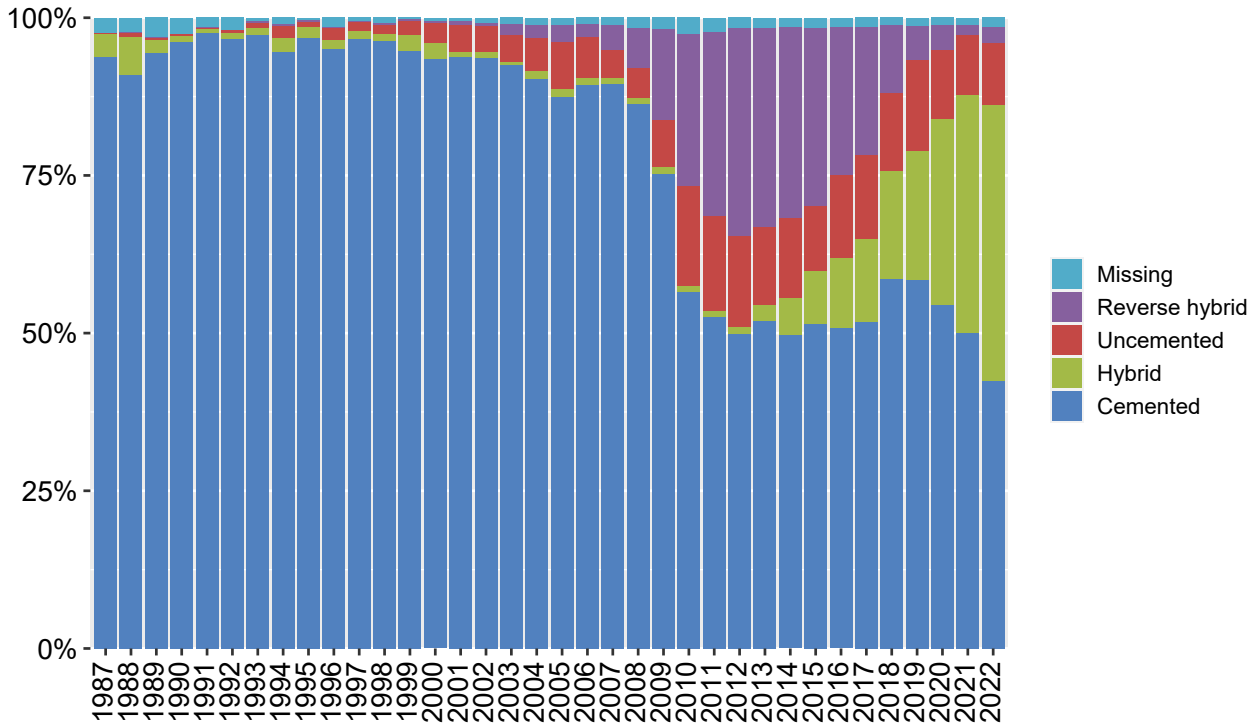


FIGURE A.26: Number of primary THA operations, 2022

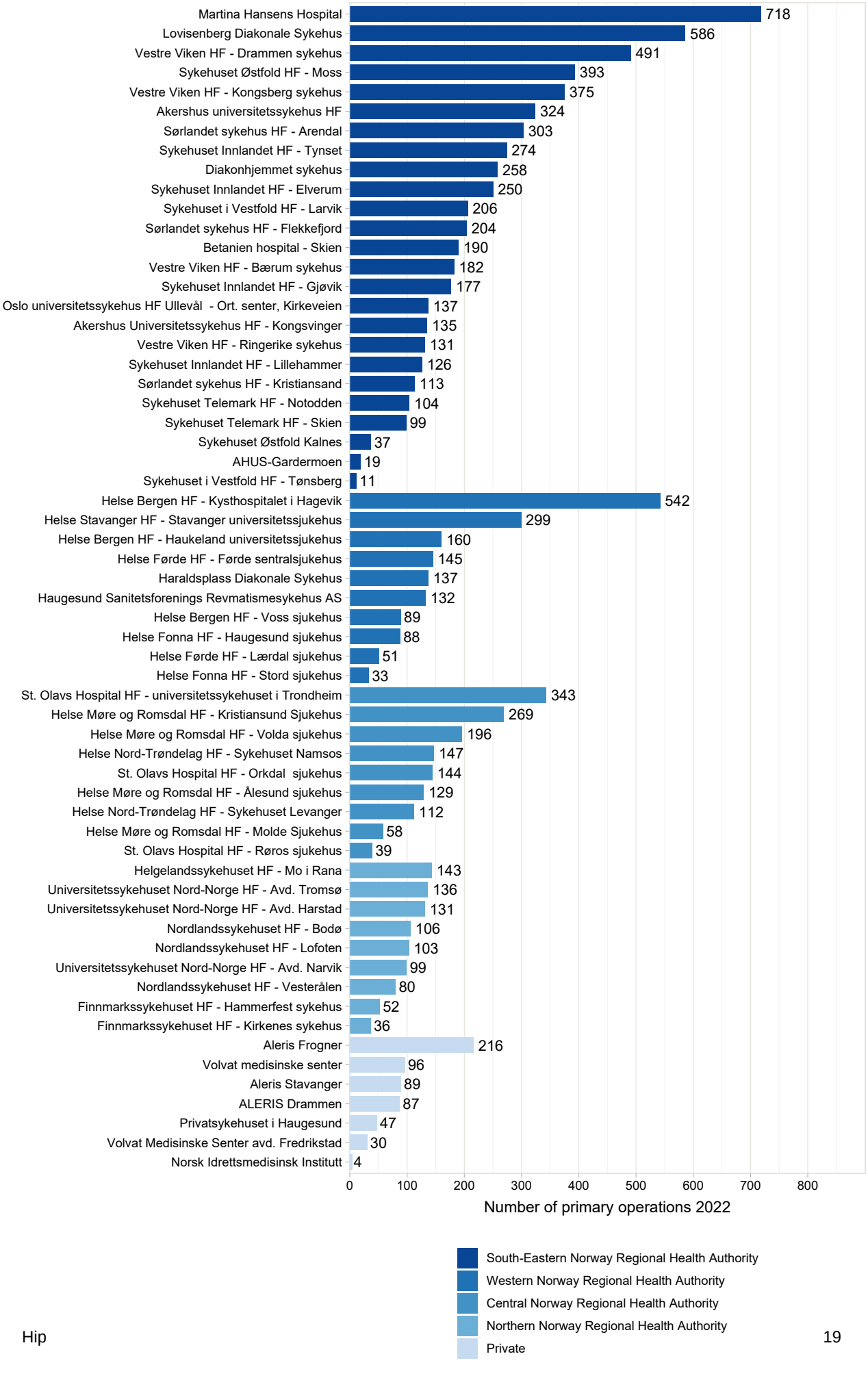
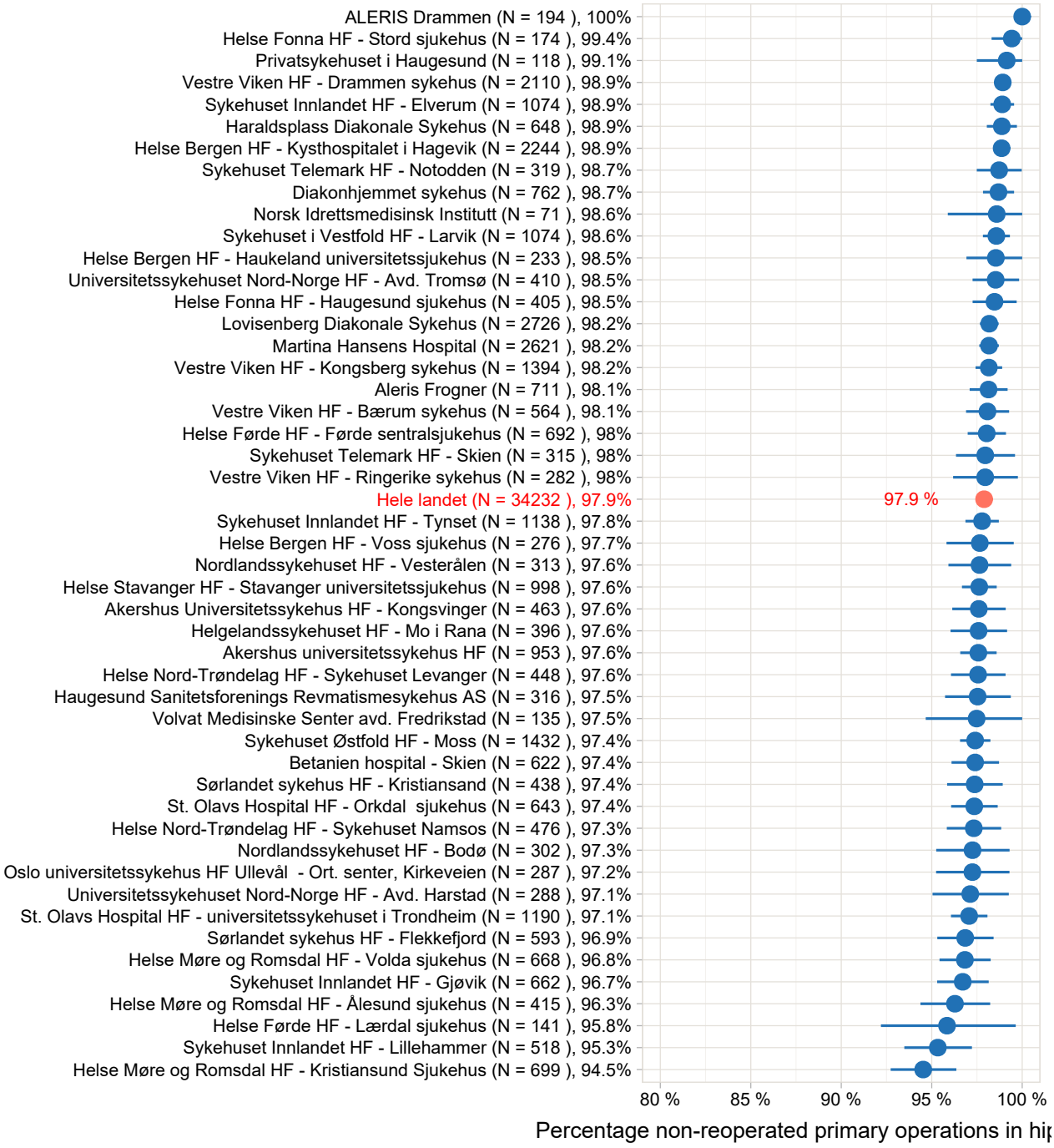
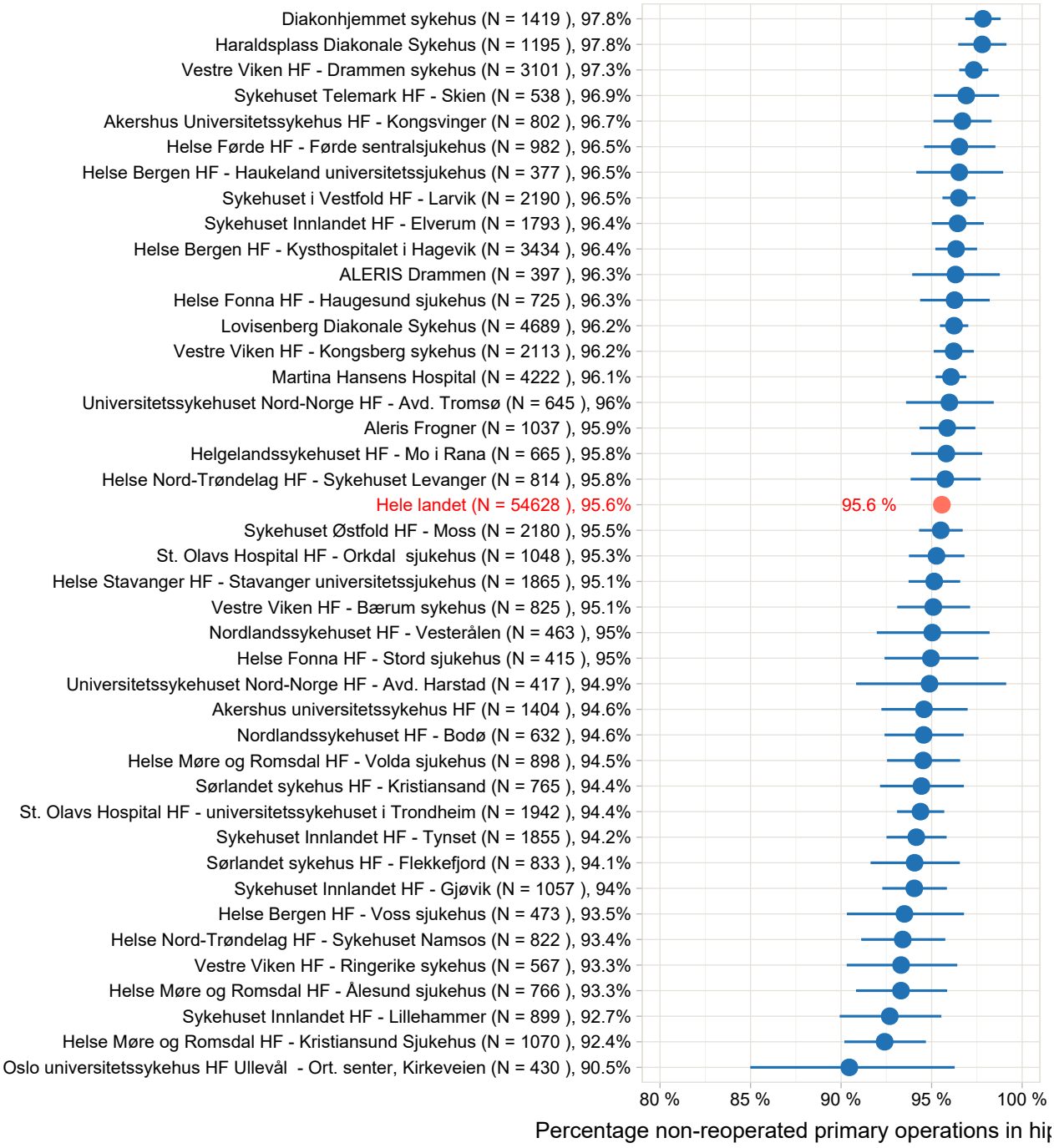


FIGURE A.27: Percentage non-revised standard patients two years after operations in 2016-2022



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 2016 to 2022. Only hospitals with operations in 2022 and with more than 50 operations from 2016 to 2022 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 2016 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 2011-2022



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 2011 to 2022. Only hospitals with operations in 2022 and with more than 50 operations from 2011 to 2022 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 2011 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:

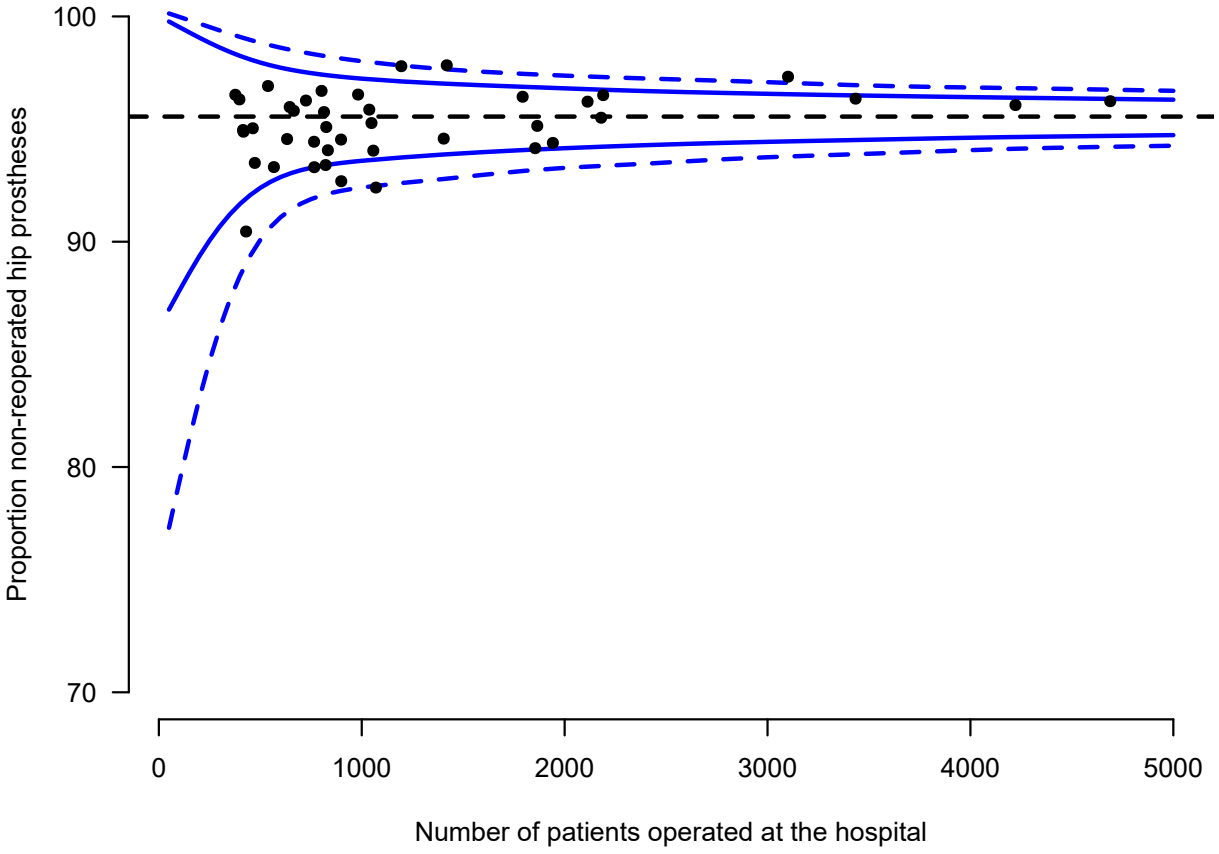
1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analyses.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications, 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 NAR are poorly suited for such calculations. The NAR 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 2011-2022



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2011 to 2022 at Norwegian hospitals. Some hospitals are excluded. This can be due to low completeness of reporting of revisions (<80 % from 2011 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 2022. 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 2011-2022.

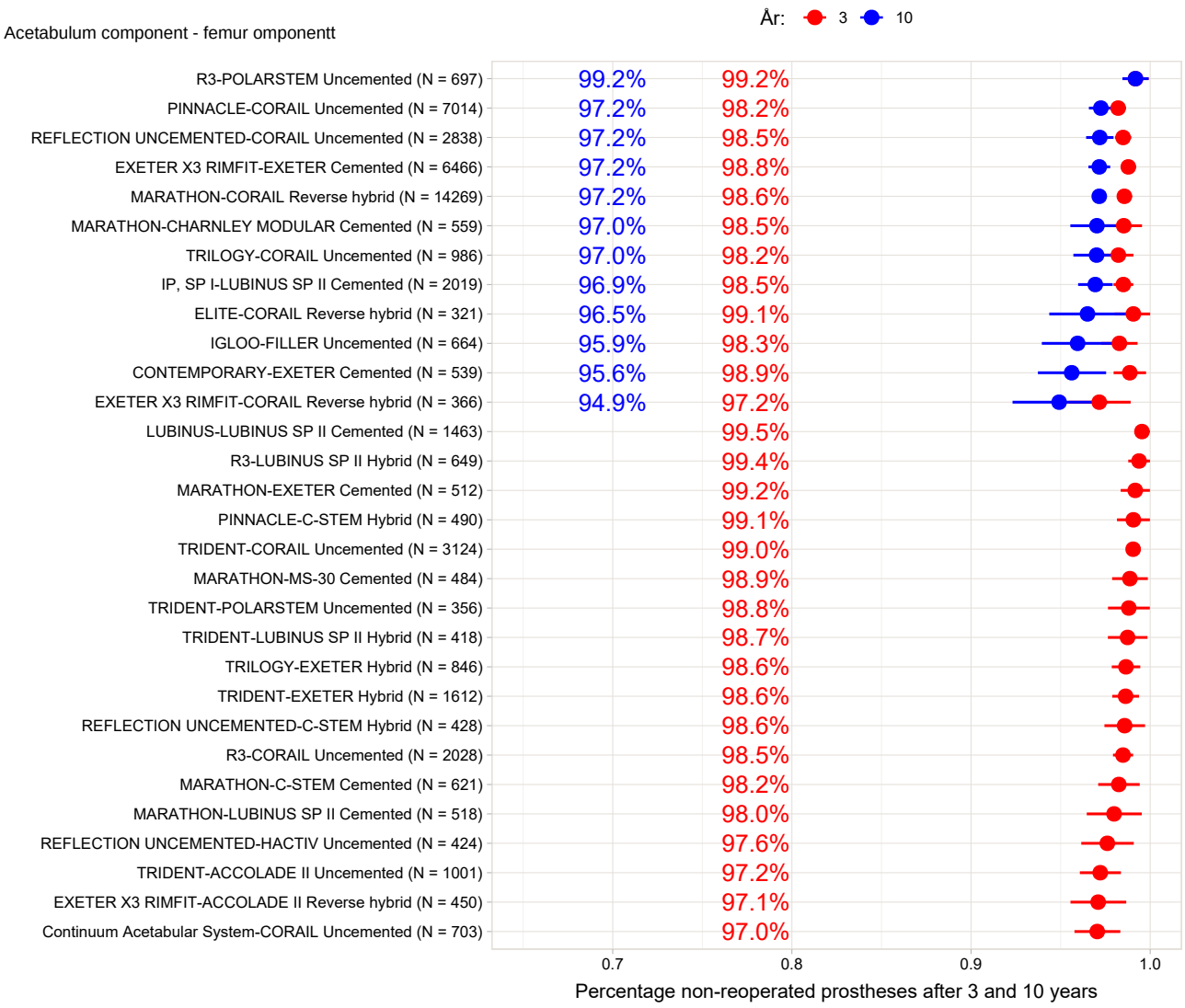


Figure A.30 shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of hip prostheses. We have only included combinations used in 500 or more operations in 2011-2022. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2011 to 2022 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.

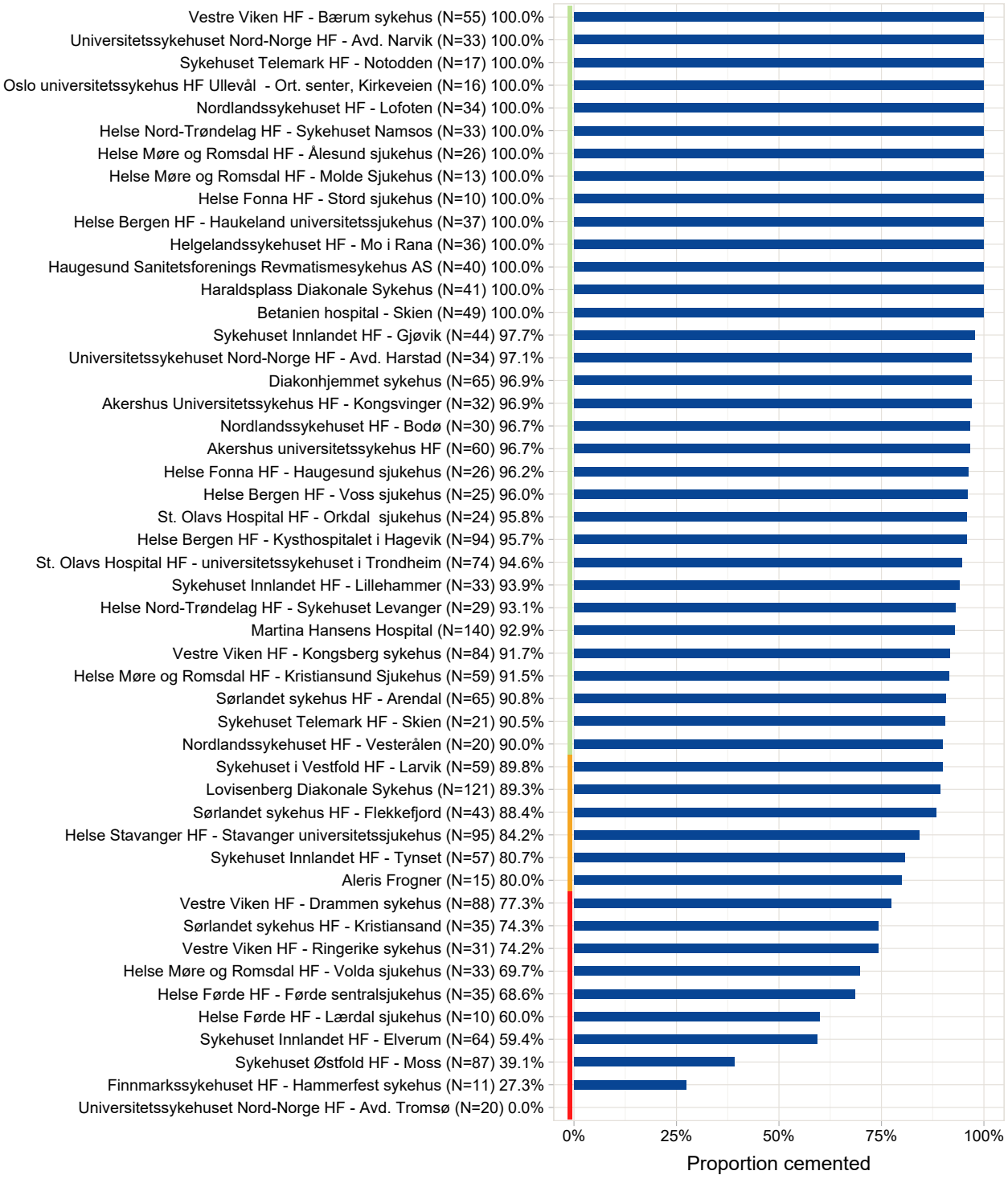
How to interpret the prosthesis results:
When prostheses are ranked by percentage of revisions, results must be interpreted with caution, as there may be many reasons for different revision percentages. We mainly publish prosthesis results in scientific journals and presentations where we account for 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 2022.



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, 87,4 % of femoral stems were cemented in women over 75 years of age.

FIGURE A.32: Proportion of patients with wear resistant cup materials (cross-linked polyethylene/ceramic) in 2022.

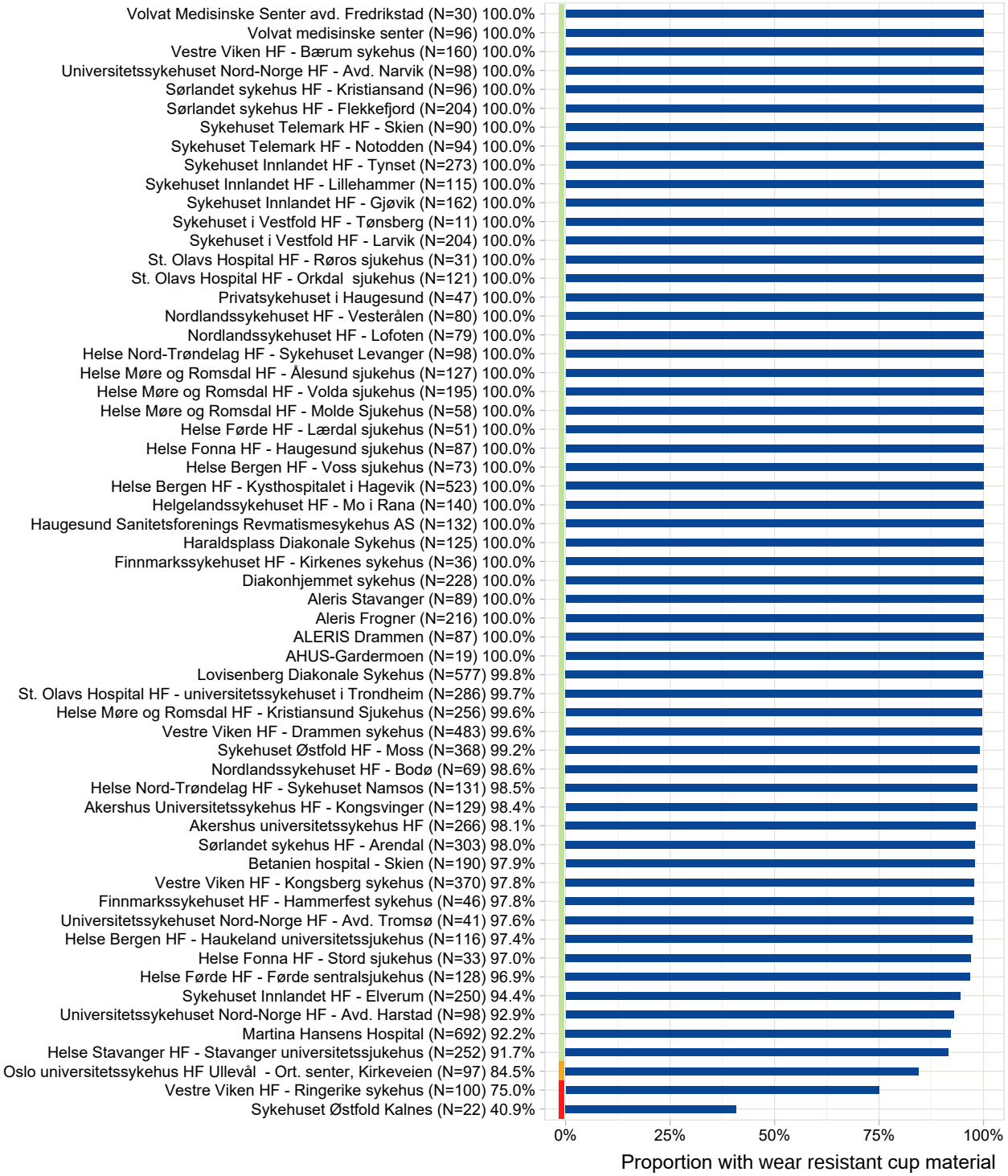
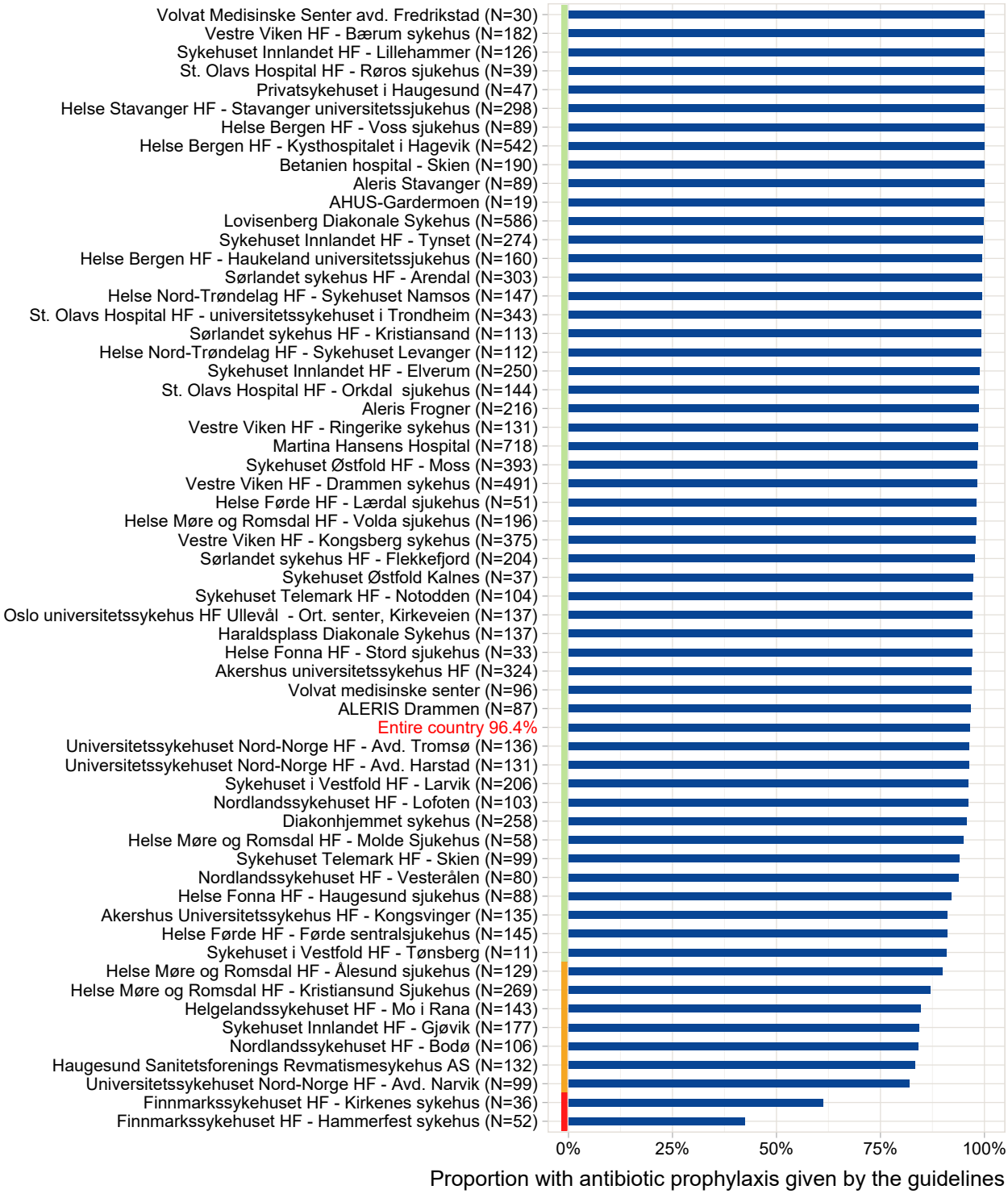


Figure A.32 shows that most patients at all hospitals receive hip prostheses with wear-resistant joint surfaces (Nationally: 98,0 %). The use of ordinary polyethylene is justified in certain patients who do not need a prosthesis lasting longer than 10-15 years.

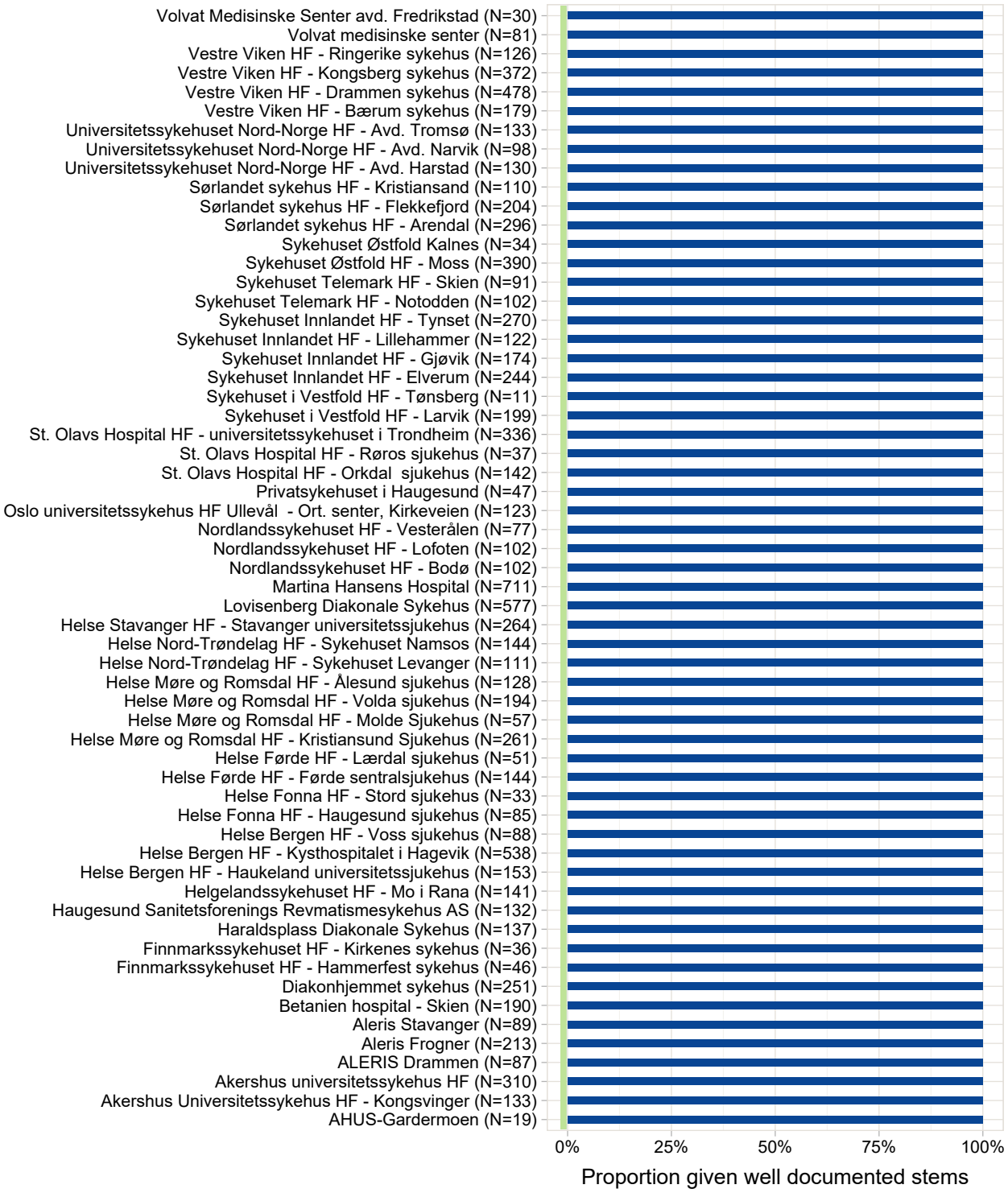
A special type of cups (Dual Mobility (DM) cups) are still delivered with conventional polyethylene. The hospitals in the lower part of the figure uses these cups. It is not clear from literature that it is necessary to use cross-linked polyethylene in DM cups.

FIGURE A.33: Proportion of patients with antibiotic prophylaxis as given by the guidelines in 2022.



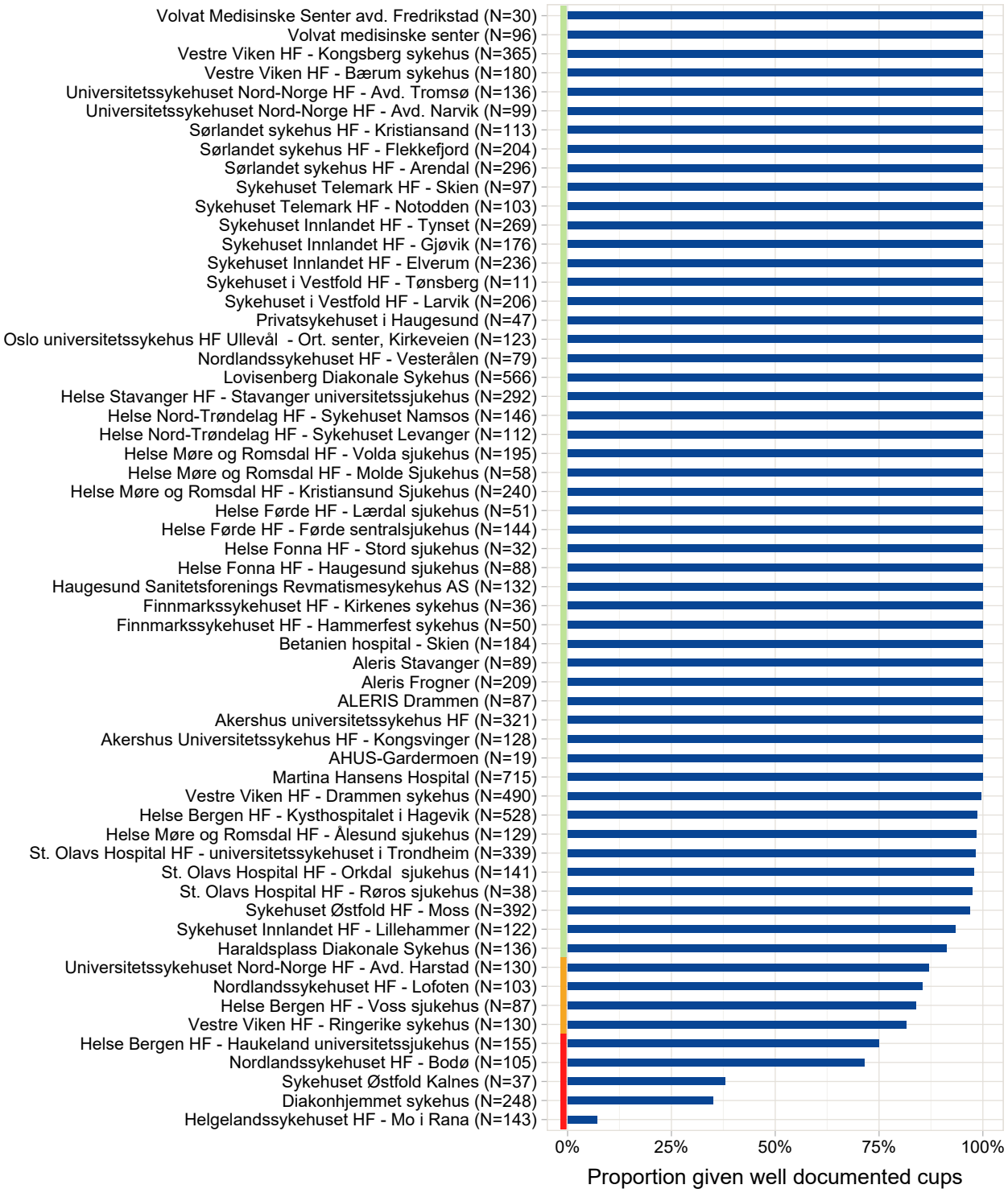
Antibiotica prophylaxis was administered according to the guidelines in 96,5 % of all operations. A low score (at the bottom of the figure) does not mean that patients have not received antibiotics; it generally means that they were given antibiotics in a manner contrary to the guidelines. Some hospitals 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 2022.



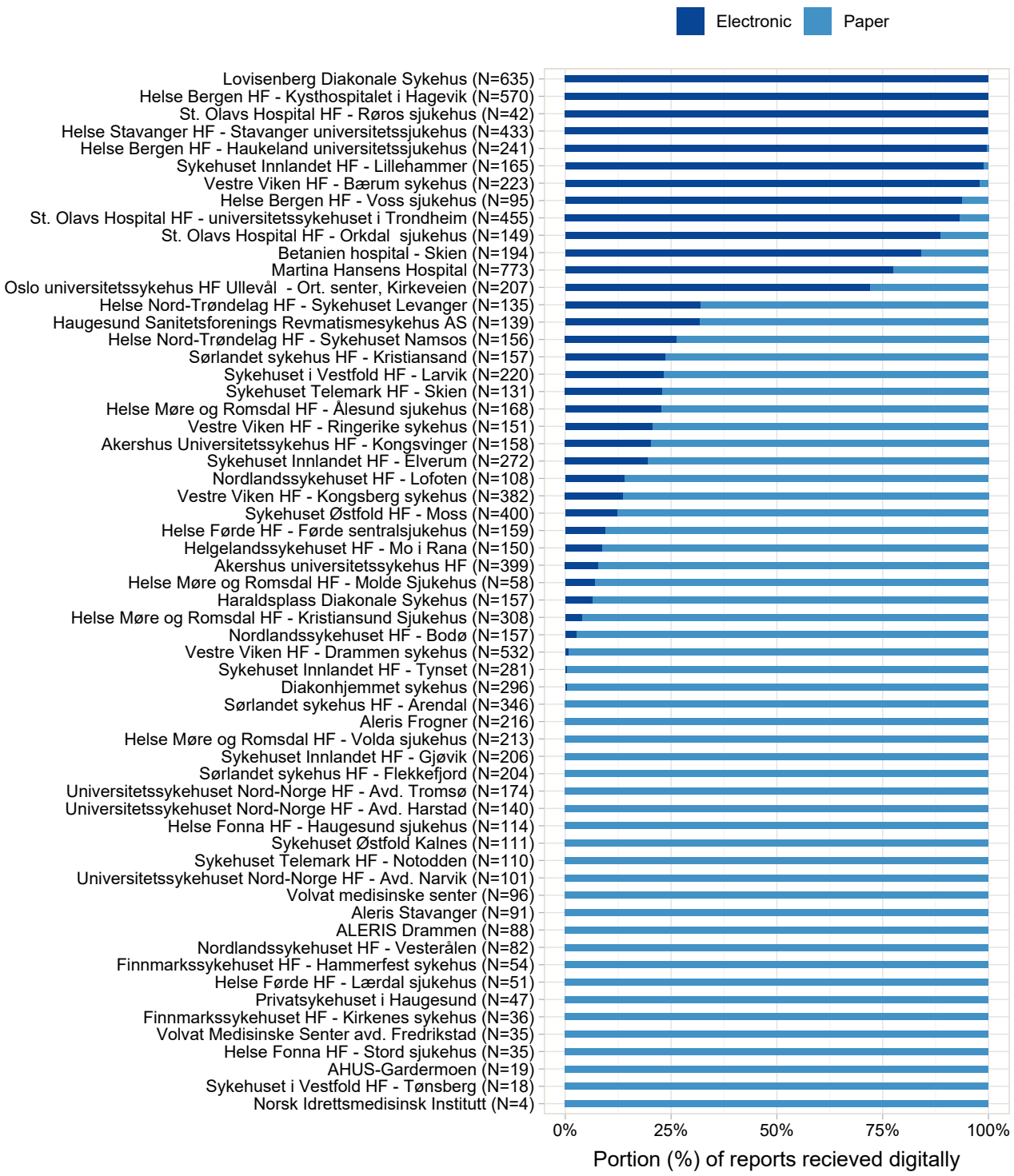
The overwhelming majority of all inserted hip stems are well documented. On a national level, 100,0 % of all hip prostheses use well documented hip stems. All hospitals have been asked to report these prostheses to the registry so that they could be excluded from the above presentation.

FIGURE A.35: Proportion of patients recieving well documented hip cups in 2022.



On a national level, 95,0 % 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.

FIGURE A.36: Form registration by format in 2022, all operations



National average for electronic form registration in 2022 is 37.6%.

PROM, Hip Arthroplasty Register

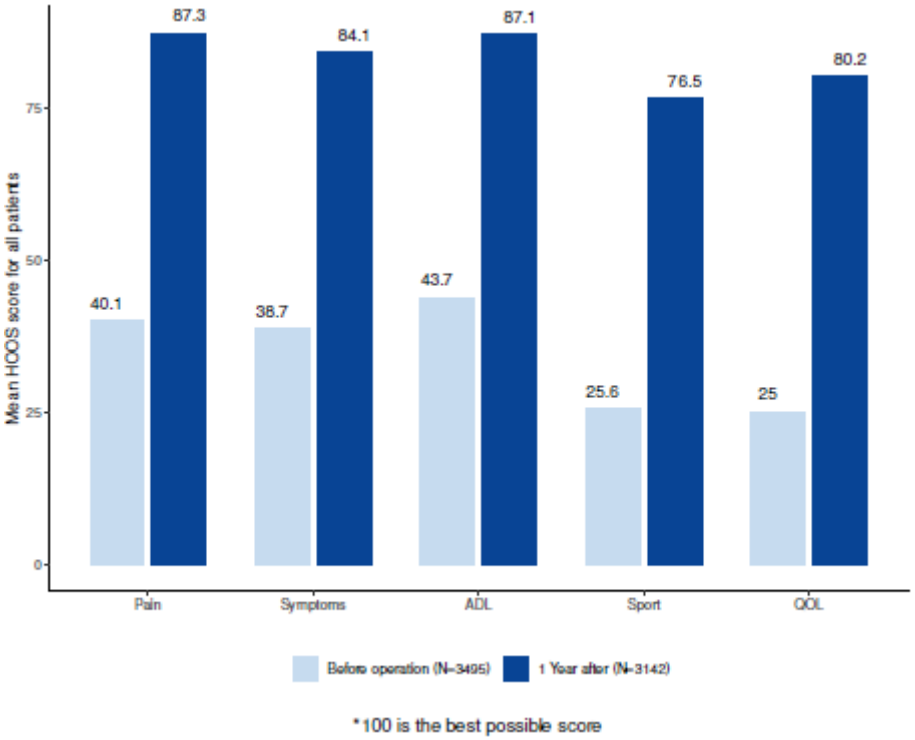
The Hip Arthroplasty Register has had electronic collection of patient-reported data (Patient Reported Outcome Measures (PROM)) since 2017. The register aims to focus more on patients' self-perceived quality of life and joint function before and after surgery. Patients complete an electronic questionnaire before surgery and 1, 6 and 10 years after surgery. The data we collect from patients will be compared with the data reported by the surgeons for the same group of patients. This will allow us to emphasize function and quality of life, in addition to a possible revision of the prosthesis.

So far, 10,065 pre-operative PROM forms and 8,911 one-year follow-up forms have been reported to the register. To date, 46 hospitals have started collecting and reporting PROMS (37 in 2022). We also received 938 paper forms from 30 hospitals. All hospitals will receive reports containing analyses of their own results. Please feel free to contact our consultant Mikal Solberg at mikal.solberg@helse-bergen.no if you have any questions about electronic PROM registration.

Patient demography	Before Operation	1 Year after
Number of forms (n)	3495	3142
Men (%)	30.3	34.3
Median age (min-max)	68 (16-91)	68 (20-95)
Body-Mass Index mean (SD)	28.6 (39.5)	27.4 (5.2)
Uses alcohol n (%)	2892 (82.7)	2487 (79.2)
Smokes n (%)	283 (8.1)	294 (9.4)
High school education or higher n (%)	1994 (57.1)	1669 (53.1)
Lives alone n (%)	967 (27.7)	821 (26.1)
UCLA activity* mean (SD)	4.6 (2)	5.8 (2)
Health** (VAS) mean (SD)	56.6 (20.6)	74.1 (18.9)

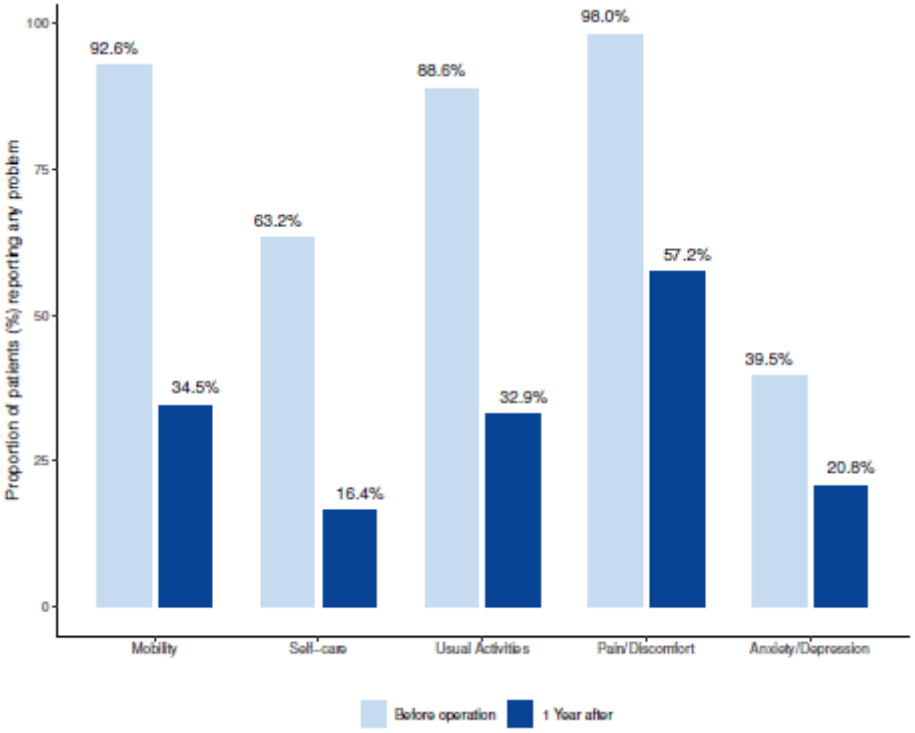
*Best possible score is 10, **100 is the best possible health

Figure A.37 Mean HOOS score before/ after operation*



*100 is the best possible score

Figure A.38 Proportion of patients reporting any problems with mobility, self-care, usual activities, pain/discomfort, or anxiety/depression before/after operation (5Q-5D-5L)



Health Trust	Reporting Hospitals	No. of Preoperative forms
Central Norway Regional Health Authority	4/9	223
Northern Norway Regional Health Authority	2/9	11
South-Eastern Norway Regional Health Authority	20/24	2291
Western Norway Regional Health Authority	9/10	886
Private	2/7	84

Figure A.39 Proportion of primary hip operations where pre-operative PROMS have been reported in 2021-2022

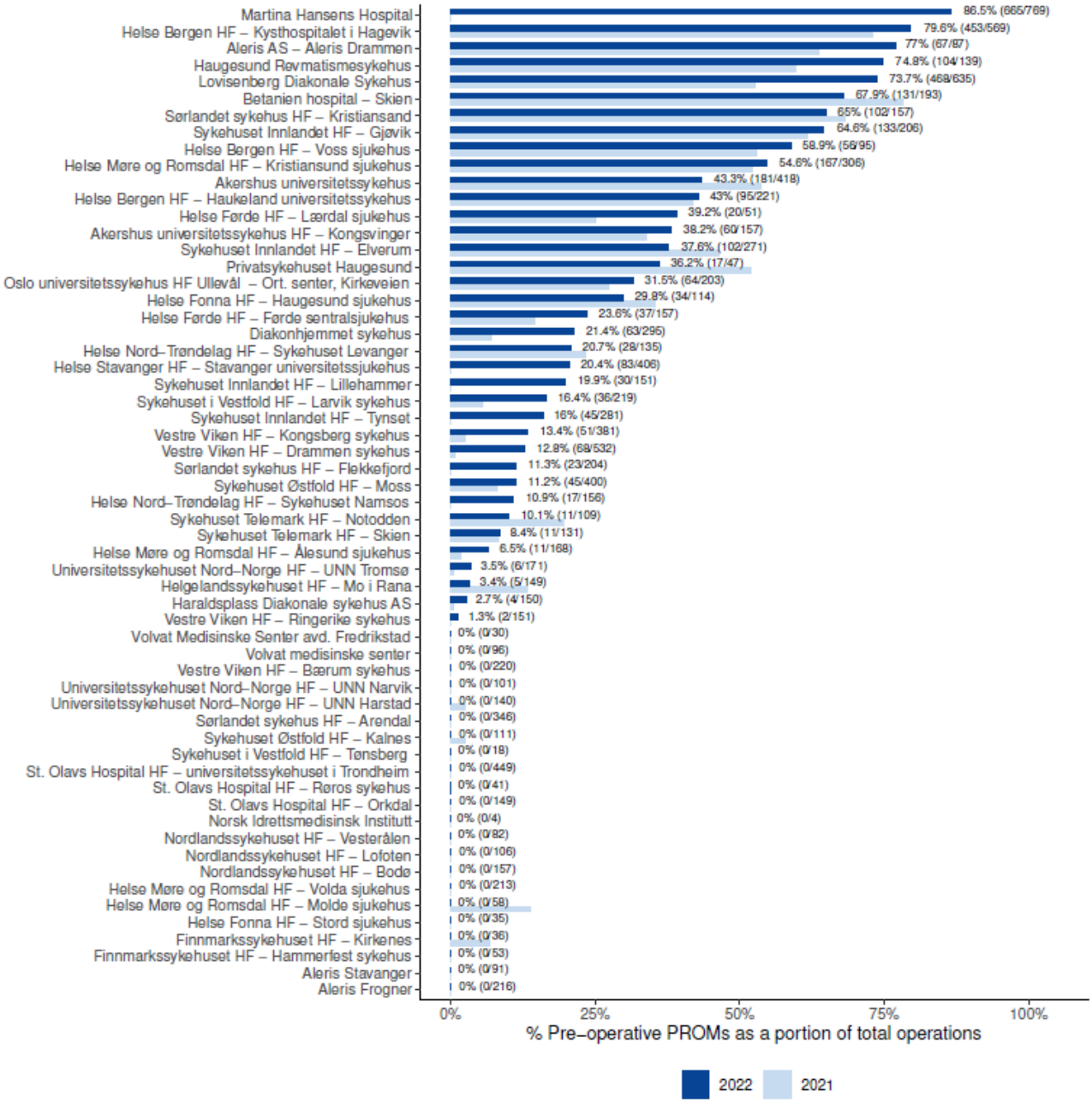


Figure A.39 presents the hospitals that have submitted preoperative PROM questionnaires either on paper or digitally through the web portal in MRS. Reporting is still low, but some hospitals appear to have taken steps to improve reporting. We would like to remind you that any questions regarding reporting in MRS can be sent to the register.

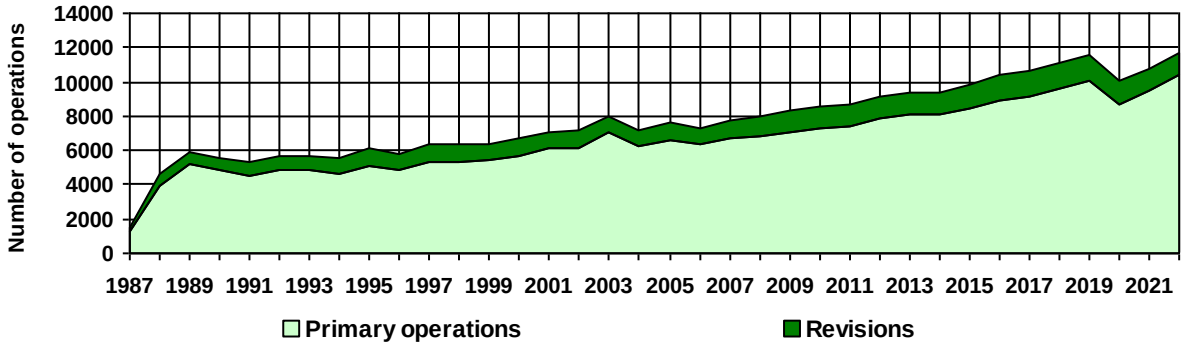
TOTAL HIP ARTHROPLASTY

Table 1: Annual numbers of operations

Year	Primary operations *		Reoperations **		Revisions		Total
2022	10 413	(88,2%)	204	(1,7%)	1 188	(10,1%)	11 805
2021	9 463	(88,0%)	115	(1,1%)	1 177	(10,9%)	10 755
2020	8 726	(86,4%)	101	(1,0%)	1 276	(12,6%)	10 103
2019	10 044	(86,9%)	106	(0,9%)	1 414	(12,2%)	11 564
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
1987-14	163 744	(85,7%)	116	(0,1%)	27 199	(14,2%)	191 059
Total	**238 580**	**(86,0%)**	**987**	**(0,4%)**	**37 882**	**(13,7%)**	**277 449**

* In addition, there were reports on 194 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.).

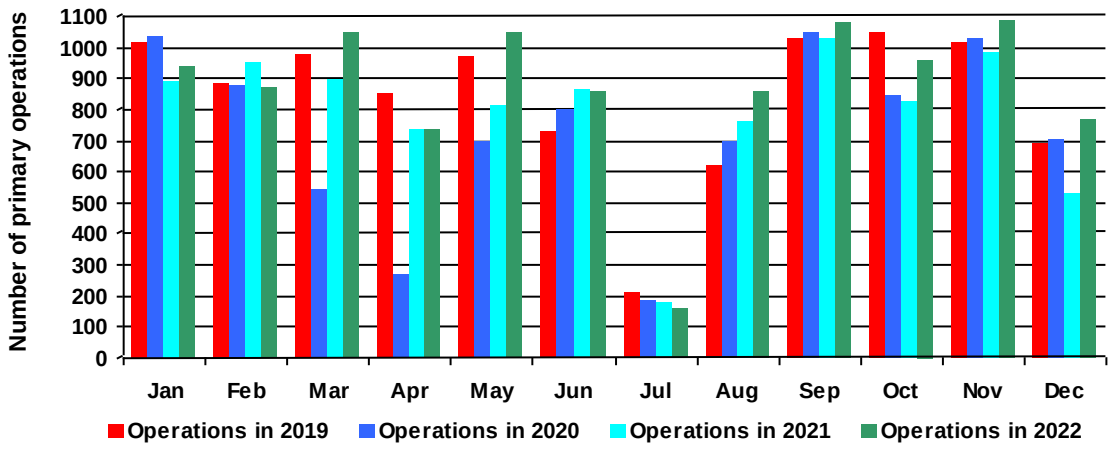
Figure 1a: Annual numbers of operations



54,7 % of all operations were performed on the right side. 66 % 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 - 2022



Incidence

Figure 2a: Incidence of primary hip prostheses

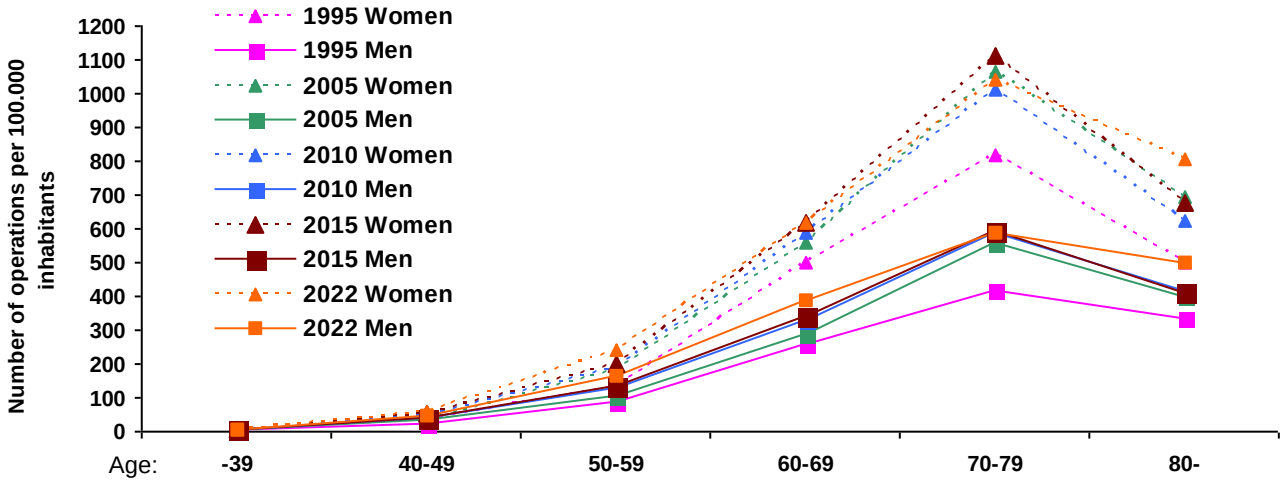


Figure 2b: Annual incidence of all primary hip prostheses

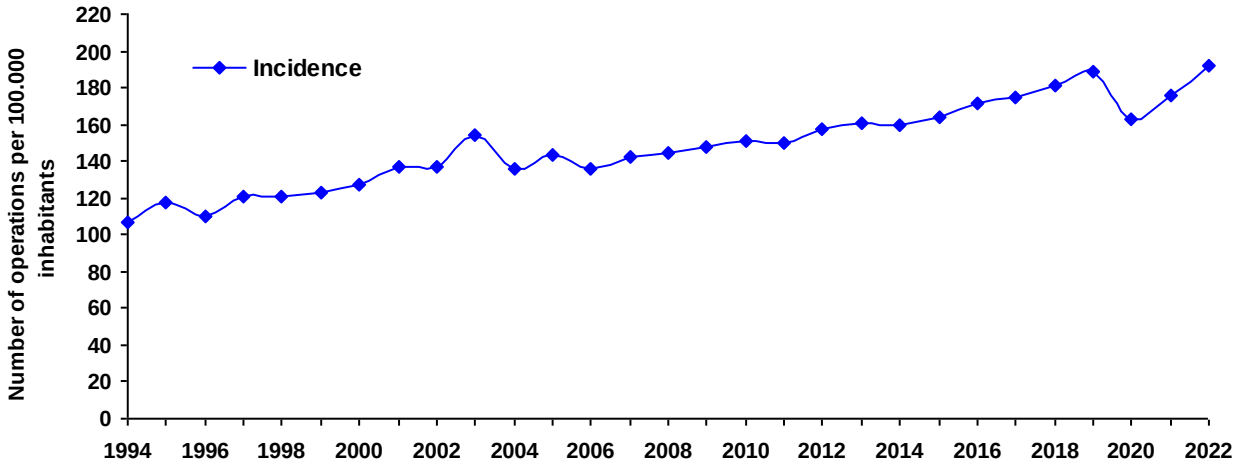
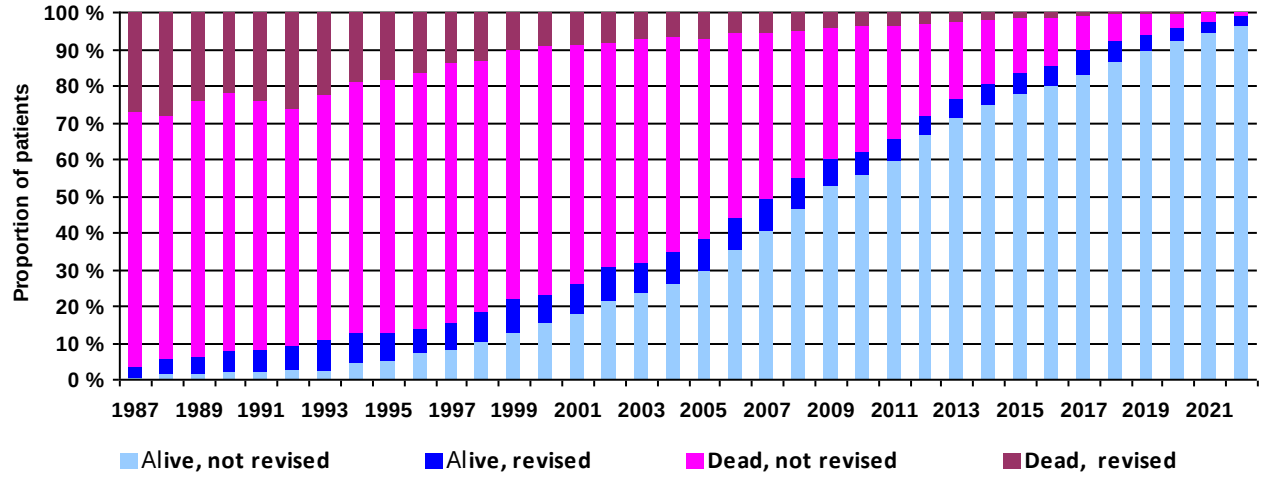


Figure 2c: Status of patients receiving total hip arthroplasty in the years 1987-2022 per 31.12.2022



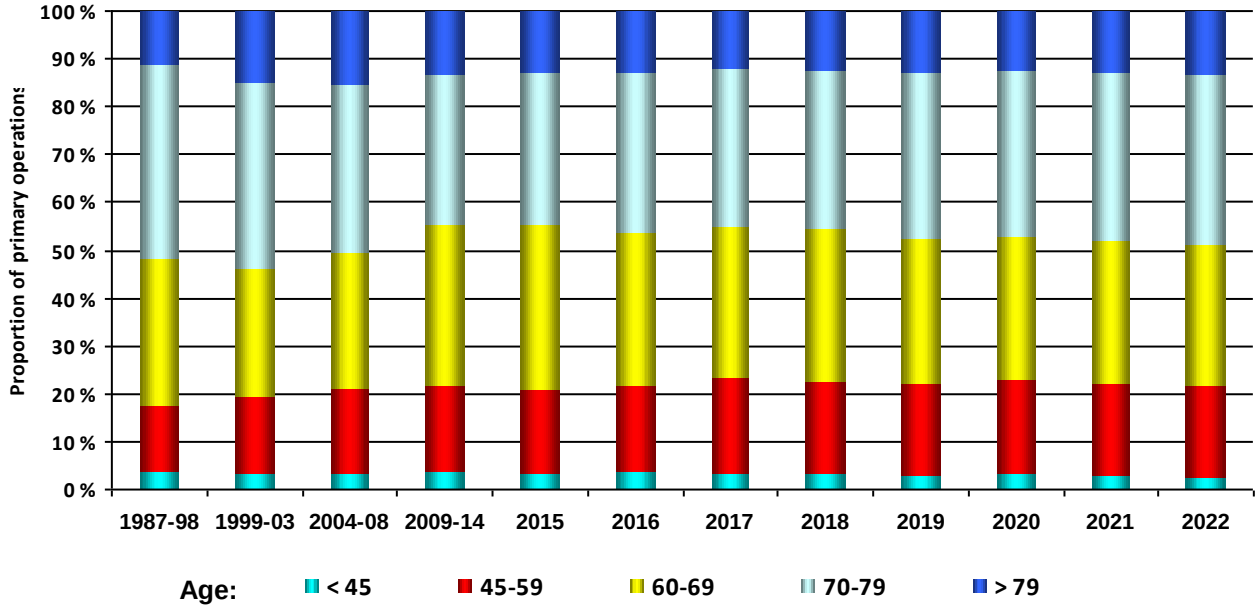
Reasons for primary operations

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
2022	8 395	104	253	785	6	89	24	543	232	13	416	16
2021	7 704	90	242	601	15	82	9	515	253	17	264	13
2020	6 902	103	271	615	6	74	18	526	222	25	236	25
2019	7 938	88	312	664	17	94	20	619	301	30	299	22
2018	7 628	97	298	653	24	112	21	574	266	23	282	9
2017	7 301	108	299	679	19	105	26	404	272	34	282	13
2016	7 109	137	355	685	11	107	19	343	229	33	246	9
2015	6 796	108	332	587	11	106	21	321	181	26	200	19
2009-14	36 087	788	2 186	3 603	126	605	172	1 276	1 072	115	1 112	175
2004-08	25 123	744	2 488	2 250	109	434	109	637	752	91	590	51
1999-03	22 539	857	2 821	2 186	140	388	145	294	333	61	472	182
1987-98	37 504	2 009	7 090	4 195	655	719	246	204	296	170	1 052	505
Total	**181 026**	**5 233**	**16 947**	**17 503**	**1 139**	**2 915**	**830**	**6 256**	**4 409**	**638**	**5 451**	**1 039**

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

Figure 3: Age by year of operation



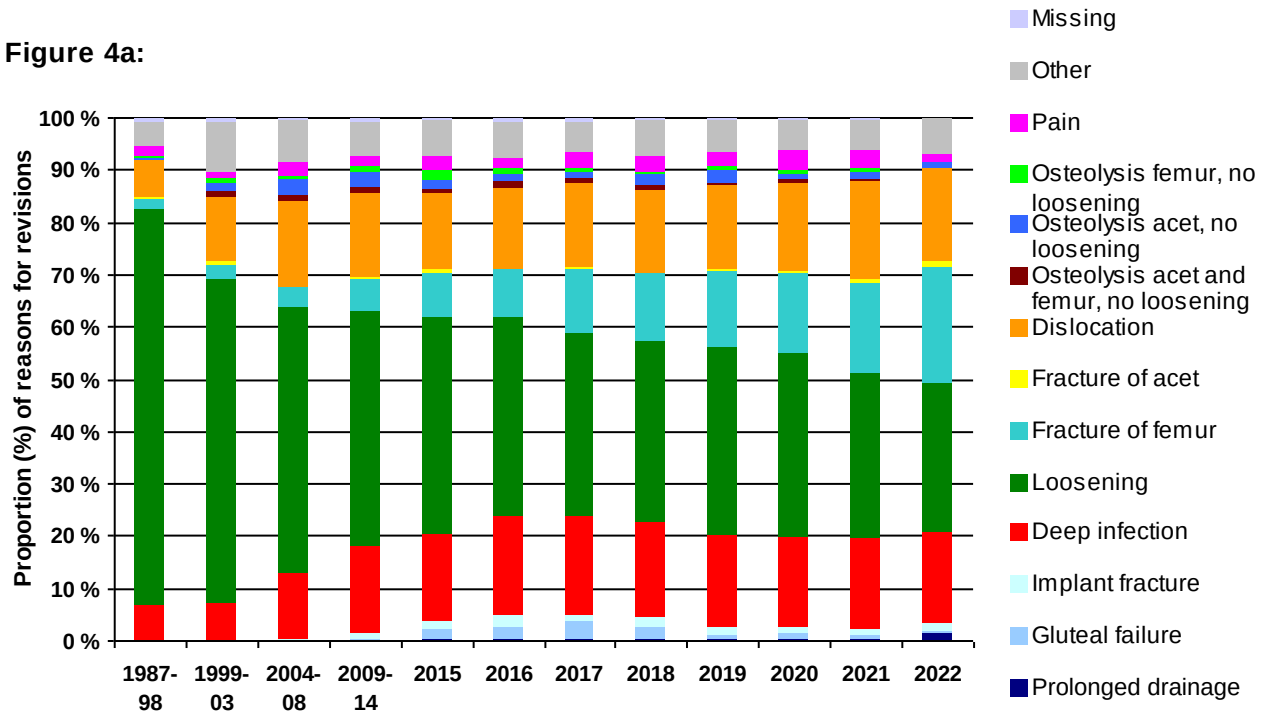
Reasons for revisions

Table 3a:

Year of revision	Loosening of acetabular component	Loosening of femoral component	Dislocation	Deep infection	Periprosthetic fracture	Pain	Osteolysis acet.,no loosening	Osteolysis femur, no loosening	Polyethylene wear	Implant fracture	Gluteal failure	Sore oozing	Other	Missing information
2022	223	134	180	159	273	71	15	12	40	23	14	18	67	1
2021	250	152	179	147	186	122	23	20	25	17	8	3	45	2
2020	315	163	184	158	190	138	30	22	33	22	11	4	56	3
2019	318	204	189	175	189	138	35	16	35	25	12	5	60	2
2018	329	214	187	188	176	153	45	24	37	34	28	5	64	5
2017	331	207	193	196	163	149	39	37	35	26	43	2	65	7
2016	371	227	178	181	135	116	43	33	28	37	34	3	59	8
2015	347	241	165	159	132	175	41	43	42	25	25	4	62	3
2009-14	2 115	1 577	927	831	575	709	296	217	312	92	39	0	258	31
2004-08	1 609	1 285	632	424	270	456	183	190	283	17	2	0	170	10
1999-03	1 621	1 655	420	208	237	288	133	158	345	16	0	0	327	25
1987-98	4 403	5 084	528	407	348	730	48	104	134	82	0	0	391	51
Total	**12 232**	**11 143**	**3 962**	**3 233**	**2 874**	**3 245**	**931**	**876**	**1 349**	**416**	**216**	**44**	**1 624**	**148**

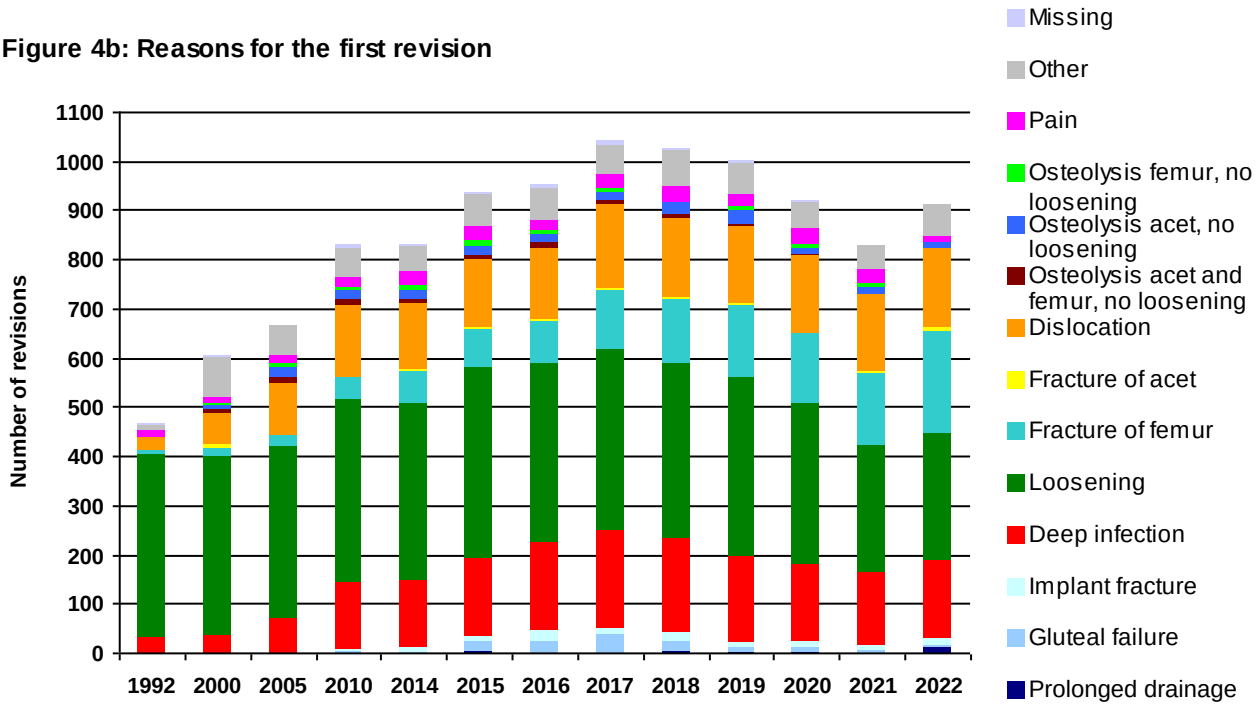
Revision causes are not mutually exclusive. More than one reason of revision is possible. Only the first reoperation is counted.

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	Femural stem	Femoral head	Acetabular cup	Liner	Other	Tota
2022	3	3	5	9	3	23
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
2009-14	15	25	13	33	6	92
2004-08	3	9	5	0	0	17
1999-03	12	3	1	0	0	16
1987-98	63	1	18	0	0	82
Total	**140**	**73**	**60**	**127**	**16**	**416**

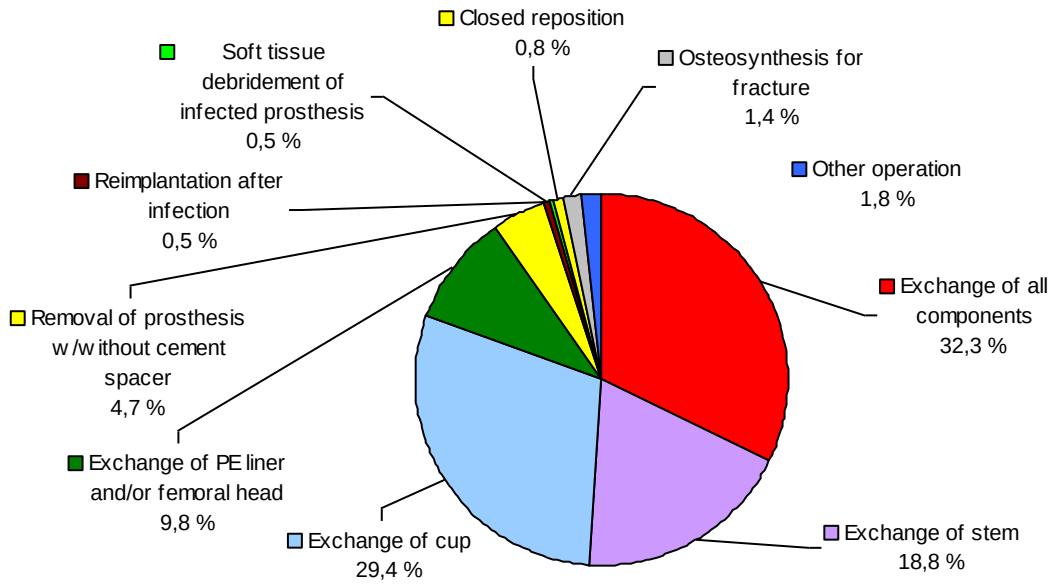
Type of revision

Table 4:

Type of revision	1987-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Exchange of femoral stem and head	3 937	135	117	142	104	144	147	131	121	92	127	**5 197**
Exchange of stem, PE liner, head	198	12	24	16	16	28	28	35	19	23	25	**424**
Exchange of acetabular cup	2 746	118	157	155	122	160	143	185	200	142	134	**4 262**
Exchange of femoral head	681	79	79	92	98	96	94	79	67	54	61	**1 480**
Exchange of femoral head and acetabular cup	2 669	204	189	214	237	203	214	172	152	118	137	**4 509**
Exchange of all components	7 492	254	216	226	248	228	205	200	188	199	174	**9 630**
Exchange of PE liner only	71	3	3	7	1	3	8	7	8	8	6	**125**
Exchange of PE liner and femoral head	637	47	46	60	59	74	76	87	65	76	85	**1 312**
Removal of prosthesis or cement spacer	853	14	20	22	8	11	13	5	6	4	9	**965**
Removal of prosthesis and insertion of cement spacer	45	34	34	38	46	39	43	40	36	38	31	**424**
Insertion of new prosthesis (after Girdlestone)	143	2	1	1	1							**148**
Soft tissue debridement of infected prosthesis	30	10	18	9	13	16	13	13	7	6	12	**147**
Muscle re-insertion and transposition	1	8	1	15	19	35	18	5	8	4	4	**118**
Osteosynthesis for fracture			1		31	35	46	63	66	80	98	**420**
Re-cemented	4	1		2	1	2		1				**11**
Closed reposition			1	1	19	22	29	34	27	35	79	**247**
Other operation	58	20	24	25	32	21	26	15	14	14	16	**265**
Missing information	107	6	4	3	4	4	4	2	4	3	3	**144**
Total	**19 672**	**947**	**935**	**1 028**	**1 059**	**1 121**	**1 107**	**1 074**	**988**	**896**	**1 001**	**29 828**

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

Figure 5:



Bone transplantation in revisions

Table 5: Acetabular cup

Year	Yes	No	Bone impaction[1]	Missing	Total
2022	106 (8,3 %)	980 (76,6 %)	26 (2 %)	168 (13,1 %)	**1 280**
2021	44 (3,6 %)	868 (70,2 %)	39 (3,2 %)	285 (23,1 %)	**1 236**
2020	41 (3,1 %)	914 (69 %)	52 (3,9 %)	318 (24 %)	**1 325**
2019	61 (4,2 %)	952 (65,1 %)	70 (4,8 %)	380 (26 %)	**1 463**
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**
2009-14	660 (8,6 %)	4 850 (63,2 %)	983 (12,8 %)	1 175 (15,3 %)	**7 668**
2004-08	679 (13,1 %)	2 913 (56,3 %)	997 (19,3 %)	586 (11,3 %)	**5 175**
1999-03	962 (20,2 %)	3 044 (63,9 %)	642 (13,5 %)	115 (2,4 %)	**4 763**
1987-98	2 590 (26,8 %)	6 481 (67,1 %)	380 (3,9 %)	201 (2,1 %)	**9 652**
Total	**5 433 (14,1 %)**	**24 842 (64,6 %)**	**3 536 (9,2 %)**	**4 620 (12 %)**	**38 431**

Table 6: Femoral stem

Year	Yes	No	Bone impaction[1]	Missing	Total
2022	52 (4,1 %)	1 032 (81,6 %)	3 (0,2 %)	177 (14 %)	**1 264**
2021	19 (1,6 %)	893 (74 %)	4 (0,3 %)	290 (24 %)	**1 206**
2020	32 (2,6 %)	891 (71,2 %)	4 (0,3 %)	325 (26 %)	**1 252**
2019	33 (2,4 %)	951 (68,8 %)	5 (0,4 %)	393 (28,4 %)	**1 382**
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**
2009-14	592 (7,8 %)	4 971 (65,3 %)	150 (2 %)	1 897 (24,9 %)	**7 610**
2004-08	720 (13,9 %)	3 094 (59,8 %)	425 (8,2 %)	934 (18,1 %)	**5 173**
1999-03	889 (18,6 %)	3 061 (64,2 %)	698 (14,6 %)	122 (2,6 %)	**4 770**
1987-98	2 140 (22,2 %)	6 786 (70,3 %)	525 (5,4 %)	202 (2,1 %)	**9 653**
Total	**4 661 (12,3 %)**	**25 539 (67,3 %)**	**1 839 (4,8 %)**	**5 892 (15,5 %)**	**37 931**

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
2022	116	93	66	35	40	14	340	**704**
2021	229	176	68	46	37	23	197	**776**
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**
2009-14	1 332	1 119	600	478	379	141	1 343	**5 392**
2004-08	832	596	336	308	240	104	819	**3 235**

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
2022	141	63	31	15	6	305	**561**
2021	244	93	45	15	8	197	**602**
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**
2009-14	1 129	949	419	114	37	1 327	**3 975**
2004-08	678	609	271	74	35	701	**2 368**

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.

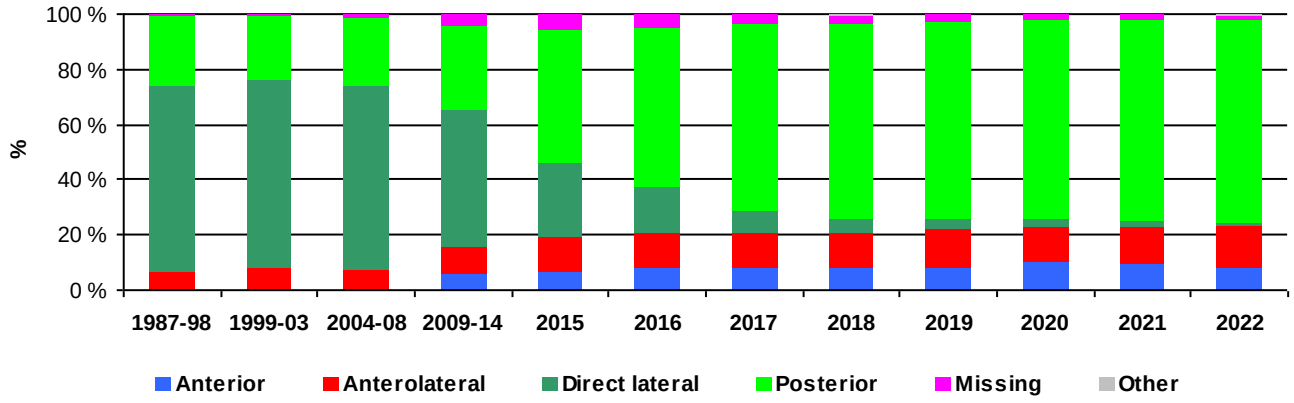
Registration of bone loss started in 2005

Surgical approach

Table 9: In primary operations *

Year	Anterior	Anterolateral	Direct lateral	Posterior	Other	Missing information	Total
2022	804 (7,7 %)	1 606 (15,4 %)	168 (1,6 %)	7 645 (73,4 %)	63 (0,6 %)	127 (1,2 %)	**10 413**
2021	910 (9,6 %)	1 295 (13,7 %)	192 (2 %)	6 852 (72,4 %)	1 (0 %)	213 (2,3 %)	**9 463**
2020	862 (9,9 %)	1 171 (13,4 %)	237 (2,7 %)	6 257 (71,7 %)	11 (0,1 %)	188 (2,2 %)	**8 726**
2019	794 (7,9 %)	1 423 (14,2 %)	414 (4,1 %)	7 109 (70,8 %)	23 (0,2 %)	281 (2,8 %)	**10 044**
2018	771 (8 %)	1 249 (13 %)	465 (4,8 %)	6 801 (70,8 %)	43 (0,4 %)	281 (2,9 %)	**9 610**
2017	713 (7,8 %)	1 170 (12,8 %)	753 (8,2 %)	6 177 (67,3 %)	4 (0 %)	359 (3,9 %)	**9 176**
2016	718 (8 %)	1 165 (13 %)	1 437 (16 %)	5 170 (57,7 %)	5 (0,1 %)	459 (5,1 %)	**8 954**
2015	521 (6,2 %)	1 147 (13,6 %)	2 235 (26,4 %)	4 087 (48,4 %)	3 (0 %)	457 (5,4 %)	**8 450**
2009-14	2 499 (5,4 %)	4 721 (10,3 %)	22 891 (49,9 %)	13 883 (30,3 %)	141 (0,3 %)	1 753 (3,8 %)	**45 888**
2004-08	99 (0,3 %)	2 226 (6,8 %)	21 749 (66,6 %)	8 093 (24,8 %)	33 (0,1 %)	442 (1,4 %)	**32 642**
1999-03	52 (0,2 %)	2 312 (7,6 %)	20 926 (68,5 %)	7 112 (23,3 %)	73 (0,2 %)	76 (0,2 %)	**30 551**
1987-98	137 (0,3 %)	3 486 (6,4 %)	36 748 (67,2 %)	13 934 (25,5 %)	44 (0,1 %)	314 (0,6 %)	**54 663**
Total	**8 880 (3,7 %)**	**22 971 (9,6 %)**	**108 215 (45,4 %)**	**93 120 (39 %)**	**444 (0,2 %)**	**4 950 (2,1 %)**	**238 580**

Figure 6: In primary operations *

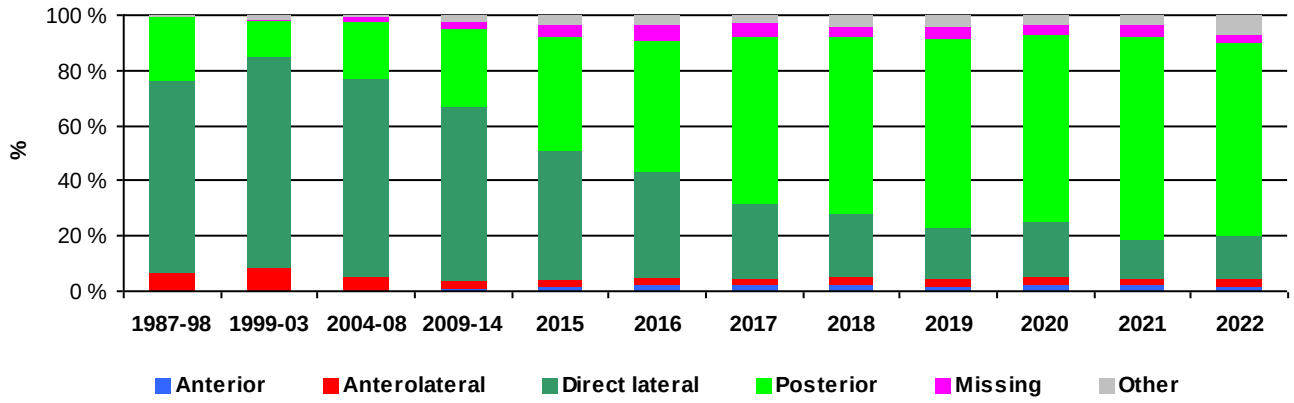


* Anterior: Operative approach between sartorius and tensor
Anterolateral: Operative approach between glut. medius and tensor
Direct lateral: Operative approach transgluteal
Posterior: Operative approach behind gluteus medius

Table 10: In revisions *

Year	Anterior	Anterolateral	Direct lateral	Posterior	Other	Missing information	Total
2022	23 (1,8 %)	36 (2,8 %)	197 (15,2 %)	907 (70,1 %)	90 (7 %)	40 (3,1 %)	**1 293**
2021	26 (2,1 %)	26 (2,1 %)	184 (14,6 %)	907 (72,2 %)	49 (3,9 %)	65 (5,2 %)	**1 257**
2020	33 (2,4 %)	36 (2,7 %)	272 (20,2 %)	899 (66,7 %)	52 (3,9 %)	55 (4,1 %)	**1 347**
2019	26 (1,7 %)	35 (2,3 %)	285 (19,1 %)	1 009 (67,7 %)	60 (4 %)	75 (5 %)	**1 490**
2018	34 (2,2 %)	47 (3,1 %)	344 (22,5 %)	975 (63,6 %)	63 (4,1 %)	69 (4,5 %)	**1 532**
2017	29 (1,9 %)	35 (2,3 %)	409 (27,4 %)	900 (60,2 %)	41 (2,7 %)	80 (5,4 %)	**1 494**
2016	27 (1,8 %)	45 (3 %)	570 (38,1 %)	714 (47,8 %)	54 (3,6 %)	85 (5,7 %)	**1 495**
2015	24 (1,7 %)	35 (2,5 %)	662 (47 %)	573 (40,7 %)	50 (3,5 %)	65 (4,6 %)	**1 409**
2009-14	81 (1,1 %)	176 (2,3 %)	4 876 (63,4 %)	2 183 (28,4 %)	164 (2,1 %)	210 (2,7 %)	**7 690**
2004-08	10 (0,2 %)	264 (5,1 %)	3 713 (71,7 %)	1 087 (21 %)	43 (0,8 %)	62 (1,2 %)	**5 179**
1999-03	14 (0,3 %)	408 (8,5 %)	3 603 (75,3 %)	624 (13 %)	85 (1,8 %)	52 (1,1 %)	**4 786**
1987-98	22 (0,2 %)	591 (6,1 %)	6 750 (69,9 %)	2 211 (22,9 %)	42 (0,4 %)	44 (0,5 %)	**9 660**
Total	**349 (0,9 %)**	**1 734 (4,5 %)**	**21 865 (56,6 %)**	**12 989 (33,6 %)**	**793 (2,1 %)**	**902 (2,3 %)**	**38 632**

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**
2022	6 321	(60,7 %)	21	(0,2 %)	4 071	(39,1 %)	668	(85,8 %)	32	(4,1 %)	79	(10,1 %)	**11 192**
2021	8 750	(92,5 %)	9	(0,1 %)	704	(7,4 %)	1 096	(90,2 %)	48	(4 %)	71	(5,8 %)	**10 678**
2020	8 339	(95,6 %)	18	(0,2 %)	369	(4,2 %)	1 203	(89,2 %)	74	(5,5 %)	71	(5,3 %)	**10 074**
2019	9 556	(95,1 %)	20	(0,2 %)	468	(4,7 %)	1 328	(88,8 %)	65	(4,3 %)	102	(6,8 %)	**11 539**
2018	9 027	(93,9 %)	27	(0,3 %)	556	(5,8 %)	1 338	(86,9 %)	94	(6,1 %)	108	(7 %)	**11 150**
2017	8 576	(93,5 %)	20	(0,2 %)	580	(6,3 %)	1 306	(87,4 %)	69	(4,6 %)	120	(8 %)	**10 671**
2016	8 458	(94,5 %)	25	(0,3 %)	471	(5,3 %)	1 307	(87,4 %)	91	(6,1 %)	97	(6,5 %)	**10 449**
2015	7 608	(90 %)	29	(0,3 %)	813	(9,6 %)	1 203	(85,4 %)	96	(6,8 %)	110	(7,8 %)	**9 859**
2009-14	41 569	(90,6 %)	242	(0,5 %)	4 077	(8,9 %)	6 491	(84,4 %)	592	(7,7 %)	604	(7,9 %)	**53 575**
2004-08	30 055	(92,1 %)	462	(1,4 %)	2 125	(6,5 %)	4 328	(84,2 %)	524	(10,2 %)	291	(5,7 %)	**37 785**
1999-03	29 317	(96 %)	861	(2,8 %)	373	(1,2 %)	4 116	(87,3 %)	559	(11,9 %)	41	(0,9 %)	**35 267**
1987-98	46 670	(85,4 %)	7 460	(13,6 %)	533	(1 %)	7 932	(82,3 %)	1 604	(16,6 %)	102	(1,1 %)	**64 301**
Total	**214 246**	**(89,8 %)**	**9 194**	**(3,9 %)**	**15 140**	**(6,3 %)**	**32 316**	**(85,1 %)**	**3 848**	**(10,1 %)**	**1 796**	**(4,7 %)**	**276 540**

Fixation in primary operations

Figure 8a: All patients

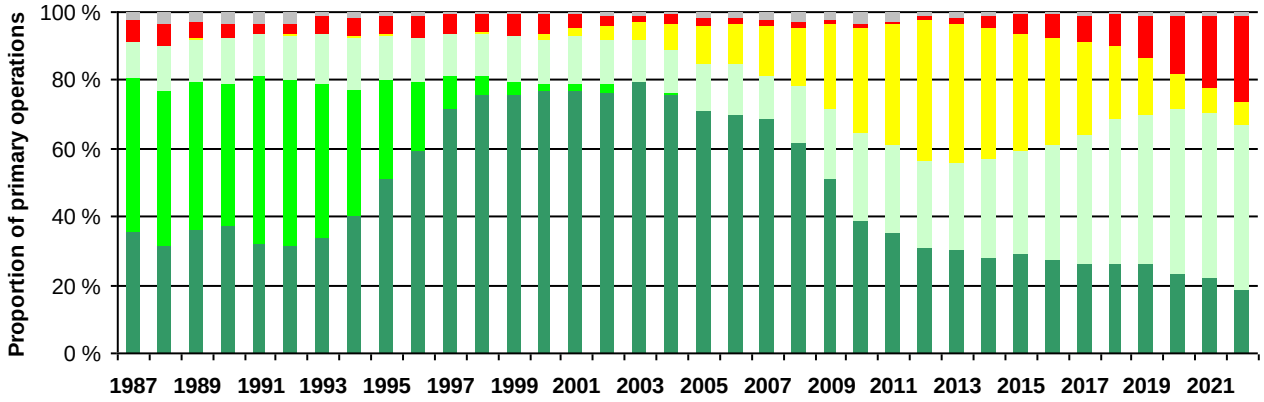
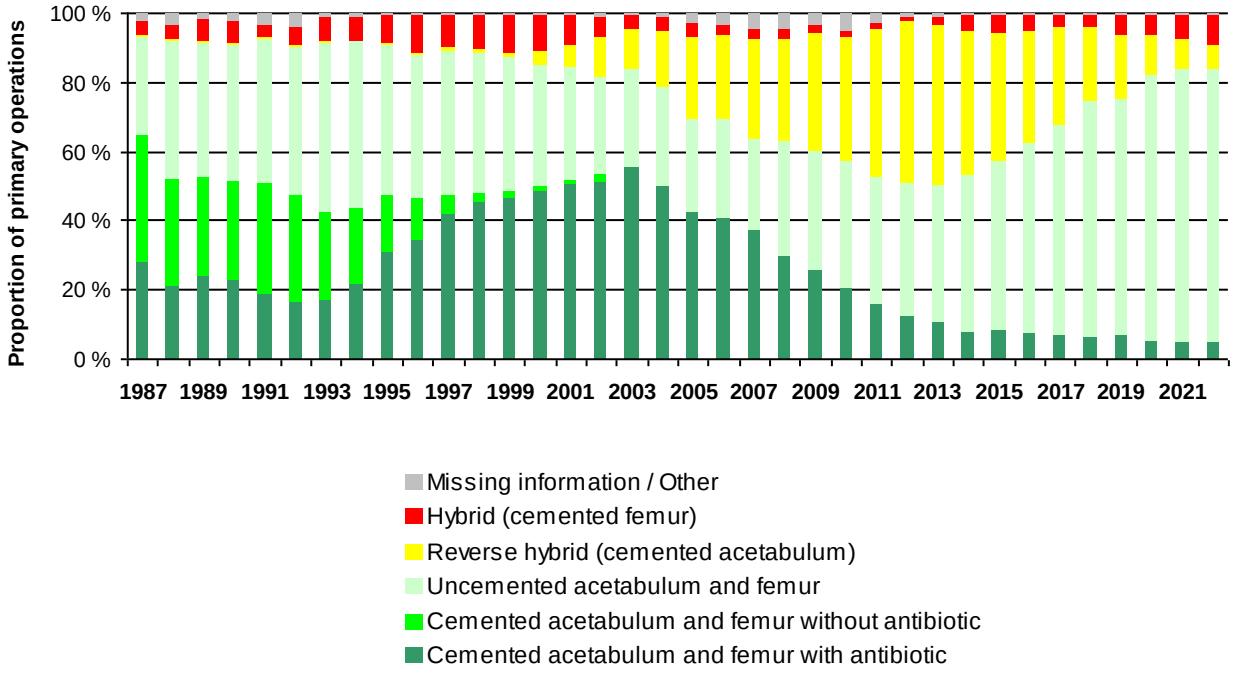


Figure 8b: Patients under 65 years old



Fixation in primary operations (cont.)

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

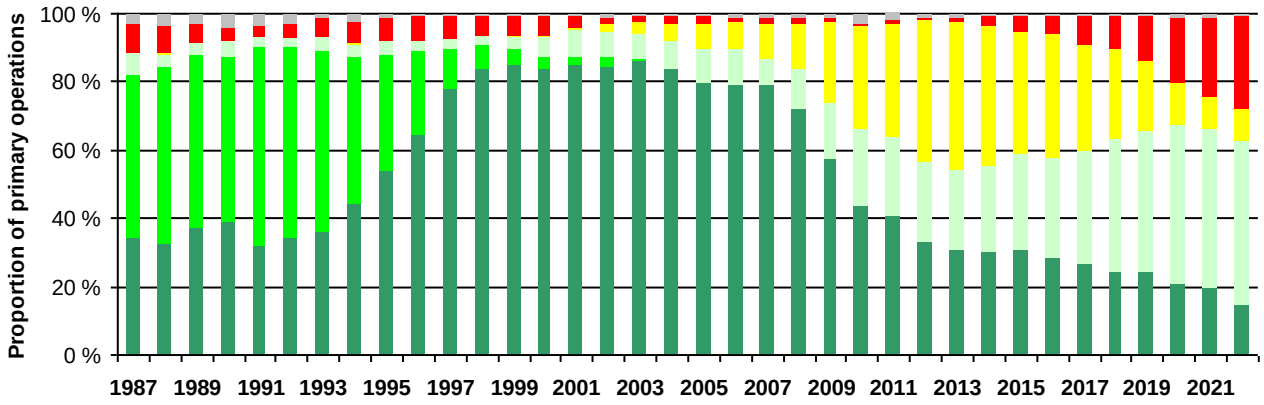
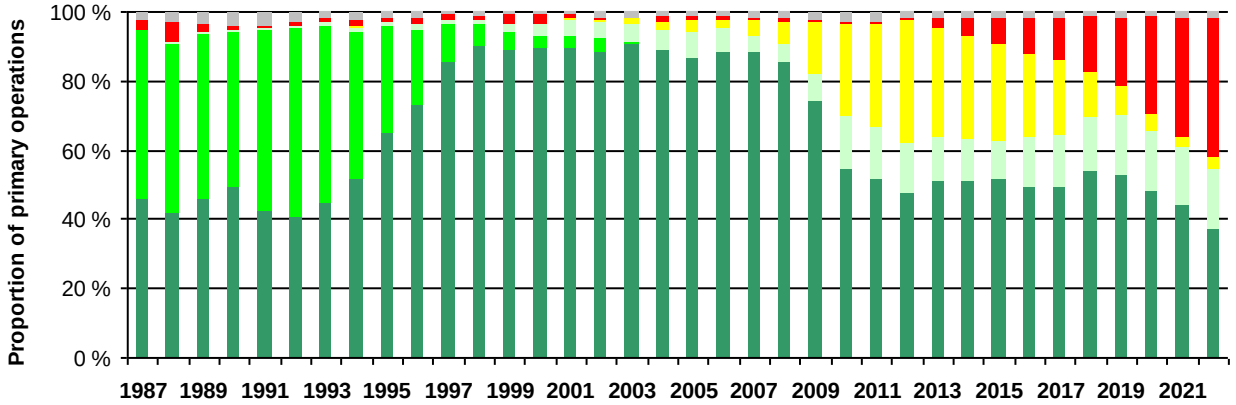
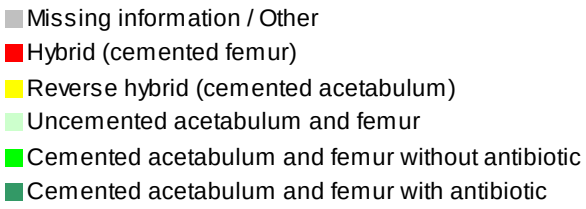


Figure 8d: Patients over 75 years old





Fixation in revisions

Figure 9: Acetabular cup - All patients

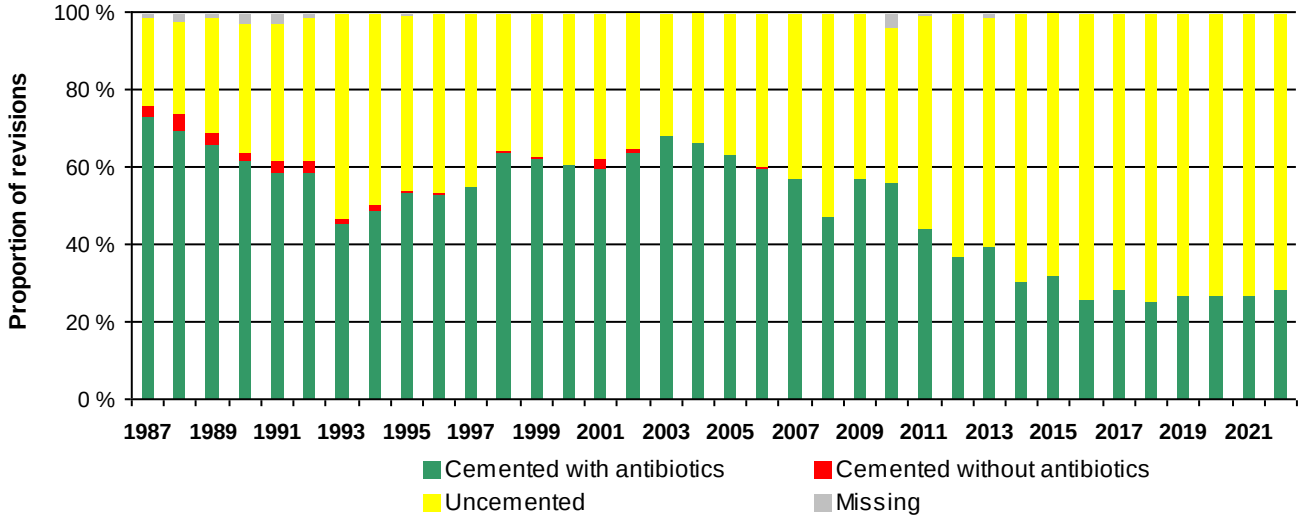
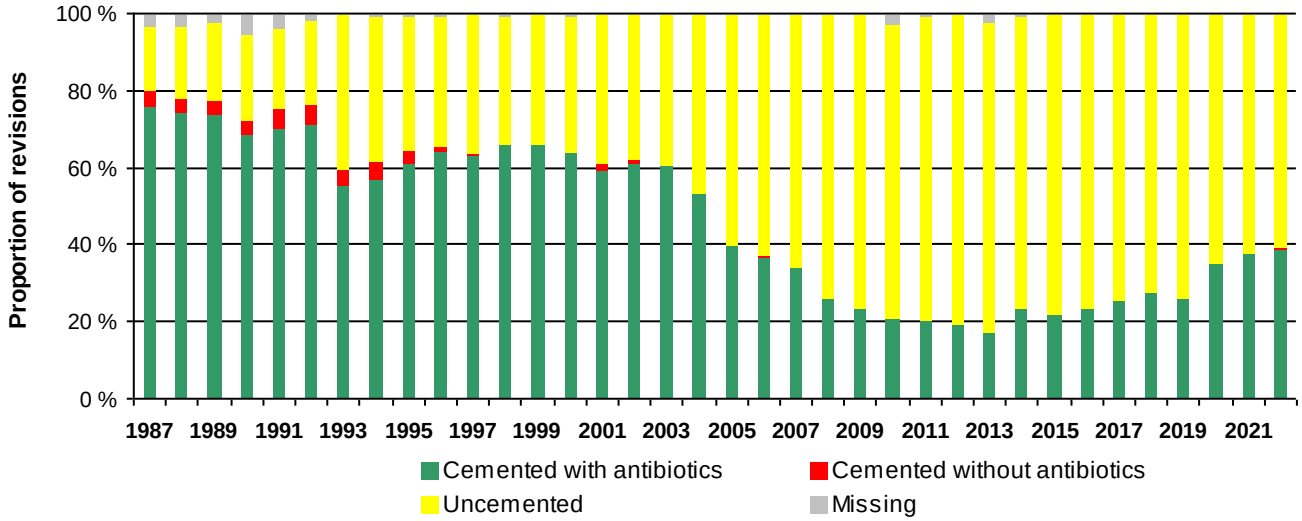


Figure 10: Femoral stem - All patients



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
2022	5%	18%	72%	5%	219	3%	10%	76%	11%	560
2021	8%	6%	75%	11%	208	4%	5%	72%	19%	570
2020	9%	2%	73%	17%	230	5%	5%	71%	19%	631
2019	11%	5%	69%	15%	251	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
2009-14	37%	8%	47%	7%	2 247	5%	16%	68%	11%	2 816
2004-08	42%	11%	42%	5%	2 064	7%	28%	59%	6%	1 452
1999-03	28%	22%	49%	1%	1 977	6%	43%	50%	1%	1 119
1987-98	7%	24%	67%	1%	3 964	3%	59%	37%	2%	2 638
Total	**23%**	**16%**	**56%**	**5%**	**12 191**	**5%**	**25%**	**60%**	**10%**	**13 159**

Table 13: Femoral stem

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2022	1%	6%	87%	6%	187	0%	8%	80%	13%	299
2021	2%	1%	83%	14%	173	0%	4%	76%	20%	292
2020	1%	2%	81%	16%	168	0%	5%	72%	22%	316
2019	1%	1%	78%	19%	143	0%	4%	72%	24%	400
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
2009-14	17%	4%	58%	21%	630	1%	19%	69%	12%	2 433
2004-08	38%	7%	50%	5%	876	4%	34%	56%	6%	1 439
1999-03	34%	14%	52%	1%	1 668	11%	50%	37%	1%	983
1987-98	8%	15%	76%	1%	4 949	6%	62%	31%	1%	2 092
Total	**15%**	**12%**	**68%**	**5%**	**9 317**	**3%**	**29%**	**57%**	**10%**	**9 897**

Registration of "Bone impaction" started in 1996

Cements used in the acetabulum and femur

Table 14: In primary- and revision surgeries

Cements	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
Boneloc	1 353	0	0	0	0	0	0	0	0	**1 353**
Cemex System Genta FAST	1 494	84	0	0	0	1	0	0	0	**1 579**
Cemex system genta ID green	0	0	18	197	204	139	3	0	0	**561**
Cemex w/gentamicin	585	150	234	0	0	1	3	0	0	**973**
CMW I	5 110	0	0	0	0	0	0	0	0	**5 110**
CMW I w/gentamicin	3 340	0	1	0	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	11	13	11	25	32	93	86	89	96	**456**
Copal w/gentamicin+clindamycin	19	9	3	13	23	41	42	29	45	**224**
Optipac Refobacin Bonecement R	10 129	2 464	2 207	1 633	1 180	88	0	1	52	**17 754**
Optipac Refobacin Bonecement R-3	0	0	0	0	0	131	120	138	119	**508**
Optipac Refobacin Revision	37	21	17	13	1	0	0	0	0	**89**
Palacos	6 989	1	0	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	26 040	2 504	2 335	1 666	1 541	1 018	529	522	484	**36 639**
Palacos R+G pro	3	1	59	790	2 081	3 751	3 559	3 908	4 384	**18 536**
Palacos w/gentamicin	62 764	1	0	0	1	0	0	0	0	**62 766**
Palamed G (gentamicin)	13	0	0	0	0	0	0	0	0	**13**
Refobacin Bone Cement R	10 435	384	632	913	59	1	0	0	0	**12 424**
Refobacin Revision	351	36	24	70	24	5	0	0	5	**515**
Refobacin Revision-3	0	0	0	0	35	38	30	35	24	**162**
Refobacin-Palacos	2 386	0	0	0	0	0	0	0	0	**2 386**
Simplex	7 147	0	0	0	0	0	0	0	1	**7 148**
Simplex unknown	827	0	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	6 980	527	534	488	503	491	333	390	433	**10 679**
SmartSet GHV	159	0	0	0	0	0	0	0	0	**159**
SmartSet GHV Genta. Smartmix	188	26	156	179	99	117	33	1	0	**799**
SmartSet HV	15	0	0	0	0	0	0	0	0	**15**
Vancogenx	7	2	1	5	4	10	6	7	0	**42**
Other (n<10)	19	1	0	1	0	0	1	4	10	**36**
Missing information	466	32	55	66	60	108	89	17	52	**945**

Cemented primary prostheses

Table 15: The 45 most frequent combinations of cup and stem

Cup	Stem	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
CHARNLEY	CHARNLEY	40 366									**40 366**
EXETER	EXETER	12 987									**12 987**
EXETER X3 RIMFIT	EXETER	4 014	1 360	1 321	992	1 044	1 009	633	537	440	**11 350**
REFLECTION CEM. ALL POLY	SPECTRON-EF	9 740									**9 740**
IP	LUBINUS SP II	5 268	307	262	217	203	222	157	178	216	**7 030**
TITAN	TITAN	6 986									**6 986**
CONTEMPORARY	EXETER	4 739	15	3	1		3	4			**4 765**
SPECTRON	ITH	2 405									**2 405**
LUBINUS	LUBINUS SP II	307	252	213	214	201	228	227	267	177	**2 086**
MARATHON	CHARNLEY MODULAR	1 435	137	46	26		2	13			**1 659**
MARATHON	EXETER	307	122	187	197	244	241	95	59	64	**1 516**
KRONOS	TITAN	1 496									**1 496**
MARATHON	C-STEM	34	42	129	118	180	249	250	232	127	**1 361**
ELITE	TITAN	1 237									**1 237**
MARATHON	LUBINUS SP II	107	69	111	40	41	110	184	214	232	**1 108**
MARATHON	MS-30		15	19	72	115	167	197	219	268	**1 072**
ELITE	CHARNLEY	932									**932**
REFLECTION CEM. ALL POLY	ITH	927									**927**
REFLECTION CEM. ALL POLY	BIO-FIT	905									**905**
WEBER ALLO PRO	MS-30	813									**813**
ELITE	EXETER	778									**778**
ZCA	CPT	756									**756**
AVANTAGE	EXETER	271	38	40	32	65	71	74	72	54	**717**
CHARNLEY	CHARNLEY MODULAR	672									**672**
IP	LUBINUS	587									**587**
ELITE	ELITE	579									**579**
CHARNLEY	EXETER	571									**571**
TITAN	FJORD	523									**523**
ELITE	CHARNLEY MODULAR	521									**521**
SPECTRON	SP I	432									**432**
MODULAR HIP SYSTEM	BIO-FIT	430									**430**
SPECTRON	TITAN	414									**414**
EXCEED ABT CEMENTED SYS	MS-30				65	97	97	38	73	37	**407**
MARATHON	CORAIL	197	51	61	28	25	14	5	16	6	**403**
CHARNLEY	C-STEM	378									**378**
POLARCUP	LUBINUS SP II	54	9	15	25	16	45	55	77	80	**376**
CHARNLEY	ELITE	375									**375**
OPERA	SPECTRON-EF	356									**356**
ELITE	MS-30	339									**339**
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	2 932	47	46	254	170	141	106	150	233	**4 079**

Uncemented primary prostheses

Table 16: The 45 most frequent combinations of cup and stem

Cup	Stem	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
PINNACLE	CORAIL	1 926	385	491	1 241	1 674	1 740	1 632	1 755	1 841	**12 685**
REFLECTION UNCEMENTED	CORAIL	4 004	543	170	219	427	182	277	188	10	**6 020**
TRIDENT	CORAIL	164	113	270	240	303	659	1 066	1 302	1 668	**5 785**
IGLOO	FILLER	3 075	124	165	108	121	136	73	39		**3 841**
TRILOGY	CORAIL	2 156	248	331	270	199	329	148	58	72	**3 811**
R3	CORAIL	2	120	493	568	519	463	334	368	423	**3 290**
TROPIC	CORAIL	2 674									**2 674**
TRIDENT	ACCOLADE II	117	174	127	116	174	233	216	248	157	**1 562**
ATOLL	CORAIL	1 282									**1 282**
Continuum Acetabular System	CORAIL	190	302	332	88	41	48	78	84	66	**1 229**
R3	POLARSTEM	285	50	74	50	14	25	108	161	314	**1 081**
DURALOC	CORAIL	1 071									**1 071**
REFLECTION UNCEMENTED	HACTIV	14	117	185	187	184	95				**782**
TRIDENT	POLARSTEM	43	58	21	60	59	121	93	74	103	**632**
BICON-PLUS	ZWEYMÜLLER	586									**586**
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	223	13	10	2						**248**
ENDLER	ZWEYMÜLLER	247									**247**
EUROPEAN CUP SYSTEM	TAPERLOC	240									**240**
TRABECULAR METAL	CORAIL	41	21	36	26	26	35	28	16	11	**240**
PLASMACUP	BICONTACT	232									**232**
LMT	TAPERLOC	227									**227**
TRIDENT	ABG II	190	22								**212**
AVANTAGE	CORAIL	91	2	29	10	12	25	14	14	12	**209**
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	149	1								**150**
G7	CORAIL							2	26	119	**147**
IGLOO	CORAIL	90							17	39	**146**
REFLECTION UNCEMENTED	PROFEMUR GLADIATOR	143									**143**
Other	Other	3 180	175	212	189	259	242	166	244	213	**4 880**

Hybrid primary prostheses

Table 17: Hybrid primary prostheses. The 20 most frequent combinations.

Cup (uncemented)	Stem (cemented)	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
TRIDENT	EXETER	101	22	31	12	174	451	556	644	735	**2 726**
TRILOGY	EXETER	752	239	245	258	170	60	32	26	18	**1 800**
R3	LUBINUS SP II		44	159	142	145	95	80	137	226	**1 028**
TRIDENT	LUBINUS SP II	1	3	7	20	13	64	214	284	367	**973**
TROPIC	TITAN	894									**894**
PINNACLE	C-STEM			3	2	25	94	121	233	364	**842**
REFLECTION UNCEMENTED	C-STEM	1	26	64	108	124	146	198	143		**810**
MORSCHER	MS-30	699									**699**
PINNACLE	LUBINUS SP II	1	2	4	5	28	36	108	150	153	**487**
TRILOGY	CHARNLEY	382									**382**
TRIDENT	C-STEM			1			4	24	104	237	**370**
ENDLER	TITAN	346									**346**
TRIDENT	MS-30			1	1	4	39	67	118	103	**333**
REFLECTION UNCEMENTED	LUBINUS SP II	116	83	1		22	9	4	2	2	**239**
PINNACLE	EXETER	11	2	9	7	20	8	21	44	100	**222**
AVANTAGE	EXETER	37	15	32	26	24	19	12	12	16	**193**
DURALOC	CHARNLEY	153									**153**
REFLECTION UNCEMENTED	BIO-FIT	145									**145**
TRILOGY	CPT	93			46	2	1				**142**
REFLECTION UNCEMENTED	SPECTRON-EF	135				1					**136**
Other	Other	1 490	38	25	98	135	234	69	105	321	**2 515**

Table 18: Reverse hybrid primary prostheses. The 20 most frequent combinations.

Cup (cemented)	Stem (uncemened)	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
MARATHON	CORAIL	11 631	2 564	2 350	2 187	1 818	1 496	796	630	597	**24 069**
ELITE	CORAIL	2 673	3	2							**2 678**
REFLECTION CEM. ALL POLY	CORAIL	1 246	30	29	31	7	2	7	3	5	**1 360**
TITAN	CORAIL	986									**986**
EXETER X3 RIMFIT	ACCOLADE II	128	123	157	121	116	62	1	1	3	**712**
CONTEMPORARY	CORAIL	683									**683**
KRONOS	CORAIL	640									**640**
EXETER X3 RIMFIT	CORAIL	260	46	129	54	24	21	11	5	13	**563**
REFLECTION CEM. ALL POLY	HACTIV	476									**476**
REFLECTION CEM. ALL POLY	FILLER	260	1		2						**263**
IP	CORAIL	204	2	5	1	3	4				**219**
AVANTAGE	CORAIL	104	12	12	14	20	10	7	12	23	**214**
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	70	35	25	7		2				**139**
CHARNLEY	CORAIL	118									**118**
MARATHON	KAR/Corail Revision	41	11	15	10	8	6	3	2	5	**101**
ELITE	SCP/UNIQUE	98	1								**99**
Other	Other	1 139	73	103	84	51	67	56	47	72	**1 692**

Acetabular cups in primary operations

Table 19: The 45 most frequent cups.

Cup	1987-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
CHARNLEY	43 103	66	40									**43 209**
MARATHON	7 481	3 319	3 193	3 045	3 000	2 762	2 495	2 331	1 555	1 385	1 317	**31 883**
PINNACLE	1 339	388	331	398	519	1 286	1 810	1 949	1 906	2 222	2 506	**14 654**
REFLECTION CEM. ALL POLY	13 923	108	53	36	33	34	8	17	15	10	20	**14 257**
EXETER	13 492	26	1									**13 519**
TRIDENT	285	161	347	441	548	546	783	1 626	2 301	2 924	3 516	**13 478**
EXETER X3 RIMFIT	1 919	1 370	1 363	1 571	1 635	1 178	1 185	1 099	648	547	508	**13 023**
REFLECTION UNCEMENTED	4 563	933	968	798	435	520	834	452	495	345	13	**10 356**
TITAN	8 816											**8 816**
TRILOGY	4 592	351	509	517	582	576	374	468	196	87	113	**8 365**
IP	5 796	440	286	315	267	220	211	228	160	178	216	**8 317**
ELITE	7 636	118	95	5	2							**7 856**
R3	154	82	84	308	829	885	808	692	523	678	987	**6 030**
CONTEMPORARY	5 332	111	58	15	3	1		3	4			**5 527**
IGLOO	2 914	211	175	124	169	110	121	136	74	57	39	**4 130**
TROPIC	3 823											**3 823**
SPECTRON	3 652											**3 652**
AVANTAGE	669	103	119	98	158	190	182	223	191	221	229	**2 383**
KRONOS	2 193											**2 193**
LUBINUS	32	125	169	253	213	215	205	230	230	275	183	**2 130**
DURALOC	1 921	62										**1 983**
ATOLL	1 491											**1 491**
POLARCUP	114	79	66	64	49	91	99	183	185	192	216	**1 338**
Continuum Acetabular System			194	320	348	98	50	60	83	89	70	**1 312**
BICON-PLUS	1 211		1	1								**1 213**
ZCA	1 063											**1 063**
EXCEED ABT CEMENTED SYS	15	13	19	32	23	206	274	179	42	75	37	**915**
MODULAR HIP SYSTEM	878											**878**
MORSCHER	843											**843**
WEBER ALLO PRO	830											**830**
ENDLER	662											**662**
BIRMINGHAM HIP RESURFACI	520	2										**522**
GEMINI	510											**510**
OPERA	457											**457**
TRABECULAR METAL	26	17	33	35	54	41	44	57	34	34	24	**399**
G7									2	48	301	**351**
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**
Other	2 510	7	26	65	81	204	121	106	74	94	101	**3 389**

Acetabular cups in revisions

Table 20: The 45 most frequent cups.

Cup	1987-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
CHARNLEY	2 861	3				1						**2 865**
AVANTAGE	1 126	99	85	86	76	90	97	91	118	86	113	**2 067**
TROPIC	1 885											**1 885**
TRABECULAR METAL	325	161	214	160	204	158	153	155	111	84	57	**1 782**
TRIDENT	112	41	44	94	88	111	169	228	268	258	303	**1 716**
TRILOGY	1 277	51	56	65	59	46	42	24	29	21	8	**1 678**
PINNACLE	581	82	117	97	111	115	134	114	118	84	57	**1 610**
ELITE	1 582	12	6									**1 600**
POLARCUP	186	119	113	132	118	129	111	123	89	96	90	**1 306**
MARATHON	500	138	66	94	66	60	46	45	35	24	15	**1 089**
EXETER	943						1					**944**
REFLECTION CEM. ALL POLY	902	4	3	4	2				1			**916**
REFLECTION UNCEMENTED	305	94	83	74	35	41	28	26	20	23	13	**742**
IGLOO	456	18	15	15	25	18	17	20	4		2	**590**
TITAN	527											**527**
ATOLL	396											**396**
R3	7	6	6	20	61	79	67	31	27	33	19	**356**
IP	251	4	3	5	3	4	1	1	1	2	4	**279**
Continuum Acetabular System			13	51	66	37	37	38	15	7	2	**266**
CONTEMPORARY	237	3										**240**
KRONOS	225											**225**
EXETER X3 RIMFIT	49	30	25	29	29	9	5	11	6	6	6	**205**
CHRISTIANSEN	196											**196**
SPECTRON	189											**189**
DURALOC	120	5	11	9	2	6	5	7	6	6	3	**180**
OPERA	101											**101**
HARRIS/GALANTE	99											**99**
ZCA	96											**96**
MODULAR HIP SYSTEM	95											**95**
CAPTIV	71				7							**78**
BICON-PLUS	51	3		2	1	5	4	5	4			**75**
EUROPEAN CUP SYSTEM	73											**73**
G7									3	28	38	**69**
LMT (Uncemented)	67											**67**
ENDLER	66											**66**
HG II	53											**53**
MORSCHER	51											**51**
GEMINI	47											**47**
SECURFIT	45											**45**
REGENEREX RINGLOC	38	2							1			**41**
OCTOPUS	40											**40**
TI-FIT	36											**36**
PARHOFER	35											**35**
PCA	34											**34**
BI-MENTUM										5	27	**32**
Other	394	3	5	4	7	18	19	19	14	19	23	**525**

Femoral stems in primary operations

Table 21: The 45 most frequent stems.

Stem	1987-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
CORAIL	24 210	4 637	4 712	4 459	4 759	5 031	5 171	5 081	4 432	4 538	4 964	**71 994**
CHARNLEY	42 420	67	44									**42 531**
EXETER	21 755	1 570	1 651	1 850	1 894	1 553	1 838	1 928	1 475	1 444	1 533	**38 491**
LUBINUS SP II	4 959	622	589	780	786	670	682	895	1 073	1 440	1 675	**14 171**
TITAN	12 188											**12 188**
SPECTRON-EF	10 608	37	10	3	1	2	6	6	10	4	7	**10 694**
FILLER	3 286	374	328	262	287	245	235	196	94	70	1	**5 378**
C-STEM	540	1	2	76	203	250	360	585	643	761	795	**4 216**
MS-30	1 876			17	21	144	227	320	329	459	634	**4 027**
ITH	3 723											**3 723**
CHARNLEY MODULAR	2 203	237	261	154	46	28		2	13			**2 944**
ACCOLADE II		110	137	314	342	266	305	325	262	312	165	**2 538**
HACTIV	1 387	38	9	150	281	242	204	134				**2 445**
CPT	1 113	1	2	1	2	440	262	175	1			**1 997**
BIO-FIT	1 993											**1 993**
POLARSTEM	207	108	103	110	97	111	112	169	219	252	457	**1 945**
SCP/UNIQUE	1 301	33	36	28	35	11		1	1	1		**1 447**
ZWEYMÜLLER	1 102											**1 102**
ELITE	1 029	1										**1 030**
OMNIFIT	890											**890**
PROFILE	890											**890**
ABG II	667	78	81	23								**849**
TAPERLOC	787											**787**
SP I	780											**780**
FJORD	652											**652**
LUBINUS	624											**624**
SECURFIT	526	32										**558**
CPS-PLUS	496											**496**
KAR/Corail Revision	170	32	21	29	42	39	24	37	21	17	20	**452**
BICONTACT	443											**443**
LMT (Cemented)	417											**417**
ABG I	304											**304**
FURLONG EVOLUTION			4	19	19	36	32	32	25	41	56	**264**
PROFEMUR GLADIATOR	129	38	4				33	20	11			**235**
TI-FIT	221											**221**
MÜLLER TYPE	213											**213**
FEMORA	182											**182**
BI-METRIC	150	2	3	7	16	1						**179**
SL-PLUS MIA	177											**177**
HARRIS/GALANTE	169											**169**
PARHOFER	159											**159**
RESTORATION	33	11	9	8	9	2	6	20	18	16	17	**149**
KAREY	136											**136**
FURLONG			41	16	19	23	18	15			3	**135**
MÜLLER TYPE V	132											**132**
Other	1 270	24	52	102	47	22	47	49	42	44	32	**1 731**

Femoral stems in revisions

Table 22: The 45 most frequent stems.

Stem	1987-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
KAR/Corail Revision	2 392	147	120	138	103	99	90	106	76	67	57	**3 395**
CHARNLEY	2 979	1	2	1			1					**2 984**
EXETER	1 773	62	63	77	78	68	84	84	91	95	96	**2 571**
CORAIL	1 402	65	40	51	66	57	50	45	40	42	43	**1 901**
RESTORATION	276	67	63	70	55	36	73	51	62	50	51	**854**
CPT	481	2	5	7	6	23	18	9	1	8	2	**562**
TITAN	538											**538**
FJORD	476											**476**
FILLER	333	17	16	10	19	19	16	19	6	10	2	**467**
TTHR	240	53	37	21	24	24	16	19	6	7		**447**
LUBINUS SP II	175	8	30	16	9	17	30	28	34	33	41	**421**
SPECTRON-EF	359	8	3	3	2	1		2	3		5	**386**
ARCOS	4	12	17	27	32	42	41	26	51	54	61	**367**
ELITE	351	1										**352**
REEF	325	2										**327**
REVITAN	14	27	20	36	31	38	33	34	15	14	10	**272**
MP RECONSTRUCTION	93	26	18	17	12	14	14	10	10	6	17	**237**
Securus		7	15	11	19	20	21	38	34	20	15	**200**
ANATOMIC BR	192											**192**
ITH	192											**192**
BIO-FIT	167											**167**
REACTIV	54	6	19	13	27	14	9	13	2	3	2	**162**
HACTIV	106	4		13	9	10	8	7				**157**
C-STEM	13		1	3	12	11	14	19	26	24	31	**154**
BI-METRIC	118	16	1		2	2						**139**
TAPERLOC	115											**115**
PRIUS			2	11	17	8	22	9	6	9	21	**105**
RECLAIM	1	13	9	12	12	6	10	5	10	3	16	**97**
ZWEYMÜLLER	83											**83**
MS-30	34				2	4	4	4	9	9	11	**77**
Profemur	58	14	5									**77**
ECHELON	68											**68**
SP I	66											**66**
SCAN HIP	59											**59**
LUBINUS	51											**51**
HARRIS/GALANTE	44											**44**
CHARNLEY MODULAR	28	3	3	3	5	1						**43**
FEMORA	43											**43**
PARHOFER	43											**43**
MRP-TITAN						6	18	12	2	1	1	**40**
PROFEMUR GLADIATOR	27	9	3									**39**
AURA	38											**38**
LANDOS (Reconstruction)	33											**33**
MÜLLER TYPE	32											**32**
OMNIFIT	32											**32**
Other	320	3	2	12	6	10	2	8	9	15	8	**395**

The 7 most common primary prostheses in the last 5 years

Table 23a: Acetabular cup

2018	2019	2020	2021	2022
MARATHON (2 495)	MARATHON (2 331)	TRIDENT (2 301)	TRIDENT (2 924)	TRIDENT (3 516)
PINNACLE (1 810)	PINNACLE (1 949)	PINNACLE (1 906)	PINNACLE (2 222)	PINNACLE (2 506)
EXETER X3 RIMFIT (1 185)	TRIDENT (1 626)	MARATHON (1 555)	MARATHON (1 385)	MARATHON (1 317)
REFLECTION * (834)	EXETER X3 RIMFIT (1 099)	EXETER X3 RIMFIT (648)	R3 (678)	R3 (987)
R3 (808)	R3 (692)	R3 (523)	EXETER X3 RIMFIT (547)	EXETER X3 RIMFIT (508)
TRIDENT (783)	TRILOGY (468)	REFLECTION * (495)	REFLECTION * (345)	G7 (301)
TRILOGY (374)	REFLECTION * (452)	LUBINUS (230)	LUBINUS (275)	AVANTAGE (229)

Table 23b: Femoral stem

2018	2019	2020	2021	2022
CORAIL (5 171)	CORAIL (5 081)	CORAIL (4 432)	CORAIL (4 538)	CORAIL (4 964)
EXETER (1 838)	EXETER (1 928)	EXETER (1 475)	EXETER (1 444)	LUBINUS SP II (1 675)
LUBINUS SP II (682)	LUBINUS SP II (895)	LUBINUS SP II (1 073)	LUBINUS SP II (1 440)	EXETER (1 533)
C-STEM (360)	C-STEM (585)	C-STEM (643)	C-STEM (761)	C-STEM (795)
ACCOLADE II (305)	ACCOLADE II (325)	MS-30 (329)	MS-30 (459)	MS-30 (634)
CPT (262)	MS-30 (320)	ACCOLADE II (262)	ACCOLADE II (312)	POLARSTEM (457)
FILLER (235)	FILLER (196)	POLARSTEM (219)	POLARSTEM (252)	ACCOLADE II (165)

Table 23c: Combinations of cup and stem

2018	2019	2020	2021	2022
MARATHON + CORAIL (1 844)	PINNACLE + CORAIL (1 743)	PINNACLE + CORAIL (1 634)	PINNACLE + CORAIL (1 757)	PINNACLE + CORAIL (1 844)
PINNACLE + CORAIL (1 676)	MARATHON + CORAIL (1 511)	TRIDENT + CORAIL (1 068)	TRIDENT + CORAIL (1 302)	TRIDENT + CORAIL (1 674)
EXETER X3 RIMFIT + EXETER (1 044)	EXETER X3 RIMFIT + EXETER (1 009)	MARATHON + CORAIL (801)	TRIDENT + EXETER (662)	TRIDENT + EXETER (760)
R3 + CORAIL (519)	TRIDENT + CORAIL (660)	EXETER X3 RIMFIT + EXETER (633)	MARATHON + CORAIL (647)	MARATHON + CORAIL (604)
REFLECTION * + CORAIL (427)	R3 + CORAIL (464)	TRIDENT + EXETER (558)	EXETER X3 RIMFIT + EXETER (538)	EXETER X3 RIMFIT + EXETER (442)
TRIDENT + CORAIL (303)	TRIDENT + EXETER (460)	R3 + CORAIL (334)	R3 + CORAIL (368)	R3 + CORAIL (425)
MARATHON + EXETER (244)	TRILOGY + CORAIL (329)	REFLECTION * + CORAIL (277)	TRIDENT + LUBINUS SP II (309)	TRIDENT + LUBINUS SP II (400)

* UNCEMENTED

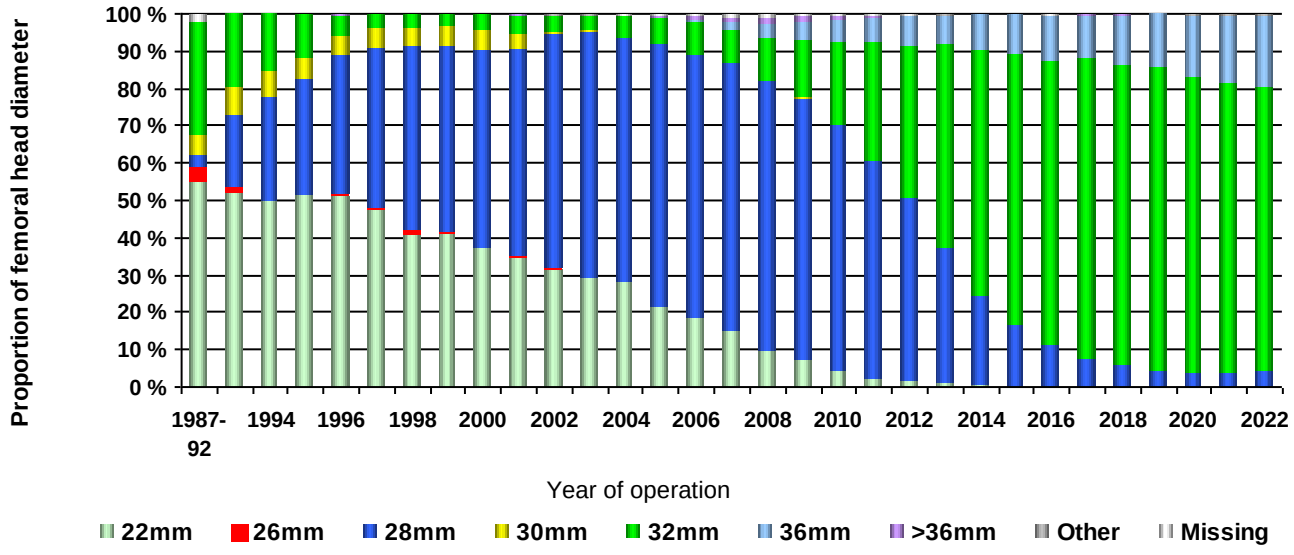
**' MODULAR

Femoral head diameter (Dual mobility 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
2022	17		418		7 662	1 945	3	24	18	**10 087**
2021	11		318		7 289	1 709	3	10	18	**9 358**
2020	16		292		7 042	1 487	7	13	20	**8 877**
2019	23		442	2	8 445	1 470	12		10	**10 404**
2018	13		584		8 219	1 361	6	4	18	**10 205**
2017	7		719		7 871	1 136	9	2	21	**9 765**
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		2 093	1	5 863	807	4	3	15	**8 843**
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**
1987-92	14 148	1 043	913	1 334	7 824	1	84		493	**25 840**
Total	**50 695**	**1 364**	**88 721**	**4 419**	**96 127**	**15 286**	**806**	**133**	**1 119**	**258 670**

Figure 11: In primary operations and revisions



Femoral head prostheses

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

Prosthesis	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
CORAIL	9 194	2 894	3 125	3 457	3 582	4 161	3 763	3 702	2 565	**36 443**
EXETER	24 170	793	744	563	568	571	382	440	537	**28 768**
CERAMTEC	12 963	2 218	2 211	2 109	2 177	1 447	1 055	1 058	797	**26 035**
LANDOS	21 743									**21 743**
UNIVERSAL	17 078	39	35	63	59	102	87	63	97	**17 623**
LFIT ANATOMIC	4 551	1 646	1 719	1 469	1 839	1 861	1 494	1 419	1 407	**17 405**
SP II	6 662	826	835	734	772	977	1 174	1 544	1 779	**15 303**
FJORD	11 769	3		2						**11 774**
PINNACLE	1 330	161	286	358	374	730	777	962	2 865	**7 843**
ELITE	3 998	136	62	35	8	8	21	4	3	**4 275**
IGLOO	3 036	170	229	207	224	201	81	51	2	**4 201**
PROTEK	1 984			381	332	285	102	132	187	**3 403**
SCANOS	1 725	211	347	289	267	178	17	23	23	**3 080**
VERSYS	217	80	81	141	164	227	270	367	431	**1 978**
OXINIUM	998	5	10	6	8	26	173	223	385	**1 834**
PLUS ENDO	1 616	14	16	15	14	6	4	5		**1 690**
CPT	1 636	1	4	3	2	1	1	1		**1 649**
MALLORY-HEAD	864	107	93	64	61	46	83	82	79	**1 479**
PROFILE	1 429									**1 429**
HIPBALL PREMIUM	868	137	116	66	54	28	19	26	4	**1 318**
TAPERLOC	1 088									**1 088**
BIOTECHNI	1 055	2	1							**1 058**
HARRIS/GALANTE	876	6	5		1	5	1		1	**895**
OMNIFIT	845	2	2	3	3	2	3		2	**862**
" OSTEONICS Hoder" , C-taper head	815									**815**
FURLONG	81	80	91	108	84	97	81	76	89	**787**
ZIRCONIA	763									**763**
BIOBALL	272	61	59	63	60	49	39	42	45	**690**
STRYKER HODER	129	41	48	19	26	106	134	156	28	**687**
BICONTACT	496	2	2	2	2	1	5	1		**511**
BIRMINGHAM HIP RESURFACING	467				1					**468**
ABG I	406	6	3	3	2	3	2	1		**426**
Zimmer Hoder	1			162	83	76	14	23	66	**425**
SURGIVAL	372									**372**
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	66	3	1	6	17	17	11	3		**124**
PCA	108	2		1	1				2	**114**
MUTARS	18	10	8	6	3	4	5	4	3	**61**
BIRMINGHAM HIP MODULÆR	58									**58**
ABG II	48									**48**
ASR MODULÆR	45									**45**
LINK Rippensystem	38									**38**
A-ACUTA					8	7	8	9	3	**35**
AURA II	29			1						**30**
Other	320	1	3	7	20	10	6	7	14	**388**

Dual Mobility articulation

Table 26 In primary operation

Prosthesis	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
AVANTAGE	892	98	158	191	182	223	191	220	209	**2 364**
POLARCUP	259	64	49	91	98	183	186	192	201	**1 323**
TRIDENT MDM	37	16	22	35	49	96	177	266	406	**1 104**
G7								10	52	**62**
Restoration Anatomic Cup	5		5	4	1	4			5	**24**
CAPTIV			19							**19**
Other (n<5)	2									**2**
Total	**1 195**	**178**	**253**	**321**	**330**	**506**	**554**	**688**	**873**	**4 898**

Table 27 In revisions

Prosthesis	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
AVANTAGE	1 361	93	92	121	108	107	136	101	134	**2 253**
POLARCUP	443	144	129	141	123	129	100	101	103	**1 413**
TRIDENT MDM	45	48	33	44	90	137	195	202	224	**1 018**
Restoration Anatomic Cup	25	12	17	28	11	4			11	**108**
G7							3	23	32	**58**
CAPTIV			10							**10**
GYROS	10									**10**
Other (n<5)				1	1					**2**
Total	**1 884**	**297**	**281**	**335**	**333**	**377**	**434**	**427**	**504**	**4 872**

ASA classification

Figure 12: Primary operations

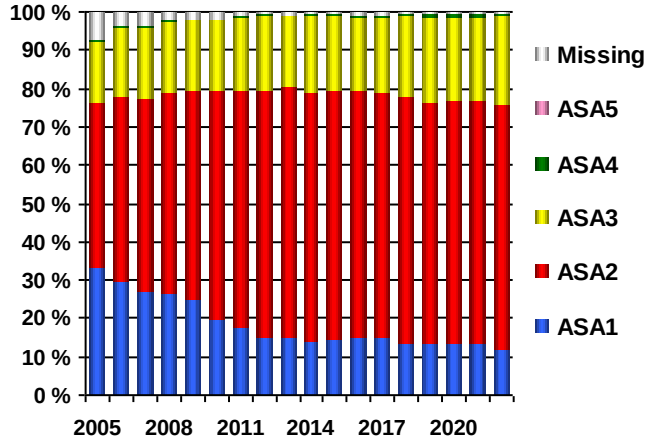
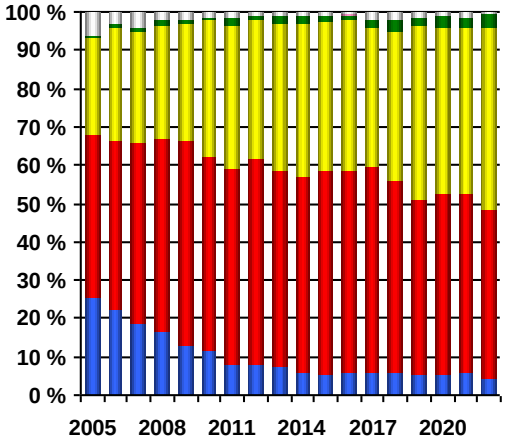


Figure 13: Revisions



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.

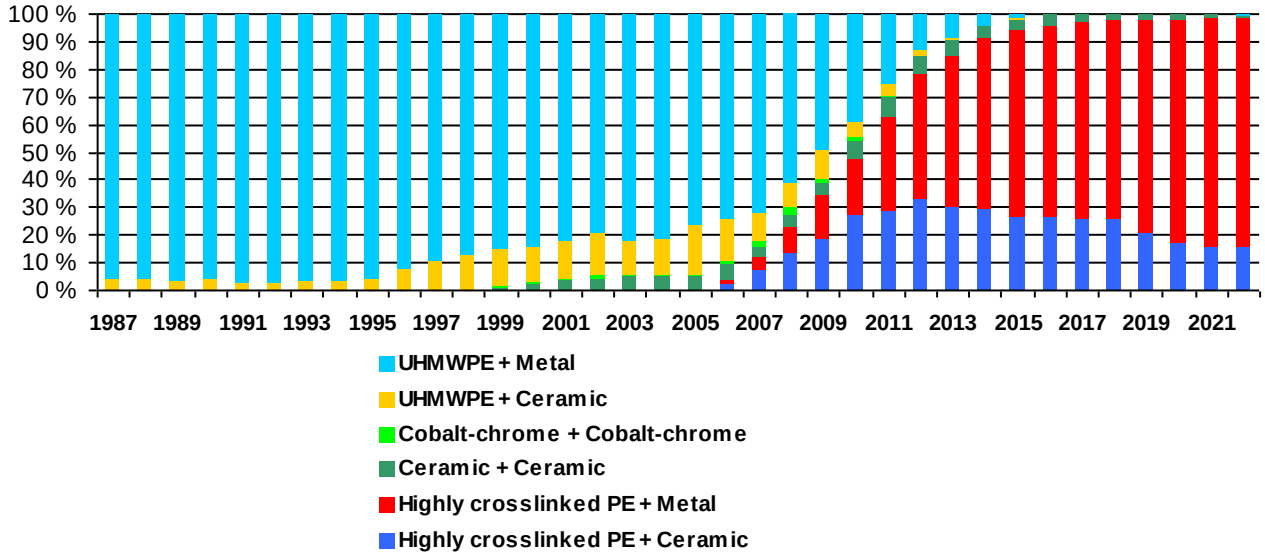
Registration of ASA classification started in 2005

Articulations (except dual mobility)

Table 28: In primary operations - All patients

Cup + Femoral head	1987-14	2015	2016	2017	2018	2019	2020	2021	2022	Total
UHMWPE + Steel	71 303	5	0	0	0	0	4	10	17	71 339
Highly crosslinked PE + Cobalt-chrome	15 377	4 755	5 229	5 774	6 195	6 853	6 196	6 751	7 243	64 373
UHMWPE + Cobalt-chrome	33 603	135	25	13	8	21	24	19	44	33 892
Highly crosslinked PE + Alumina	11 172	1 529	1 424	860	696	293	149	136	76	16 335
Highly crosslinked PE + Alumina/Zirconium[1]	2 676	630	904	1 423	1 688	1 673	1 207	1 219	1 329	12 749
UHMWPE + Alumina	10 912	4	2	0	0	0	0	0	0	10 918
Highly crosslinked PE + Steel	3 091	797	682	493	427	422	266	262	307	6 747
Alumina + Alumina	3 783	7	0	1	0	0	0	0	0	3 791
Alumina/Zirconium + Alumina/Zirconium[1]	1 203	342	372	218	205	193	118	122	44	2 817
UHMWPE + Titanium	1 908	0	0	0	0	0	0	0	0	1 908
Highly crosslinked PE + Oxinium	766	3	2	2	2	21	161	210	374	1 541
UHMWPE + Zirconium	1 402	0	0	0	0	0	0	0	0	1 402
Cobalt-chrome + Cobalt-chrome	1 045	0	0	0	0	0	0	0	0	1 045
UHMWPE + Alumina/Zirconium[1]	341	5	0	0	0	0	0	0	1	347
Titanium + Alumina	147	2	2	1	0	0	0	0	0	152
Highly crosslinked PE + Titanium	83	0	0	0	0	0	0	0	0	83
UHMWPE + Oxinium	77	0	0	0	0	0	0	0	0	77
Missing	3 386	27	44	52	45	23	31	23	41	3 672
Other (n<50)	187	17	7	7	3	7	2	3	5	238
Total	**162 462**	**8 258**	**8 693**	**8 844**	**9 269**	**9 506**	**8 158**	**8 755**	**9 481**	**233 426**

Figure 14: In primary operations



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

Vancouver Classification

Table 29: 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
2022	21	8	85	50	6	14	46	23	2	24	32
2021	6	5	64	23	5	14	38	16	2	11	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

Thrombosis prophylaxis

Table 30: Primary operations *

År	1		2		3		4		Missing		Total
2022	363	(3%)	9 284	(89%)	604	(6%)	122	(1%)	40	(0%)	**10 413**
2021	324	(3%)	8 111	(86%)	870	(9%)	116	(1%)	42	(0%)	**9 463**
2020	396	(5%)	7 418	(85%)	753	(9%)	130	(1%)	29	(0%)	**8 726**
2019	466	(5%)	8 510	(85%)	880	(9%)	150	(1%)	38	(0%)	**10 044**
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**
2005-11	22 191	(46%)	20 186	(42%)	4 857	(10%)	48	(0%)	945	(2%)	**48 227**

Table 31: Revisions *

År	1		2		3		4		Missing		Total
2022	193	(15%)	979	(75%)	72	(5%)	56	(4%)	13	(1%)	**1 313**
2021	159	(12%)	934	(73%)	97	(8%)	63	(5%)	27	(2%)	**1 280**
2020	172	(13%)	1 006	(73%)	125	(9%)	47	(3%)	19	(1%)	**1 369**
2019	193	(13%)	1 088	(72%)	145	(10%)	67	(4%)	27	(2%)	**1 520**
2018	202	(13%)	1 124	(72%)	146	(9%)	66	(4%)	23	(1%)	**1 561**
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**
2005-11	3 449	(43%)	3 424	(43%)	918	(11%)	29	(0%)	172	(2%)	**7 992**

Figure 15: Primary operations

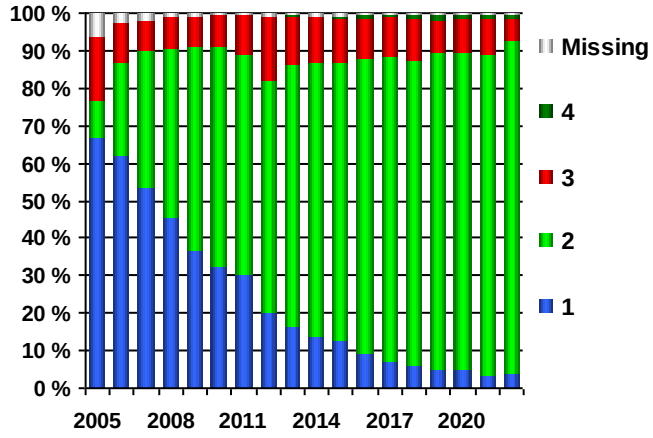
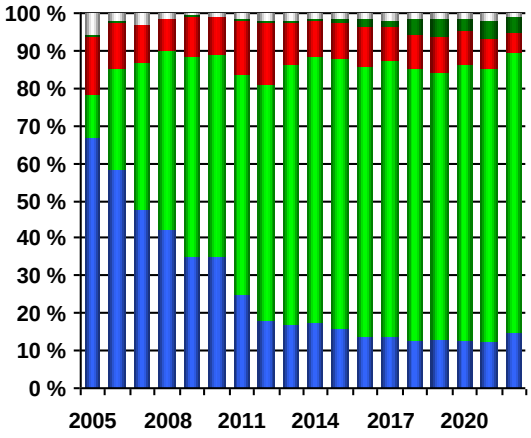


Figure 16: Revisions



*

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

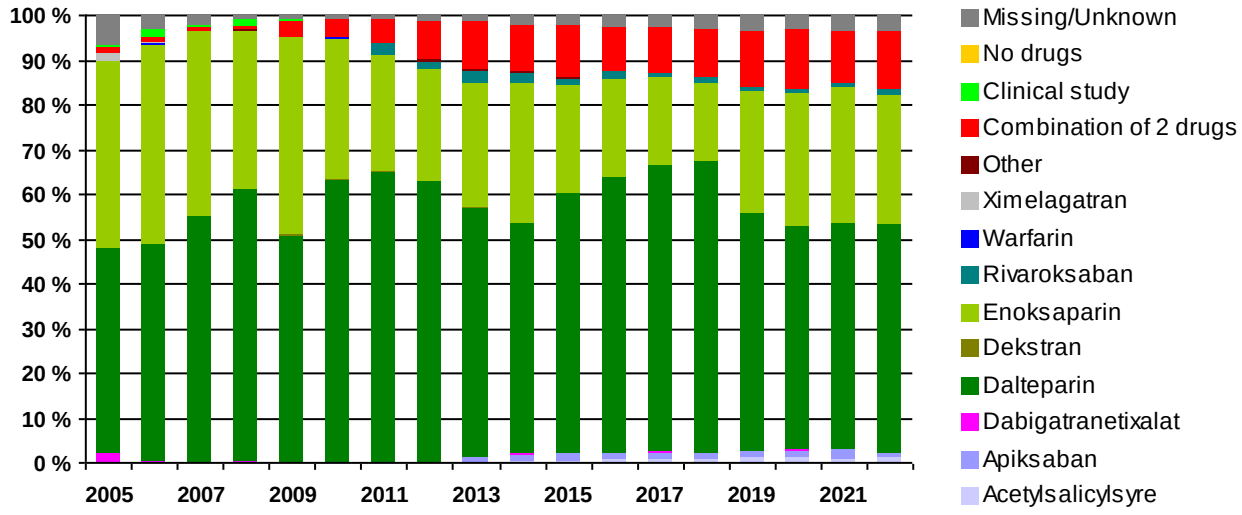
Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 32a: All operations

Drugs	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
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 %	1,4 %
Apiksaban (Eliquis)		1,2 %	1,5 %	1,5 %	1,5 %	1,6 %	1,4 %	1,3 %	1,8 %	1,9 %	0,7 %
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 %	51,0 %
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 %	30,1 %	29,2 %
Rivaroksaban (Xarelto)	0,7 %	2,3 %	2,2 %	1,5 %	1,5 %	1,1 %	1,1 %	1,0 %	0,9 %	0,9 %	1,2 %
Warfarin (Marevan)	0,1 %			0,1 %							
Ximelagatran (Exanta, Malagatran)	0,3 %										
Other			0,1 %						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 %	11,6 %	12,7 %
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 %	3,5 %
Total	**65 408**	**9 467**	**9 455**	**9 878**	**10 467**	**10 690**	**11 184**	**11 569**	**10 119**	**10 773**	**11 815**

Figure 17: Drugs - All operations



Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 32b: Combination of 2 drugs - All operations

Drugs	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Enoxaparin + Acetylsalicylsyre	42,0%	30,5%	29,7%	28,1%	25,9%	25,6%	30,6%	27,5%	26,7%	31,4%	27,8%
Dalteparin + Apixaban	2,1%	15,3%	22,2%	21,9%	26,8%	26,4%	15,5%	11,7%	12,0%	13,7%	29,2%
Enoxaparin + Apixaban	3,7%	15,8%	13,3%	12,2%	11,0%	6,8%	8,8%	24,6%	29,1%	26,4%	18,1%
Dalteparin + Dabigatranetixalat	10,7%	25,7%	16,7%	16,5%	15,4%	11,7%	5,8%	0,6%	0,1%	0,1%	0,1%
Dalteparin + Acetylsalicylsyre	4,4%	0,5%	0,7%	0,6%	0,3%	7,0%	20,9%	20,6%	18,4%	10,5%	4,6%
Dalteparin + Rivaroxaban	1,2%	0,1%	1,0%	4,8%	6,4%	9,1%	2,9%	7,7%	10,1%	13,3%	15,3%
Enoxaparin + Rivaroxaban	4,5%	7,4%	12,3%	11,5%	12,1%	11,4%	11,9%	2,8%	0,4%	0,6%	0,5%
Dalteparin + Warfarin	17,4%	1,7%	1,0%	1,5%	0,6%	0,2%	0,7%	0,1%	0,5%	0,1%	0,1%
Enoxaparin + Dabigatranetixalat	1,3%	0,6%	2,4%	0,9%	0,8%	1,1%	2,1%	3,5%	2,2%	2,1%	3,3%
Enoxaparin + Warfarin	8,5%	1,2%	0,5%	1,3%	0,4%	0,2%		0,5%	0,2%	0,2%	0,1%
Dalteparin + Enoxaparin	0,7%	0,3%		0,1%	0,1%		0,2%	0,1%	0,1%	0,1%	
Dalteparin + Dextran	0,4%	0,6%									
Enoxaparin + Acetylsalicylsyre and dipyridamol	0,5%			0,1%				0,1%			
Enoxaparin + Dextran	0,7%										
Rivaroxaban + Missing/Unknown		0,1%								1,0%	
Enoxaparin + Clopidogrel	0,2%								0,2%	0,1%	0,3%
Dalteparin + Clopidogrel	0,2%			0,1%		0,1%	0,2%			0,1%	
Enoxaparin + Clinical study	0,4%										
Enoxaparin + Hydroxyethylstivelse	0,1%			0,3%	0,1%		0,1%				0,1%
Acetylsalicylsyre + Clopidogrel	0,1%			0,1%		0,1%		0,1%		0,1%	0,1%
Acetylsalicylsyre + Dipyridamol	0,0%				0,1%	0,1%	0,1%	0,1%			
Acetylsalicylsyre + Dextran	0,1%	0,1%									
Acetylsalicylsyre + Missing/Unknown		0,1%				0,1%		0,1%			0,1%
Dalteparin + Clinical study	0,2%										
Dalteparin + Dipyridamol	0,1%				0,1%				0,1%		
Enoxaparin + Dipyridamol	0,1%										0,1%
Apixaban + Missing/Unknown									0,1%		0,1%
Dalteparin + Hydroxyethylstivelse						0,1%	0,1%				0,1%
Acetylsalicylsyre + Rivaroxaban	0,1%										
Clopidogrel + Rivaroxaban	0,0%						0,1%				
Dalteparin + Acetylsalicylsyre and dipyridamol	0,0%										0,1%
Dalteparin + Missing/Unknown	0,0%	0,1%									
Dalteparin + Pyrazolidon	0,1%										
Dextran + Dabigatranetixalat	0,0%		0,1%								
Enoxaparin + Edoxaban										0,1%	0,1%
Enoxaparin + Heparin				0,1%							0,1%
Enoxaparin + Missing/Unknown	0,0%									0,1%	
Acetylsalicylsyre + Apixaban										0,1%	
Acetylsalicylsyre + Ticagrelor						0,1%					
Dabigatranetixalat + Apixaban			0,1%								
Dalteparin + Edoxaban								0,1%			
Dextran + Rivaroxaban			0,1%								
Dipyridamol + Apixaban								0,1%			
Dipyridamol + Ticlopidin									0,1%		
Enoxaparin + Ticagrelor						0,1%					
Enoxaparin + Ximelagatran	0,0%										
Warfarin + Apixaban							0,1%				
Warfarin + Dextran		0,1%									
Total	**2 150**	**1 020**	**1 003**	**1 135**	**1 049**	**1 091**	**1 222**	**1 449**	**1 313**	**1 260**	**1 507**

Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 33: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2022	3 110	4 771	869	14	1 130	18	0	1 903	11 815
2021	2 589	4 575	783	21	950	15	0	1 840	10 773
2020	2 534	3 997	767	42	1 115	13	1	1 650	10 119
2019	2 658	4 473	919	117	1 411	14	0	1 977	11 569
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
2005-08	3 699	8 870	4 312	1 728	7 365	510	11	4 168	30 663

Registration of thrombosis prophylaxis started in 2005

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 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.

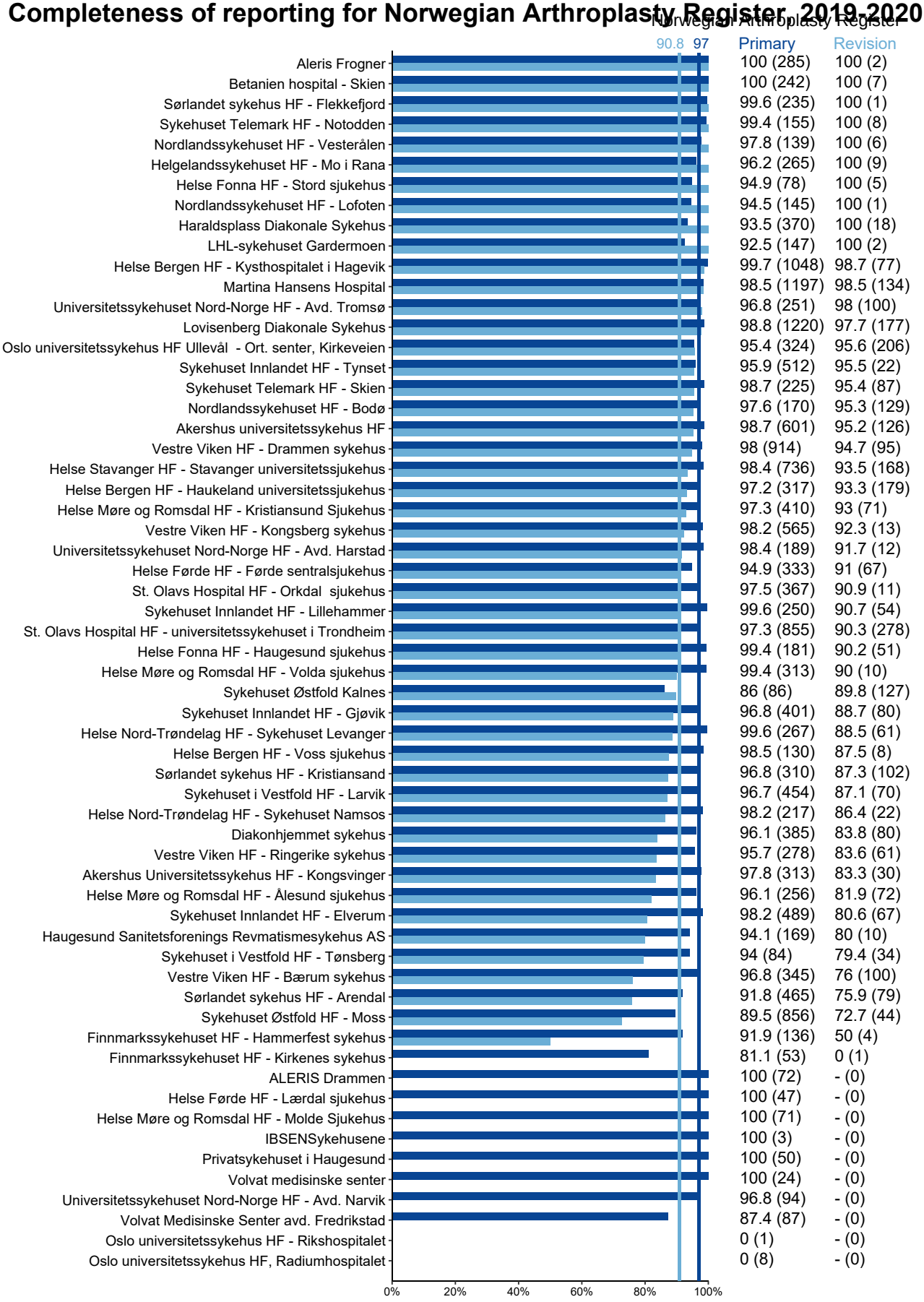
Procedure codes to be used for primary operations: NFB 20 - NFB 30 - NFB 40

Revision operations. In 2019-2020, 3 178 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 show the national averages.

CONTENTS

Knee prostheses

ANNUAL REPORT KNEE AND OTHER JOINTS

In the period from 1994 to 2022, a total of 128,894 knee prostheses, 13,492 shoulder prostheses, and 11,108 prostheses in other joints were registered. The number of primary knee prostheses implanted in 2022 reached 7,785, which is a record high. The data suggests that hospitals are recovering from the impact of the COVID-19 pandemic. The number of knee prosthesis revisions was 592, accounting for a revision rate of 7%. This reflects a positive declining trend in revision rates.

ELECTRONIC REPORTING

Electronic reporting has been established in the Medical Registration System (MRS) for hip, knee, and shoulder prostheses. This allows individual hospitals to access their own data, and reports can be directly generated from the MRS system. Surgeons are required to register as users in the Norwegian Arthroplasty Register on the Norwegian Health Network https://falk.nhn.no. Here you can use mrs.nhn.no to registrer the patiente in the operation form. Instructions for this process can be found on our website.

We use the scanning program from Procordo to read the barcodes for the implants at pscan.procordo.com. The scanner needs to be installed in the operating room. Currently, registration for elbow/hand/fingers/toes and ankle prostheses must be done on paper forms, but we are working on an electronic solution for all joints. The paper forms will not be updated. Instructions have been posted on our website helse-bergen.no/nrl to help you get started. Our consultant Mikal Solberg (mobile 90583174) or the registry office (phone 55 97 37 42/43) can be contacted for assistance.

PROM

We request that hospitals facilitate the PROM registration before surgery for hip, knee, and shoulder prosthesis patients. There will automatically be sent out questions to the patients 1 year after the operation on Helsenorge.no as long as preoperative PROM is completed or the operation is registered electronically. The 1-year PROM will be sent to patients who are registered on paper, collected twice a year. An overview of results for knee function and pain (KOOS), quality of life (EQ-5D-5L), and other variables recorded by patients is presented in the results section. We have also compiled a list of the percentage of patients who record preoperative PROM at each hospital. Currently, there are three hospitals with over 80% preoperative PROM registration. Hospitals need to strengthen their efforts with preoperative PROM. Hospitals will be able to use this data for their own quality assurance, research, and improvement. Instructions to get started are available on our website.

ALBA STUDY KNEE (ANTIBIOTIC LOADE BONE CEMENT)

We have initiated the first registry-randomized study in Norway through the Arthroplasty Register; the ALBA study aims to investigate whether antibiotics in bone cement prevent periprosthetic joint infections in primary knee prosthesis surgery. The protocol has been published (Leta T 2021). The registration form, which is the same as the electronic registration of knee prostheses, includes a built-in randomization solution. The study commenced in January 2021, and as of June 1st, 2023, 2,075 knees were included. We hope that all hospitals will participate in the study. Please get in touch if your hospital has not yet started. Instructions are available on our website.

DESCRIPTION OF KNEE ARTHOPLASTY PRACTISE

Most total knee prostheses are cemented or hybrid CR prostheses. This has yielded favorable outcomes in all registries. The proportion of PS (posterior-stabilized) ppolyethylene components has increased in recent years (13%). This might be attributed to the replacement of deep dish polyethylene in patients with a compromised posterior cruciate ligament, a practice that could be justified. However, in several registry studies, PS knees have shown higher revision rates. The utilization of uncemented total knee prostheses has also seen an increase in recent years. This trend contradicts findings from the registries. A recent NARA study demonstrates higher revision rates associated with the use of uncemented total knee prostheses in patients of all age groups (Niemeläinen M 2020, Irmola T 2021).

There is an increasing utilization of patellar components in knee prostheses. The NICE (National Institute for Health and Care Excellence) guidelines recommend the use of patellar components in total knee prostheses as it appears to reduce the need for reoperations. This trend might be attributed to surgeons offering patellar component insertion as an option for patients complaining about knee pain. In Norway, however, there has been no observed difference in revision risk (Figure B.13) associated with the use of patellar components.

The use of cross-linked polyethylene (XLPE) has risen in recent years in total knee prostheses. In 2022, 38% of primary knee prostheses were implanted with XLPE. Currently, in Norway, there is no evidence of better outcomes with XLPE, but the follow-up period of 10 years is relatively short. Data from Australia show slightly better or comparable results at 10 years of follow-up using XLPE, depending on the prosthesis brand. This suggests that the use of XLPE in knee prostheses is likely safe.

Conversely, the application of mobile-bearing in total knee prostheses has declined, aligning with both Norwegian and international registry studies indicating slightly higher revision rates associated with this type of prosthesis (Paxton E 2011, Gøthesen Ø 2014, Namba R 2014, Gøthesen Ø 2017).

The proportion of unicompartmental knee prostheses has gradually increased and now accounts for 14% of all primary knee prostheses. There is still much international debate regarding the use of unicompartmental knee prostheses. In the USA, it is used in 4% of knee replacement patients, while in England, NICE guidelines now recommend offering it to suitable patients. Approximately 35% of the unicompartmental knee prostheses are un-cemented, and this has remained stable since 2017. In a recently published article from our registry (Skåden Ø 2023), we found more early periprosthetic fractures, infections, and polyethylene fractures/dislocations with un-cemented compared to cemented prostheses. We also found fewer femoral component loosening with the new cemented Oxford partial compared to cemented Oxford III. We conclude that it seems safe to use the new cemented Oxford partial, but the un-cemented variant should be avoided as we observe many early revisions. In Norway, 94% of unicompartmental prostheses have a mobile polyethylene component. Registry studies from England and Australia show better results with fixed polyethylene components.

In the web-based registration, we now inquire about height and weight, robot-assisted surgery, access technique to the knee joint, closure technique, anesthesia, osteoarthritis grade according to Ahlbäck's

classification, bone loss classification in revisions, and classification of periprosthetic fractures. We also record stems, augments, and cones with product numbers. Tables 43-54 display these new variables. The paper form will not be updated, so hospitals reporting on paper will not have data on these variables. For 2022, 14% of patients have a normal weight, 40% are overweight, 31% have obesity grade 1, and 3% have obesity grade 3 (BMI over 40) according to WHO classification. There is substantial evidence that obese patients benefit just as much from knee prostheses as those of normal weight, and obesity should not be used as an argument to deny joint replacement surgery.

We observe that 12% of patients have Ahlbäck grade 1 osteoarthritis, meaning non-bone-to-bone osteoarthritis. These patients are at an increased risk of being dissatisfied with the operation and should receive extra information on this matter (Olsen U 2022 and 2023). All knee prosthesis patients should complete the AktivA course (https://aktivmedartrose.no/) or equivalent non-operative treatment before surgery.

107 knees were operated with robot assistance. Most of these patients are part of a randomized clinical study. Computer navigation was used in 8% of total prostheses, with 99% of alle total knee replacements having a medial parapatellar approach, 83% receiving spinal anesthesia, 84% receiving local infiltration anesthesia (LIA), 40% receiving peripheral nerve blockade, 64% closed with clips, and 32% with continuous skin sutures. Bone loss classification (Anderson) and fracture classification (Mayo classification for tibia and patella, as well as Rorabeck and Lewis classification for femur) have been introduced. Reoperations for prosthesis-related fractures where the prosthesis is not replaced should also be reported for knee prostheses, shoulders, and other joints.

THE QUALITY OF KNEE ARTHROPLASTY SURGEY IN NORWAY

The survival curves demonstrate a gradual improvement in the outcomes of knee prostheses since 1994 when the endpoint is revision surgery. In the period from 2010 to 2022, there has been a pleasing enhancement in the outcomes of unicondylar knee prostheses. A study conducted on our registry data revealed that hospitals performing more than 100 knee prostheses per year had fewer revisions than hospitals with lower procedure volumes (Badawy M 2013). Unicondylar knee prostheses should be concentrated in fewer hospitals (Badawy M 2014) to reduce the risk of revision.

Infection, instability, aseptic loosening of the tibial component, and pain continue to be the most frequent *reasons for reoperation in total knee prostheses* (Dyrhovden G 2017). Many of these revisions can likely be attributed to poor surgical craftsmanship. The key factors for better results include a focus on proper patient selection, infection prevention measures, selecting the appropriate stabilization of the prosthesis, employing good techniques for component placement, proper balancing, and correct cementation techniques (Refsum et al. 2019). Revisions based solely on the indication of pain should be avoided.

PERIPROSTHETIC FRACTURES

Reoperations for periprosthetic fractures, where the prosthesis is not replaced, should also be reported for knee prostheses, shoulder prostheses, and other joints. A classification system for periprosthetic fractures in the knee has been implemented.

DOCUMENTATION OF KNEE ARTHROPLASTIES

We presented the proportion of patients who received well-documented knee prostheses at each hospital (Figure B.35). In consultation with the reference group, we have chosen the ODEP (Orthopaedic Data Evaluation Panel-UK) classification 10A as the requirement for labeling a prosthesis as well-documented. This corresponds to documentation of ≥93% prosthesis survival after 10 years. The long-term goal is 10A*, which corresponds to ≥95% survival. We have excluded prostheses used in ethics committee-approved studies and revision prostheses. In 2019, 61% of patients received well-documented prostheses, and in 2022, this increased to 80%. This is hopefully due to increased awareness among surgeons, but it is also influenced by the fact that some prostheses (e.g., Legion) now have 10 years of documented good results from the Australian registry. We observe that some hospitals choose to use prostheses that cannot be classified as well-documented. We hope that hospitals review their practices in relation to the tenders in the health enterprises and ensure that they use prostheses that are specified in the tenders and that they are aware of the registry's stance on procurement processes for joint prostheses, as outlined on our website. The documentation is available on our website under "Recommendations and Guidelines."

We present the 3-year and 10-year durability of the most commonly used knee prostheses in Norway during the period 2011-2022 (where more than 500 prostheses have been used) (Figure B.33 and B.34). None of the prostheses currently in use have poor results, but several prosthesis combinations lack 10-year results from Norway and/or other countries. A more detailed overview of prosthesis durability can be found on the website under "Recommendations and Guidelines."

COMPLETENESS OF REPORTING

In this report, we present the completeness of reporting rates for primary operations and revision surgeries for the years 2019-2020. The national average completeness of reporting rate is favorable for primary knee prostheses (96.6%), which represents a slight decrease from 97.6% for the years 2018-2019. For revisions, the coverage rate was 92.9%, showing a small decrease from 93.2% for the years 2018-2019. These are good figures, but it is crucial that you establish effective procedures to cross-reference with the surgical protocols as we transition to electronic reporting. We have developed a recommended procedure for this, which can be obtained by contacting our office.

Some hospitals have low reporting rates for revision surgeries. This can potentially lead to a falsely optimistic perception of prosthetic survival at those hospitals. In the figures depicting the proportion of unrevised cases after 2 and 10 years (Figure B.30 and B.31), we have excluded hospitals with coverage rates lower than 80% for revision surgeries.

We would like to remind you that prosthetic surgeries for the ankle, hand, fingers, spine, and toes should also be reported. For these types of prosthetic procedures, the coverage rate is lower compared to other joints. The next completeness of reporting analysis will be conducted next year for the years 2021-2022. We encourage hospitals to review their reporting procedures if the completeness of reporting is low.

HOSPITAL RESULTS

In this report, we present various results from hospitals. We display the proportion of non-revised total knee prostheses after 2 years (surgery performed between 2016-2022) and 10 years for standard patients during the period 2011-2022. Standard patients are those aged 55-85 years, classified as ASA class 1 and 2, and with primary osteoarthritis. We also provide a funnel plot showing the proportion of non-revised prostheses after 10 years for standard patients operated on from 2011 to 2022. The funnel plot takes into account the number of knee prostheses operated on at each hospital. Hospitals with a revision risk more than 3 standard deviations (99.8%) higher than the national average should be considered to have excessively high revision risk and should review their procedures (Figure B.32). Four hospitals with a high proportion of revisions have previously received letters urging them to review their procedures. The hospitals have explained their practices, reviewed their internal procedures, and initiated improvement measures. We hope this will yield results in the long term, although poor results from 10 years ago may persist for some years.

ELBOW

The number of total elbow prostheses inserted in recent years has generally decreased, except for 2019 and 2020, during which there was a significant increase compared to 2018. In 2022, 17 total prostheses were implanted. Additionally, 8 hemiprostheses were implanted in 2022, which is consistent with previous years. Hemiprostheses are used instead of total prostheses for supracondylar and intracondylar humerus fractures.

The humeral component is fixed with cement in all total prostheses, except for one, while the ulnar component is cemented in just under half of the prostheses. This is consistent with previous years. In the last two years, Nexel and Discovery have been the most commonly used prostheses.

The number of revisions of elbow prostheses has slightly decreased. The use of capitellum/radius head prostheses has steadily increased over the past 10 years, and there have never been more of these prostheses recorded than in 2022. This type is primarily used in cases of acute fractures

FINGER AND WRIST

The number of inserted finger prostheses remains low compared to previous years, with 43 surgeries performed in total, of which 11 (16.3%) were reoperations. In 2022, 11 primary wrist prostheses and 3 secondary prostheses (radio-carpal) were implanted. This number is lower than in previous years. Hand base joint prostheses (CMC I prostheses) have increased in number over the past years, following a low point in 2016 with only 5 prostheses inserted. In 2022, 43 primary prostheses were implanted, while the number for 2021 was 30.

ANKLE

There has been a decrease in primary ankle prostheses, with only 26 primary ankle prostheses reported in 2022. There were 13 revisions, which corresponds to 33% of all ankle prosthesis surgeries in 2022. We believe that the decision-making process for indications regarding arthrodesis and prostheses is challenging and should be centralized to a few hospitals. In 2022, ankle prosthesis surgeries were performed at three hospitals for both primary and revision cases. From the FDA, we have received a report about a high rate of plastic breakage in the STAR ankle prosthesis. This type

of prosthesis has not been used in Norway since 2013. We have now had a study accepted for publication that sheds light on some of these issues.

SUMMARY OF THE MOST IMPORTANT SCIENTIFIC FINDINGS IN THE PAST YEAR
In a recently published study from the registry (Skåden Ø 2023), we demonstrate that there are more early periprosthetic fractures, infections, and polyethylene breakages/dislocations with uncemented compared to cemented Oxford partial unicondylar knee prostheses. We also found less femoral component loosening with the new cemented Oxford partial compared to cemented Oxford III. We conclude that it appears safe to use the new cemented Oxford partial, and we recommend to use the cemented variant due to the observed high rate of early revisions in the uncemented variant.

Multiple cartilage surgery cohorts from Norway have been linked to the knee prosthesis registry (Birkenes T 2023). The incidence of knee prostheses after 20 years was 19%. Deep lesions, advanced age at cartilage surgery, high BMI at follow-up, cartilage transplantation (ACI), and >1 cartilage injury were associated with knee prostheses.

Olsen O 2023 has published a systematic review and meta-analysis on factors correlated with pain after knee prosthesis surgery. More pain catastrophizing, more symptomatic joints, and greater preoperative pain were correlated with more postoperative pain, while more severe osteoarthritis was correlated with less pain 1 year after the surgery. The same research group has published a similar study on factors correlated with function 1 year after knee prosthesis surgery. High preoperative BMI was correlated with lower function, better preoperative function and more severe osteoarthritis were correlated with better function 1 year after the surgery. The study used scores after 1 year and did not assess changes from before the surgery. In studies where improvement between preoperative and 1 year postoperative scores are examined, individuals with high BMI have shown to have similar improvements in function and pain as those with normal weight.
Tiulpin A 2022 investigated the value of ultrasound in predicting knee prosthesis surgery using machine learning. Data from the Ullensaker study (MUST) were linked to the Arthroplasty Register. Ultrasound was not as effective as conventional X-ray, but in addition to X-ray, it provided more information than X-ray alone.

Irmola T 2022 published data from the Nordic Arthroplasty Register Association (NARA) for knee prostheses from 2000 to 2017. Over 500,000 knee prostheses were studied. The incidence of knee prostheses plateaued in Sweden and Denmark after 2010, while it increased in Finland and Norway. In 2017, the incidence was highest in Finland at 226 per 100,000, while it was under 150 per 100,000 in the other three countries. The revision rate after 15 years was approximately 9% in Norway and Denmark, 7% in Finland, and lowest at 6% in Sweden. There were significant differences between countries in the choice of implant brand and type, fixation methods, use of patella, and utilization of unicondylar knee prostheses. There has been no improvement in the overall revision rate since 2000.

Brendsdal E 2023 has published the results for almost 3,000 metacarpophalangeal (MCP) prostheses from 1994-2019. The survival rate of the prostheses after 20 years was 84%, and the most common reason for revision was a fractured implant. Most of the prostheses were made of silicone. The use of

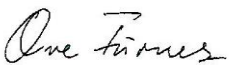
MCP prostheses has declined in recent years due to better medications for rheumatoid arthritis patients.

Perry A 2022, as part of an international collaboration involving four registries, has published survival analyses for ankle prostheses. Approximately half of the ankle prostheses in Norway have undergone revision after 20 years, which is a higher proportion compared to Sweden. The other countries had shorter follow-up times. These figures raise concerns, and we have a publication on ankle prostheses under review in a journal where this is being addressed. We believe that ankle prosthesis surgery should be performed at a few specialized hospitals, as it is a demanding procedure with numerous complications. Currently, this surgery is mainly performed (97%) at Diakonhjemmet in Oslo and Haukeland in Bergen.

Congratulations to Frank-David Øhrn in Kristiansund for completing his PhD at NTNU in April 2022. His dissertation is titled "Contemporary Total Knee Arthroplasty: Designs and Surgical Methods." He studied, among other topics, included registry data on Medial Pivot (MP) total knee prostheses in Norway and Australia, demonstrating that there were more revisions due to alignment errors and instability compared to Cruciate-Retaining (CR) knee prostheses.

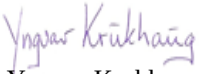
We appreciate the thorough reporting. However, please remember to also report on the small joints in the hands, feet, and spine. If hospitals wish, you can assign a contact person for each of these joints. We are open to receiving suggestions for research projects and are interested in collaborating on research initiatives.

Bergen, June 2023



Ove Furnes
Senior Consultant Ortho Surgeon
Professor
Knee Surgery

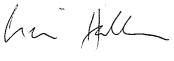
Anne Marie Fenstad
Biostatistician/researcher



Yngvar Krukhaug
Consultant Ortho Surgeon
Elbow/hand/finger

Irina A Kvinnesland
IT consultant

Sigurd Stenvik
Biostatistician/researcher

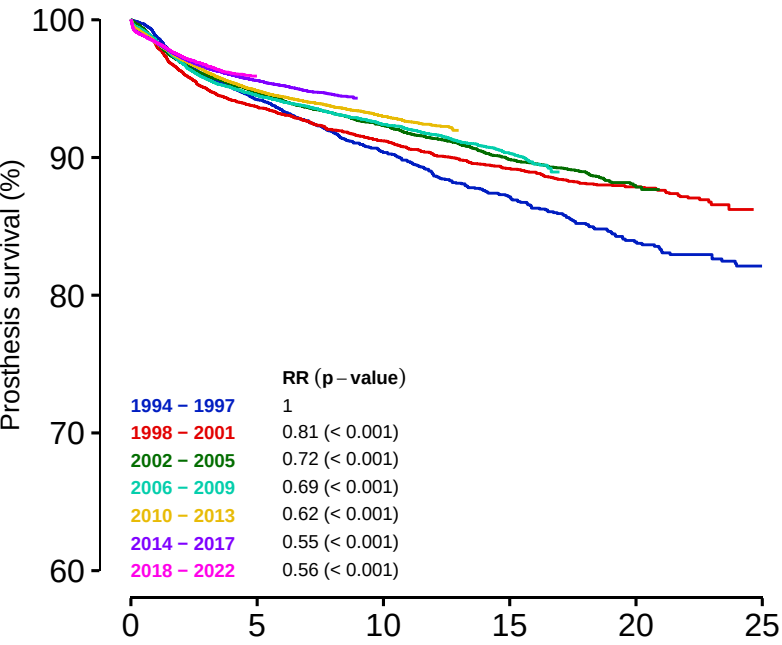


Geir Hallan
Consultant Ortho Surgeon
Professor
Ankle/foot/hip

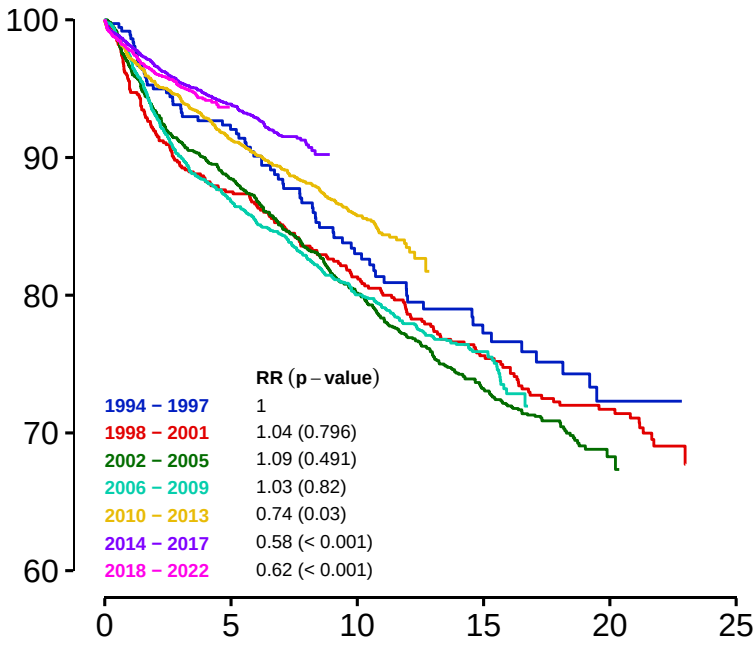
Survival curves for knee prosthesis
1994−2022

Report 2023

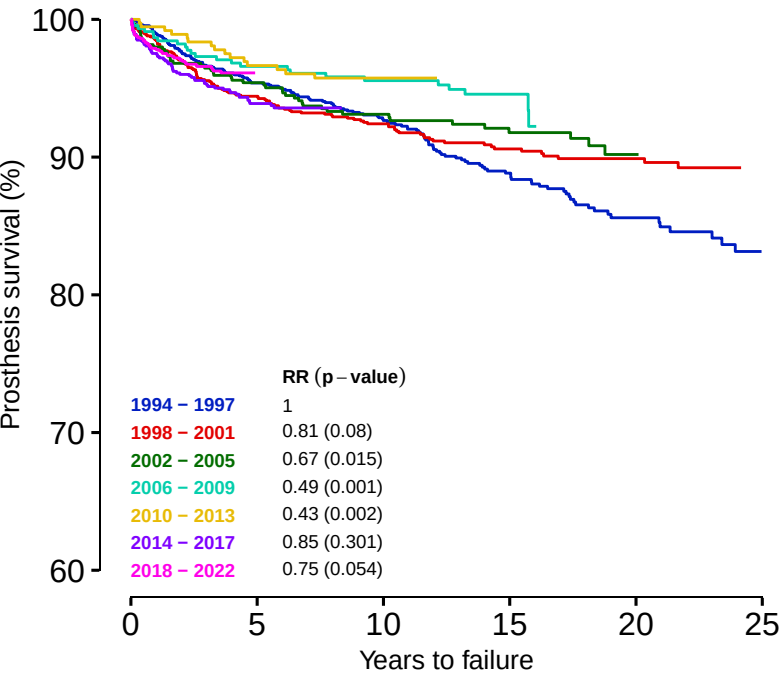
B.1) All



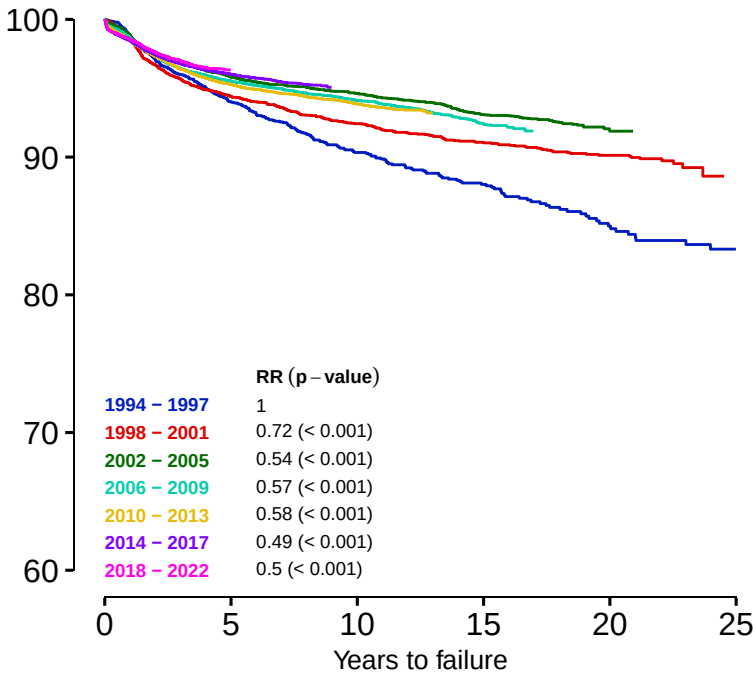
B.2) Unicondylar



B.3) Total with patella



B.4) Total without patella

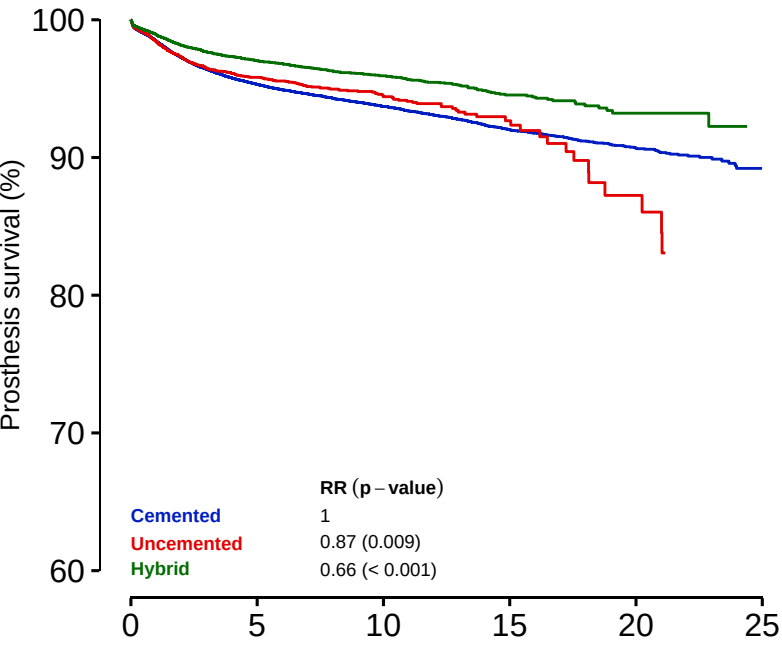


Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox−analysises as the assumption of proportional hazard does not hold for all models.

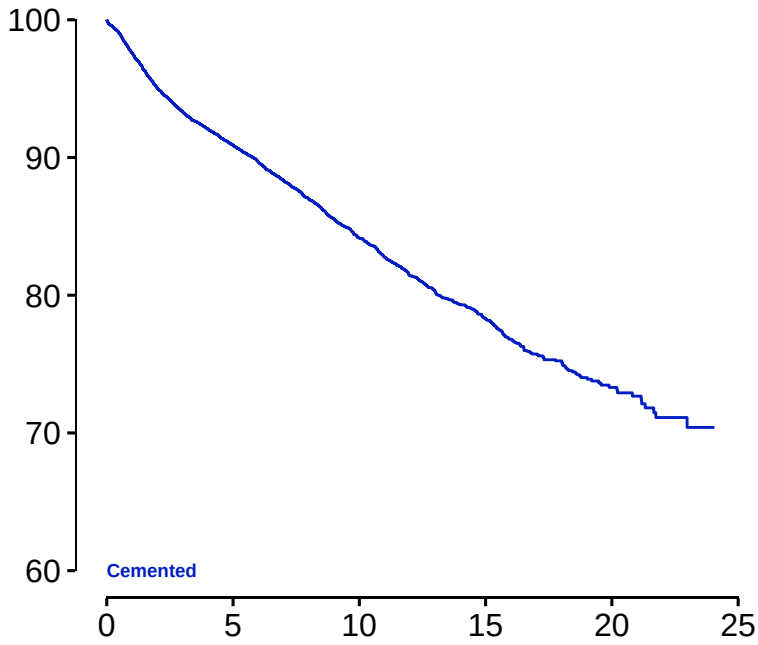
Survival curves for knee prosthesis − Fixation
1994 − 2022

Norwegian Arthroplasty Register

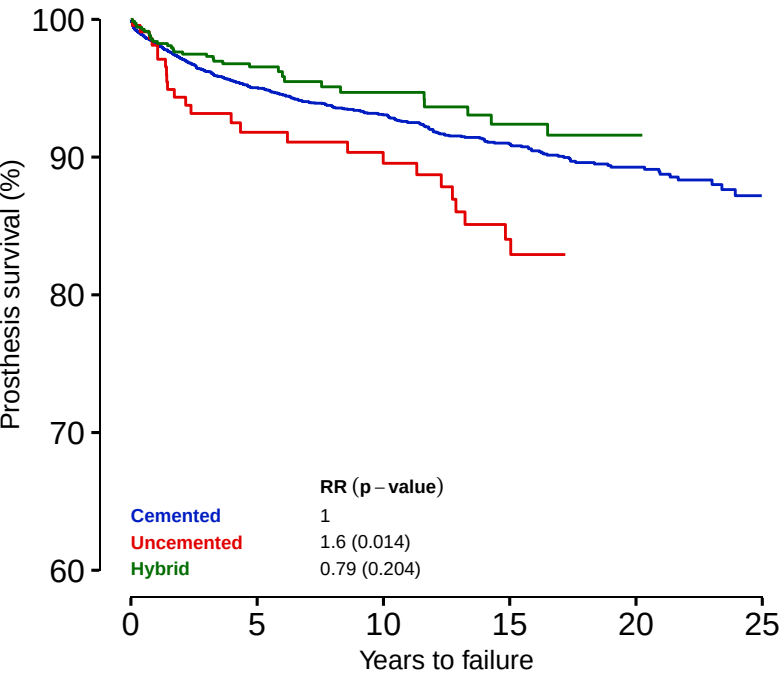
B.5) Total prosthesis



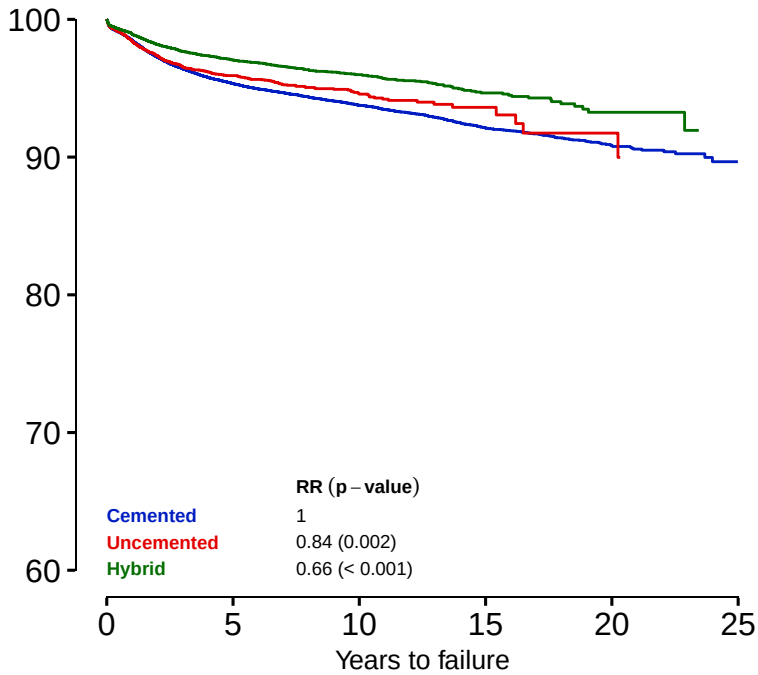
B.6) Unicondylar



B.7) Total with patella



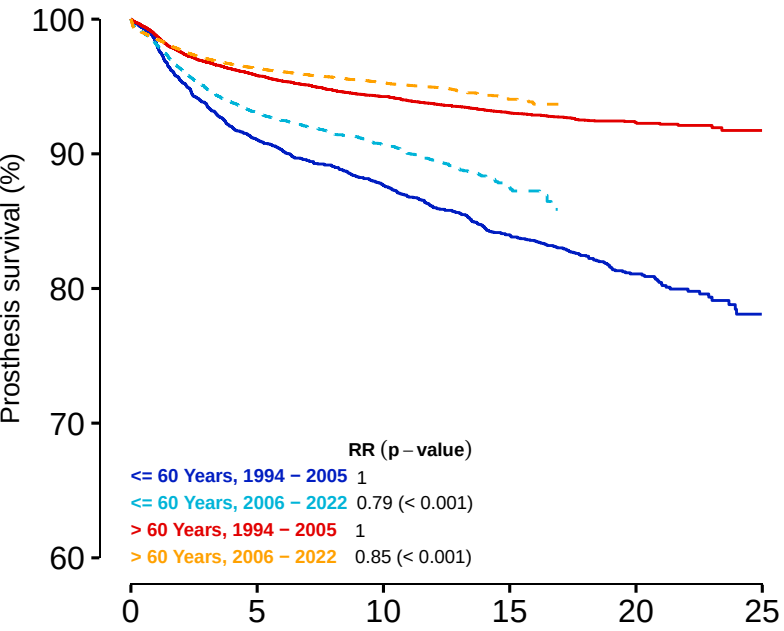
B.8) Total without patella



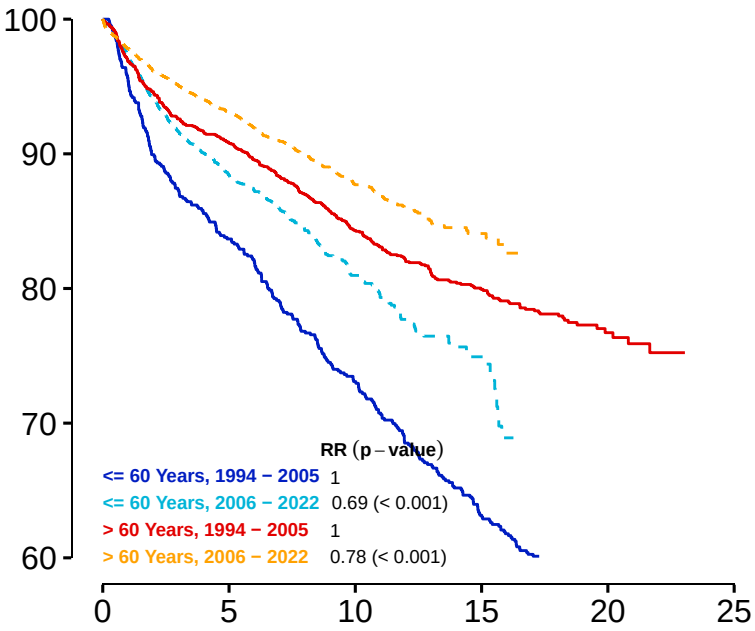
Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox−analysises as the assumption of proportional hazard does not hold for all models.

Survival curves for knee prosthesis − Age 1994 − 2022

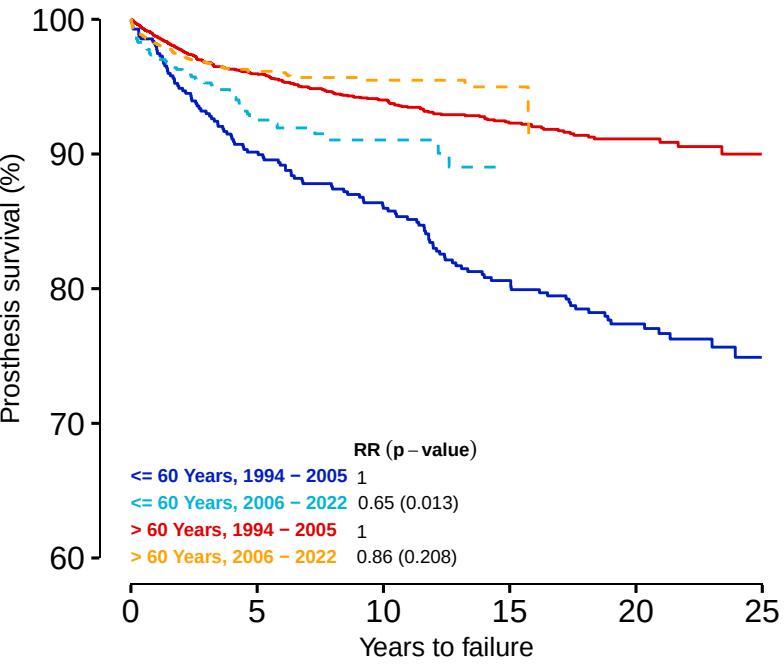
B.9) Total prosthesis



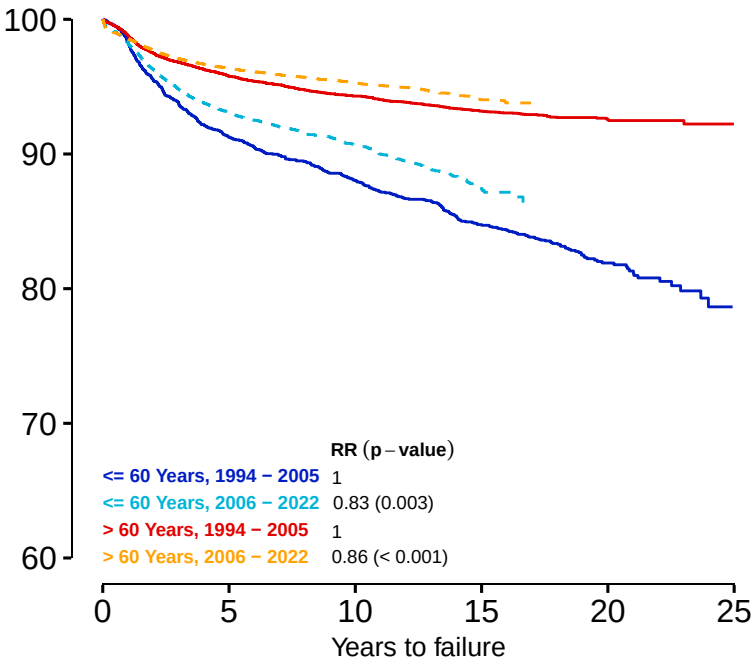
B.10) Unicondylar



B.11) Total with patella



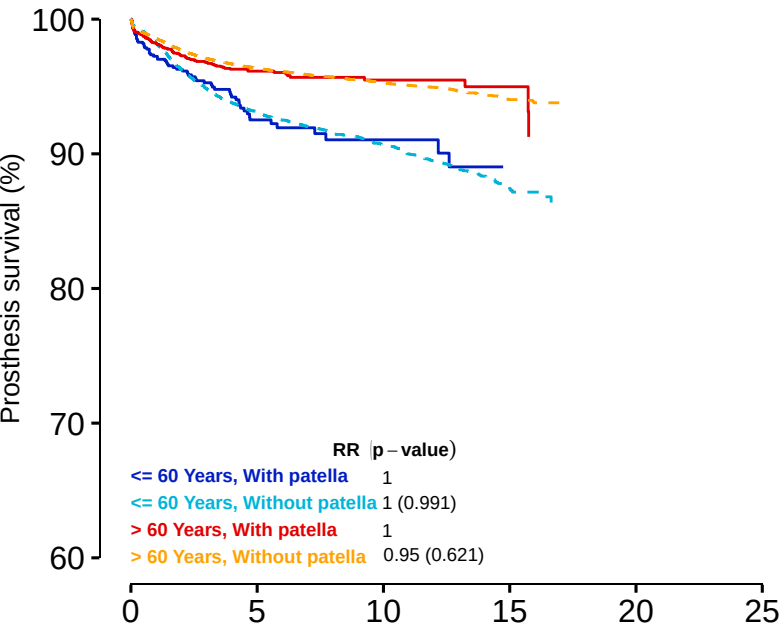
B.12) Total without patella



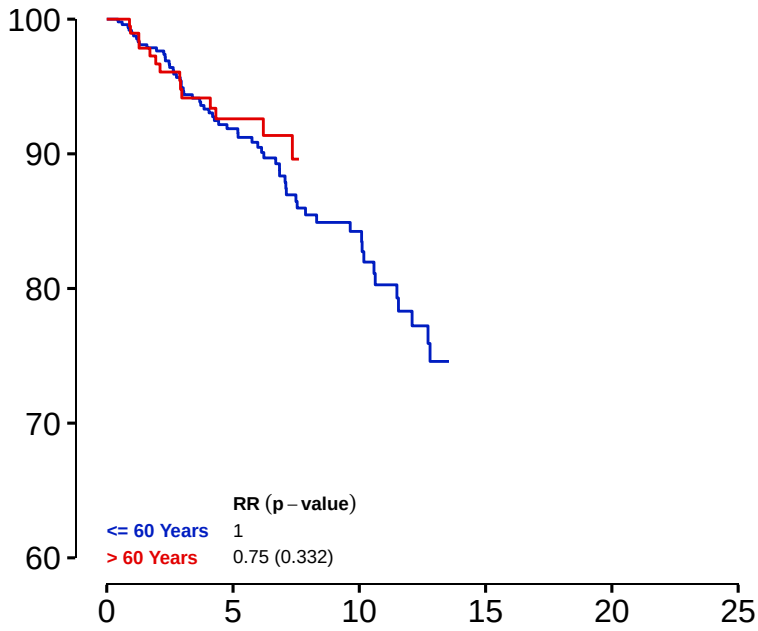
Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
For figures B.9−12 two Cox−regressions have been fit; one for each age group. the years 1994−2005 is used as reference in both models.
There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

Survival curves for knee prostheses
1994 − 2022

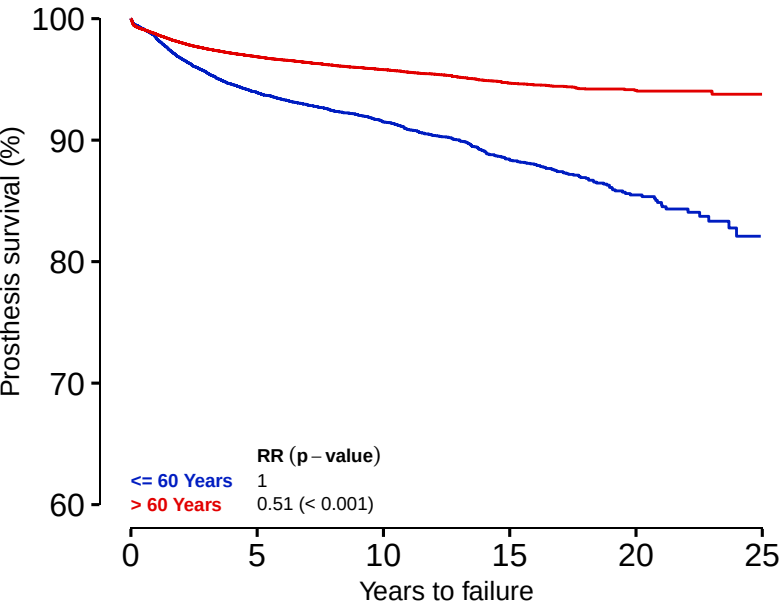
B.13) Total, 2006 − 22



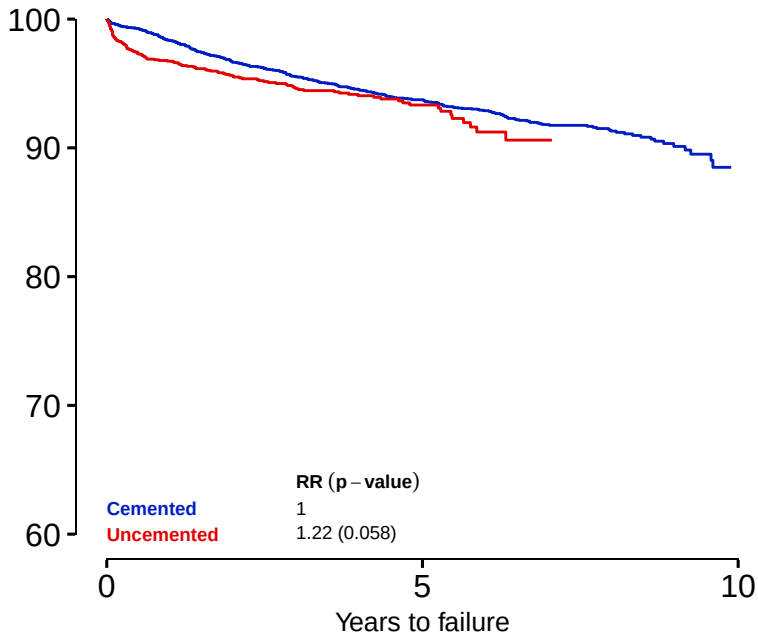
B.14) Patellofemoral



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



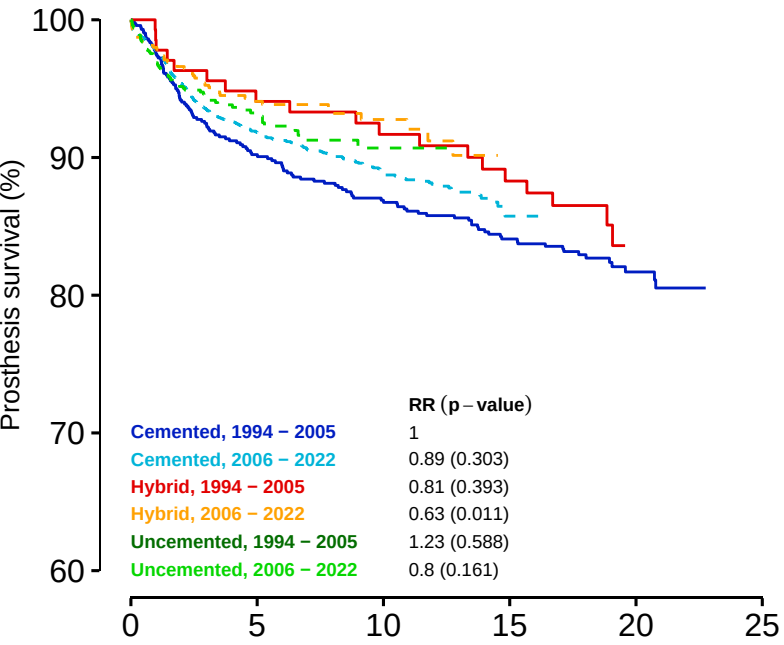
B.16) Unicondylar prostheses cemented | uncemented



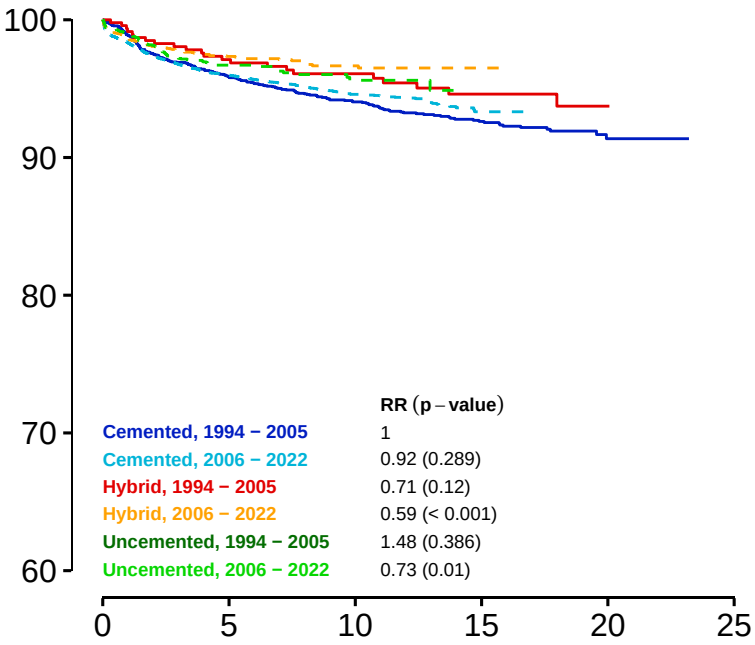
Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
For figure B.13 two Cox−regressions have been fit; one for each age group. the years 1994−2005 is used as reference in both models.
There is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

Survival curves for total prostheses in knee without patella
1994 − 2022

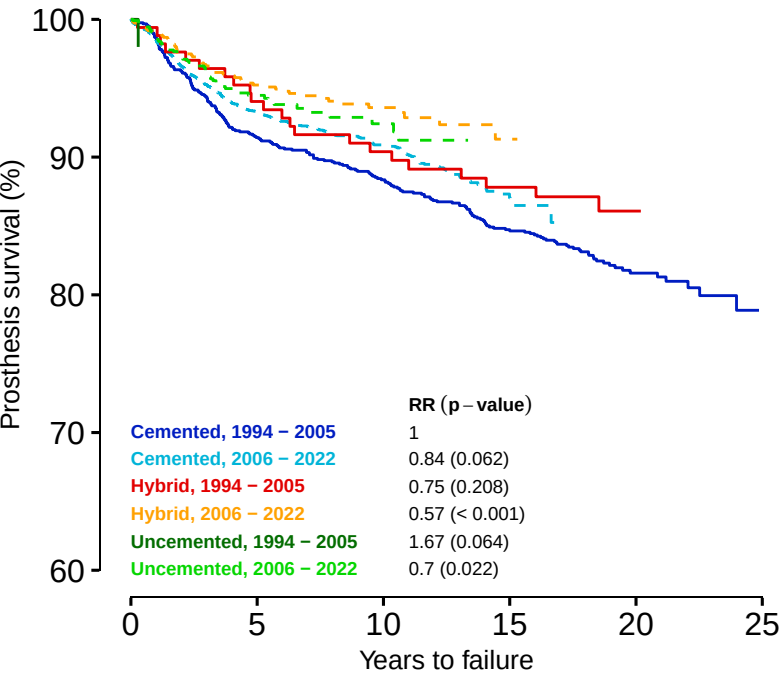
B.17) Men, under 60 years



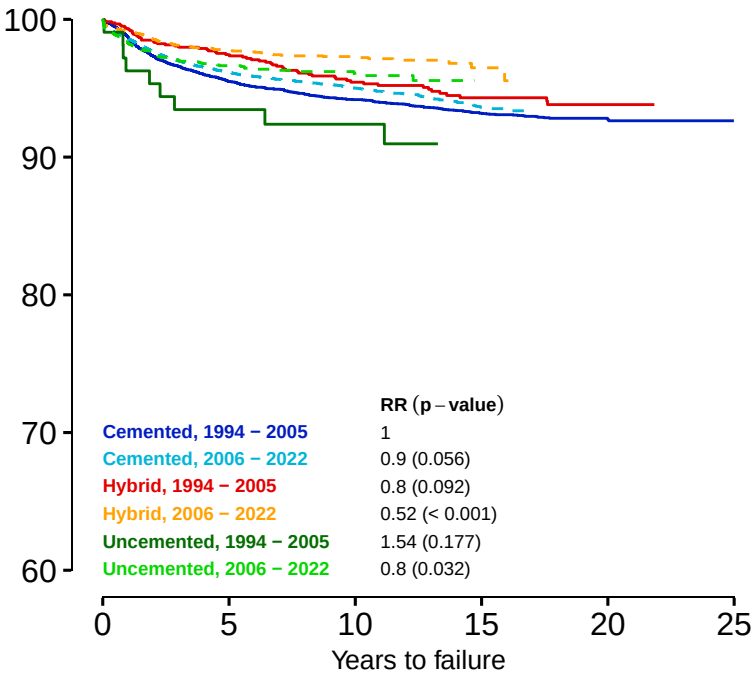
B.18) Men, over 60 years



B.19) Women, under 60 years



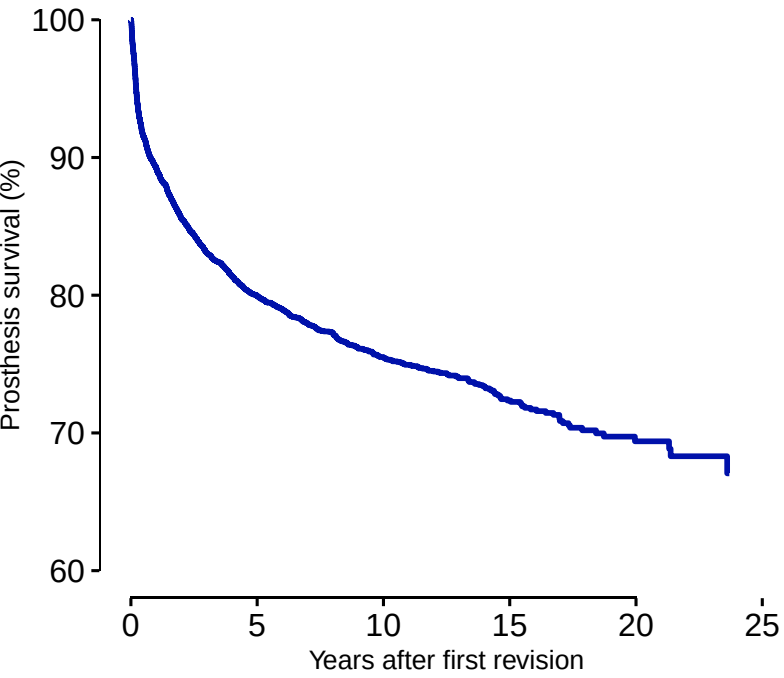
B.20) Women, over 60 years



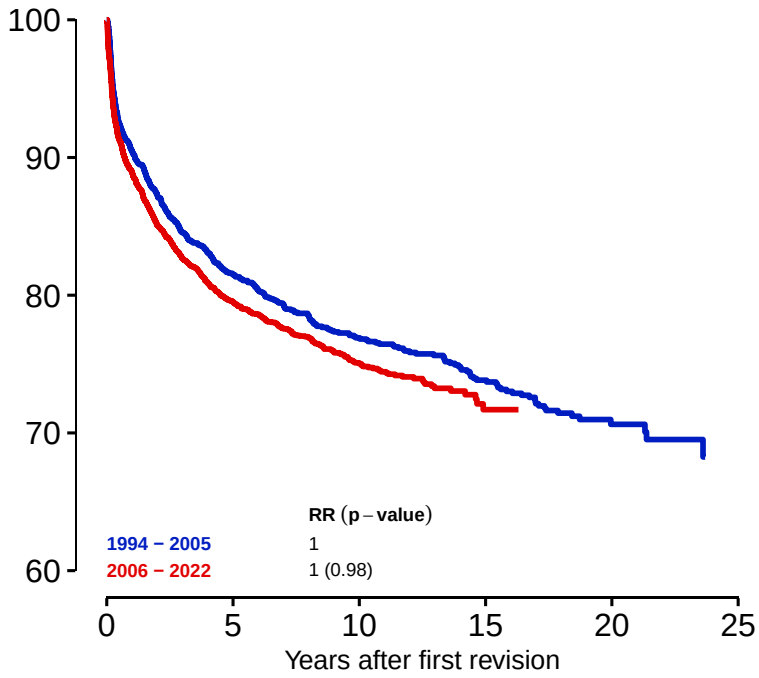
Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox−analysises as the assumption of proportional hazard does not hold for all models.

Survival curves for first-time revisions of knee prostheses
1994 − 2022

B.21) Alle



B.22) Two time−frames

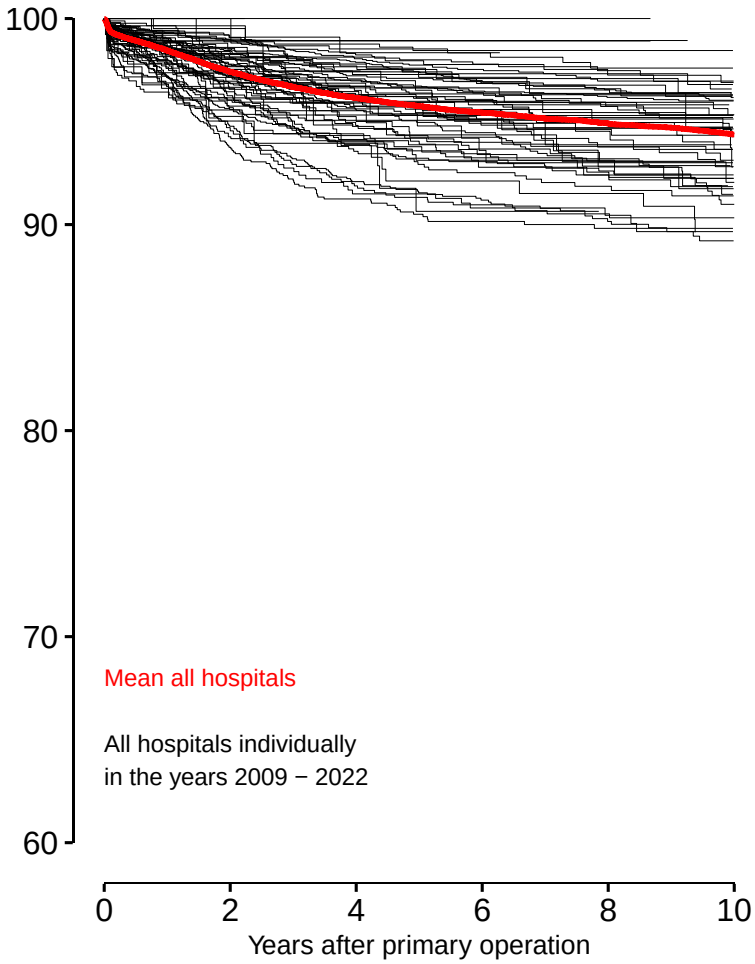


Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox−analysises as the assumption of proportional hazard does not hold for all models.

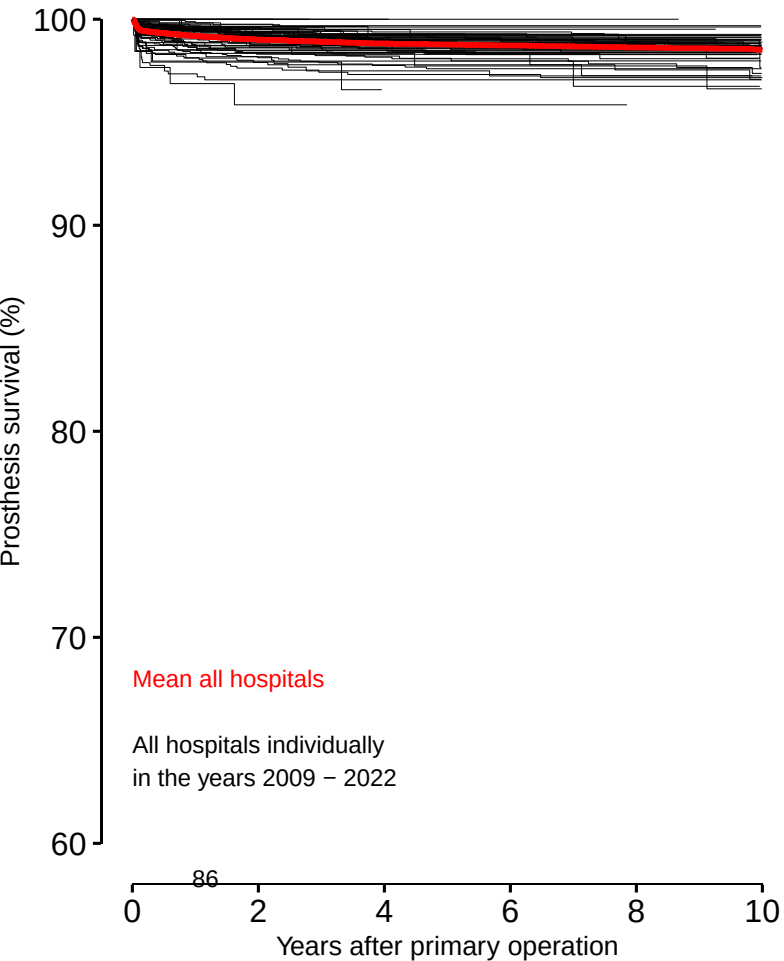
Survival curves for total knee prostheses

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

B.24) All hospitals in the years 2009 − 2022

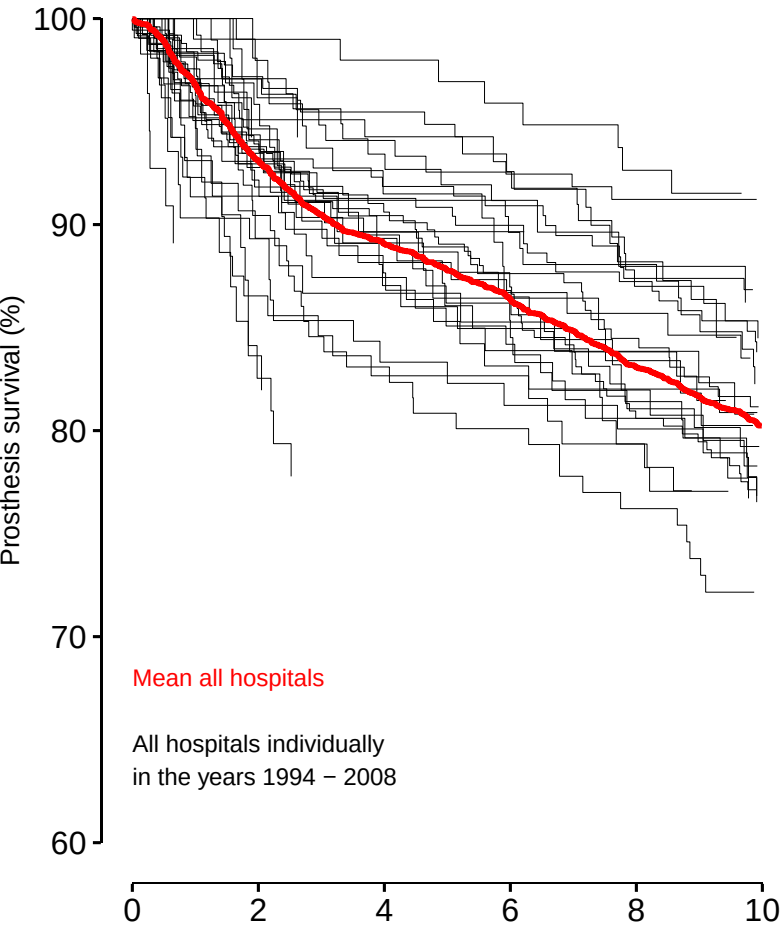


B.25) Endpoint revision for infection, 2009 − 2022

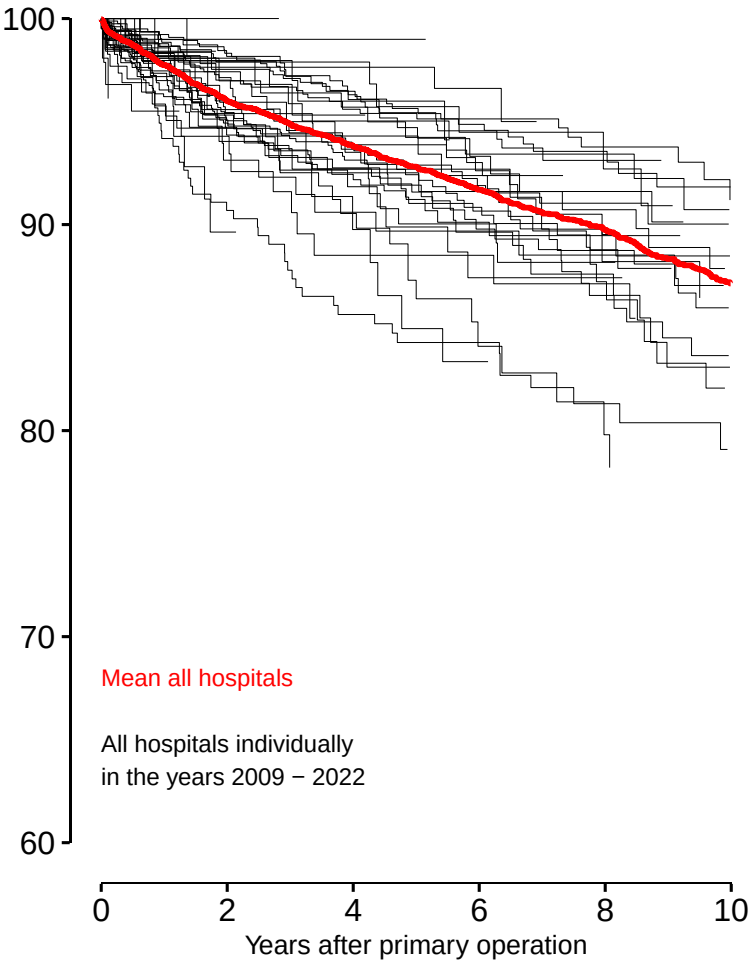


Survival curves for unicondylar knee prostheses

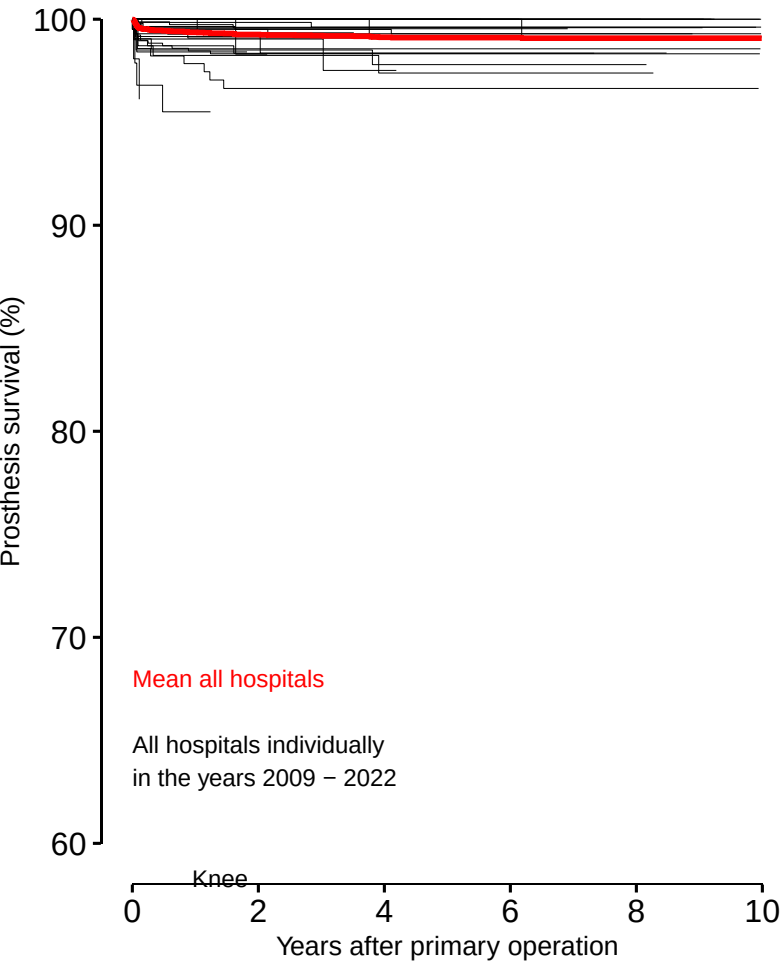
B.26) All hospitals in the years 1994 − 2008



B.27) All hospitals in the years 2009 − 2022



B.28) Endpoint revision for infection, 2009 − 2022



One stage bilateral operation in knee arthroplasty

Year	1994-2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Sum:
Number of patients	102	22	43	50	79	74	74	88	109	89	68	798

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

FIGURE B.29: Number of primary operations in knee, 2022

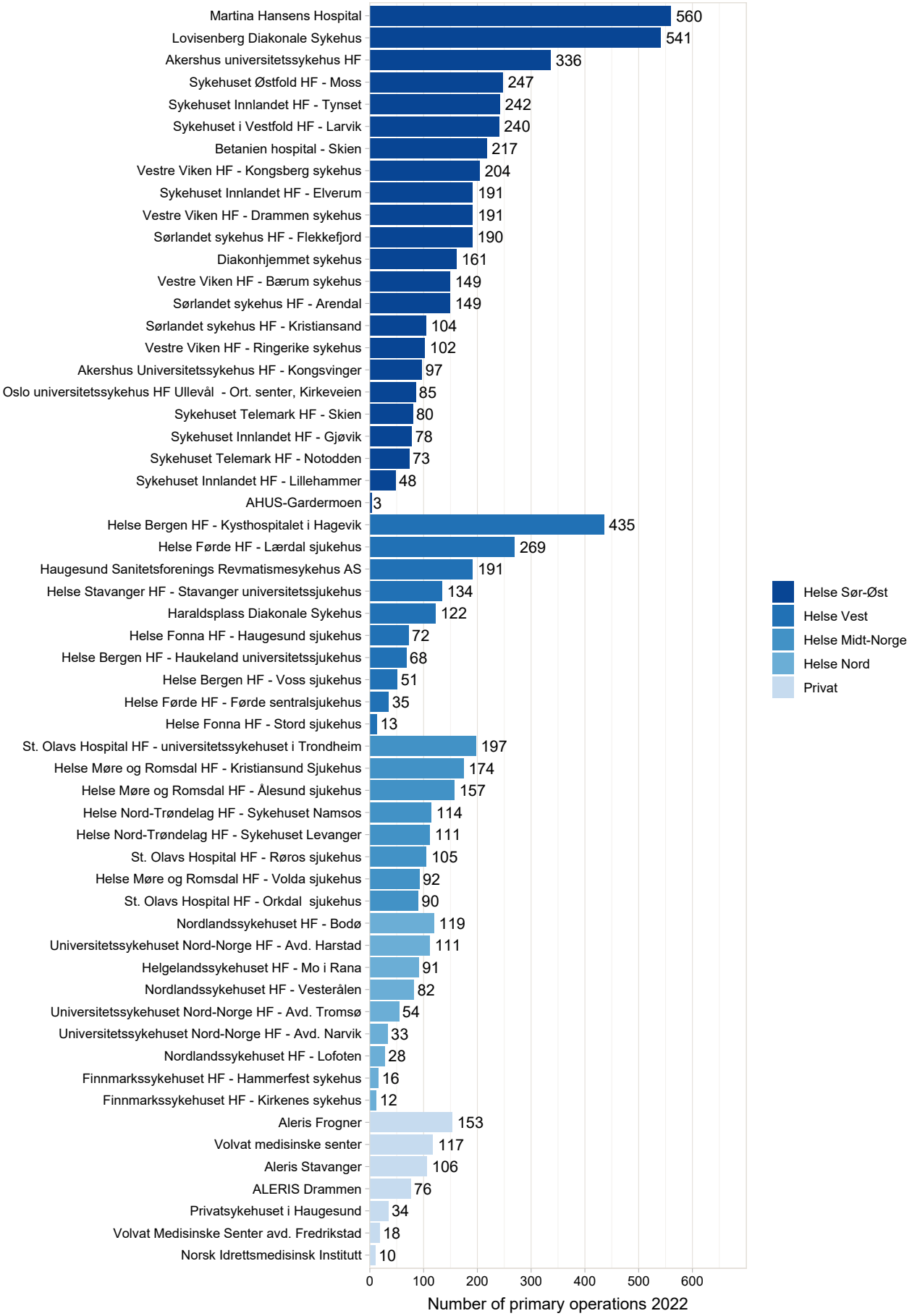
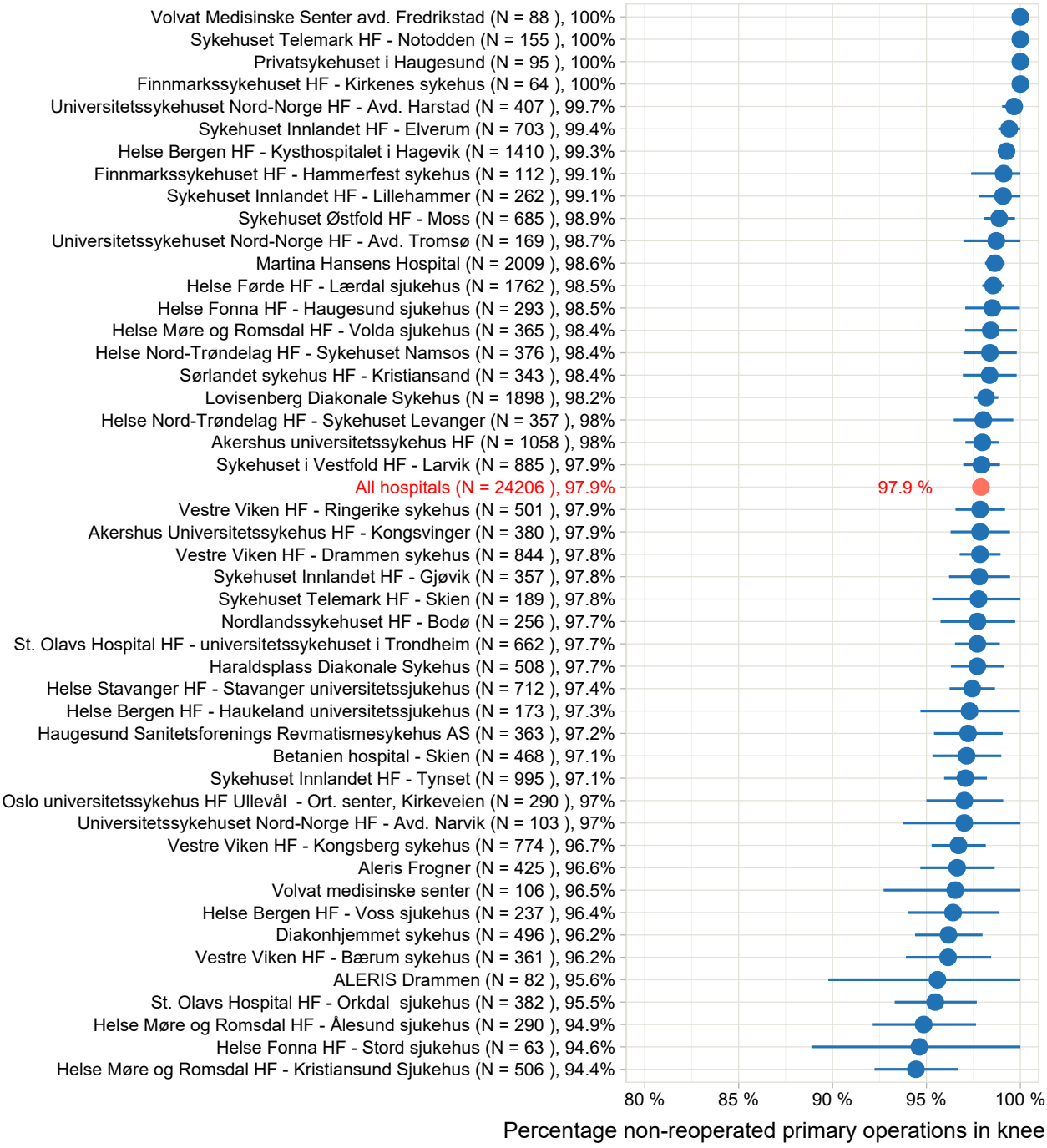
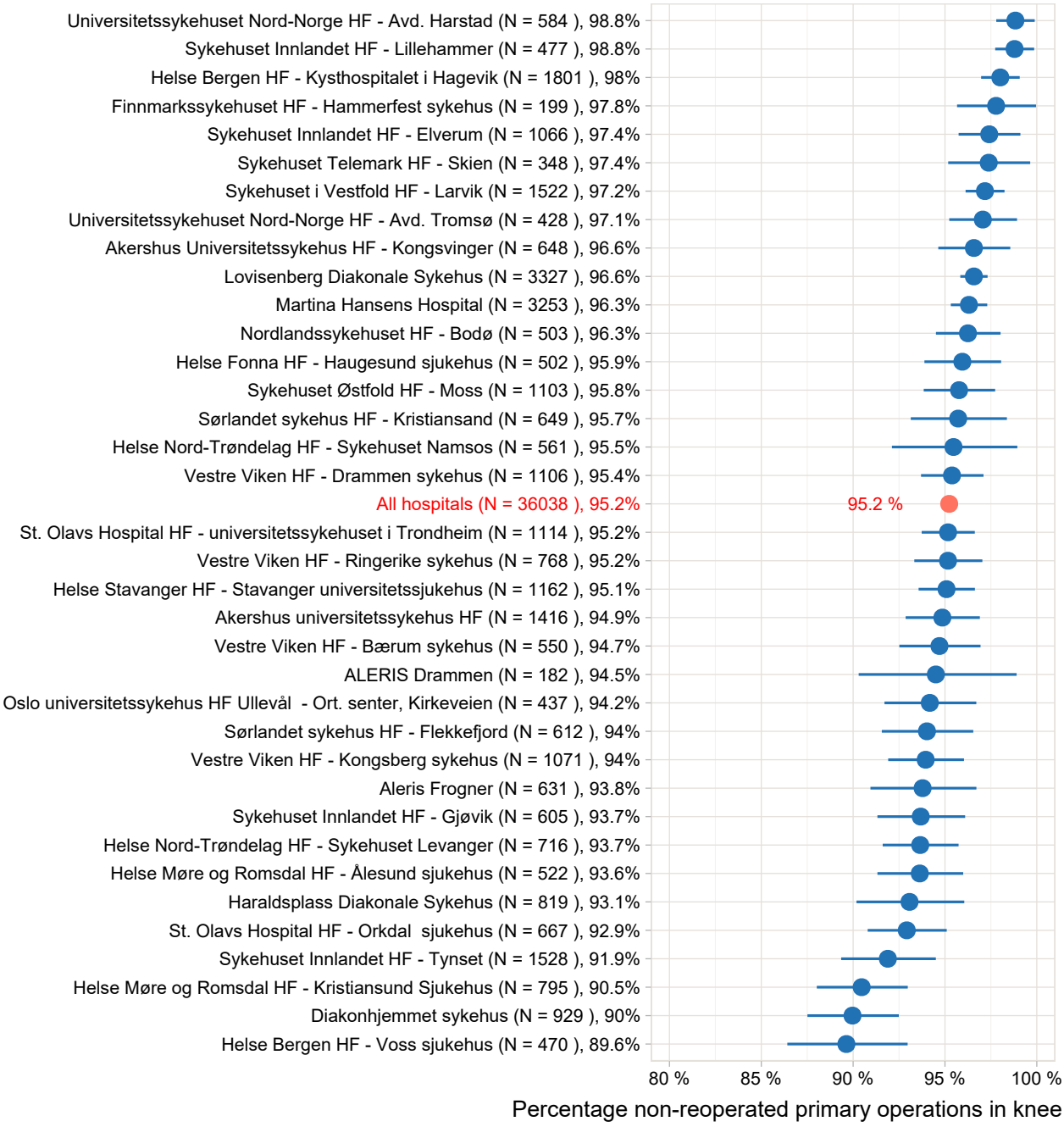


FIGURE B.30: Percentage non-revised standard patients two years after operations in 2016-2022



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 2016 to 2022. Only hospitals with operations in 2022 and with more than 50 operations from 2016 to 2022 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 2016 to 2020 are included.

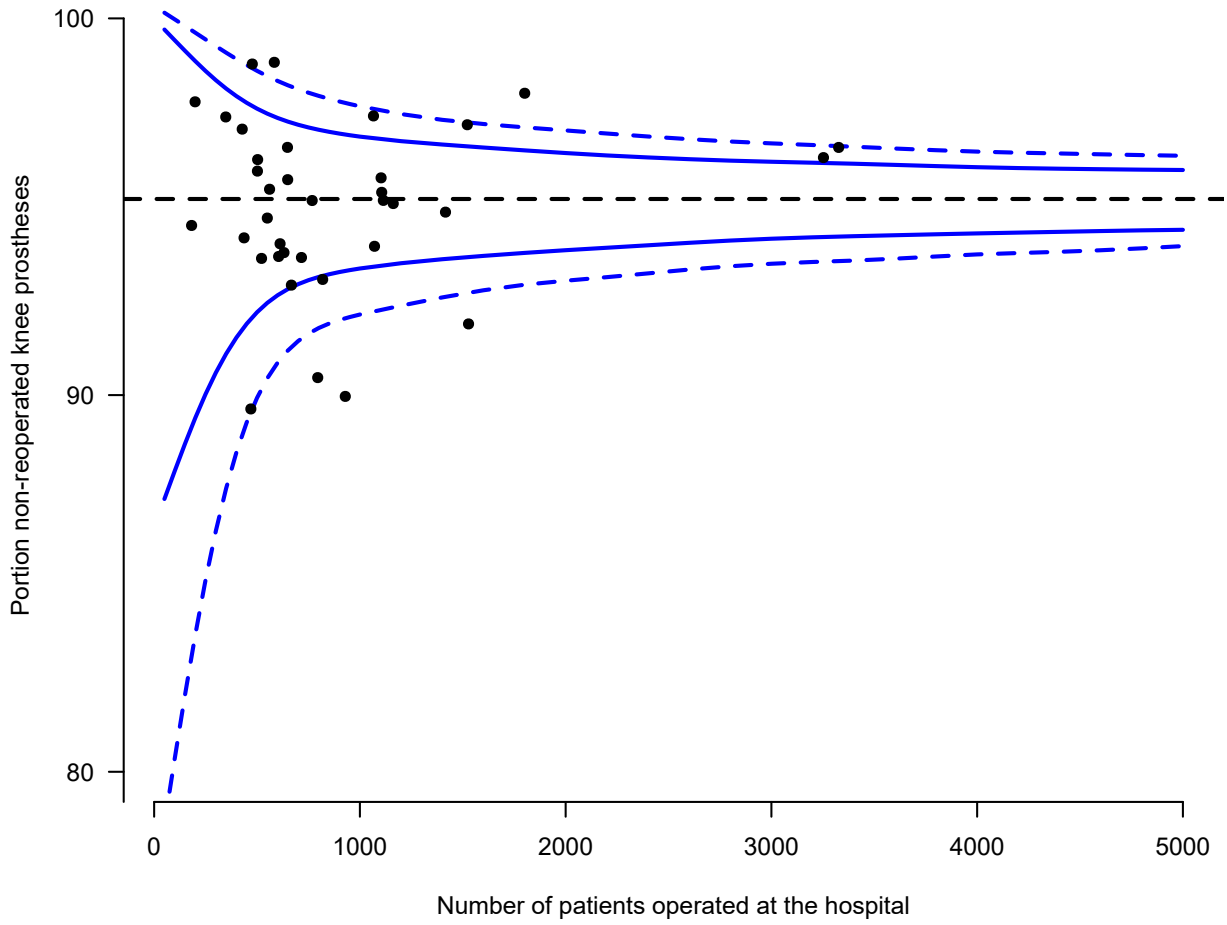
FIGURE B.31: Percentage non-revised standard patients ten years after operations in 2011-2022



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 2011 to 2022. Only hospitals with operations in 2022 and with more than 50 operations from 2011 to 2022 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 2011 to 2020 are included.

See “How to interpret the hospital-based results” page 22.

FIGURE B.32: Funnel plot, percentage non-revised standard patients ten years after operations in 2011-2022



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2011 to 2022 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 2022. 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.

FIGURE B.33: Percentage non-reoperated total prostheses in knee after 3 and 10 years, 2011-2022.

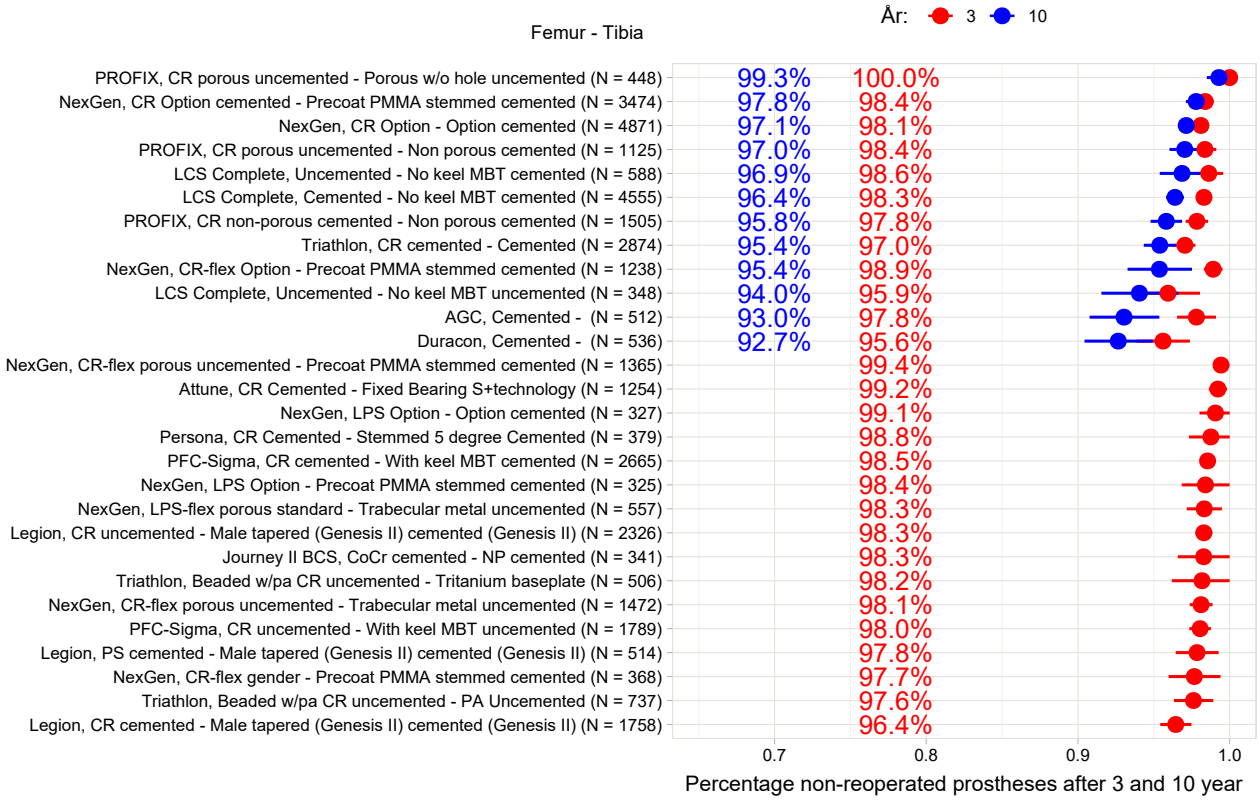


FIGURE B.34: Percentage non-reoperated uni prostheses in knee after 3 and 10 years, 2011-2022.

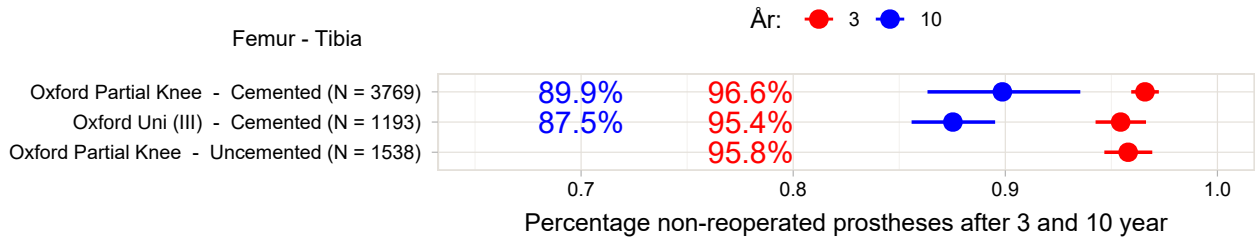
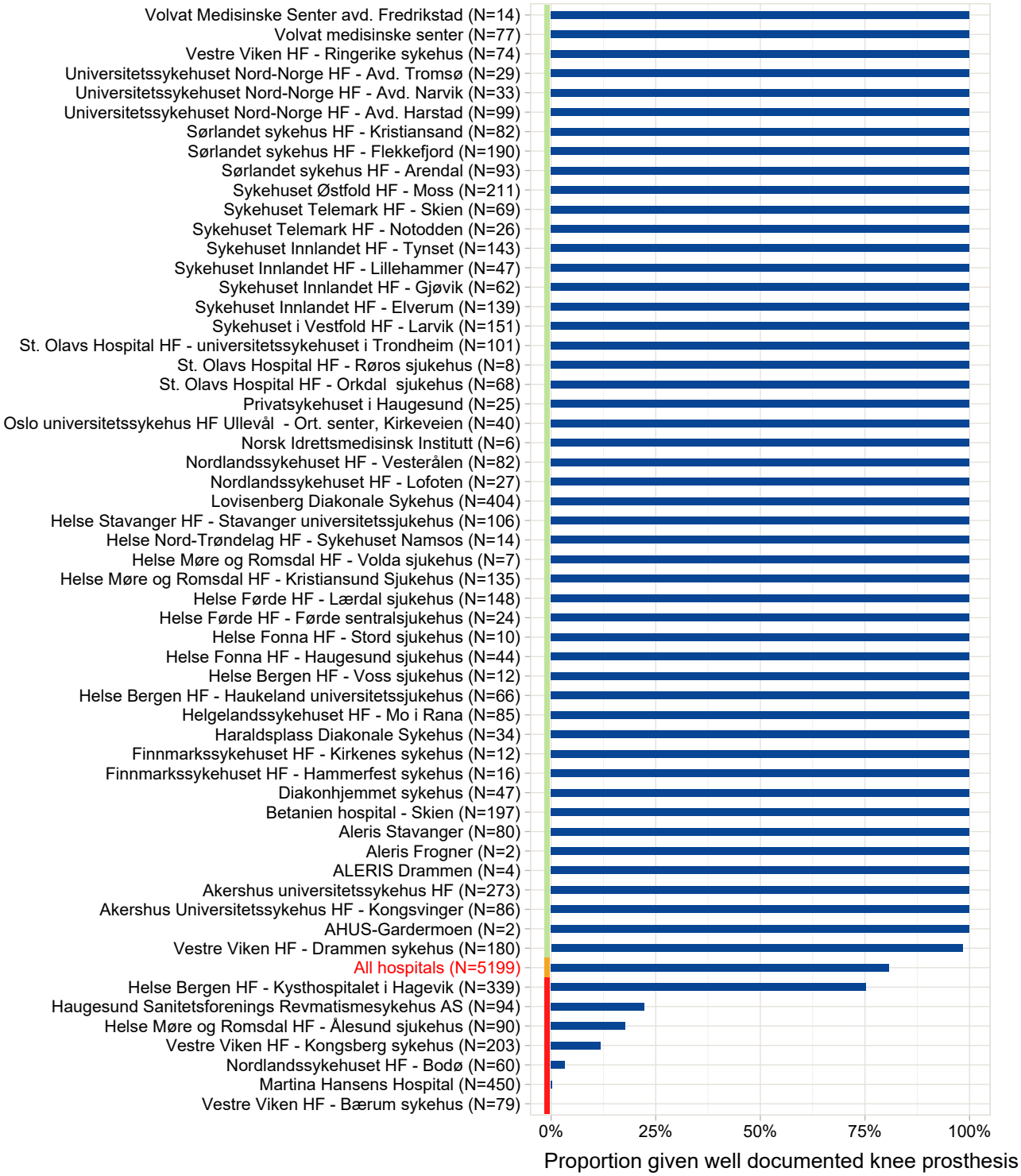


Figure B.33 and B.34 shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of knee prostheses. We have only included combinations used in 500 or more operations in 2011-2022. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2011 to 2022 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.

FIGURE B.35: Portion of patients recieving well documented knee prosthesis by hospital and nationally in 2022



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.

FIGURE B.36: Form registration by format in 2022, all operations

National average for electronic form registration in 2022 is 46,6 %.

PROM, Knee Arthroplasty Register

The Knee Arthroplasty Register has had electronic collection of patient-reported data (Patient Reported Outcome Measures (PROM)) since 2019. The register aims to focus more on patients' self-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. The data we collect from patients will be compared with the data reported by the surgeons for the same group of patients. This will allow us to emphasize function and quality of life, in addition to a possible revision of the prosthesis.

So far, 8,505 pre-operative PROM forms and 7,102 one-year follow-up forms have been reported to the register. In 2022 3,285 pre-operative PROM forms and 2,297 one-year follow-up forms were reported. To date, 44 hospitals have started collecting and reporting PROMS (36 in 2022). We also received 858 paper forms from 22 hospitals. All hospitals will receive reports containing analyses of their own results. Please feel free to contact our consultant Mikal Solberg at mikal.solberg@helse-bergen.no if you have any questions about electronic PROM registration.

Patient demography	Before Operation	1 Year after
Number of forms (n)	3285	2297
Men (%)	36.6	50
Median age (min-max)	69 (32-98)	68 (33-91)
Body-Mass Index mean (SD)	30.6 (16.2)	29.3 (4.8)
Uses alcohol n (%)	2752 (83.8)	1911 (83.2)
Smokes n (%)	195 (5.9)	148 (6.4)
High school education or higher n (%)	1747 (53.2)	1144 (49.8)
Lives alone n (%)	749 (22.8)	510 (22.2)
UCLA activity* mean (SD)	5 (1.9)	5.7 (1.8)
Health** (VAS) mean (SD)	61.5 (19.3)	72.4 (17.8)

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

Figur B.37 Mean KOOS score before/ after operation*

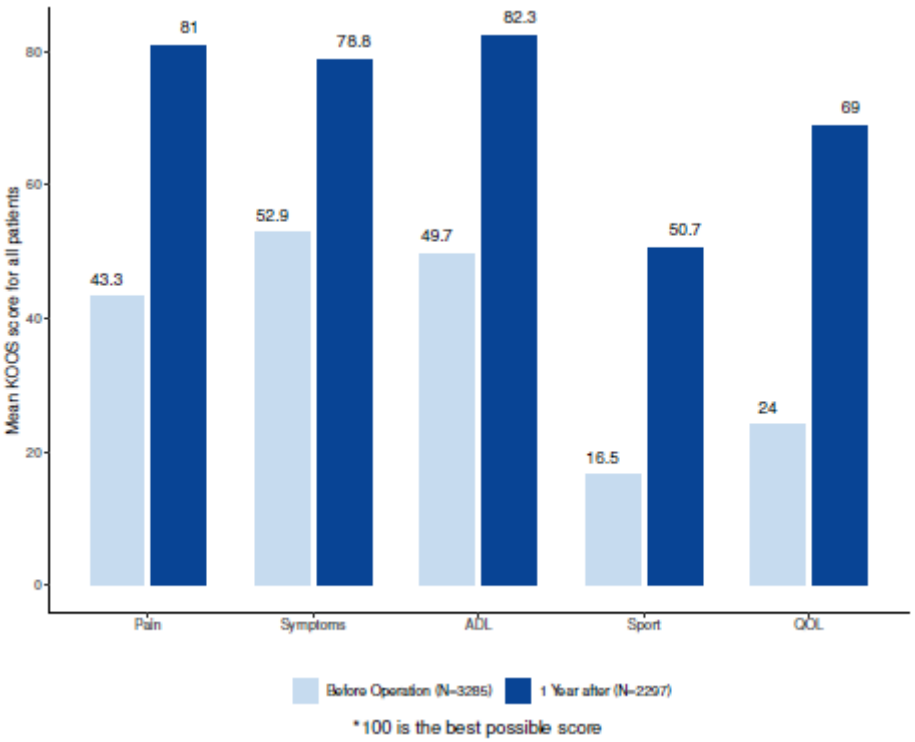
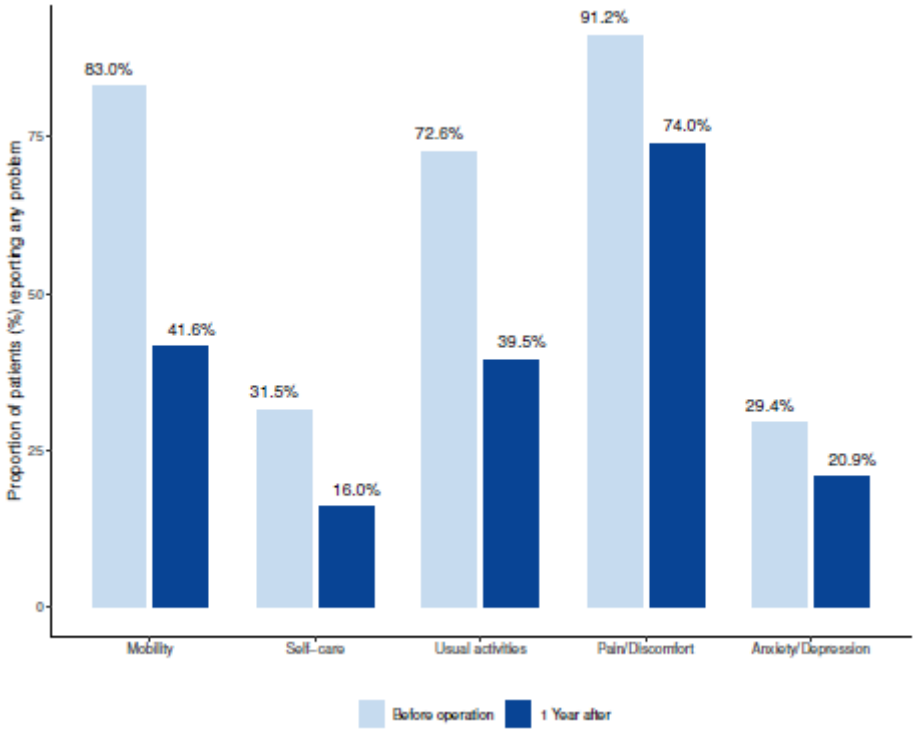


Figure B.38 Proportion of patients reporting any problems with mobility, self-care, usual activities, pain/discomfort, or anxiety/depression before/after operation (5Q-5D-5L)



Health Trust	Reporting Hospitals	No. of Preoperative forms
Central Norway Regional Health Authority	4/8	183
Northern Norway Regional Health Authority	1/9	5
South-Eastern Norway Regional Health Authority	20/24	2211
Western Norway Regional Health Authority	9/10	822
Private	2/7	64

Figure B.39 Proportion of primary knee operations where pre-operative PROMS have been reported in 2021-2022

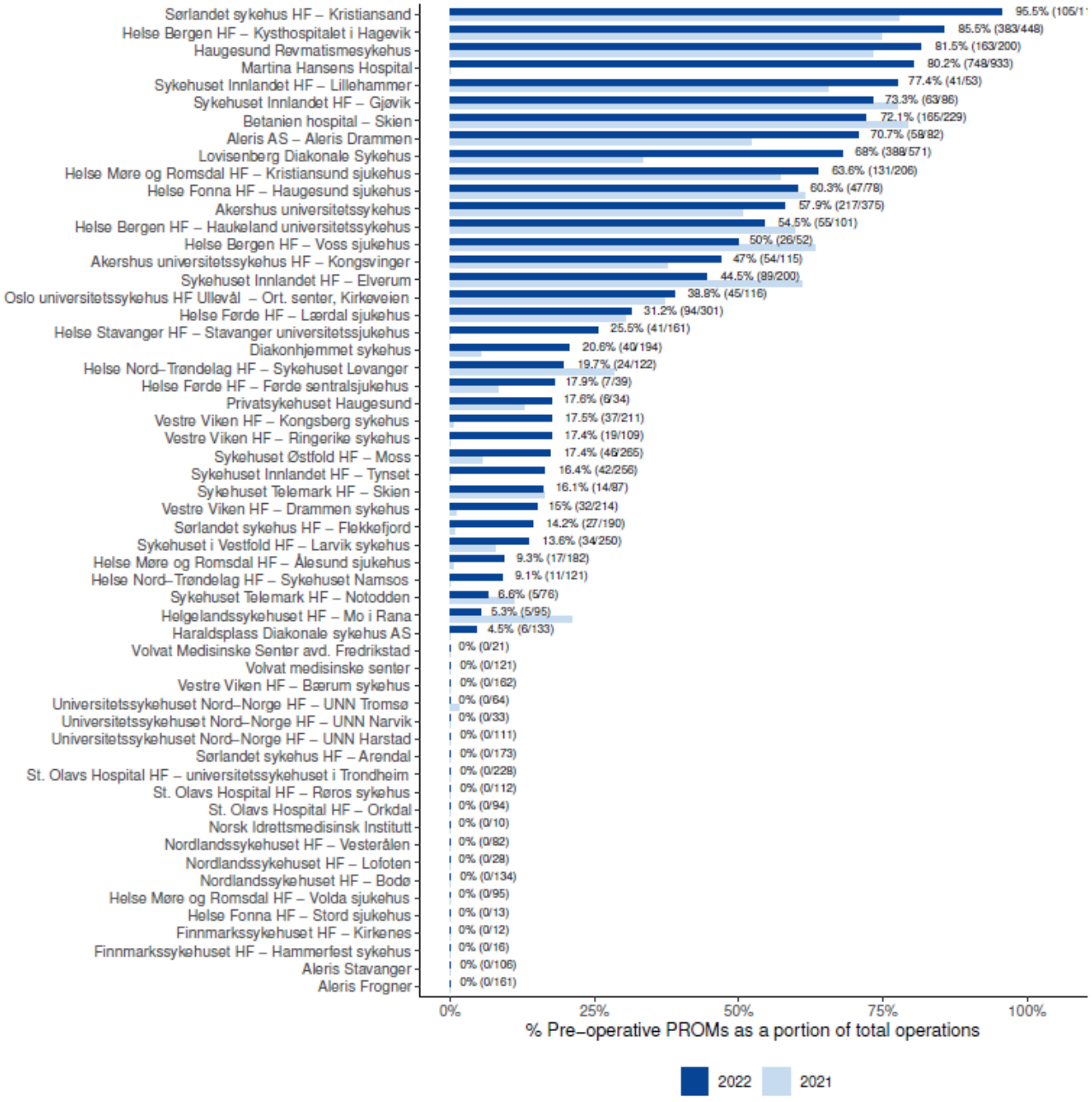


Figure B.39 presents the hospitals that have submitted preoperative PROM questionnaires either on paper or digitally through the web portal in MRS. Reporting is still low, but some hospitals appear to have taken steps to improve reporting. We would like to remind you that any questions regarding reporting in MRS can be sent to the register.

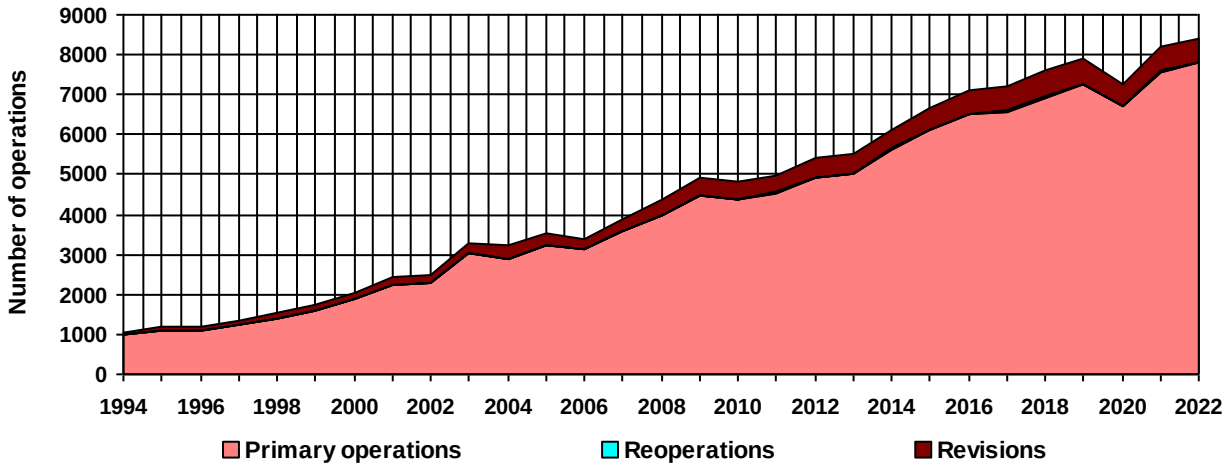
KNEE PROSTHESES

Table 1: Annual numbers of operations

Year	Primary operations		Reoperations *		Revisions		Total
2022	7 785	(92,5%)	38	(0,45%)	592	(7,0%)	**8 415**
2021	7 575	(92,2%)	40	(0,49%)	603	(7,3%)	**8 218**
2020	6 688	(92,0%)	23	(0,32%)	562	(7,7%)	**7 273**
2019	7 256	(91,8%)	19	(0,24%)	632	(8,0%)	**7 907**
2018	6 933	(91,2%)	13	(0,17%)	653	(8,6%)	**7 599**
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	5 640	(91,9%)	7	(0,11%)	492	(8,0%)	**6 139**
1994-13	57 067	(91,5%)	14	(0,02%)	5 256	(8,4%)	**62 337**
Total	**118 159**	**(91,7%)**	**193**	**(0,15%)**	**10 542**	**(8,2%)**	**128 894**

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

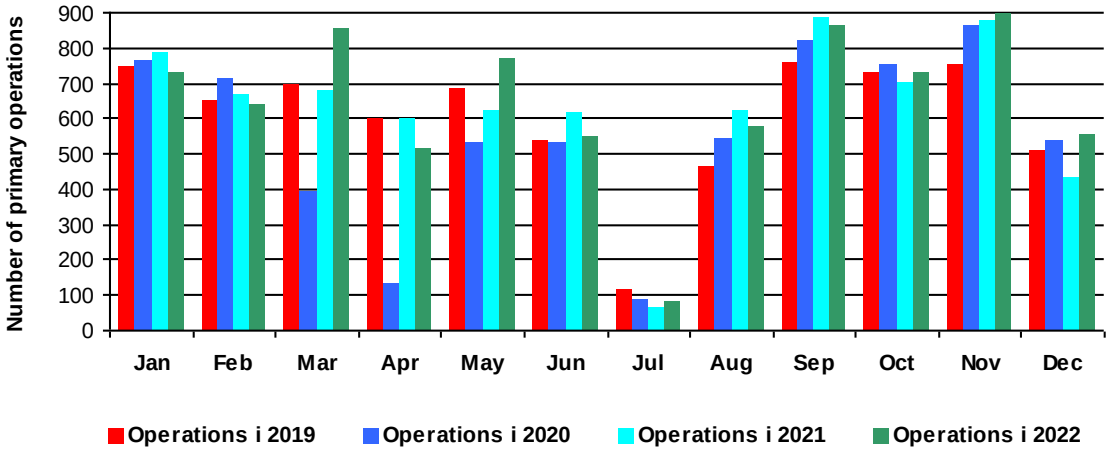
Figure 1a: Annual numbers of operations



53,1 % of all operations were performed on the right side. 60,9 % performed in women.
Mean age at primary surgery was 68,5 years, 69 years for women and 67,7 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 68,7 years in 2022, 68,9 years for women and 68,5 years for men.

COVID-19

Figure 1b: Monthly primary operations in 2019 - 2022



Incidence

Figure 2a: Incidence of primary knee prostheses

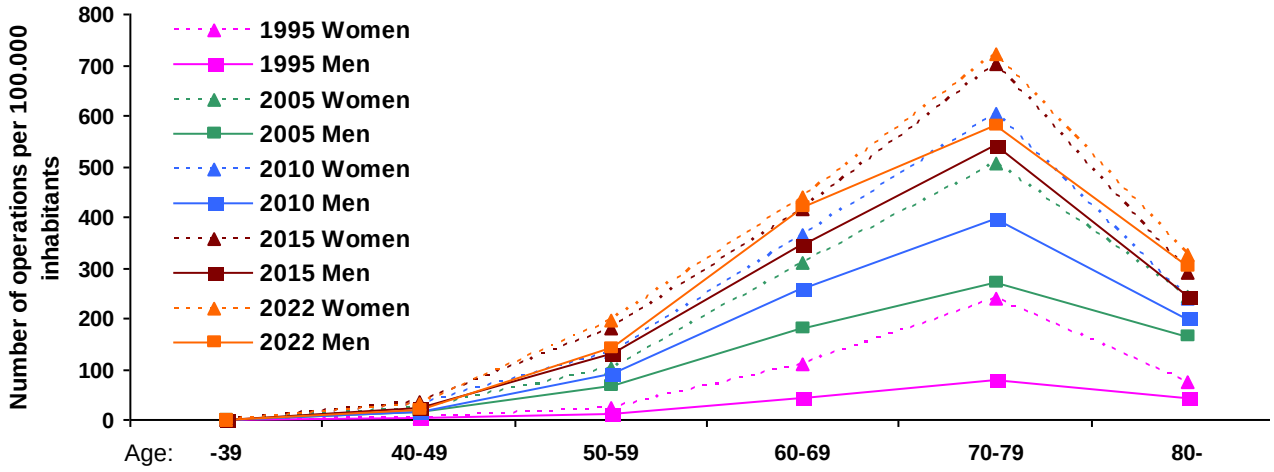


Figure 2b: Annual total incidence of primary knee prostheses for men and women

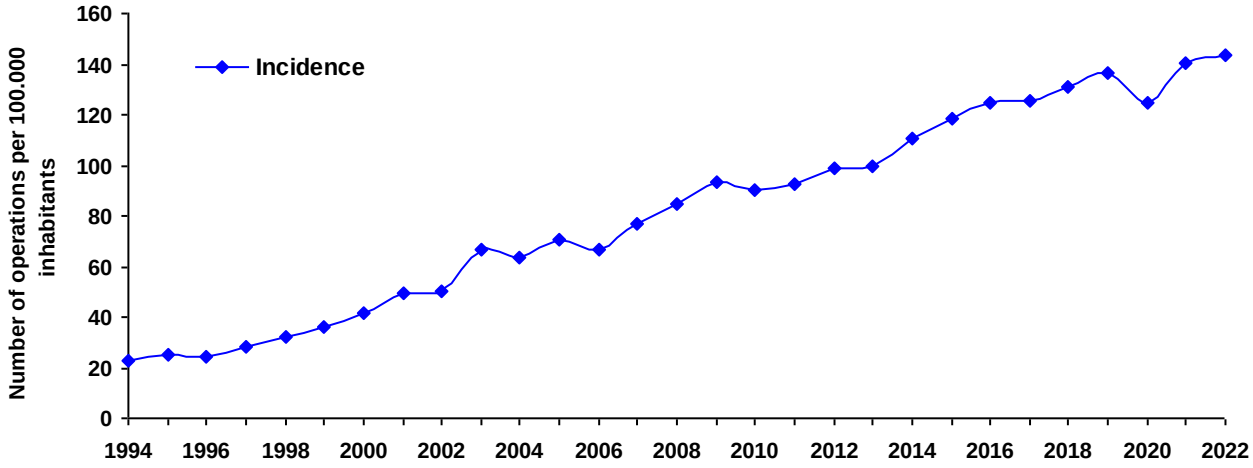


Figure 2c: Status of patients with knee replacement surgery in the period 1994-2022 per 31.12.2022

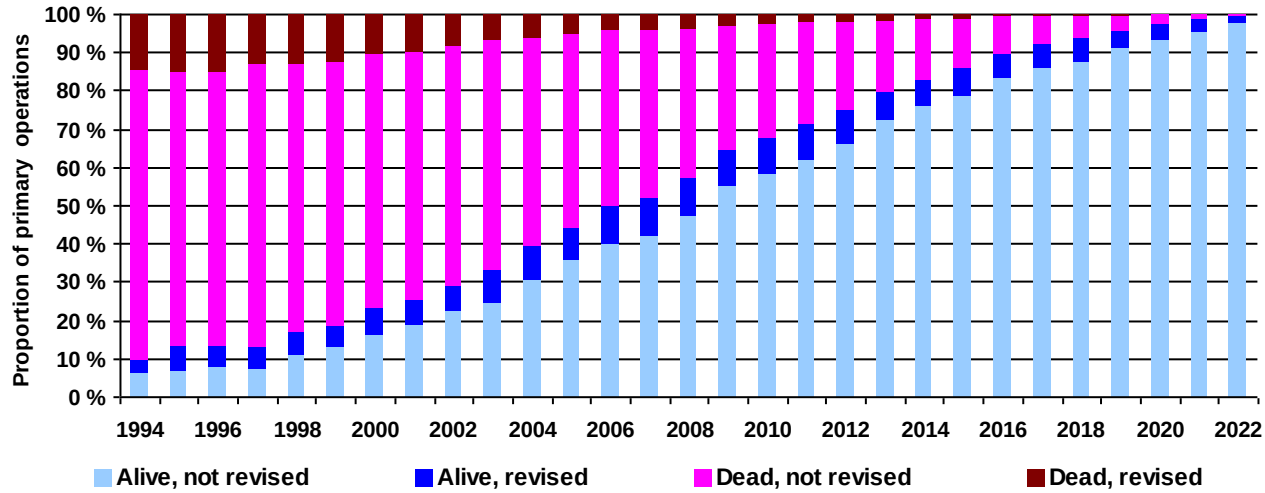


Figure 3: Age at the insertion of primary total knee prostheses

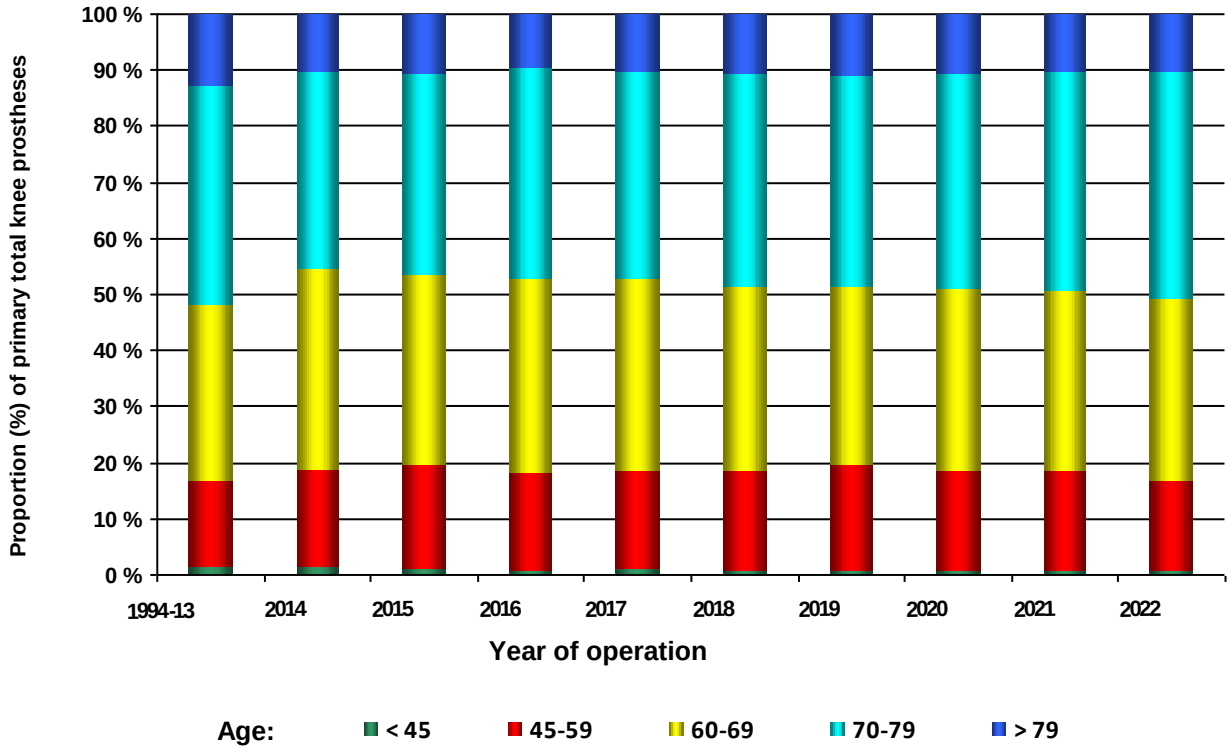


Figure 4: Age at the insertion of primary unicondylar knee prostheses

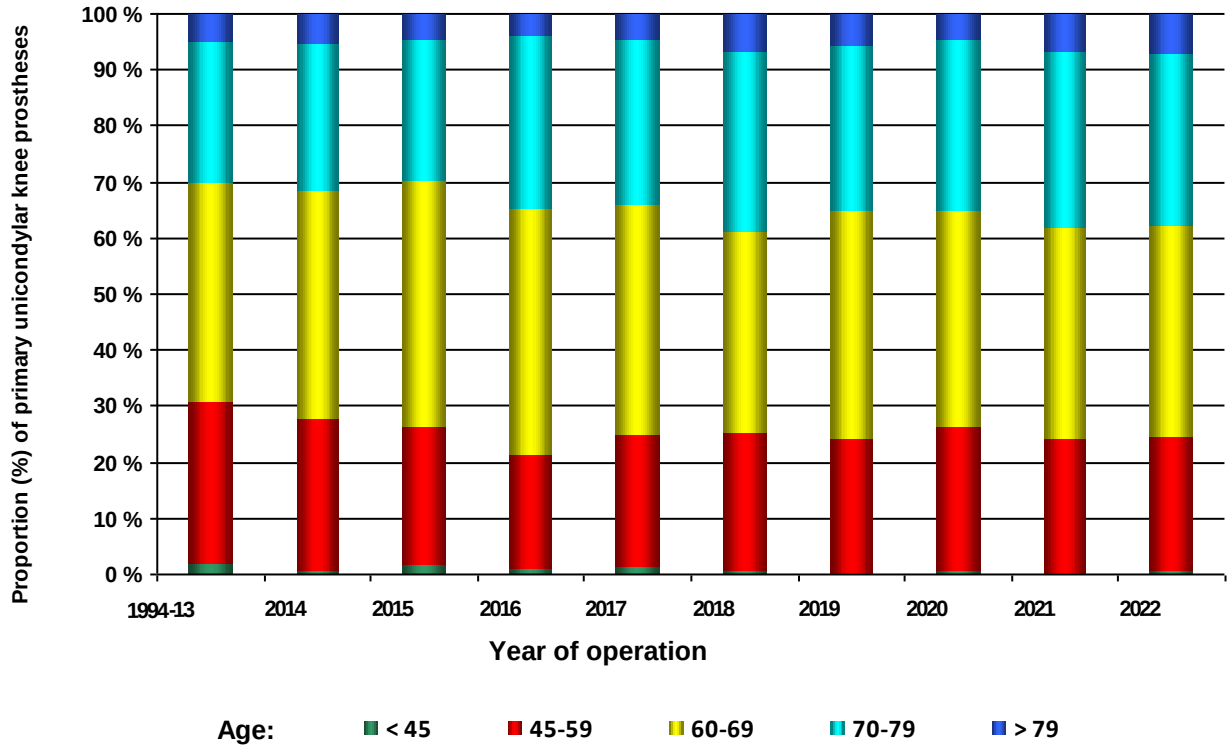


Figure 5: Age and sex at the insertion of primary total knee prostheses

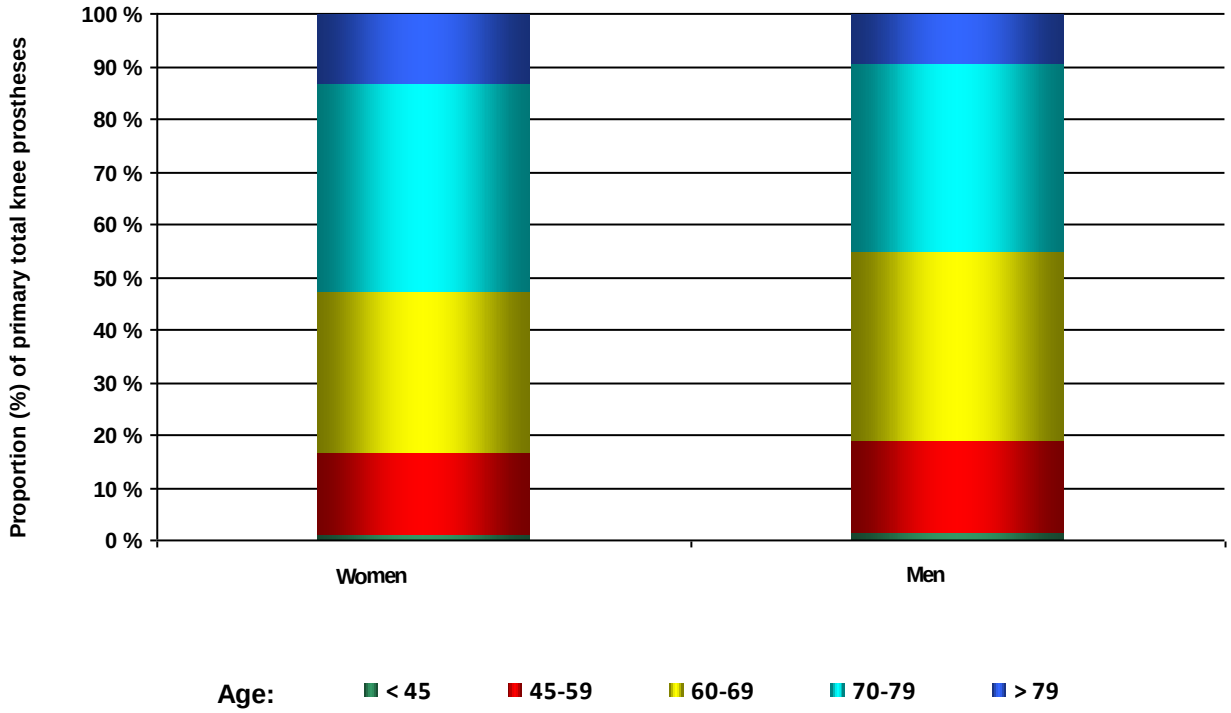
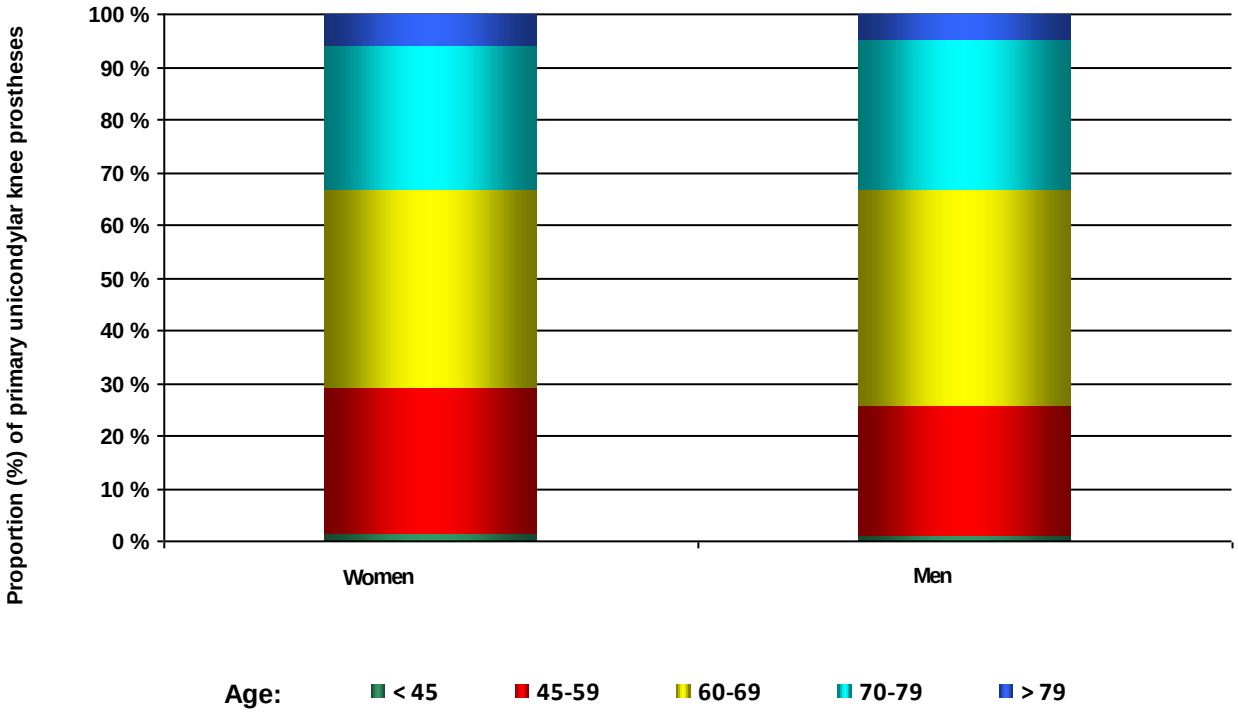


Figure 6: Age and sex at the insertion of primary unicondylar knee prostheses



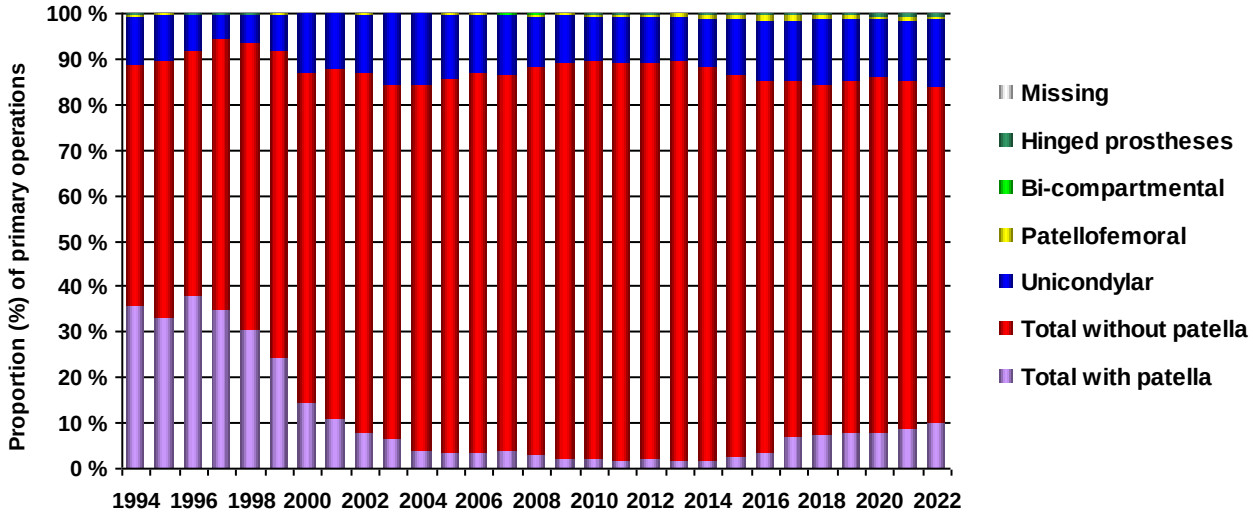
Types of knee prostheses

Table 2: Primary operations

Year	Total with patella		Total without patella		Unicondylar		Patello-femoral		Bicompart-mental		Hinged * prostheses		Missing		Total
2022	783	(10,1%)	5 732	(73,6%)	1 131	(14,5%)	67	(0,9%)			51	(0,7%)			**7 785**
2021	659	(8,7%)	5 784	(76,4%)	1 001	(13,2%)	72	(1,0%)			53	(0,7%)	2	(0,0%)	**7 575**
2020	527	(7,9%)	5 231	(78,2%)	840	(12,6%)	44	(0,7%)			45	(0,7%)	1	(0,0%)	**6 688**
2019	586	(8,1%)	5 589	(77,0%)	995	(13,7%)	53	(0,7%)			33	(0,5%)			**7 256**
2018	504	(7,3%)	5 338	(77,0%)	1 001	(14,4%)	58	(0,8%)			31	(0,4%)			**6 933**
2017	458	(7,0%)	5 152	(78,3%)	868	(13,2%)	71	(1,1%)			32	(0,5%)			**6 581**
2016	221	(3,4%)	5 329	(81,8%)	863	(13,2%)	68	(1,0%)			32	(0,5%)	1	(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%)	4 865	(86,3%)	605	(10,7%)	41	(0,7%)			20	(0,4%)	1	(0,0%)	**5 640**
1994-13	4 331	(7,6%)	46 067	(80,7%)	6 326	(11,1%)	220	(0,4%)	2	(0,0%)	120	(0,2%)	1	(0,0%)	**57 067**
Total	**8 337**	**(7,1%)**	**94 221**	**(79,7%)**	**14 383**	**(12,2%)**	**733**	**(0,6%)**	**2**	**(0,0%)**	**450**	**(0,4%)**	**7**	**(0,0%)**	**118 159**

* Indicated by the surgeon on the report form

Figure 7a: Primary operations



Classification of stability and modularity in primary total prostheses (with and without patella component)

Table 3a:

	---------- MS ----------		---------- PS ----------						
Year	**All poly**	**MT**	**All poly**	**MT**	**CCK**	**Rotating platform**	**Hinged * prostheses**	**Segmental prostheses**	**Total**
2022	182	4 655	0	879	20	773	52	6	**6 561**
2021	208	4 495	0	762	29	945	54	5	**6 493**
2020	245	4 052	1	605	33	821	46	5	**5 803**
2019	103	4 441	1	606	33	989	33	6	**6 206**
2018	1	4 002	1	565	26	1 244	31	3	**5 870**
2017	0	3 676	0	543	42	1 348	32	1	**5 641**
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	3 397	0	131	22	1 416	20	2	**4 988**
2013	1	3 178	0	55	25	1 254	9	1	**4 522**
2012	5	2 854	0	21	16	1 490	17	1	**4 403**
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**
1994-06	8	16 044	0	41	17	6 688	38	35	**22 836**
Total	**773**	**69691**	**3**	**5081**	**331**	**26 570**	**371**	**83**	**102 903**

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

Figure 7b:

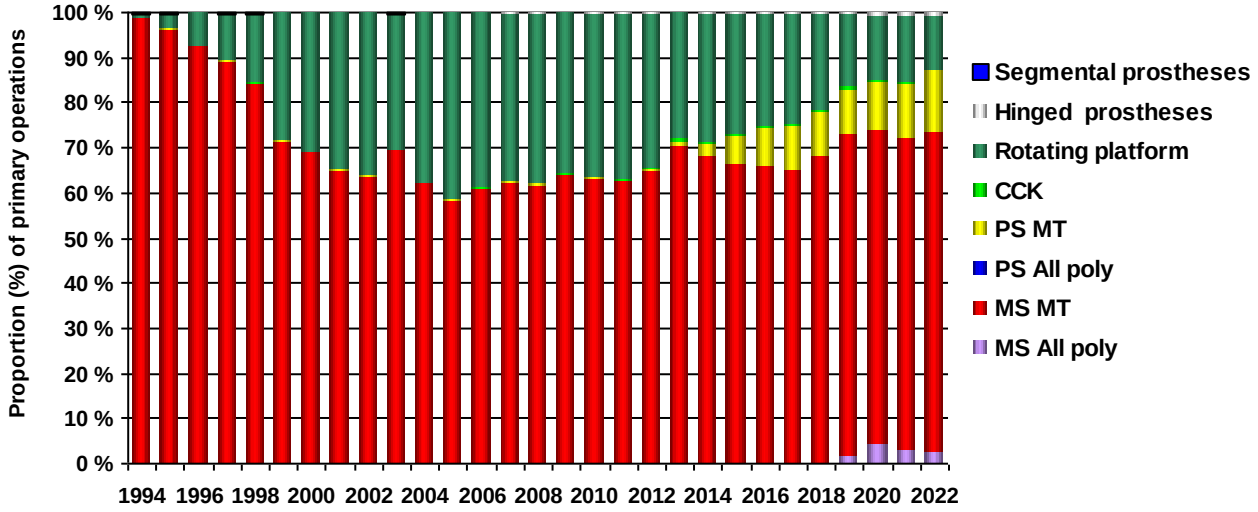


Table 3b: Classification of stability and modularity in revision total prostheses (with and without patella component)

	---------- MS ----------		---------- PS ----------			Rotating	Hinged *	Segmental	
Year	**All poly**	**MT**	**All poly**	**MT**	**CCK**	**platform**	**prostheses**	**protese**	**Total**
2022	0	133	0	103	46	44	79	8	**413**
2021	0	133	0	105	54	67	79	8	**446**
2020	0	106	0	112	90	62	58	4	**432**
2019	1	137	0	119	80	82	70	11	**500**
2018	1	150	0	112	109	93	42	2	**509**
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**
1994-06	2	1 021	0	54	58	419	30	16	**1 600**
Total	**6**	**3120**	**0**	**1148**	**1008**	**1 823**	**734**	**84**	**7 923**

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

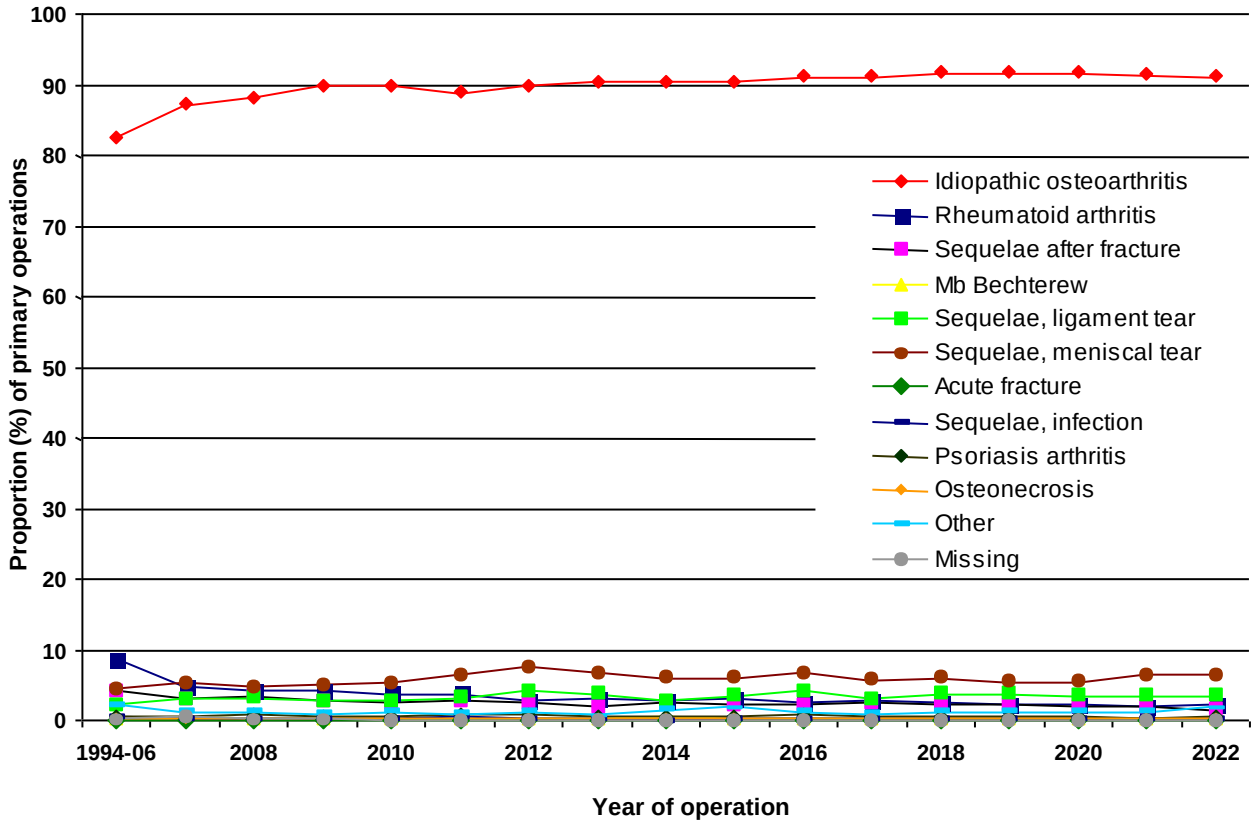
Reasons for primary operations - Total knee prostheses

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
2022	5 951	143	105	17	247	417	4	22	41	27	136	2
2021	5 897	131	122	15	244	411	7	13	27	23	93	0
2020	5 280	130	121	22	208	331	1	11	28	19	73	0
2019	5 674	134	137	14	235	346	4	10	29	16	93	0
2018	5 365	143	132	13	228	365	4	10	28	13	89	0
2017	5 120	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	4 498	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	3 943	125	106	15	181	331	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
1994-06	18 851	2 011	939	92	509	1 004	20	98	144	58	496	75
Total	**91 084**	**4 338**	**2 808**	**341**	**3 350**	**5 859**	**62**	**303**	**636**	**274**	**1 652**	**127**

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

Figure 8:



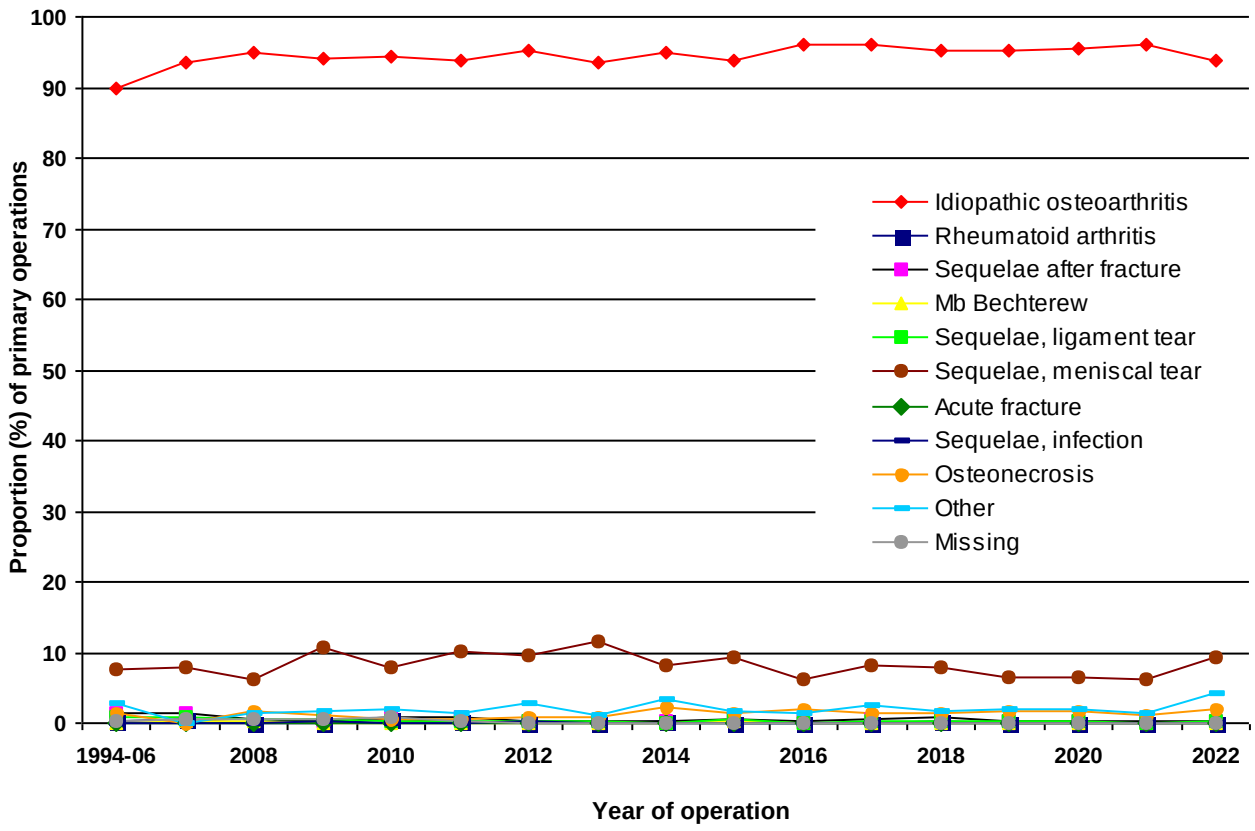
Reasons for primary operations - Unicondylar knee prostheses

Table 5:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Sequelae, infection	Osteonecrosis	Other	Missing
2022	1 060	0	2	0	2	104	1	22	49	0
2021	962	0	2	1	0	61	0	11	13	1
2020	802	0	3	0	2	54	0	14	17	0
2019	948	1	2	0	2	64	0	18	20	0
2018	954	2	8	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	575	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
1994-06	2 835	7	44	2	24	237	3	44	93	13
Total	**13 495**	**19**	**92**	**8**	**54**	**1 138**	**7**	**201**	**325**	**24**

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

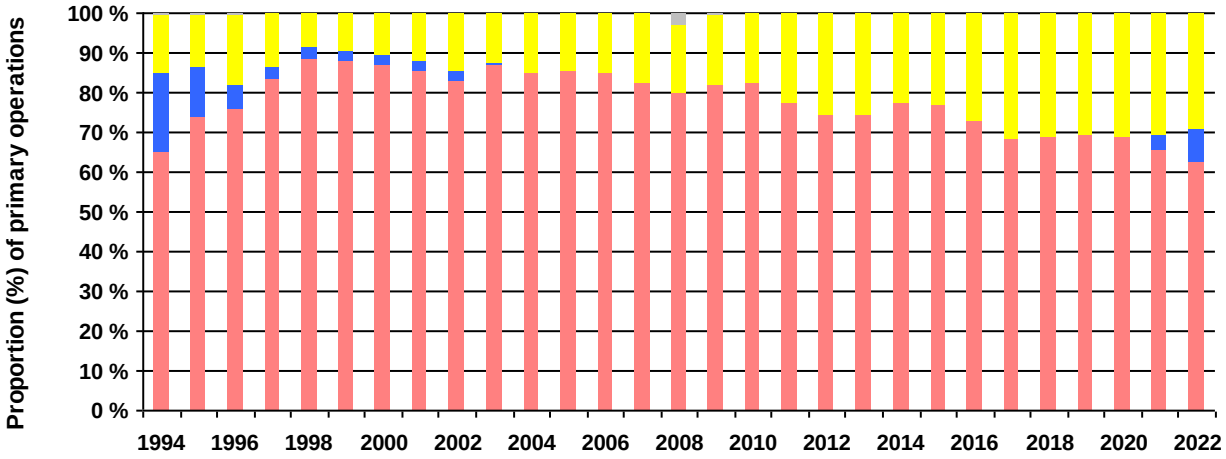


Figure 11: Tibia

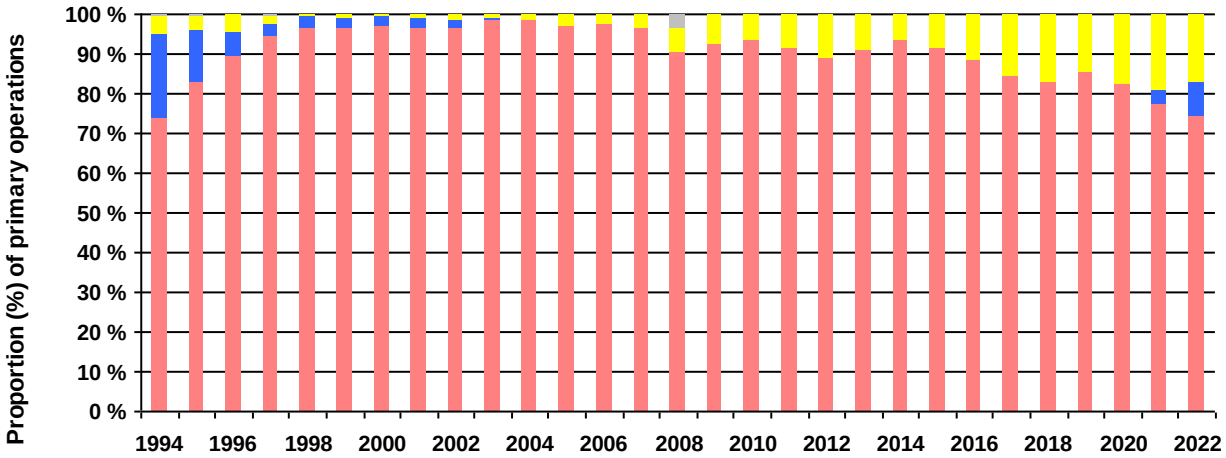
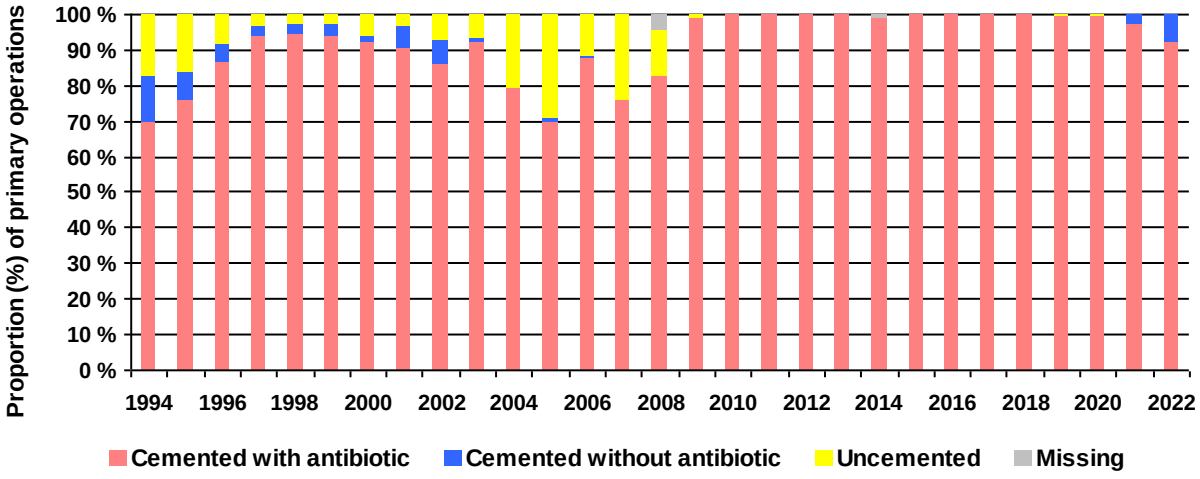


Figure 12: Patella



Use of cement in total knee prostheses

Figure 13: Primary operations

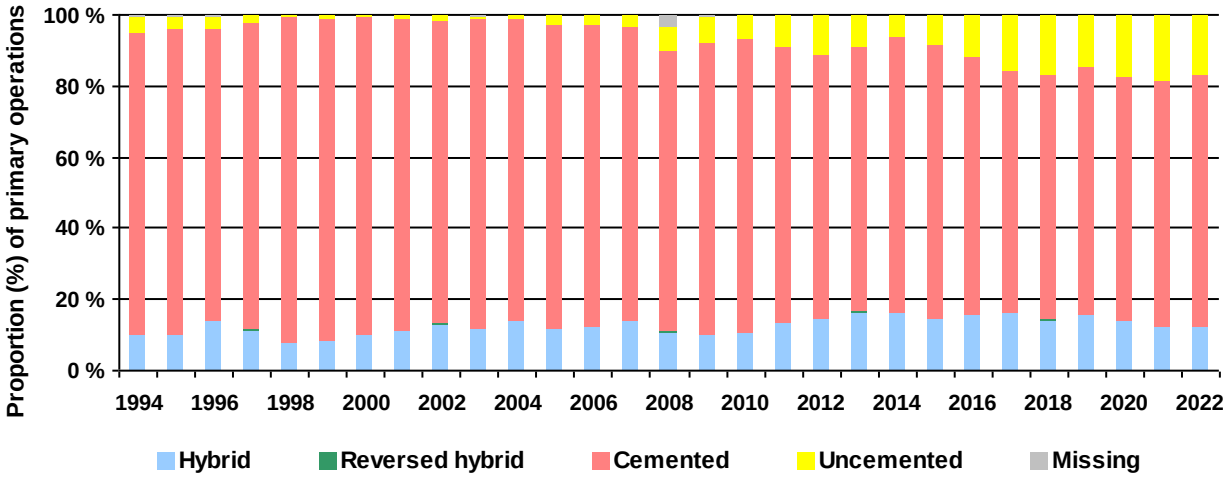
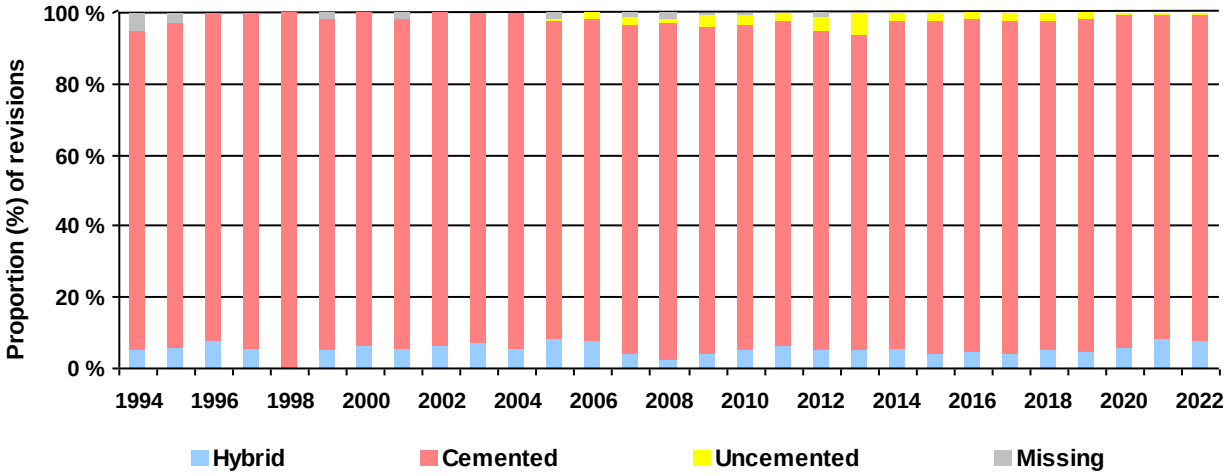
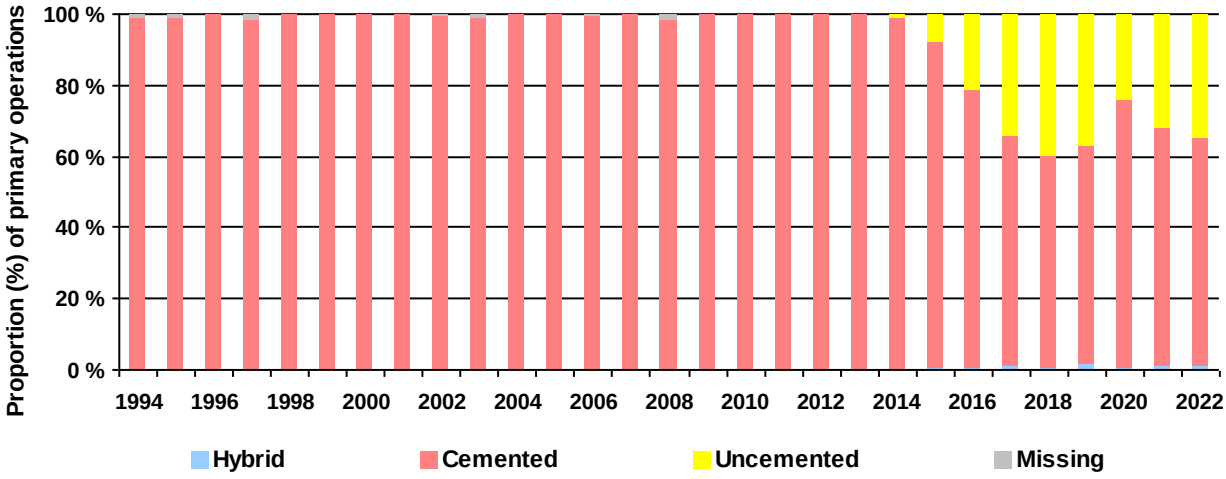


Figure 14: Revisions



Use of cement in unicondylar knee prostheses

Figure 15: Primary operations



The 8 most common primary total prostheses (with and without patella component) in 2016-2022

Table 6:

Product	Cemented *	Uncemented *	Hybrid	All poly	Rotating platform	Stabilization HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
NexGen	12 899	2 457	2 658	0	0	2 788	15 573	2 232	212	**18 025**
Triathlon	4 190	1 873	104	3	0	5 489	5 958	167	36	**6 170**
Legion	3 546	8	2 532	7	0	590	5 100	991	1	**6 094**
PFC-Sigma	3 048	2 211	396	93	5 528	0	5 579	36	38	**5 659**
Attune	2 658	50	21	0	72	2 732	2 186	546	0	**2 732**
LCS Complete	1 696	2	183	0	1 881	0	0	3	3	**1 881**
Persona	534	18	130	0	0	133	682	1	0	**683**
Journey II BCS	459	0	0	0	0	456	0	459	0	**459**

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	Stabilization PS	Stabilization CCK	Total
CR Option	8 628	0	8 632	0	0	**8 632**
CR-flex porous uncemented	91	3 892	3 987	0	0	**3 987**
CR-flex Option	1 488	1	1 490	0	0	**1 490**
LPS Option	1 156	0	0	1 157	0	**1 157**
LPS-flex porous standard	7	826	0	834	0	**834**
CR-flex gender	667	0	667	0	0	**667**
CR-flex porous	6	233	239	0	0	**239**
CR Flex Precoat	220	0	220	0	0	**220**
CR Precoat	215	3	218	0	0	**218**
LCCK Option	212	0	0	0	212	**212**
LPS-flex Option	150	18	0	168	0	**168**
CR Porous uncemented	4	100	104	0	0	**104**
LPS-flex gender	27	0	0	27	0	**27**
LPS-Flex Tivanium	15	0	0	15	0	**15**
LPS macro Option	13	0	0	13	0	**13**
LPS-flex	5	0	0	5	0	**5**
Other	3	3	0	6	0	**6**
Unknown	23	8	0	0	0	**31**

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	Stabilization MS	Stabilization PS	Stabilization CCK	Total
Cemented	1 657	1	0	0	0	**1 658**
Uncemented	32	184	0	0	0	**216**
Other	4	0	0	0	3	**4**
Unknown	3	0	0	3	0	**3**

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	Stabilization MS	Stabilization PS	Stabilization CCK	Total
CR cemented	2 992	1	2 997	0	0	**2 997**
CR uncemented	7	2 566	2 573	0	0	**2 573**
Revision	38	1	0	0	0	**39**
PS	36	0	0	36	0	**36**
Unknown	5	5	0	0	0	**10**

Product: Triathlon (58)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	3 984	4	3 991	0	0	**3 991**
Beaded w/pa CR uncemented	10	1 957	1 967	0	0	**1 967**
PS cemented	166	0	0	166	0	**166**
TS cemented	36	0	0	0	36	**36**
Other	0	1	0	0	0	**1**
Unknown	6	1	0	0	0	**7**

Product: Legion (62)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR uncemented	34	2 519	2 554	0	0	**2 554**
CR cemented	2 419	2	2 424	0	0	**2 424**
PS cemented	905	3	0	908	0	**908**
Legion CR cemented	88	0	88	0	0	**88**
PS Oxinium cemented	45	0	0	49	0	**49**
CR Oxinium cemented	31	1	32	0	0	**32**
Femur cemented	21	0	0	21	0	**21**
Legion PS cemented	9	0	0	9	0	**9**
Other	1	1	1	0	1	**2**
Unknown	4	1	0	0	0	**5**

Product: Journey II BCS (75)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
Journey II BCS	458	0	0	458	0	**458**
Unknown	1	0	0	0	0	**1**

Product: Attune (83)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR Cemented	2 114	0	2 117	0	0	**2 117**
PS femur Cemented	543	1	0	544	0	**544**
CR Cementless	0	69	69	0	0	**69**
Unknown	2	0	0	0	0	**2**

Product: Persona (84)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR Femoral	528	3	532	0	0	**532**
CR Femoral Porous, Trabecular Metal	5	145	150	0	0	**150**
Other	1	0	0	1	0	**1**

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	9 679	1	0	**9 681**
Option cemented	5 652	2	0	**5 654**
Trabecular metal uncemented	8	2 482	0	**2 490**
Precoat AP wedge stemmed	161	0	0	**161**
Other	0	4	0	**4**
Unknown	30	3	0	**33**

Table 6 B: Tibia

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	All poly	Total
No keel MBT* cemented	1 859	2	0	**1 861**
MBT* revision	16	0	0	**16**
Other	4	2	0	**6**
Unknown	6	0	0	**6**

* MBT = Mobile bearing tray

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	All poly	Total
With keel MBT* cemented	3 211	14	0	**3 225**
With keel MBT* uncemented	3	2 212	0	**2 215**
All poly	113	0	113	**113**
MBT* revision	80	6	0	**86**
Other	2	2	0	**4**
Unknown	25	4	0	**29**

* MBT = Mobile bearing tray

Product: Triathlon (58)

Product Category	Cemented *	Uncemented *	All poly	Total
Cemented	3 530	4	0	**3 534**
PA uncemented	5	1 092	0	**1 097**
Tritanium baseplate	5	788	0	**793**
CS All poly, cemented	625	0	625	**625**
Universal cemented	103	0	0	**103**
Other	1	0	1	**1**
Unknown	10	3	0	**13**

Product: Legion (62)

Product Category	Cemented *	Uncemented *	All poly	Total
Male tapered cemented (Genesis II)	6 054	5	0	**6 061**
Porous HA tibial base w/o holes uncemented	1	16	0	**17**
All poly CR	5	0	5	**5**
Other	2	0	2	**2**
Unknown	5	0	0	**5**

Product: Journey II BCS (75)

Product Category	Cemented *	Uncemented *	All poly	Total
Journey II base NP	461	0	0	**461**

Product: Attune (83)

Product Category	Cemented *	Uncemented *	All poly	Total
FB Tib base with S+ technology	2 267	1	0	**2 271**
FB Tib base	328	1	0	**329**
RP Tib base Cementless	0	48	0	**48**
RP Tib base	15	0	0	**15**
RP Tib base with S+ technology	5	0	0	**5**
Unknown	5	1	0	**6**

Table 6 B: Tibia

Product: Persona (84)

Product Category	Cemented *	Uncemented *	All poly	Total
Stemmed 5 Degree Tibia	664	0	0	**664**
Two-Peg Trabecular Metal Tibia	0	18	0	**18**
Unknown	1	0	0	**1**

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	Stabilization				Total
		HXLPE	MS	PS	CCK	
CR-Flex	0	0	12 756	0	0	**12 756**
CR-Prolong	0	2 759	2 759	0	0	**2 759**
LPS-FlexFixed	0	0	0	2 247	0	**2 247**
LCCK	0	0	0	0	174	**174**
LPS-flex	0	29	0	30	0	**30**
CR	0	0	10	0	0	**10**
Other	0	0	0	1	0	**1**
Unknown	0	0	0	0	0	**43**

Product: LCS Complete (48)

Product Category	Rotating platform	Stabilization				Total
		HXLPE	MS	PS	CCK	
Rotating platform RP	1 876	0	1 876	0	0	**1 876**
Other	3	0	0	0	3	**3**
Unknown	2	0	0	2	0	**2**

Product: PFC-Sigma (49)

Product Category	Rotating platform	Stabilization				Total
		HXLPE	MS	PS	CCK	
Rotating platform RP-CV	5 456	0	5 456	0	0	**5 456**
Revision TC3	38	0	0	0	38	**38**
Revision STB	34	0	0	34	0	**34**
Other	0	0	1	0	0	**1**
Unknown	0	0	0	0	0	**11**

Product: Triathlon (58)

Product Category	Rotating platform	Stabilization				Total
		HXLPE	MS	PS	CCK	
CR-X3 HXLPE	0	2 079	2 079	0	0	**2 079**
CR-X3 HXLPE, EtO sterilized	0	1 789	1 740	49	0	**1 789**
CS-X3 HXLPE	0	855	855	0	0	**855**
CS-X3 HXLPE, EtO sterilized	0	608	608	0	0	**608**
PS-X3 HXLPE	0	112	0	112	0	**112**
PS	0	0	0	52	0	**52**
TS-X3 HXLPE	0	29	0	0	29	**29**
Other	0	3	1	0	3	**4**
Unknown	0	14	0	0	0	**14**

Table 6 C: Foring Tibia Insert

Product: Legion (62)

Product Category	Rotating platform	Stabilization				Total
		HXLPE	MS	PS	CCK	
CR standard	0	0	3 560	0	0	**3 560**
Dished	0	0	1 344	0	0	**1 344**
PS	0	0	0	518	0	**518**
PS high flex	0	396	0	396	0	**396**
CR-highflex HXLPE	0	179	179	0	0	**179**
Constrained	0	0	0	0	72	**72**
Unknown	0	13	0	0	0	**13**

Product: Journey II BCS (75)

Product Category	Rotating platform	Stabilization				Total
		HXLPE	MS	PS	CCK	
Journey II BCS, XLPE	0	458	0	458	0	**458**
Unknown	0	0	0	0	0	**3**

Product: Attune (83)

Product Category	Rotating platform	Stabilization				Total
		HXLPE	MS	PS	CCK	
CR FB insert	0	2 113	2 113	0	0	**2 113**
PS FB insert	0	546	0	546	0	**546**
CR RP insert	67	67	67	0	0	**67**
Other	3	3	0	3	0	**3**
Unknown	0	4	0	0	0	**4**

Product: Persona (84)

Product Category	Rotating platform	Stabilization				Total
		HXLPE	MS	PS	CCK	
CR Articular Surface	0	0	469	0	0	**469**
Medial congruent bearing	0	133	133	0	0	**133**
UC Articular Surface	0	0	81	0	0	**81**

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	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen	3 822	2 200	2 313	2 047	1 794	1 857	2 141	1 613	1 706	1 770	**21 263**
LCS Complete	8 478	590	587	567	558	313	140	93	25		**11 351**
Profix	9 768	112		1							**9 881**
Triathlon	1 173	195	257	449	404	381	502	802	798	851	**5 812**
PFC-Sigma	293	428	428	473	455	548	479	327	431	364	**4 226**
Legion	13	252	350	324	347	397	452	468	761	804	**4 168**
LCS	4 164										**4 164**
AGC Universal	3 112										**3 112**
Genesis I	3 100										**3 100**
Attune				44	122	424	484	466	557	562	**2 659**
Duracon	2 575										**2 575**
AGC Anatomic	1 725										**1 725**
Tricon -C with Pro-Fit	1 079										**1 079**
Vanguard TM	707	65	65	42	2						**881**
Journey II BCS		7	69	57	31	6	35	81	96	152	**534**
Persona				12	78	60	72	126	87	90	**525**
E-motion	461										**461**
Kinemax	411										**411**
Advance	298	12									**310**
NexGen Rotating Hinge	54	19	29	25	29	25	23	29	34	38	**305**
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	6	**37**
S-ROM Rotat. Hinge	1		1		2	1	1	8	8	6	**28**
Interax I.S.A.	24										**24**
RT-Plus Modular	16						1				**17**
Other (n<15)	60	2		2	1	1	2	5	4	26	**103**
Total	**41 590**	**3 882**	**4 112**	**4 085**	**3 866**	**4 061**	**4 338**	**4 022**	**4 518**	**4 669**	**79 143**

Table 7b: Uncemented femoral prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen	255	234	382	652	814	815	726	679	749	647	**5 953**
Profix	4 766	19									**4 785**
Legion	126	422	401	448	421	367	420	360	255	256	**3 476**
PFC-Sigma	165	278	300	280	283	314	443	420	477	355	**3 315**
LCS Complete	1 911	121	88	51	55	52	15		12		**2 305**
Triathlon	129	33	41	57	203	257	259	293	418	476	**2 166**
LCS	652										**652**
Tricon M	288										**288**
Genesis I	192										**192**
Duracon	163										**163**
Persona							2	26	51	68	**147**
Interax I.S.A.	81										**81**
Attune								1		69	**70**
Kotz	29										**29**
GMK Sphere									10	19	**29**
Other (n<15)	22	1					1	1	1		**26**
Total	**8 779**	**1 108**	**1 212**	**1 488**	**1 776**	**1 805**	**1 866**	**1 780**	**1 973**	**1 890**	**23 677**

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Total prostheses

Table 8a: Cemented femoral prostheses in revisions *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen LCCK Option	203	73	79	80	79	86	59	62	32	32	**785**
Profix	553	4									**557**
NexGen Rotating Hinge	95	47	53	53	39	27	64	48	52	59	**537**
NexGen	179	29	40	26	38	42	37	37	25	32	**485**
LCS Complete	340	16	11	16	23	24	17	10	3		**460**
Legion	1	18	33	30	46	53	62	50	57	46	**396**
Triathlon TS	61	13	12	6	20	28	31	37	30	22	**260**
PFC-Sigma	9	15	20	27	15	26	30	17	29	20	**208**
Genesis I	207										**207**
LCS	172										**172**
Triathlon	30	11	11	11	11	12	8	11	11	17	**133**
Legion Hinge Knee		1	7	8	9	5	3	6	21	18	**78**
Scorpio TS	76										**76**
LCS Complete VVS	42	12	5	5	1	4		1			**70**
Vanguard TM	67										**67**
Duracon	64										**64**
AGC Dual	62										**62**
AGC Universal	62										**62**
Profix constrained	43	2									**45**
S-ROM Rotat. Hinge	13	3	1	3	7	6	2	1	1	3	**40**
Legion constrained	21	3	2	3	1	2	1			1	**34**
Dual Articular 2000	30										**30**
RT-Plus Modular	21	1							1		**23**
Tricon -C with Pro-Fit	20										**20**
AGC Anatomic	19										**19**
ATTUNE-REVISION								5	8	5	**18**
Scorpio	18										**18**
Attune				2		1	2	1	3	8	**17**
E-motion	16										**16**
Kinemax	16										**16**
Other (n<15)	87	2		2	10	3	5	1	3	4	**117**
Total	**2 527**	**250**	**274**	**272**	**299**	**319**	**321**	**287**	**276**	**267**	**5 092**

Table 8b: Uncemented femoral prostheses in revisions *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Profix	79										**79**
LCS Complete	53	2		2	1	2	2				**62**
PFC-Sigma	3	6	4	3	4	7	6	5	5	6	**49**
Legion	1	5	6	5	4	5	1	4	6	1	**38**
NexGen	5	1	2	1	7	4	4	1	5	4	**34**
LCS Complete VVS	16	1									**17**
Other (n<15)	32	1	1	4	1	3	2		2	5	**51**
Total	**189**	**16**	**13**	**15**	**17**	**21**	**15**	**10**	**18**	**16**	**330**

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Table 9a: Cemented tibial prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen	3 939	2 365	2 513	2 363	2 206	2 227	2 520	1 941	2 098	2 172	**24 344**
Profix	13 643	113		1							**13 757**
LCS Complete	9 247	712	674	618	615	364	155	94	37		**12 516**
Legion	139	672	751	772	768	760	866	826	1 012	1 060	**7 626**
Triathlon	1 235	229	294	458	408	399	521	812	808	859	**6 023**
PFC-Sigma	326	477	473	506	465	565	617	391	485	405	**4 710**
AGC Universal	4 510										**4 510**
LCS	4 351										**4 351**
Genesis I	3 284										**3 284**
Duracon	2 704										**2 704**
Attune				44	122	424	483	454	541	552	**2 620**
Tricon II	1 346										**1 346**
Vanguard TM	706	65	65	42	2						**880**
Persona				12	78	61	74	152	129	149	**655**
Journey II BCS		7	70	57	31	6	35	81	96	153	**536**
E-motion	468										**468**
Kinemax	411										**411**
LCS Universal	372										**372**
AGC Anatomic	330										**330**
Advance	298	12									**310**
NexGen Rotating Hinge	53	19	29	25	29	26	23	29	34	38	**305**
Scorpio	126										**126**
Interax I.S.A.	106										**106**
Evolution Medial-Pivot			10	19	26	42	1				**98**
ATTUNE-REVISION							1	12	18	33	**64**
Search	40										**40**
Legion Hinge Knee			3	5	1	3	5	4	11	6	**38**
GMK Sphere				18	16	3			1		**38**
AGC Dual	28										**28**
RT-Plus Modular	16						1				**17**
Other (n<15)	75	3		2	1	1	2	3	2	24	**113**
Total	**47 753**	**4 674**	**4 882**	**4 942**	**4 768**	**4 881**	**5 304**	**4 799**	**5 272**	**5 451**	**92 726**

Table 9b: Uncemented tibial prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen	136	69	182	340	402	447	350	351	357	243	**2 877**
PFC-Sigma	132	230	257	247	273	300	306	363	431	318	**2 857**
Triathlon	65		4	50	199	239	241	283	408	467	**1 956**
LCS Complete	1 093			1		2					**1 096**
Profix	887	18									**905**
LCS	141										**141**
Tricon II	66										**66**
Attune								2		49	**51**
GMK Sphere									10	19	**29**
Duracon	28										**28**
Kotz	27										**27**
Legion		2	1	2		4	6	3	4	2	**24**
Persona									9	9	**18**
Other (n<15)	13						1		1		**15**
Total	**2 588**	**319**	**444**	**640**	**874**	**992**	**904**	**1 002**	**1 220**	**1 107**	**10 090**

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Table 10a: Cemented tibial prostheses in revisions *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen	391	110	122	114	124	132	97	94	56	62	**1 302**
LCS Complete	523	40	24	25	33	38	21	14	5	2	**725**
Profix	677	7	1	1	1						**687**
NexGen Rotating Hinge	93	47	51	51	39	25	62	48	52	60	**528**
Legion	23	26	40	38	48	64	57	47	58	41	**442**
Triathlon	95	24	24	20	31	44	43	49	43	45	**418**
Genesis I	257										**257**
PFC-Sigma	8	13	21	32	22	31	32	21	34	26	**240**
LCS	232										**232**
Duracon	117										**117**
Scorpio	97		1								**98**
Legion Hinge Knee		1	7	8	9	5	3	6	22	18	**79**
AGC Universal	77										**77**
Vanguard TM	67										**67**
AGC Dual	59										**59**
Tricon II	57										**57**
ATTUNE-REVISION						1		9	12	11	**33**
Dual Articular 2000	29										**29**
RT-Plus Modular	21	1									**22**
Maxim	20										**20**
E-motion	18										**18**
Kinemax	16										**16**
Journey II BCS				2	8	1	2		1	1	**15**
Other (n<15)	80	3		2	3	3	5	2	4	8	**110**
Total	**2 957**	**272**	**291**	**293**	**318**	**344**	**322**	**290**	**287**	**274**	**5 648**

Table 10b: Uncemented tibial prostheses in revisions *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
LCS Complete	60	6	1								**67**
PFC-Sigma	4	7	3	1	6	8	3	1	1	1	**35**
Other (n<15)	14	1	2	6	1	1	1	3	2		**31**
Total	**78**	**14**	**6**	**7**	**7**	**9**	**4**	**4**	**3**	**1**	**133**

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

Prosthesis	Material	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Advance	Uhmwpe	296	12									**308**
AGC	Uhmwpe	4 849										**4 849**
AGC Dual	Uhmwpe	36										**36**
Attune	HXLPE				44	122	424	484	468	560	631	**2 733**
ATTUNE-REVISION	HXLPE									2	9	**11**
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	19	**67**
INTERAX I.S.A.	Uhmwpe	103										**103**
Journey II BCS	HXLPE		7	70	57	31	6	35	81	97	150	**534**
Kinemax	Uhmwpe	410										**410**
LCS	Uhmwpe	4 481										**4 481**
LCS Complete	Uhmwpe	10 368	712	675	618	613	365	155	93	37		**13 636**
LCS Universal	Uhmwpe	383										**383**
Legion	HXLPE	7	13	29	18	45	62	104	57	147	155	**637**
Legion	Uhmwpe	131	658	721	752	723	701	768	772	869	908	**7 003**
MAXIM	Uhmwpe	5										**5**
MG II	Uhmwpe	1										**1**
Mutars	Uhmwpe	10	1				1	1	3		1	**17**
NexGen	HXLPE	86	120	152	292	493	498	522	311	336	336	**3 146**
NexGen	Uhmwpe	4 007	2 314	2 543	2 411	2 115	2 172	2 348	1 981	2 119	2 082	**24 092**
NexGen Rotating Hinge	Uhmwpe	54	19	29	24	29	25	23	29	34	38	**304**
Persona	HXLPE								4	53	74	**131**
Persona	Uhmwpe				12	78	61	74	148	85	84	**542**
PFC-Sigma	Uhmwpe	458	707	729	753	738	865	922	747	908	719	**7 546**
PROFIX	Uhmwpe	14 553	131		1							**14 685**
RT-Plus Modular	Uhmwpe	16						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	8	5	**27**
Triathlon	HXLPE	1 092	222	295	499	601	633	743	862	1 001	1 149	**7 097**
Triathlon	Uhmwpe	210	7	3	9	6	5	19	233	215	192	**899**
Tricon II	Uhmwpe	1 410										**1 410**
Vanguard 360 Revision	Uhmwpe	2										**2**
Vanguard TM	Uhmwpe	370	62	65	42	2						**541**
Total		**50 024**	**4 985**	**5 322**	**5 569**	**5 640**	**5 864**	**6 201**	**5 797**	**6 482**	**6 552**	**102 436**

* Surgeon's report for fixation

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

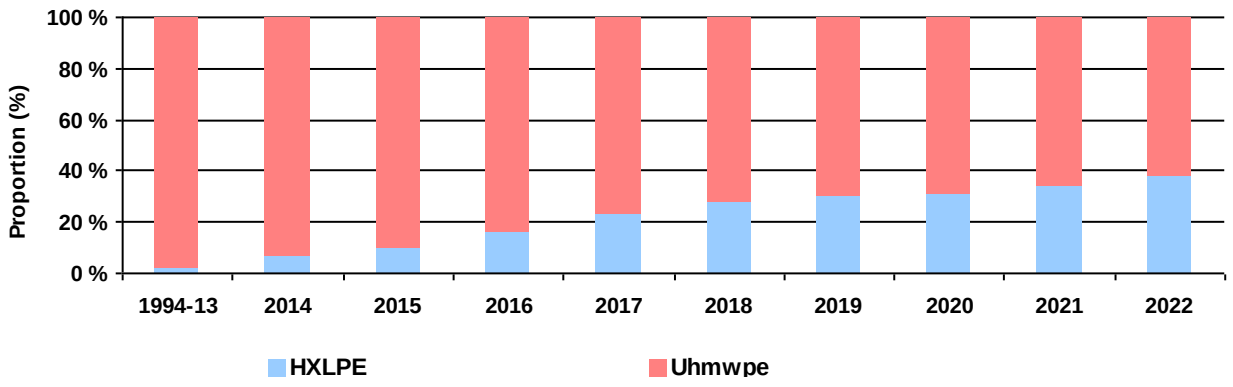
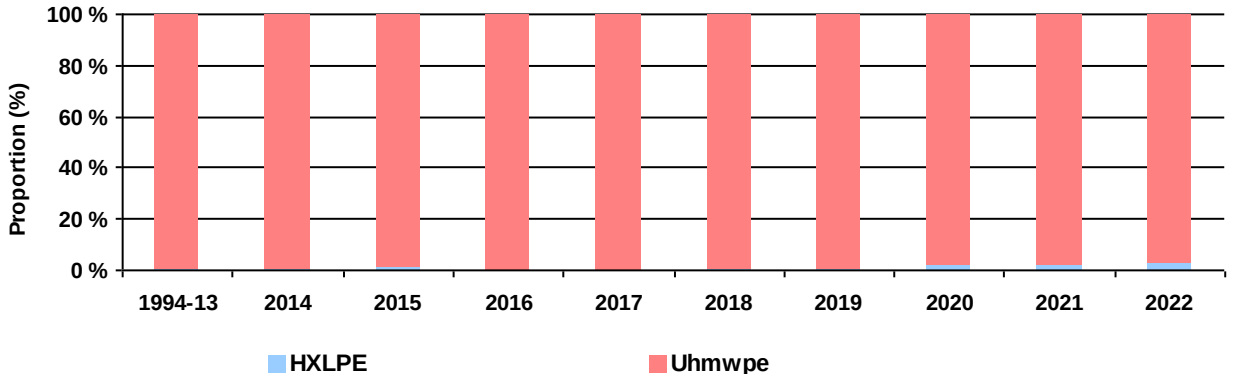


Table 10d: Material in tibia insert for unicondylar knee prostheses in primary operations

Prosthesis	Material	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	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	317	373	523	634	557	763	952	801	957	1 075	**6 952**
Oxford UNI (III)	Uhmwpe	4 775	205	191	201	292	204					**5 868**
Oxford UNI II	Uhmwpe	46										**46**
Persona Partial Knee	HXLPE							11	19	26	37	**93**
Preservation Uni	Uhmwpe	69										**69**
Sigma High Performance Uni	HXLPE	25	6	9	3	1	5					**49**
Thriathlon PKR - UNI	HXLPE	3										**3**
Total		**5 650**	**587**	**725**	**844**	**852**	**984**	**963**	**830**	**992**	**1 112**	**13 539**

* 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	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Oxford Partial Knee	312	373	517	631	551	576	592	604	632	688	**5 476**
Oxford UNI (III)	4 779	198	136	18	1						**5 132**
Genesis UNI	332										**332**
Miller-Galante UNI	294										**294**
MOD III uni	198										**198**
Preservation Uni	166										**166**
LINK Schlitten UNI	47	15	17	17	14	8	11	7	6	6	**148**
Persona Partial Knee							11	18	26	37	**92**
Journey Uni	24	6	13	7	2						**52**
Duracon uni	50										**50**
Sigma High Performance Uni	25	6	9	3	1	5					**49**
Oxford UNI II	45										**45**
iBalance UKA						12		10	9		**31**
ZUK (Unicondylar)	27										**27**
Other (n<15)	20								1	1	**22**
Total	**6 319**	**598**	**692**	**676**	**569**	**601**	**614**	**639**	**674**	**732**	**12 114**

Table 11b: Uncemented femoral prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Oxford Partial Knee	2	7	61	187	299	400	380	200	325	396	**2 257**
Other (n<15)									1		**1**
Total	**2**	**7**	**61**	**187**	**299**	**400**	**380**	**200**	**326**	**396**	**2 258**

Table 12a: Cemented tibial prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Oxford Partial Knee	313	372	521	628	545	574	602	600	636	686	**5 477**
Oxford UNI (III)	4 778	199	131	24	3	1					**5 136**
Genesis UNI	332										**332**
Miller-Galante UNI	282										**282**
MOD III uni	199										**199**
Preservation Uni	165										**165**
LINK Schlitten UNI	47	15	17	17	14	8	11	7	6	6	**148**
Persona Partial Knee							11	19	26	37	**93**
Journey Uni	24	6	13	7	2						**52**
Duracon uni	49										**49**
Sigma High Performance Uni	25	6	9	3	1	5					**49**
Oxford UNI II	46										**46**
iBalance UKA						12		10	9		**31**
ZUK (Unicondylar)	27										**27**
Other (n<15)	18								1	1	**20**
Total	**6 305**	**598**	**691**	**679**	**565**	**600**	**624**	**636**	**678**	**730**	**12 106**

Table 12b: Uncemented tibial prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Oxford Partial Knee	1	7	62	184	303	401	371	204	322	397	**2 252**
PFC-Sigma									1		**1**
Total	**1**	**7**	**62**	**184**	**303**	**401**	**371**	**204**	**323**	**397**	**2 253**

* Surgeon's report for fixation

Patellofemoral prostheses

Table 13a: Cemented femoral prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen PFJ Gender	42	19	32	50	53	45	35	30	61	56	**423**
Journey PFJ	114	22	7	18	17	10	16	11	11	11	**237**
Patella Mod III / II	29										**29**
LCS PFJ	18										**18**
iBalance PFJ						3	2	3			**8**
Other (n<5)	12				1						**13**
Total	**215**	**41**	**39**	**68**	**71**	**58**	**53**	**44**	**72**	**67**	**728**

Patellofemoral femoral prostheses in primary operations are all cemented

Table 14a: Cemented patella prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NexGen PFJ Gender	42	19	31	49	53	45	34	30	61	55	**419**
Journey PFJ	112	22	7	18	18	10	16	11	11	11	**236**
Patella Mod III / II	31										**31**
LCS PFJ	11										**11**
iBalance PFJ						2	2	3			**7**
Other (n<5)	11		1	1			1			1	**15**
Total	**207**	**41**	**39**	**68**	**71**	**57**	**53**	**44**	**72**	**67**	**719**

Table 14b: Uncemented patella prostheses in primary operations *

Prosthesis	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	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

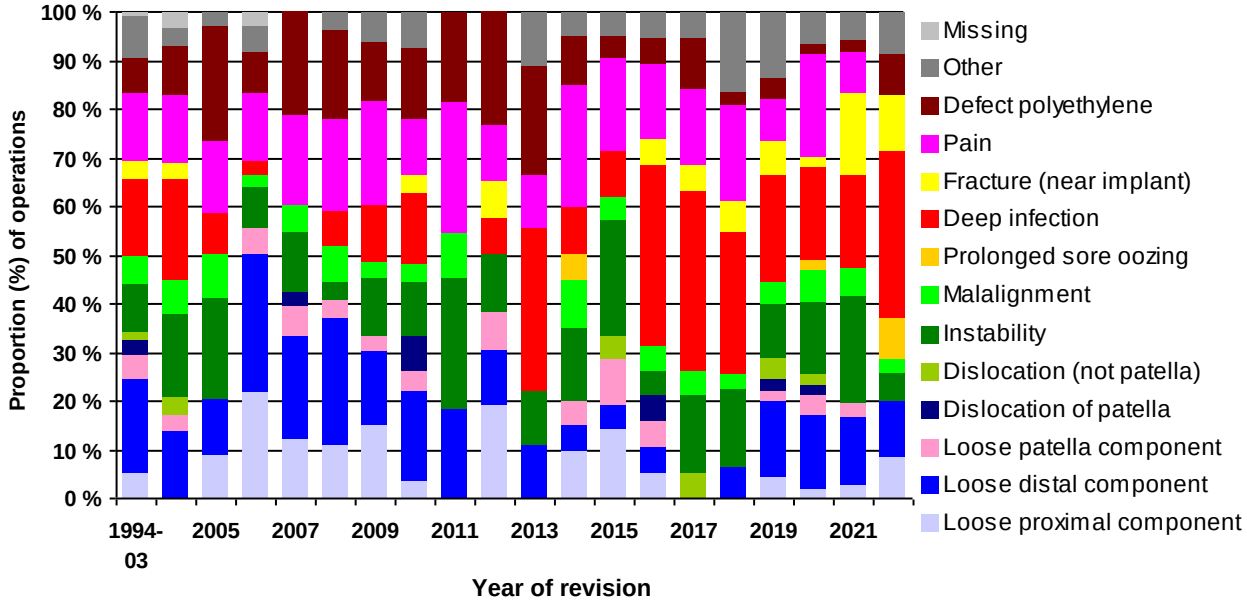
Reasons for revisions

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	Prolonged sore oozing	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2022	3	4	0	0	0	2	1	12	3	4	0	3	3	0
2021	1	5	1	0	0	8	2	7	0	6	3	1	2	0
2020	1	7	2	1	1	7	3	9	1	1	10	1	3	0
2019	2	7	1	1	2	5	2	10	0	3	4	2	6	0
2018	0	2	0	0	0	5	1	9	0	2	6	1	5	0
2017	0	0	0	0	1	3	1	7	0	1	3	2	1	0
2016	1	1	1	1	0	1	1	7	0	1	3	1	1	0
2015	3	1	2	0	1	5	1	2	0	0	4	1	1	0
2014	2	1	1	0	0	3	2	2	1	0	5	2	1	0
2013	0	1	0	0	0	1	0	3	0	0	1	2	1	0
2012	5	3	2	0	0	3	0	2	0	2	3	6	0	0
2011	0	2	0	0	0	3	1	0	0	0	3	2	0	0
2010	1	5	1	2	0	3	1	4	0	1	3	4	2	0
2009	5	5	1	0	0	4	1	4	0	0	7	4	2	0
2008	3	7	1	0	0	1	2	2	0	0	5	5	1	0
2007	4	7	2	1	0	4	2	0	0	0	6	7	0	0
2006	8	10	2	0	0	3	1	1	0	0	5	3	2	1
2005	3	4	0	0	0	7	3	3	0	0	5	8	1	0
2004	0	4	1	0	1	5	2	6	0	1	4	3	1	1
1994-03	14	50	13	8	4	26	15	42	0	9	36	20	22	2
Total	**56**	**126**	**31**	**14**	**10**	**99**	**42**	**132**	**5**	**31**	**116**	**78**	**55**	**4**

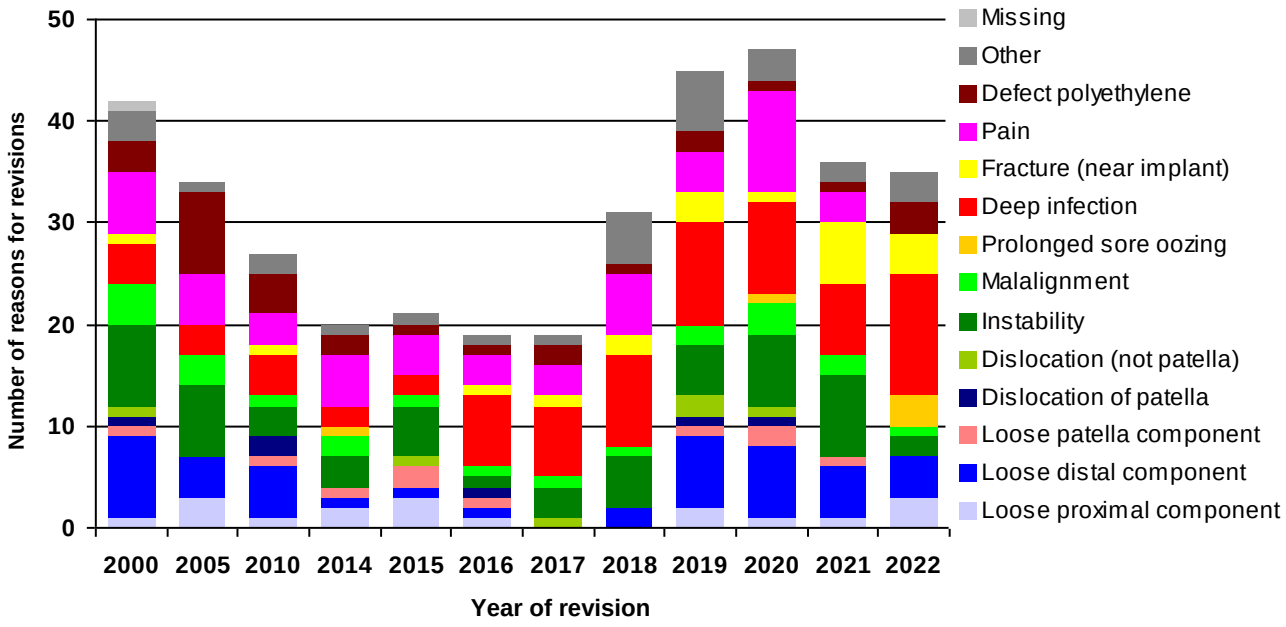
Revision causes are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

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



Reasons for revisions

Figure 18b: Reason for first revision of primary total prostheses with patellar component



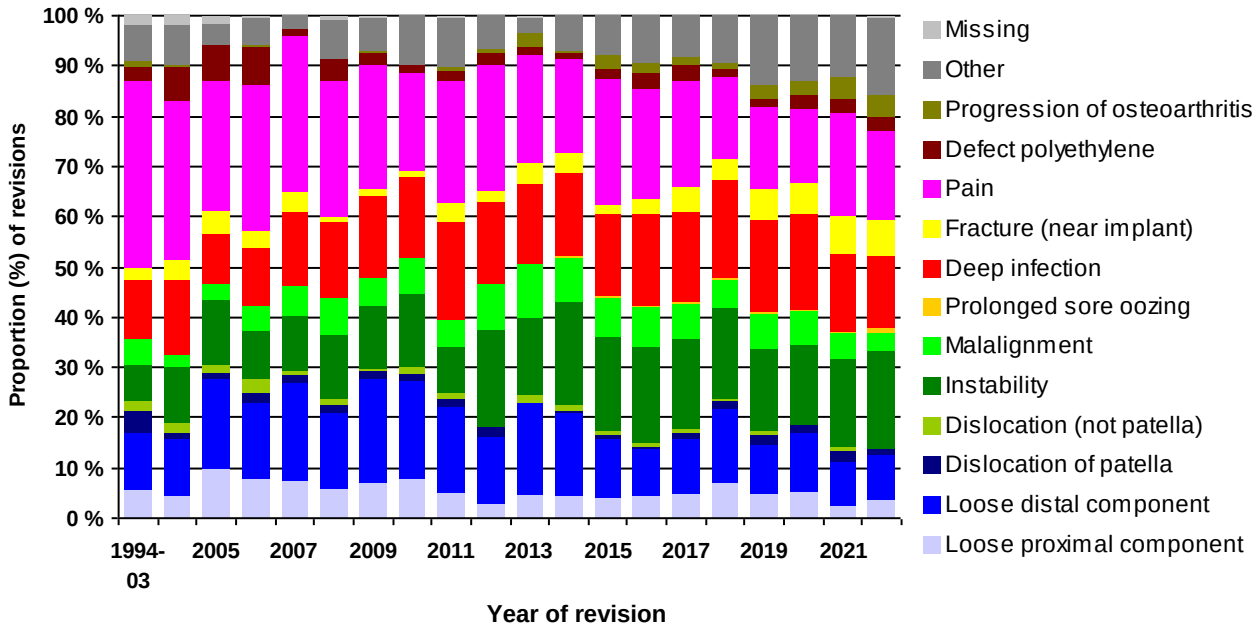
Reasons for revisions

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	Prolonged drainage	Fracture (near implant)	Fracture osteosynthesis	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2022	16	42	5	1	88	16	66	6	9	23	81	14	19	49	1
2021	12	43	13	3	89	25	78	2	15	23	105	13	23	38	0
2020	21	46	6	0	63	27	76	1	13	11	58	12	10	41	0
2019	21	42	9	3	69	32	78	1	16	11	71	7	12	48	0
2018	33	68	7	1	84	26	90	2	15	5	74	8	6	38	0
2017	20	49	6	3	79	30	77	3	20	3	92	13	8	33	0
2016	19	39	3	3	81	33	78	1	9	5	92	13	8	36	0
2015	15	47	3	3	73	30	63	2	7		97	9	10	31	0
2014	16	60	2	4	75	31	61	2	14		67	4	2	26	0
2013	15	58	1	5	49	34	51	0	14		68	6	8	11	1
2012	8	42	7	0	60	28	51	0	7		77	8	2	21	0
2011	16	54	5	3	29	17	62	0	12		76	6	3	31	1
2010	21	51	4	4	38	19	43	0	3		52	4		26	0
2009	20	60	4	2	36	16	47	0	5		71	6	1	20	1
2008	15	39	4	3	32	19	39	0	3		69	11		20	2
2007	13	33	3	1	19	10	25	0	7		53	2		5	0
2006	14	26	3	5	16	9	20	0	6		50	13	1	9	1
2005	13	23	2	2	17	4	13	0	6		34	9		6	2
2004	7	19	2	3	18	4	24	0	7		51	11	1	13	3
1994-03	31	67	26	10	42	30	69	0	14		214	16	7	42	11
Total	**346**	**908**	**115**	**59**	**1 057**	**440**	**1 111**	**20**	**202**	**81**	**1 552**	**185**	**121**	**544**	**23**

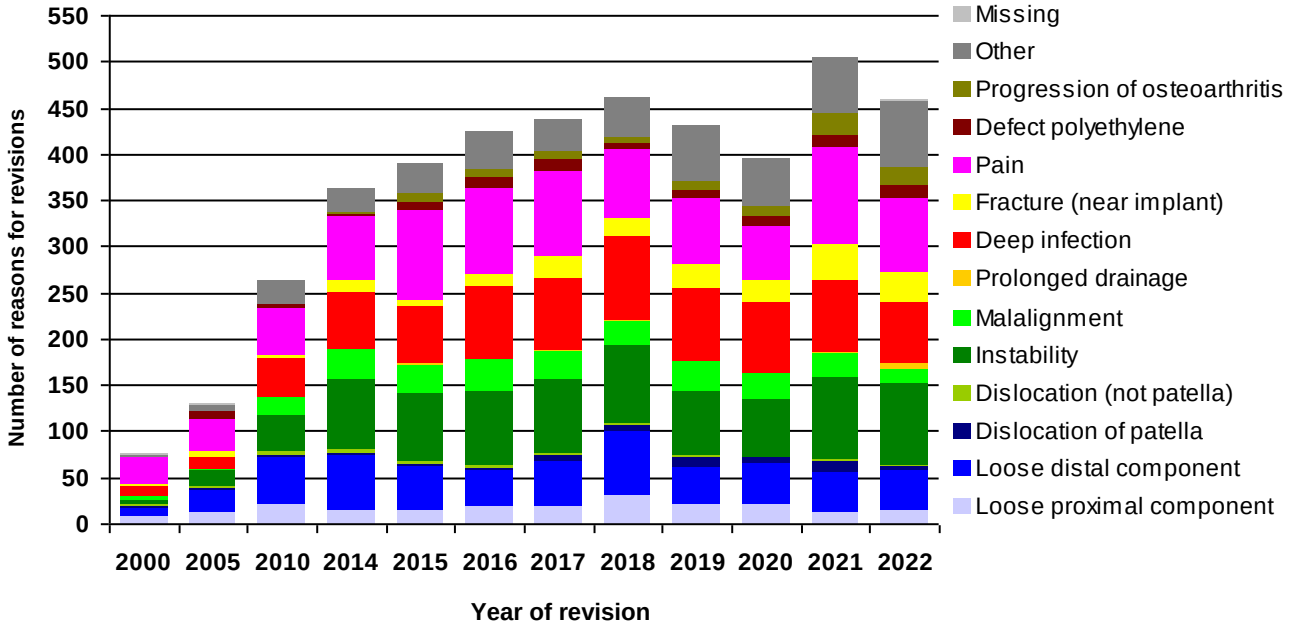
Revision causes are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

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



Reasons for revisions

Figure 19b: Reason for first revision of primary total prostheses without patellar component



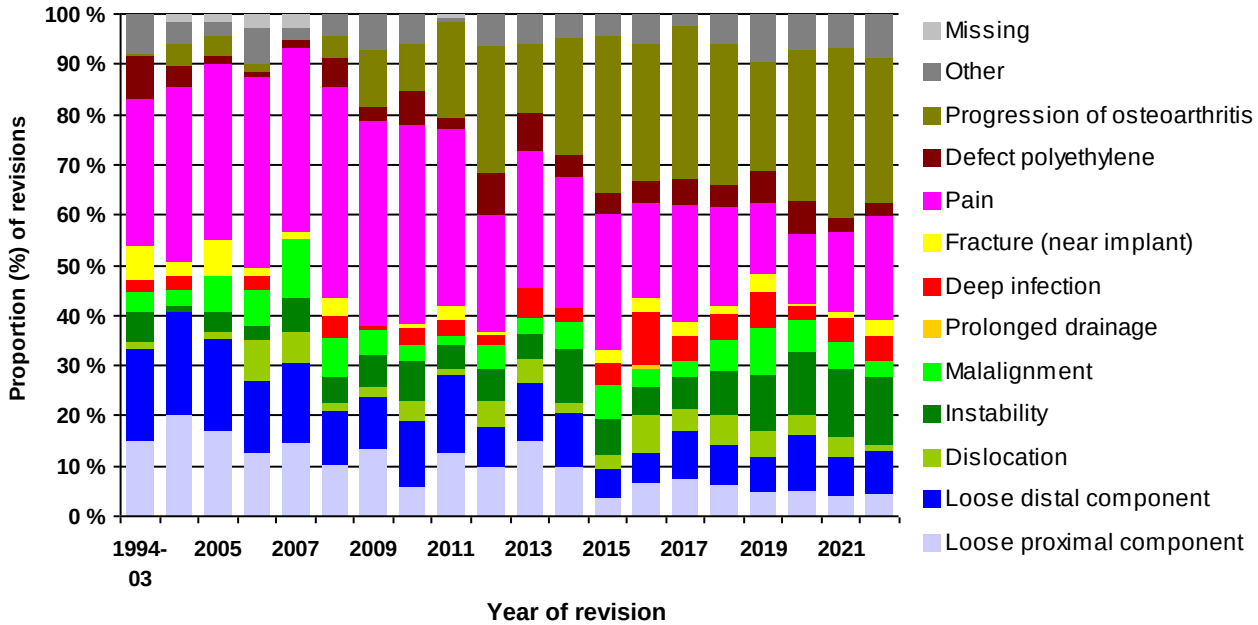
Reasons for revisions

Table 17: Reasons for revisions of primary unicondylar knee prostheses

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Prolonged drainage	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2022	8	16	2	25	6	9	0	6	38	5	53	16	0
2021	6	12	6	20	8	7	0	2	24	4	51	10	0
2020	8	17	6	19	10	4	0	1	21	10	46	11	0
2019	9	13	9	20	18	13	0	6	26	12	40	17	0
2018	12	15	11	16	12	10	0	3	37	8	53	11	0
2017	12	15	7	10	5	8	0	4	37	8	48	4	0
2016	9	8	10	7	5	14	1	4	25	6	36	8	0
2015	5	8	4	10	9	6	0	4	37	6	43	6	0
2014	14	15	3	15	8	4	0	0	37	6	33	7	0
2013	18	14	6	6	4	7	0	0	33	9	17	7	0
2012	13	10	7	8	6	3	0	1	30	11	33	8	0
2011	15	18	1	6	2	4	0	3	41	3	22	1	1
2010	7	15	5	9	4	4	0	1	46	8	11	7	0
2009	19	14	3	9	7	1	0	0	57	4	16	10	0
2008	12	12	2	6	9	5	0	4	48	7	5	5	0
2007	11	12	5	5	9	0	0	1	28	1		2	2
2006	9	10	6	2	5	2	0	1	27	1	1	5	2
2005	12	13	1	3	5	0	0	5	25	1	3	2	1
2004	14	14	0	1	2	2	0	2	24	3	3	3	1
1994-03	27	33	3	11	7	4	0	12	53	16	1	14	0
Total	**240**	**284**	**97**	**208**	**141**	**107**	**1**	**60**	**694**	**129**	**515**	**154**	**7**

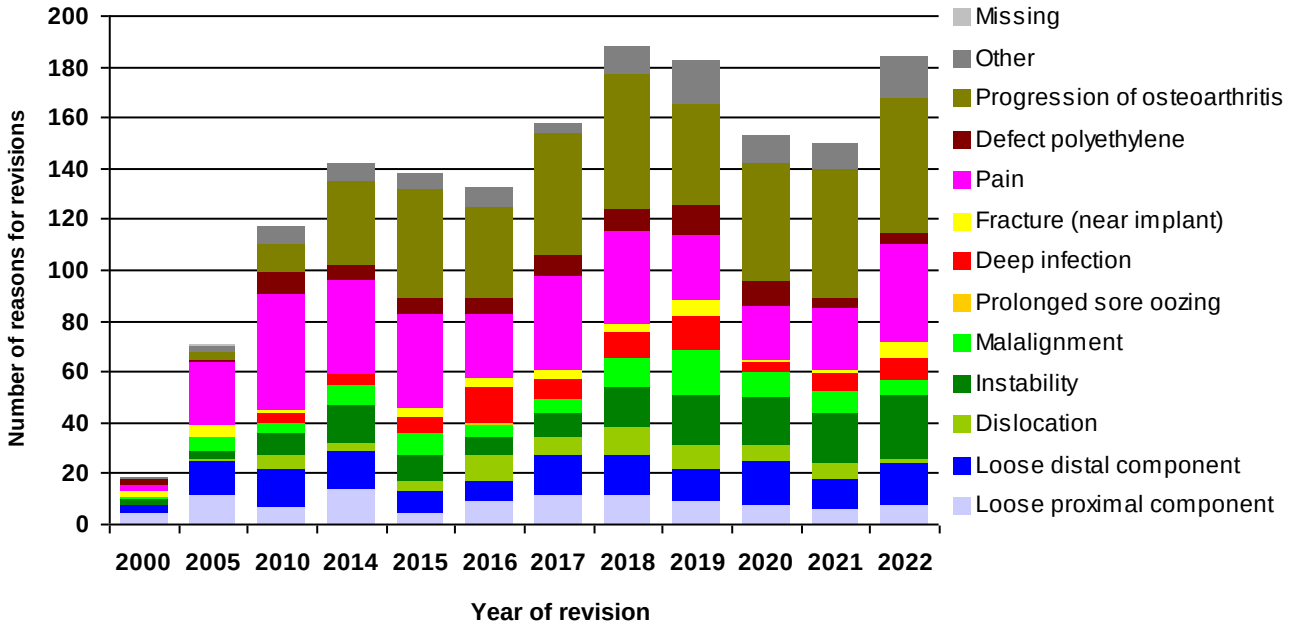
Revision causes are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

Figure 20a: Reasons for revisions of primary unicondylar knee prostheses



Reasons for revisions

Figure 20b: Reason for first revision of primary unicondylar knee prostheses

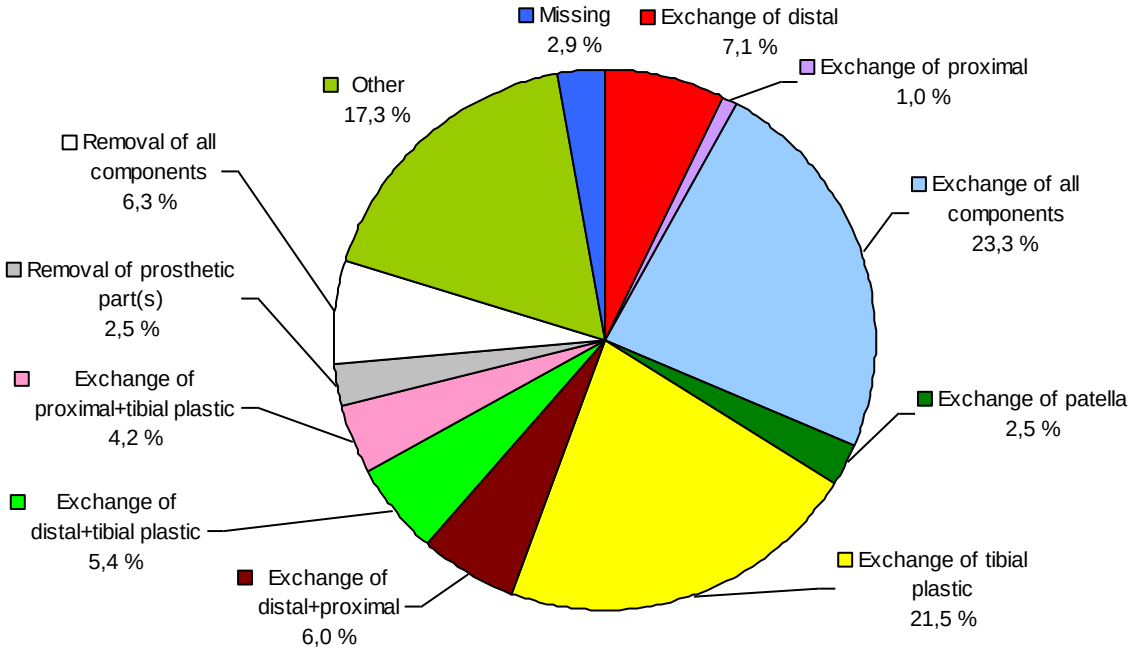


Type of revision

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
2022						7							**8**
2021				2		6					2	1	**12**
2020		1				5		1			3		**11**
2019		2		5		8		2			9		**26**
2018		5		4		6		3					**19**
2017		4		2		7		3			5	1	**22**
2016	1	1		1		8					5		**16**
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			1			1		**6**
2005		1		1	1				1		1	1	**6**
2004		1		2	1	3		1		1	2		**11**
1994-03	33	7	28	87	7	36	5	7	28	10	45	7	**302**
Total	**34**	**26**	**29**	**112**	**12**	**103**	**5**	**20**	**30**	**12**	**83**	**14**	**487**

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

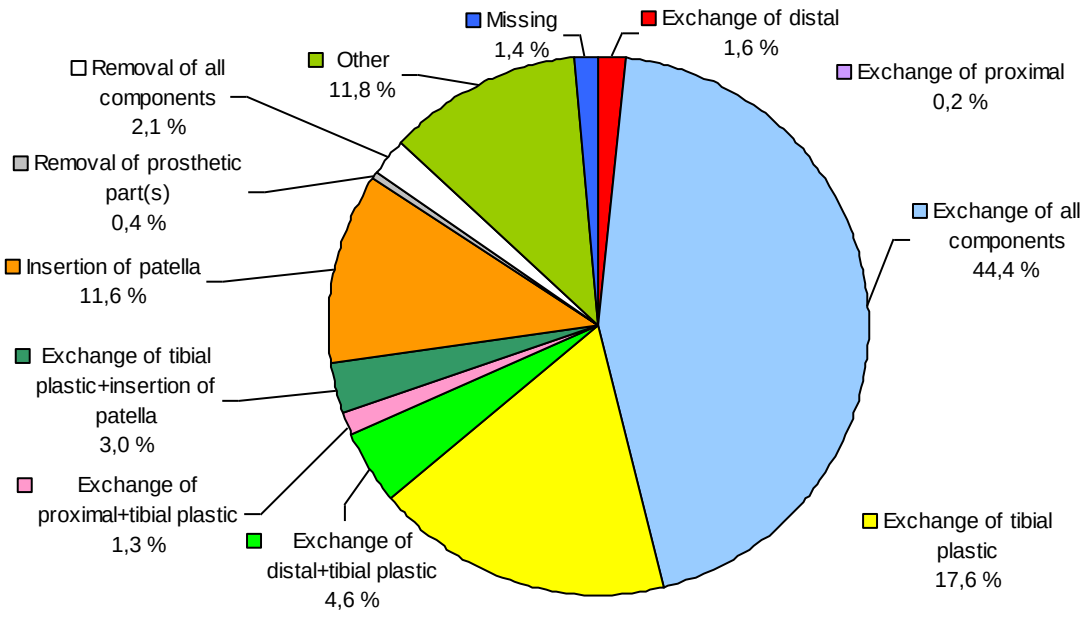


Type of revision

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
2022			4		23		3				1	16	1	**48**
2021		7	40	5	50		3			11		16	1	**133**
2020		4	34	5	41		4			28	2	26	3	**147**
2019	1	5	70	9	45		7			17	5	36		**195**
2018		8	99	6	76		6			16	7	27	2	**247**
2017		17	82	9	70	1	9			25	3	25	4	**245**
2016		9	102	13	64		2	2		9	7	56	7	**271**
2015		8	115	12	74		4			35	4	44	4	**300**
2014		15	130	18	61		1	9	1	22	3	27	4	**291**
2013	1	10	156	11	53		5	2	1	22	4	28	8	**301**
2012	1	22	183	12	52			5	1	18	6	36	6	**342**
2011	1	24	186	11	65	1	2	8		31	5	39	6	**379**
2010	2	24	174	8	47		2	5	2	37	7	26	3	**337**
2009	4	22	184	3	55		6	9	1	29	7	30	3	**353**
2008	2	21	141	9	52		2	9	2	22	4	25	2	**291**
2007	2	14	147	6	35	1	2	6	2	22	4	25	3	**269**
2006	6	11	123	5	21		3	10	1	25	7	16	1	**229**
2005	6	11	90	3	15		2	7		27	1	25		**187**
2004	9	11	84	4	30		5	9		23	2	16	3	**196**
1994-03	68	33	513	29	124	1	11	47	13	275	2	83	21	**1 220**
Total	**103**	**276**	**2 657**	**178**	**1 053**	**4**	**79**	**128**	**24**	**694**	**81**	**622**	**82**	**5 981**

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

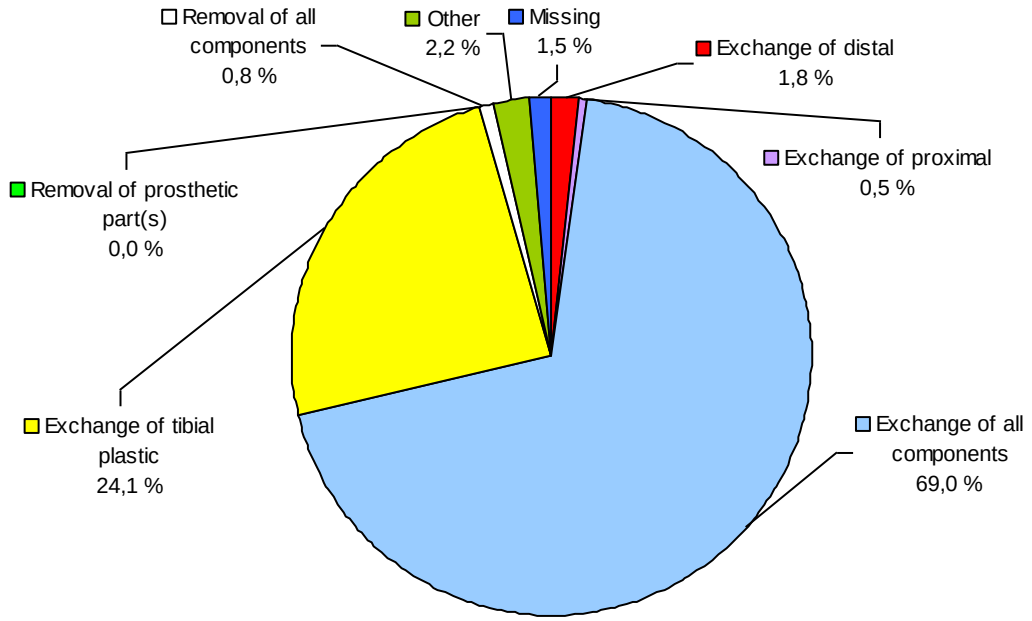


Type of revision

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
2022	1	3	8						**12**
2021		13	20						**33**
2020		16	18				1		**35**
2019	4	37	40				1		**82**
2018		41	38	1			1	1	**82**
2017	1	27	38					1	**67**
2016	1	42	30				6	1	**80**
2015	1	49	24				2	1	**77**
2014	2	50	10		1		3		**66**
2013		32	24		1		1		**58**
2012	2	51	22	1	1			1	**78**
2011	1	51	16	1			1	1	**71**
2010		69	26				4	1	**100**
2009		73	26		1		1		**101**
2008	1	74	20		2			1	**98**
2007		103	14	1	2		6	2	**128**
2006	1	90	16	1	1		5	2	**116**
2005	2	92	22				1	4	**121**
2004	1	106	16		2			2	**127**
1994-03	18	383	62	6	6	1	12	12	**500**
Total	**36**	**1 402**	**490**	**11**	**17**	**1**	**45**	**30**	**2 032**

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
2022	704	5 375	1 600	19		87	**7 785**
2021	718	5 114	1 581	11		151	**7 575**
2020	624	4 501	1 398	10		155	**6 688**
2019	720	4 811	1 520	7		198	**7 256**
2018	709	4 611	1 438	7		168	**6 933**
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	3 912	1 058	8		75	**5 640**
2013	551	3 520	896	5	1	68	**5 041**
2012	667	3 276	902	8		63	**4 916**
2011	582	3 023	873	6		65	**4 549**
2010	661	2 845	797	7		90	**4 400**
2005-09	4 048	10 445	3 368	28	2	530	**18 421**

Table 22: Revisions

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2022	25	355	231	6		13	**630**
2021	25	330	244	13		31	**643**
2020	30	320	201	12		22	**585**
2019	27	369	212	11		32	**651**
2018	39	365	224	11		27	**666**
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	0		12	**482**
2012	52	287	136	3		15	**493**
2011	54	249	119	0		9	**431**
2010	77	199	121	1		13	**411**
2005-09	386	745	401	7		85	**1 624**

Figure 24: Primary operations

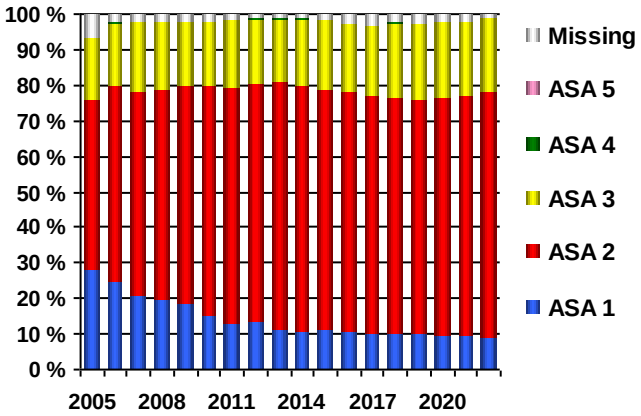
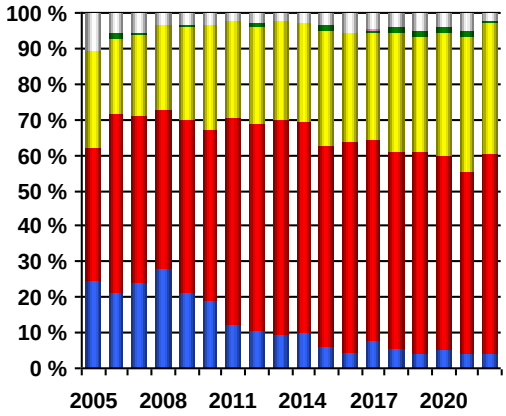


Figure 25: Revisions



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
2022	315	6 905	415	87	63	**7 785**
2021	398	6 361	667	81	68	**7 575**
2020	391	5 608	563	67	59	**6 688**
2019	407	5 892	805	101	51	**7 256**
2018	712	5 309	834	48	30	**6 933**
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	4 013	763	25	28	**5 640**
2013	909	3 352	716	10	54	**5 041**
2012	1 131	2 879	871	7	28	**4 916**
2011	1 271	2 289	952	8	29	**4 549**
2010	1 412	2 408	533	8	39	**4 400**
2005-09	8 962	6 539	2 584	50	286	**18 421**

Table 24: Revisions

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2022	71	490	36	21	12	**630**
2021	78	492	45	16	12	**643**
2020	62	453	43	18	9	**585**
2019	74	478	70	23	6	**651**
2018	83	488	77	11	7	**666**
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**
2005-09	622	642	292	22	46	**1 624**

* Missing information on medication start

Figure 26: Primary operations

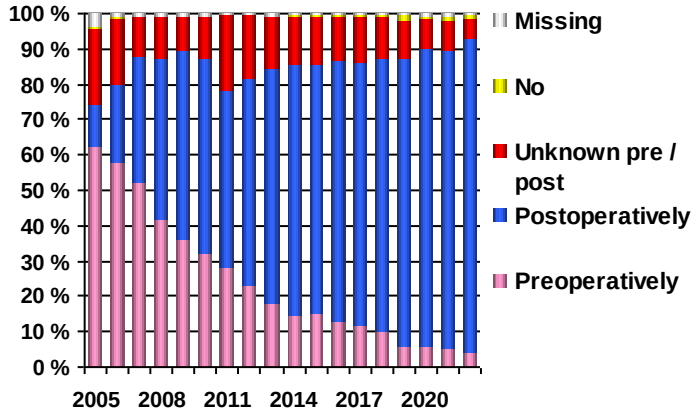
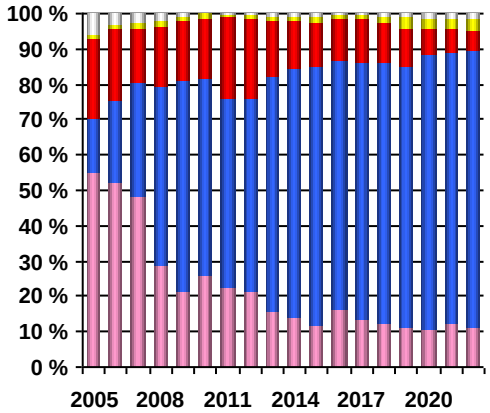


Figure 27: Revisions



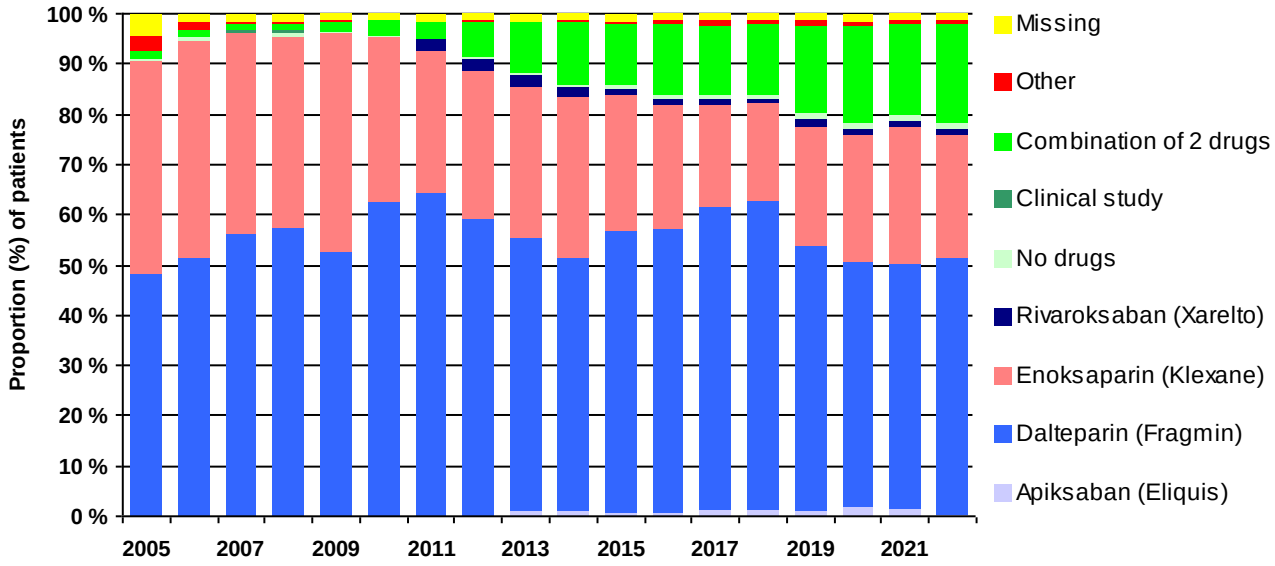
Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 25a: Drugs - All operations

Drugs	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)	0,0%		0,3%	0,4%	0,6%	0,9%	1,0%	1,0%	1,0%	0,9%	1,0%
Apiksaban (Eliquis)		1,2%	1,1%	0,9%	1,0%	1,1%	1,3%	1,1%	1,9%	1,7%	0,6%
Dalteparin (Fragmin)	57,1%	54,1%	50,3%	56,2%	56,5%	60,6%	61,5%	52,7%	48,8%	48,4%	50,7%
Enoksaparin (Klexane)	36,4%	29,9%	32,1%	26,8%	24,4%	20,2%	19,2%	23,7%	25,1%	27,1%	24,5%
Rivaroksaban (Xarelto)	0,7%	2,4%	1,8%	1,4%	1,1%	1,1%	1,1%	1,3%	1,2%	1,4%	1,3%
Ximelagatran (Exanta, Malagatran)	0,4%										
No drugs	0,3%	0,3%	0,5%	0,6%	0,9%	0,8%	0,8%	1,6%	1,2%	1,2%	1,3%
Clinical study	0,2%										
Combination of 2 drugs	2,9%	10,2%	12,5%	12,3%	14,2%	13,9%	13,9%	17,3%	19,4%	17,9%	19,5%
Other	0,2%	0,2%	0,2%	0,1%	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%	0,1%
Missing	1,7%	1,6%	1,2%	1,5%	1,2%	1,3%	1,1%	1,3%	1,4%	1,2%	1,0%
Total	**35 245**	**5 523**	**6 139**	**6 676**	**7 118**	**7 212**	**7 599**	**7 907**	**7 273**	**8 218**	**8 415**

Figure 28: Drugs



Thrombosis prophylaxis

Tablle 25b: Combination of 2 drugs - All operations

Drugs	2005-12	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Enoxaparin + Apixaban	8,0%	29,4%	27,3%	27,6%	33,8%	33,5%	26,6%	49,1%	48,2%	50,0%	37,2%
Enoxaparin + Acetylsalicylsyre	35,9%	21,6%	19,3%	18,3%	17,8%	15,8%	14,4%	16,3%	16,5%	13,8%	17,8%
Dalteparin + Apixaban	1,1%	16,6%	17,8%	17,4%	21,3%	29,8%	28,5%	12,4%	12,8%	14,6%	26,0%
Dalteparin + Dabigatranetixalat	14,9%	25,7%	22,0%	22,4%	14,3%	3,7%	2,2%	0,1%		0,1%	
Dalteparin + Rivaroxaban	1,3%	0,2%	0,9%	3,2%	2,6%	4,4%	1,6%	6,9%	10,0%	14,0%	15,2%
Dalteparin + Acetylsalicylsyre	5,0%	1,4%	1,2%			4,4%	15,2%	11,5%	10,5%	5,2%	1,1%
Enoxaparin + Rivaroxaban	0,5%	1,1%	7,6%	7,3%	7,3%	6,8%	8,0%	2,0%	0,1%	0,1%	0,1%
Dalteparin + Warfarin	18,0%	1,8%	1,2%	1,0%	0,7%	0,1%	0,2%	0,1%		0,1%	0,1%
Enoxaparin + Dabigatranetixalat		0,5%	1,3%	1,7%	1,5%	1,3%	3,0%	1,4%	1,8%	2,1%	2,2%
Enoxaparin + Warfarin	7,5%	1,4%	1,0%	0,9%	0,4%	0,1%	0,1%			0,1%	
Enoxaparin + Dextran	5,1%										
Dalteparin + Enoxaparin	0,8%	0,4%								0,1%	0,1%
Dalteparin + Dextran	0,6%										
Dalteparin + Clopidogrel	0,2%			0,1%	0,1%						
Enoxaparin + Clopidogrel	0,3%				0,1%						
Enoxaparin + Acetylsalicylsyre and dipyridamol	0,2%		0,1%								
Acetylsalicylsyre + Clopidogrel								0,1%			
Acetylsalicylsyre + Missing/Unknown											0,1%
Acetylsalicylsyre + Ticagrelor			0,1%								
Acetylsalicylsyre and dipyridamol						0,1%					
Apixaban + Missing/Unknown											0,1%
Dalteparin + Clinical study	0,1%										
Dalteparin + Fondaparinux	0,1%										
Dalteparin + Heparin	0,1%										
Dalteparin + Missing/Unknown											0,1%
Dalteparin + Prasugrel	0,1%										
Dalteparin + Ximelagatran				0,1%							
Dextran + Apixaban			0,1%								
Dextran + Clopidogrel	0,1%										
Enoxaparin + Dipyridamol											0,1%
Enoxaparin + Heparin								0,1%			
Enoxaparin + Hydroxyethylstivelse							0,1%				
Enoxaparin + Ximelagatran	0,1%										
Fondaparinux + Rivaroxaban					0,1%						
Warfarin + Fondaparinux	0,1%										
Ximelagatran + Pyrazolidon	0,1%										
Total	**1 023**	**565**	**765**	**821**	**1 008**	**1 002**	**1 059**	**1 368**	**1 414**	**1 475**	**1 647**

Thrombosis prophylaxis

Table 26: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2022	2 454	3 991	129	13	456	16	108	1 248	**8 415**
2021	1 953	3 571	178	9	385	13	97	2 012	**8 218**
2020	2 255	3 156	235	11	572	5	85	954	**7 273**
2019	2 198	3 320	394	29	692	9	124	1 141	**7 907**
2018	1 690	3 210	442	142	803	5	59	1 248	**7 599**
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	1 797	1 024	370	1 065	153	32	723	**6 139**
2013	733	1 595	1 005	398	1 002	120	16	654	**5 523**
2012	584	1 633	1 205	335	890	96	13	653	**5 409**
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**
2005-09	2 299	6 322	3 991	743	3 333	125	72	3 160	**20 045**

Registration of thrombosis prophylaxis started in 2005

Fibrinolysis Inhibitor

Table 27: Drugs - Primary operations

Drugs	2010-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Cyclokapron (Tranexamic acid)	8 829	4 728	5 324	5 755	5 819	6 191	6 720	6 279	7 133	7 404	64 182
Missing	311	114	72	63	84	72	66	68	66	52	968
Total	**9 140**	**4 842**	**5 396**	**5 818**	**5 903**	**6 263**	**6 786**	**6 347**	**7 199**	**7 456**	**65 150**

Registration of fibrinolysis inhibitor started in 2010

Perioperative complications

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

Type	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Patella tendon rupture / Avulsion fractures / ligament rupture / tendon injury	103	21	17	15	6	11	19	17	8	4	221
Fracture	126	8	12	12	10	7	8	7	16	6	212
Rupture / damage MCL (medial colateral ligament)	51	5	5	10	19	18	22	20	15	7	172
Technical problem with cement	52	5	4		1	5	3	2	4		76
Adm. failure (missing comp. etc.)	37	2		4	3	7	3	1		1	58
Problem due to difficult anatomy	29	5	5	3	2	4	5		3	2	58
Blood torniquet failing	46		1			1	1	6			55
Failure of instruments	41	7	1	1		1					51
Anesthesia problems	26	7	4	1	3	3			3		47
Bleeding (Unusually large)	17	1	4	1	2	2	1	2	3	5	38
Other periop. compl.	229	33	36	26	20	21	23	17	25	10	440

Previous operation in relevant joint

Table 29: For primary total prostheses

Type	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Meniscus	5 627	769	757	882	737	764	703	635	786	862	12 522
Osteotomy	2 177	134	119	137	111	108	151	113	139	123	3 312
Arthroscopy (diagnostic)	1 163	183	205	194	166	149	93	75	77	83	2 388
Cruciate Ligament	696	104	125	188	119	143	144	148	168	193	2 028
Osteosynthesis of intraarticular joint fracture	1 031	95	94	98	114	107	109	86	91	88	1 913
Synovectomy	1 199	66	66	41	51	41	32	33	32	41	1 602
Artrodesis	27			2	1	1			2		33
Other previous op.	909	89	78	86	120	146	123	125	160	194	2 030

Mini-invasive surgery

Table 30: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2022	4 (0%)	6 129 (94%)	382 (6%)	**6 515**
2021	18 (0%)	5 109 (79%)	1 316 (20%)	**6 443**
2020	8 (0%)	5 321 (92%)	429 (7%)	**5 758**
2019	8 (0%)	5 715 (93%)	452 (7%)	**6 175**
2018	14 (0%)	5 351 (92%)	477 (8%)	**5 842**
2017	9 (0%)	5 038 (90%)	563 (10%)	**5 610**
2016	10 (0%)	4 964 (89%)	576 (10%)	**5 550**
2015	5 (0%)	4 632 (87%)	657 (12%)	**5 294**
2014	2 (0%)	4 324 (87%)	647 (13%)	**4 973**
2013	10 (0%)	3 791 (84%)	716 (16%)	**4 517**
2012	16 (0%)	3 688 (84%)	685 (16%)	**4 389**
2011	15 (0%)	3 582 (88%)	465 (11%)	**4 062**
2010	21 (1%)	3 739 (95%)	185 (5%)	**3 945**
2005-09	70 (0%)	15 169 (94%)	864 (5%)	**16 103**

Figure 29: Primary operations - Total knee prostheses

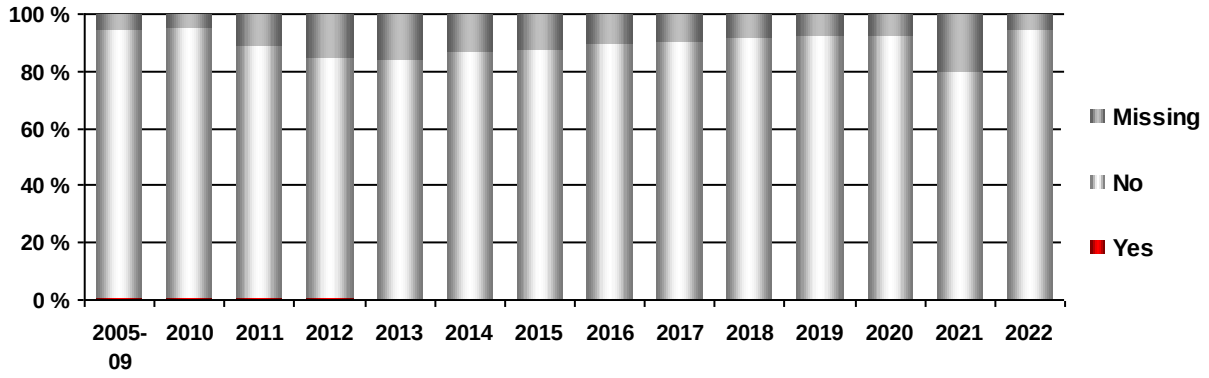


Table 31: Primary operations - Unicondylar knee prostheses

Year	Yes	No	Missing	Total
2022	436 (39%)	641 (57%)	54 (5%)	**1 131**
2021	393 (39%)	467 (47%)	141 (14%)	**1 001**
2020	320 (38%)	493 (59%)	27 (3%)	**840**
2019	358 (36%)	575 (58%)	62 (6%)	**995**
2018	409 (41%)	556 (56%)	36 (4%)	**1 001**
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	240 (40%)	280 (46%)	85 (14%)	**605**
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**
2005-09	961 (43%)	1 184 (53%)	79 (4%)	**2 224**

Registration of MIS started in 2005

Computer navigation

Table 32: Primary operations - Total knee prostheses

Year	Yes		No		Missing		Total
2022	500	(8%)	5 729	(88%)	286	(4%)	**6 515**
2021	543	(8%)	5 514	(86%)	386	(6%)	**6 443**
2020	503	(9%)	4 839	(84%)	416	(7%)	**5 758**
2019	514	(8%)	5 227	(85%)	434	(7%)	**6 175**
2018	597	(10%)	4 793	(82%)	452	(8%)	**5 842**
2017	569	(10%)	4 523	(81%)	518	(9%)	**5 610**
2016	584	(11%)	4 413	(80%)	553	(10%)	**5 550**
2015	475	(9%)	4 167	(79%)	652	(12%)	**5 294**
2014	443	(9%)	3 882	(78%)	648	(13%)	**4 973**
2013	390	(9%)	3 404	(75%)	723	(16%)	**4 517**
2012	416	(9%)	3 291	(75%)	682	(16%)	**4 389**
2011	445	(11%)	3 170	(78%)	447	(11%)	**4 062**
2010	659	(17%)	3 101	(79%)	185	(5%)	**3 945**
2005-09	2 317	(14%)	12 982	(81%)	804	(5%)	**16 103**

Figure 30: Primary operations - Total knee prostheses

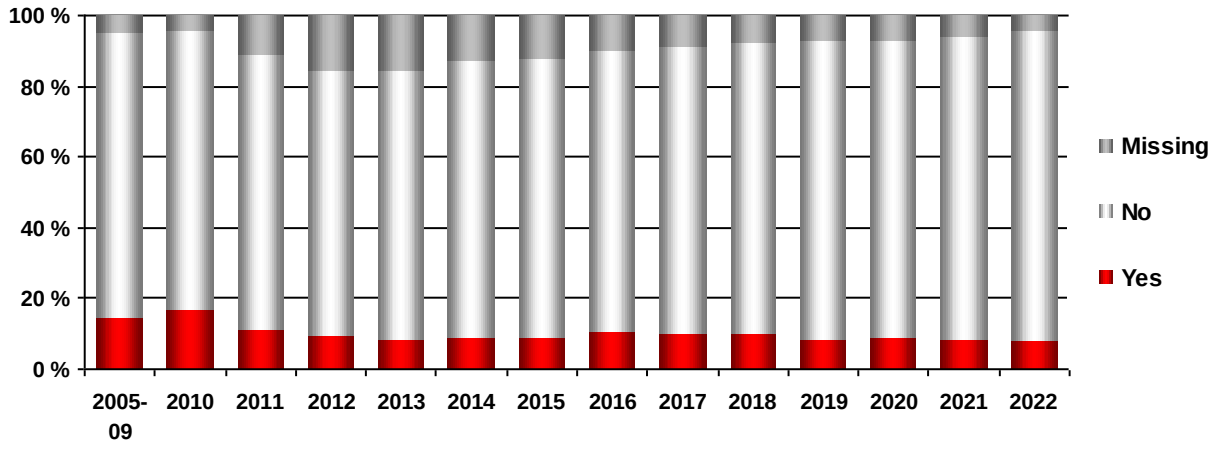


Table 33: Primary operations - Unicondylar knee prostheses

Year	Yes		No		Missing		Total
2022	3	(0%)	1 085	(96%)	43	(4%)	**1 131**
2021	3	(0%)	963	(96%)	35	(3%)	**1 001**
2020	3	(0%)	811	(97%)	26	(3%)	**840**
2019	0		930	(93%)	65	(7%)	**995**
2018	1	(0%)	962	(96%)	38	(4%)	**1 001**
2017	0		810	(93%)	58	(7%)	**868**
2016	0		800	(93%)	63	(7%)	**863**
2015	4	(1%)	681	(90%)	68	(9%)	**753**
2014	0		518	(86%)	87	(14%)	**605**
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**
2005-09	39	(2%)	2 099	(94%)	86	(4%)	**2 224**

Registration of CAOS started in 2005

Cements used in total knee prostheses

Table 34: Primary operations - Femur

Cement	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Palacos R + G	11 517	1 442	1 477	1 428	1 005	957	633	362	336	251	**19 408**
Palacos R+G pro			5	15	360	1 537	2 923	3 181	3 683	3 802	**15 506**
Optipac Refobacin Bonecement R	5 908	1 727	2 150	1 835	1 455	1 475	483				**15 033**
Palacos w/gentamicin	14 673										**14 673**
Refobacin Bone Cement R	5 157	353	158	551	882	49	1				**7 151**
SmartSet GHV Genta. Smartmix	470	268	291	275	246	214	242	299	196		**2 501**
Cemex w/gentamicin	1 382	209	160	149	92	43	24	4	1		**2 064**
Refobacin-Palacos	1 571										**1 571**
Optipac Refobacin Bonecement R-3						2	259	373	248	238	**1 120**
Simplex w/Tobramycin	674										**674**
Palacos R									190	455	**645**
Palacos	424										**424**
Cemex System Genta FAST	202										**202**
Simplex	183										**183**
CMW I w/gentamicin	169										**169**
Bone Cement R-3									46	88	**134**
Copal G + V	2	5	5	2	11	6	6	4	12	15	**68**
CMW I	53										**53**
Other (n<50)	145	1	2	2	10	9	8	17	6	7	**207**
Missing information	63										**63**
Total	**42 593**	**4 005**	**4 248**	**4 257**	**4 061**	**4 292**	**4 579**	**4 240**	**4 718**	**4 856**	**81 849**

Table 35: Primary operations - Tibia

Cement	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Palacos R + G	15 843	2 187	2 225	2 249	1 147	1 096	730	407	391	254	**26 529**
Palacos R+G pro	1	1	5	40	1 132	2 318	4 006	4 146	4 694	4 898	**21 241**
Palacos w/gentamicin	17 805										**17 805**
Optipac Refobacin Bonecement R	6 435	1 912	2 324	1 969	1 525	1 562	480				**16 207**
Refobacin Bone Cement R	5 565	374	171	567	931	47					**7 655**
SmartSet GHV Genta. Smartmix	479	269	293	277	246	214	242	300	198		**2 518**
Cemex w/gentamicin	1 515	222	165	150	91	43	24	4	1		**2 215**
Refobacin-Palacos	1 627										**1 627**
Optipac Refobacin Bonecement R-3						2	272	362	240	232	**1 108**
Simplex w/Tobramycin	679										**679**
Palacos R									191	455	**646**
Palacos	452										**452**
Cemex System Genta FAST	283										**283**
CMW I w/gentamicin	194										**194**
Simplex	186										**186**
Bone Cement R-3									46	88	**134**
Copal G + V	5	4	10	3	13	6	7	4	26	37	**115**
CMW I	54										**54**
Other (n<50)	165	2	2	2	17	11	10	17	8	27	**261**
Missing information	69	1									**70**
Total	**51 357**	**4 972**	**5 195**	**5 257**	**5 102**	**5 299**	**5 771**	**5 240**	**5 795**	**5 991**	**99 979**

Cements used in unicondylar knee prostheses

Table 36: Primary operations - Femur

Cement	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Palacos R + G	1 849	389	428	364	169	131	172	127	148	121	**3 898**
Palacos w/gentamicin	2 211										**2 211**
Palacos R+G pro		1		6	110	214	321	413	472	566	**2 103**
Optipac Refobacin Bonecement R	723	171	228	222	176	250	62				**1 832**
Refobacin Bone Cement R	797	26	25	81	111						**1 040**
Refobacin-Palacos	269										**269**
Optipac Refobacin Bonecement R-3							57	99	54	47	**257**
Simplex w/Tobramycin	221	2									**223**
Cemex w/gentamicin	63										**63**
Cemex System Genta FAST	63										**63**
SmartSet GHV	27	6	9	2	1	6	1				**52**
Simplex	40										**40**
Other (n<20)	70	3	2	1	2		1		1	1	**81**
Total	**6 333**	**598**	**692**	**676**	**569**	**601**	**614**	**639**	**675**	**735**	**12 132**

Table 37: Primary operations - Tibia

Cement	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Palacos R + G	1 860	390	427	366	170	130	172	127	148	121	**3 911**
Palacos w/gentamicin	2 205										**2 205**
Palacos R+G pro		1		6	108	214	331	410	475	565	**2 110**
Optipac Refobacin Bonecement R	718	170	228	223	175	250	62				**1 826**
Refobacin Bone Cement R	787	26	25	81	109						**1 028**
Refobacin-Palacos	266										**266**
Optipac Refobacin Bonecement R-3							57	99	54	47	**257**
Simplex w/Tobramycin	216	2									**218**
Cemex w/gentamicin	63										**63**
Cemex System Genta FAST	62										**62**
SmartSet GHV	27	6	9	2	1	6	1				**52**
Simplex	39										**39**
Other (n<20)	65	3	2	1	2		1		1	1	**76**
Total	**6 308**	**598**	**691**	**679**	**565**	**600**	**624**	**636**	**678**	**734**	**12 113**

Antibiotic prophylaxis

Table 38: Primary operations

Drugs	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Cefalotin (Keflin)	45 532	4 893	5 229	5 640	5 642	4 722	605	468	969	1 226	**74 926**
Cefazolin (Cephazolin)	39	1			339	1 670	5 919	5 747	6 182	6 130	**26 027**
Klindamycin (Dalacin, Clindamycin)	1 355	281	316	341	346	405	365	302	332	360	**4 403**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	3 945	14		1			74	1		1	**4 036**
Kloksacillin (Ekvacillin)	2 041	134	208	23	1	1	200	109	18		**2 735**
Dikloksacillin (Diclocil, Dicillin)	1 675	8	1	3	1	1			1		**1 690**
Imipenem (Tienam)	51										**51**
Cefaleksin (Keflex, Cefalexin)	20	1					5				**26**
Benzylpenicillin (Penicillin G)	19	1									**20**
Erytromycin (Ery-max, Abboticin)	17										**17**
Vankomycin (Vancomycin, Vancocin)	6		1		3		3	1	1	2	**17**
Cefotaksim (Claforan)	2			1	2			4	3		**12**
Ciprofloksasin (Ciproxin)	8			2							**10**
Combination of 2 drugs	1 962	248	312	462	223	107	57	26	32	41	**3 470**
Other (n<10)	22	2	3	5	1			2	1	1	**37**
Missing	373	57	50	36	23	27	28	28	36	24	**682**
Total	**57 067**	**5 640**	**6 120**	**6 514**	**6 581**	**6 933**	**7 256**	**6 688**	**7 575**	**7 785**	**118 159**

Table 39: Revisions

Drugs	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Cefalotin (Keflin)	3 334	290	322	356	355	277	20	28	49	76	**5 107**
Cefazolin (Cephazolin)	1				25	158	380	341	379	362	**1 646**
Klindamycin (Dalacin, Clindamycin)	216	27	25	27	27	35	42	22	39	33	**493**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	325	1	1	1		1	4	1			**334**
Kloksacillin (Ekvacillin)	137	21	19	15	9	15	24	20	22	13	**295**
Dikloksacillin (Diclocil, Dicillin)	215	3	6	5	4	9	2		4	1	**249**
Vankomycin (Vancomycin, Vancocin)	120	19	8	14	10	8	7	11	7	5	**209**
Benzylpenicillin (Penicillin G)	34	2	4	4	7	5	4	6	1	5	**72**
Cefotaksim (Claforan)	2	1	2		3	2	1	1	4	4	**20**
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	13				1	1	1	1		1	**18**
Ciprofloksasin (Ciproxin)	8	1		1	1			2		1	**14**
Combination of 2 drugs	661	123	158	139	150	104	111	96	90	73	**1 705**
Annet - MRS (Annet - MRS)									1	1	**2**
Other (n<10)	21	3	4	1	1	2	3	1	1		**37**
Missing	183	8	7	41	38	49	52	55	46	55	**534**
Total	**5 270**	**499**	**556**	**604**	**631**	**666**	**651**	**585**	**643**	**630**	**10 735**

Patient specific instruments

Table 40:

Year	Yes	No	Missing	Total
2022	2	7 760	653	**8 415**
2021	4	7 453	761	**8 218**
2020	6	6 671	596	**7 273**
2019	5	7 222	680	**7 907**
2018	6	6 858	735	**7 599**
2017	1	6 313	898	**7 212**
2016	5	6 204	909	**7 118**
2015	14	5 434	1 228	**6 676**
2014	21	4 802	1 316	**6 139**
2013	25	4 032	1 466	**5 523**
2012	87	3 686	1 636	**5 409**
2011	64	1 438	3 478	**4 980**

Registration started in 2011

Drain

Table 41:

Year	Yes	No	Missing	Total
2022	207	7 993	215	**8 415**
2021	296	7 619	303	**8 218**
2020	531	6 341	401	**7 273**
2019	698	6 602	607	**7 907**
2018	1 010	5 830	759	**7 599**
2017	1 338	4 950	924	**7 212**
2016	1 632	4 613	873	**7 118**
2015	1 843	4 170	663	**6 676**
2014	1 876	3 478	785	**6 139**
2013	1 708	2 922	893	**5 523**
2012	1 850	2 505	1 054	**5 409**
2011	928	951	3 101	**4 980**

Registration started in 2011

Table 42: Torniquet

Year	Yes	No	Mean Time (min) *	Missing	Total
2022	4 491	3 029	65	50	7 570
2021	3 844	2 384	67	42	6 270
2020	3 855	2 446	70	34	6 335
2019	4 075	2 145	69	93	6 313
2018	1 900	710	70	99	2 709
Total	**18 165**	**10 714**	**68**	**318**	**29 197**

Registration started in 2018. There are 318 forms are missing registration

* Mean duration of torniquet time

Table 43a: Weight and height for primary

Year	Mean weight (kg)	Mean height (cm)	Weight missing (total)	Height missing (total)	Total
2022	86,9	171,9	243	245	3 637
2021	85,8	171,0	69	71	1 379
2020	87,0	168,3	0	0	6

Reported by surgeon. Electronic reporting started during 2020.

* Mean for these patients where weight or height is given

Table 43b: Classification of BMI

Year	1		2		3		4		5		6		Total
2022	8	(0,2%)	472	(13,9%)	1 365	(40,2%)	1 056	(31,1%)	387	(11,4%)	104	(3,1%)	**3 392**
2021	4	(0,3%)	204	(15,6%)	534	(40,9%)	378	(28,9%)	142	(10,9%)	45	(3,4%)	**1 307**
2020	0		1	(16,7%)	1	(16,7%)	2	(33,3%)	2	(33,3%)	0	(0,0%)	**6**

WHO's classification of BMI (body mass index)
1 - Less than 18.5 is underweight
2 - 18.5 - 24 is normal weight
3 - 25 - 29 is overweight
4 - 30 - 34 is obesity degree 1
5 - 35 - 39 is obesity degree 2
6 - 40 and over is obesity degree 3

Table 44: Ahlbäck's grading of osteoarthritis grade 1-5 for all primary prostheses

Year	GRADE1	GRADE2	GRADE3	GRADE4	GRADE5	Missing	Total
2022	421	877	1 355	745	80	159	**3 637**
2021	216	334	447	208	30	144	**1 379**
2020	2	2	1	1	0	0	**6**
Total	**639**	**1 213**	**1 803**	**954**	**110**	**303**	**5 022**

Electronic registration started during 2020

Table 45: Joint space in mm for all primary prostheses

Year	0	1	2	3	4	5	6	7	10	Missing	Total
2022	2 365	520	300	84	30	9	1	1		0	**3 310**
2021	751	199	146	54	21	10	2	1	1	0	**1 185**
2020	1	3	2							0	**6**
Total	**3 117**	**722**	**448**	**138**	**51**	**19**	**3**	**2**	**1**	**0**	**4 501**

Electronic registration started during 2020

Table 46: Robot-assisted surgery for all primary prostheses

	Robot assisted		Robot type			
Year	No	Yes	NAVIO	CORI	Missing	Total
2022	3 259	107	99	8	271	**3 637**
2021	1 171	53	53		155	**1 379**
2020	6	0			0	**6**
Total	**4 436**	**160**	**152**	**8**	**426**	**5 022**

Electronic registration started during 2020

Table 47: Surgical approach for all primary prostheses

Year	Parapatellar medially	Parapatellar laterally	Subvastus	Other	Missing	Total
2022	3 584	27	1	13	12	**3 637**
2021	1 272	6	3	1	97	**1 379**
2020	6	0	0	0	0	**6**
Total	**4 862**	**33**	**4**	**14**	**109**	**5 022**

Electronic registration started during 2020

Table 48: Anesthesia for all primary prostheses

Year	General	Epidural	Spinal	Other	Missing	Total
2022	470	42	2 546	2	577	**3 637**
2021	133	15	1 079	0	152	**1 379**
2020	1	0	5	0	0	**6**
Total	**604**	**57**	**3 630**	**2**	**729**	**5 022**

Electronic registration started during 2020

Table 49: Local infiltration anesthesia for all primary prostheses

Year	Yes	No	Missing	Total
2022	3 059	555	23	**3 637**
2021	1 063	234	82	**1 379**
2020	5	1	0	**6**
Total	**4 127**	**790**	**105**	**5 022**

Electronic registration started during 2020

Table 50: Peripheral nerve block primary

Year	Yes	No	Missing	Total
2022	1 238	2 138	261	**3 376**
2021	417	814	148	**1 231**
2020	4	2	0	**6**
Total	**1 659**	**2 954**	**409**	**5 022**

Electronic registration started during 2020

Closure of primary knee prostheses

Table 51: Skin closed for all primary prostheses

Yeas	Extension	Flexion	Both extended and flexed	Other	Missing	Total
2022	171	3 237	140	49	40	**3 637**
2021	106	1 139	2	31	101	**1 379**
2020	1	5	0	0	0	**6**
Total	**278**	**4 381**	**142**	**80**	**141**	**5 022**

Electronic registration started during 2020

Table 52: Suture technique

Year	Continuous skin suture	Single skin suture	Intracutaneous skin suture	Clips	Glue	Other	Total
2022	1 137	57	166	2 291	78	2	**3 603**
2021	285	18	23	1 074	9	7	**1 368**
2020	3	0	0	3	0	0	**6**
Total	**1 425**	**75**	**189**	**189**	**189**	**9**	**4 977**

Electronic registration started during 2020

Bone loss according to Anderson classification *

Table 53: Femur Classification

Year	Type 1	Type 2A	Type 2B	Type 3	Total
2022	7 (50,0%)	3 (21,43%)	1 (7,1%)	3 (21,4%)	**14**
2021	4 (50,0%)	1 (12,50%)	3 (37,5%)	0	**8**
Total	**11 (50,0%)**	**4 (18,18%)**	**4 (18,2%)**	**3 (13,6%)**	**22**

Electronic registration started during 2021. Registered classified 22

Tablle 54: Tibia Classification

Year	Type 1	Type 2A	Type 2B	Type 3	Total
2022	5 (35,7%)	6 (42,86%)	3 (21,4%)	0	**14**
2021	3 (33,3%)	3 (33,33%)	1 (11,1%)	2 (22,2%)	**9**
Total	**8 (34,8%)**	**9 (39,13%)**	**4 (17,4%)**	**2 (8,7%)**	**23**

Electronic registration started during 2021. Registered classified 23

Fracture of bone (near the prosthesis) of reoperated knee prostheses *

Table 55: Femur Classification

Year	Yes	Femur - I	Femur - II	Femur - III	Total
2022	13	0	6 (75,00%)	2 (25,0%)	**8**
2021	1	0	0	0	**0**
Total	**14**	**0 (0,0%)**	**6 (75,00%)**	**2 (25,0%)**	**8**

Electronic registration started during 2021. Currently registered 14 (8 classified).

Table 56: Tibia Classification

Year	Ja	Tibia- I			Tibia- II			Tibia- III			Tibia-IV			Total
		a	b	c	a	b	c	a	b	c	a	b	c	
2022	1	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Electronic registration started during 2022. Currently registered 1 (0 classified).

Table 57: Patella Classification

Year	Yes	Patella - I	Patella - II	Patella - III		Total
				a	b	
2022	1	0	0	0	0	**0**
2021	1	0	0	0	0	**0**
Total	**2**	**0**	**0**	**0**	**0**	**0**

Electronic registration started during 2021. Currently registered 2 (0 classified).

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

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

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

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

Primary operations. In 2019-2020, 14208 primary knee replacements were reported to one or both of the registers. 96,5 % of these were reported to the NAR while 94,7 % 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 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.

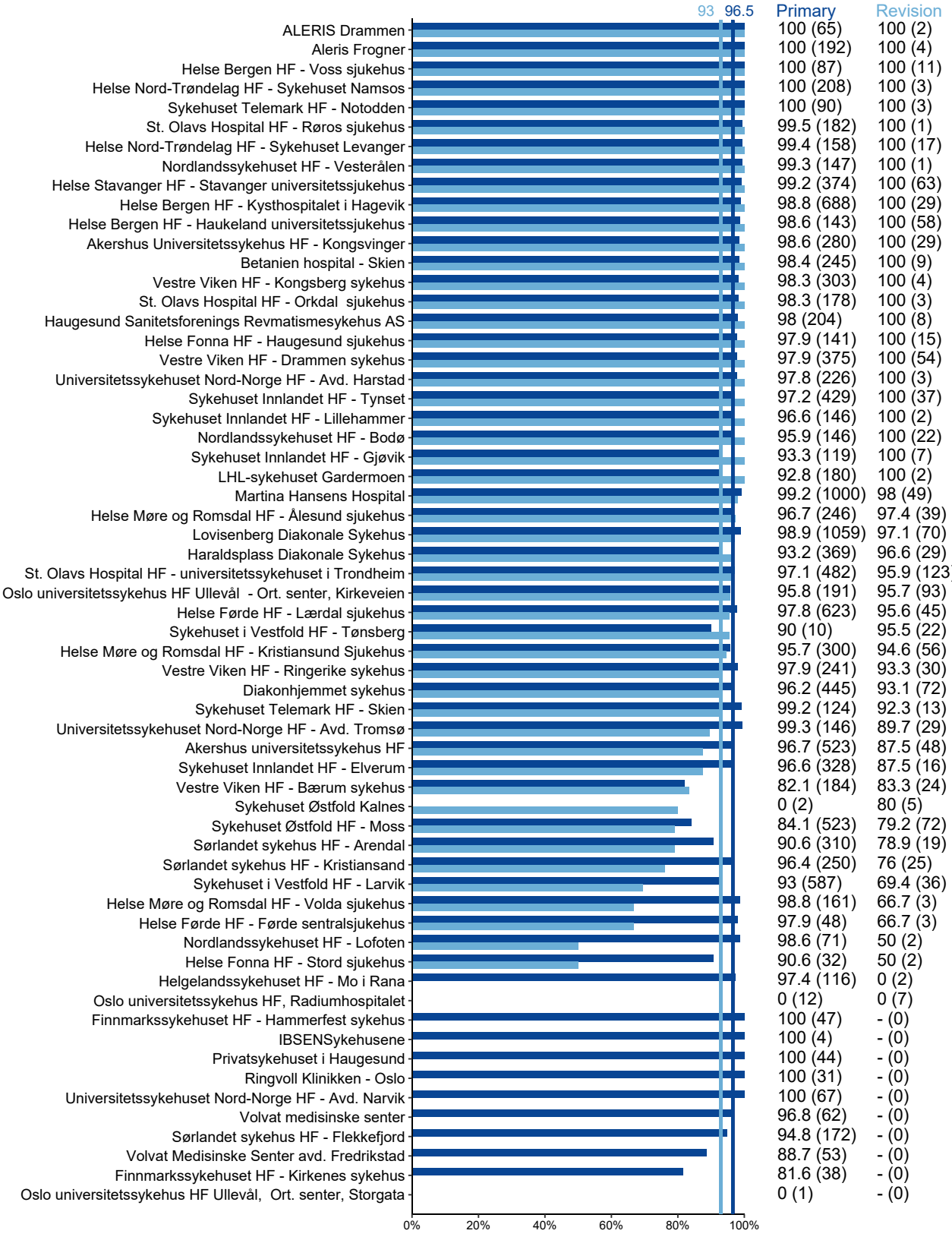
Procedure codes to be used for primary operations:
NGB 0* - NGB 1* - NGB 20 - NGB 30 - NGB 40

Revision operations. In 2019-2020, 1321 revisions were reported to one or both of the registers. 93,0 % of these were reported to the NAR while 77,1 % 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

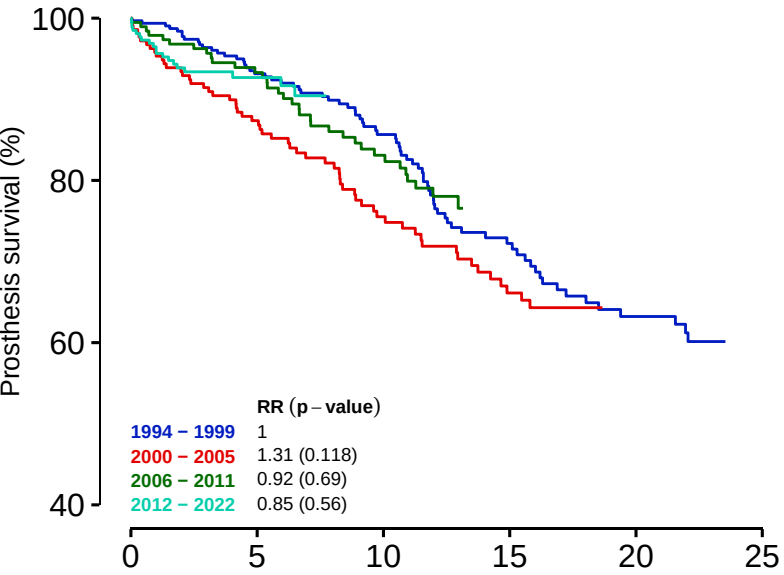


Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered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

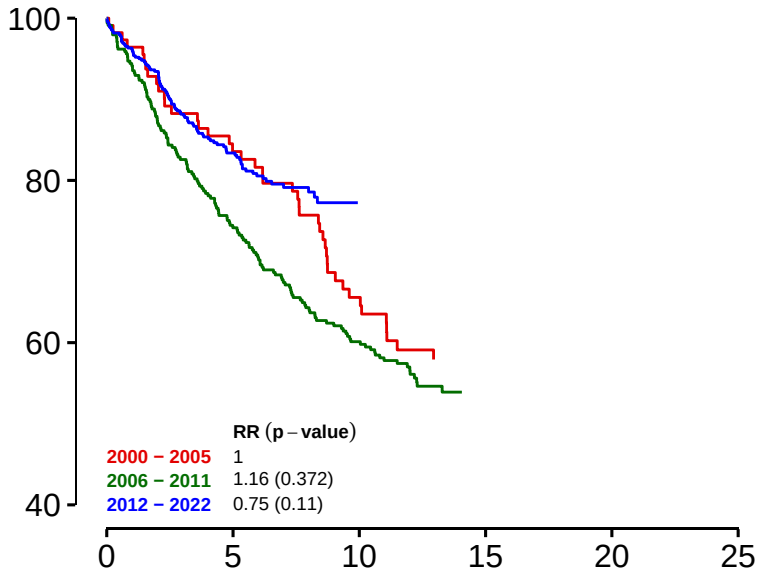
CONTENTS

Survival curves for joint prosthesis
1994−2022

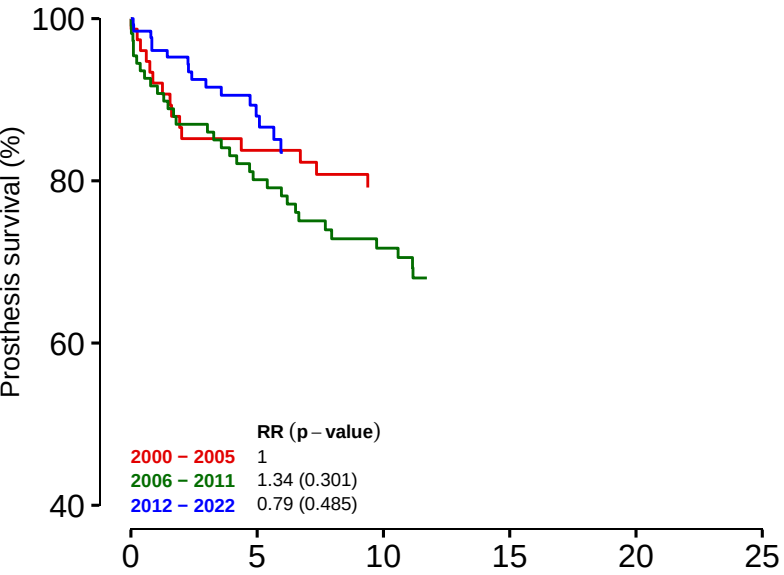
C.1) Total prosthesis in elbow*



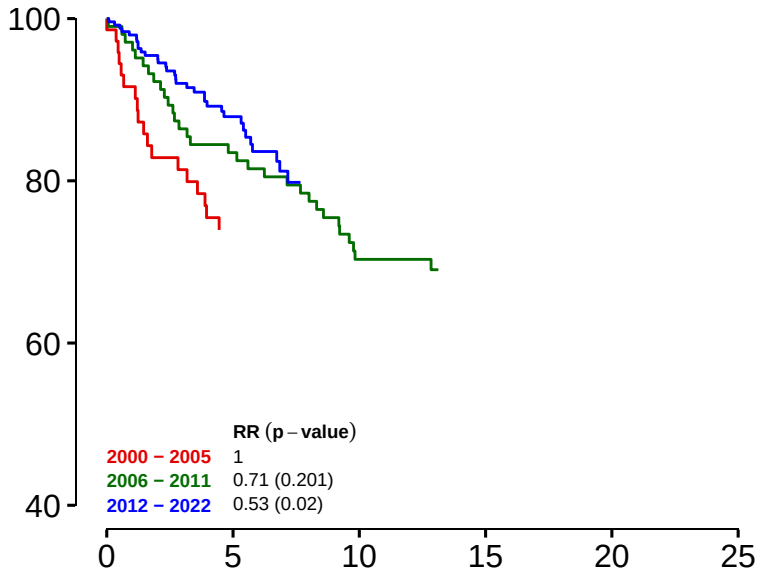
C.2) Ankle, without rheumatoid arthritis



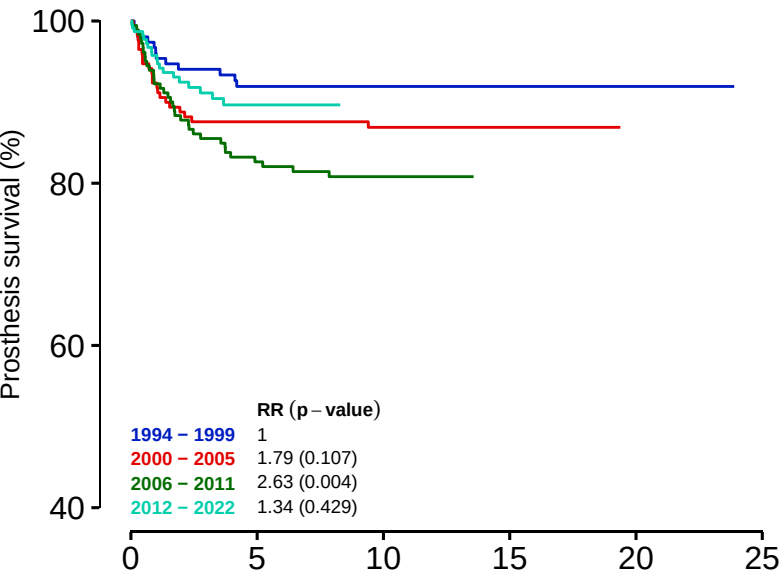
C.3) Ankle, only rheumatoid arthritis



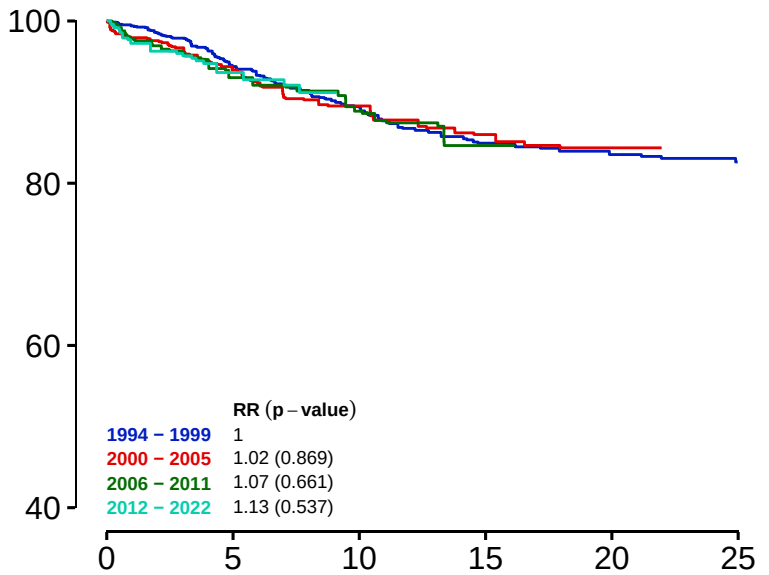
C.4) Wrist



C.5) Carpometacarpal (CMC I)



C.6) Finger (MCP)



*Caput radii prosthesis for acute fracture is not included.

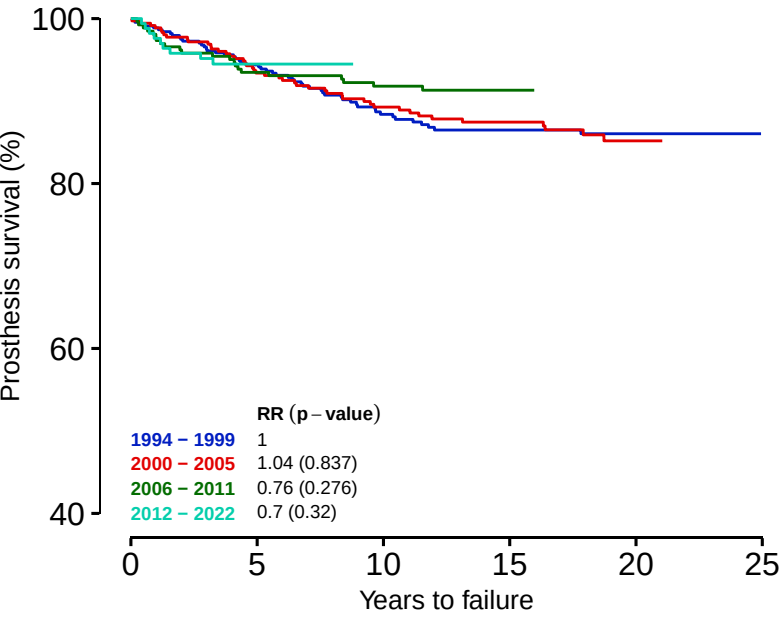
Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.

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

Survival curves for joint prosthesis
1994−2022

Norwegian Arhtroplasty Register

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.

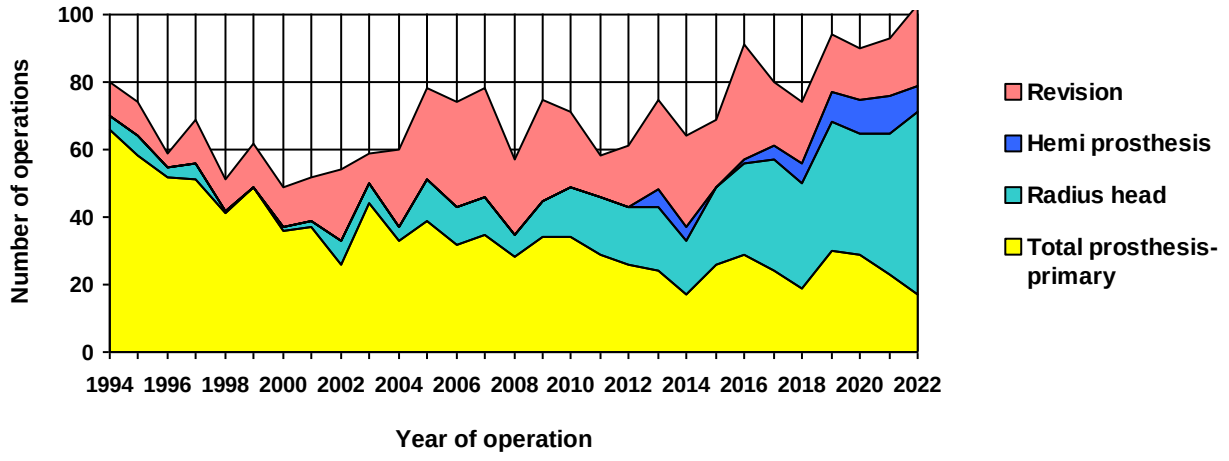
ELBOW PROSTHESES

Table 1: Annual number of prostheses

Year	Primary operations						Reoperations *		Revisions		Total
	Hemi prosthesis		Total prosthesis		Radius head						
2022	8	(7,8%)	17	(16,5%)	54	(52,4%)	2	(1,9%)	22	(21,4%)	**103**
2021	11	(11,8%)	23	(24,7%)	42	(45,2%)			17	(18,3%)	**93**
2020	10	(11,1%)	29	(32,2%)	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**
1994-06			564	(68,7%)	62	(7,6%)			195	(23,8%)	**821**
Total	**58**	**0**	**988**	**(48,1%)**	**459**	**(22,3%)**	**6**	**(0,3%)**	543	(26,4%)	**2 054**

* 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. 73,2 % performed in women. Mean age: 62,2 years.

Table 2: Elbow diagnosis 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
2022	3	5	4		1	5			
2021	2	9	6			6	2		
2020	3	9	9			9	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	
1994-06	29	484	39	6	1	11	1	20	7
Total	**62**	**702**	**124**	**6**	**5**	**99**	**6**	**52**	**7**

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

Table 3: Elbow diagnosis 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
2022						8			
2021			1			10			
2020			1			9			
2019						9			
2018	1		1			5			
2017						4			
2016						1			
2014		1	1			3			
2013			1			4			
Total	**1**	**1**	**5**	**0**	**0**	**53**	**0**	**0**	**0**

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

Table 4: Elbow diagnosis in primary operations - Radial 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
2022	2		5			47			
2021			3			39			
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			
1994-06	4	13	17			26		6	1
Total	**12**	**14**	**59**	**0**	**2**	**374**	**0**	**10**	**1**

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

Fixation of elbow prostheses

Table 5: Primary operations - Humerus

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022	24 (92,3%)		2 (7,7%)		**26**
2021	33 (94,3%)		2 (5,7%)		**35**
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**
1994-06	308 (54,6%)	95 (16,8%)	158 (28,0%)	3 (0,5%)	**564**
Total	**759 (72,3%)**	**95 (9,0%)**	**186 (17,7%)**	**10 (1,0%)**	**1 050**

Table 6: Primary operations - Ulna/radial

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022	21 (29,6%)		50 (70,4%)		**71**
2021	29 (42,6%)		39 (57,4%)		**68**
2020	34 (51,5%)		32 (48,5%)		**66**
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**
1994-06	461 (73,6%)	96 (15,3%)	66 (10,5%)	3 (0,5%)	**626**
Total	**965 (66,4%)**	**97 (6,7%)**	**375 (25,8%)**	**16 (1,1%)**	**1 453**

Implant brands used in elbow prostheses - Total prostheses

Table 7: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Discovery	152	9	18	16	5	1	1		2	8	**212**
Norway	180										**180**
Kudo	162										**162**
IBP	136										**136**
Nexel			4	13	19	17	28	22	21	7	**131**
GSB III	73	3	1								**77**
NES	54										**54**
Mutars	5	1	2			1	1	1		1	**12**
Latitude EV		2						6		1	**9**
IBP Reconstruction	5										**5**
Coonrad/Morrey	3	1	1								**5**
Other (n < 5)	4	1									**5**
Total	**774**	**17**	**26**	**29**	**24**	**19**	**30**	**29**	**23**	**17**	**988**

Table 8: Primary operations - Ulna/radial

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Discovery	152	9	18	16	5	1	1		2	8	**212**
Norway	179										**179**
Kudo	162										**162**
IBP	136										**136**
Nexel			4	13	19	17	28	22	21	7	**131**
GSB III	73	3	1								**77**
NES	55										**55**
Mutars	5	1	2			1	1	1		1	**12**
Latitude EV		2						6		1	**9**
IBP Reconstruction	5										**5**
Coonrad/Morrey	3	1	1								**5**
Other (n < 5)	4	1									**5**
Total	**774**	**17**	**26**	**29**	**24**	**19**	**30**	**29**	**23**	**17**	**988**

Implant brands used in elbow prostheses - Hemiprostheses

Table 9: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Latitude EV		1					4	10	11	8	**34**
Latitude Anatomic hemi	5	3		1	4	6	5				**24**
Total	**5**	**4**		**1**	**4**	**6**	**9**	**10**	**11**	**8**	**58**

Implant brands used in elbow prostheses - Radial head prostheses

Table 10: Primary operations - Radial

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Acumed anatomic radial head	32	5	13	13	12	17	20	17	24	33	**186**
Explor	7	5	7	10	17	14	16	15	5		**96**
rHead	60	2		1	1						**64**
EVOLVE (Proline)	5				3		2	1	12	21	**44**
Radial Head	29										**29**
Silastic H.P. 100	20										**20**
Link radius	3	4	3								**10**
Other (n < 5)	3			3				3	1		**10**
Total	**159**	**16**	**23**	**27**	**33**	**31**	**38**	**36**	**42**	**54**	**459**

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
2022	2	2		2		3		3	3	2	4	
2021	1	1		1	1	2	3	4		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	
1994-06	61	56	15	14	7	10	22	24	8		18	1
Total	**102**	**112**	**24**	**38**	**16**	**36**	**51**	**58**	**65**	**7**	**76**	**2**

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

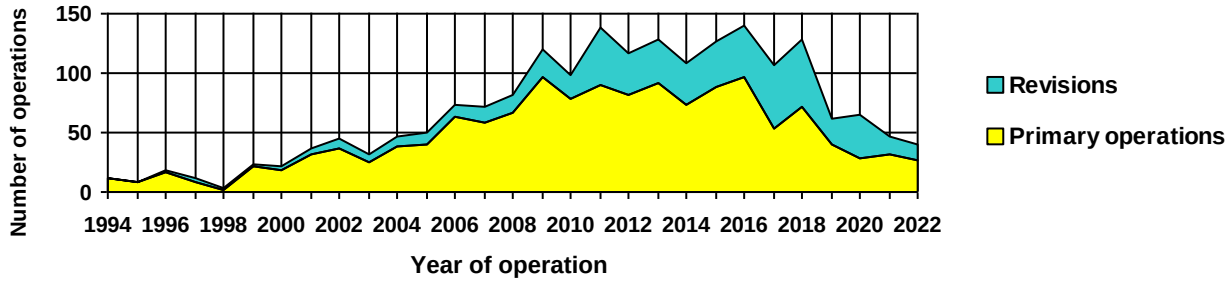
ANKLE PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Reoperations *		Revisions		Total
2022	27	(67,5%)			13	(32,5%)	**40**
2021	32	(68,1%)			15	(31,9%)	**47**
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**
1994-06	322	(84,3%)			60	(15,7%)	**382**
Total	**1 398**	**(71,3%)**	**2**	**(0,1%)**	**562**	**(28,6%)**	**1 962**

* 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 % of all operations were performed on the right side. 53,2 % performed in women. Mean age: 60,4 years.

Table 2: Ankle diagnosis in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2022	9	7	5		5			3	
2021	3	9	12		6		1	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	
1994-06	74	143	81	4	10			30	1
Total	**373**	**369**	**432**	**13**	**189**	**1**	**8**	**94**	**2**

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

Fixation of ankle prostheses

Table 3: Primary operations - Tibia

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			27 (100,0%)		**27**
2021			32 (100,0%)		**32**
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**
1994-06	23 (7,1%)	10 (3,1%)	288 (89,4%)	1 (0,3%)	**322**
Total	**29 (2,1%)**	**10 (0,7%)**	**1 349 (96,6%)**	**8 (0,6%)**	**1 396**

Table 4: Primary operations - Talus

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			27 (100,0%)		**27**
2021			32 (100,0%)		**32**
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**
1994-06	25 (7,8%)	11 (3,4%)	286 (88,8%)		**322**
Total	**31 (2,2%)**	**11 (0,8%)**	**1 349 (96,6%)**	**6 (0,4%)**	**1 397**

Implant brands used in ankle prostheses

Table 5: Primary operations - Tibia

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
STAR	615		1								**616**
Salto Talaris	26	62	85	81	28	35					**317**
INFINITY					2	11	29	28	27	25	**122**
Mobility	101										**101**
TM Total Ankle		3	3	16	22	20	8	1	5	2	**80**
CCI	69	9									**78**
Norwegian TPR	32										**32**
Rebalance	15										**15**
Salto Mobile	12										**12**
Hintegra	11										**11**
Integra Cadence					2	4	2				**8**
AES	3										**3**
Total	**884**	**74**	**89**	**97**	**54**	**70**	**39**	**29**	**32**	**27**	**1 395**

Table 6: Primary operations - Talus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
STAR	615		1								**616**
Salto Talaris	22	61	84	80	27	35					**309**
INFINITY					2	11	29	25	24	23	**114**
Mobility	101										**101**
TM Total Ankle		3	3	16	22	20	8	1	5	2	**80**
CCI	69	9									**78**
Norwegian TPR	32										**32**
Rebalance	15										**15**
Salto Mobile	12										**12**
Hintegra	11										**11**
Salto XT	4	1	1	1	1						**8**
Integra Cadence					2	4	2				**8**
INBONE II								3	3	2	**8**
AES	3										**3**
Talus Hemicap							1				**1**
Total	**884**	**74**	**89**	**97**	**54**	**70**	**40**	**29**	**32**	**27**	**1 396**

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

Implant brands used in ankle total prostheses

Table 7: Primary operations - Tibia Insert in total prostheses

Prostheses	Material	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Totalt
STAR	Uhmwpe	615		1								**616**
Salto Talaris	Uhmwpe	25	62	85	81	28	35					**316**
INFINITY	Uhmwpe					2	11	29	28	27	25	**122**
Mobility	Uhmwpe	101										**101**
TM Total Ankle	HXLPE		3	3	16	22	20	8	1	5	2	**80**
CCI	Uhmwpe	68	9									**77**
Rebalance	Uhmwpe	15										**15**
Salto Mobile	Uhmwpe	12										**12**
Hintegra	Uhmwpe	11										**11**
Integra Cadence	HXLPE					2	4	2				**8**
AES	Uhmwpe	3										**3**
Salto XT	Uhmwpe	1										**1**
Totalt		**851**	**74**	**89**	**97**	**54**	**70**	**39**	**29**	**32**	**27**	**1 362**

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
2022		1				1		2	4			2	
2021	2			1	1	2	2	2	4	1			
2020	6	7	1	1	3	1	2	10	4	1		2	
2019		2		1		2	1	6	4	2		3	
2018	9	8		1	4	4	3	17	10	1			
2017	8	8		2	8		1	23	8	7		4	
2016	10	10		2	1	1	2	13	4	2	1		
2015	5	4			6	1		12	8	6			
2014	11	9		1	3	1		8	8				
2013	5	2	1	3	7	1	1	13	16	3			
2012	5	3		1	1	2	1	10	9	1		1	
2011	5	5	1	5	4	1	1	16	7		1	1	
2010	2	1		2	3	1	2	9	3		3		
2009	5	2	1	3	6	3	1	7	3				
2008	1	2	1	1	5			3	1			2	
2007	2	1		2	1	1		5	3				
1994-06	15	5		4	9	3	2	14	3		1	1	
Total	**91**	**70**	**5**	**30**	**62**	**25**	**19**	**170**	**99**	**24**	**6**	**16**	**0**

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

FINGER JOINT PROSTHESES

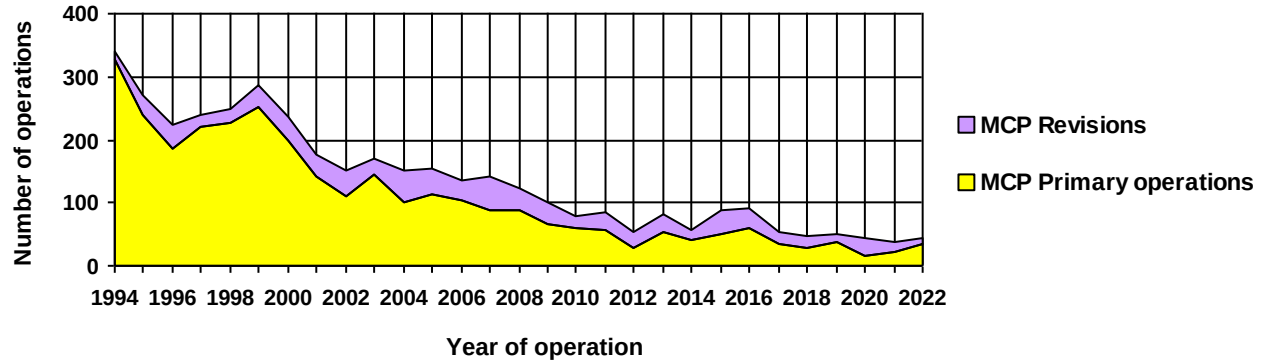
Table 1: Annual number of operations - MCP

Year	Primary operations		Revisions		Total
2022	36	(83,7%)	7	(16,3%)	**43**
2021	22	(56,4%)	17	(43,6%)	**39**
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**
1994-06	2 358	(84,8%)	424	(15,2%)	**2 782**
Total	**3 125**	**(79,0%)**	**833**	**(21,0%)**	**3 958**

Table 2: Annual number of operations - PIP

Year	Primary operations		Revisions		Total
2022	11	(84,6%)	2	(15,4%)	**13**
2021	15	(93,8%)	1	(6,3%)	**16**
2020	16	(100,0%)			**16**
2019	14	(93,3%)	1	(6,7%)	**15**
2018	10	(83,3%)	2	(16,7%)	**12**
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**
1994-06	52	(83,9%)	10	(16,1%)	**62**
Total	**164**	**(88,6%)**	**21**	**(11,4%)**	**185**

Figure 1: Annual number of operations



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

Reasons for primary operations

Table 3: MCP prostheses - Finger diagnosis

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2022	5	30					1	1	
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	
1994-06	56	2 237	13	8	1	1	2	60	3
Total	**98**	**2 922**	**16**	**12**	**1**	**1**	**6**	**99**	**3**

More than one reason for primary operation is possible

Table 4: PIP prostheses - Finger diagnosis

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2022	10		1						
2021	13	2							
2020	14	3	1						
2019	10	2	2					1	
2018	7	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
1994-06	21	27	3			3		5	
Total	**98**	**44**	**18**	**0**	**2**	**3**	**3**	**8**	**1**

More than one reason for primary operation is possible

Fixation of MCP prostheses

Table 5: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			25 (100,0%)		**25**
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**
1994-06	2 (0,1%)	2 (0,1%)	2 342 (99,5%)	8 (0,3%)	**2 354**
Total	**5 (0,2%)**	**2 (0,1%)**	**2 993 (99,4%)**	**11 (0,4%)**	**3 011**

Table 6: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			2 (100,0%)		**2**
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**
1994-06			26 (100,0%)		**26**
Total			**40 (100,0%)**		**40**

Fixation of PIP prostheses

Table 7: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			10 (100,0%)		**10**
2021			13 (100,0%)		**13**
2020			10 (100,0%)		**10**
2019			12 (100,0%)		**12**
2018			8 (100,0%)		**8**
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			**144 (98,0%)**	**3 (2,0%)**	**147**

Table 8: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			10 (100,0%)		**10**
2021			13 (100,0%)		**13**
2020			9 (100,0%)		**9**
2019			10 (100,0%)		**10**
2018			8 (100,0%)		**8**
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			**84 (98,8%)**	**1 (1,2%)**	**85**

Implant brands used in Finger prostheses

Table 9: MCP prostheses in primary operations - Proximal

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Silastic HP 100	1 957		4	1	2		2				**1 966**
Avanta	554		1		3						**558**
Silastic HP 100 II	44	34	28	41	16	16	19	11	12	22	**243**
NeuFlex	198										**198**
Ascension MCP	29	1		2						1	**33**
MCS	6										**6**
TACTYS							1			1	**2**
HAPY							2				**2**
SR Avanta				1							**1**
Moje	1										**1**
KeriFlex										1	**1**
Total	**2 789**	**35**	**33**	**45**	**21**	**16**	**24**	**11**	**12**	**25**	**3 011**

Table 10: MCP prostheses in primary operations - Distal

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Ascension MCP	27	1		2						1	**31**
MCS	6										**6**
TACTYS							1			1	**2**
Moje	1										**1**
Total	**34**	**1**		**2**			**1**			**2**	**40**

Table 11: PIP prostheses in primary operations - Proximal

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Tota
TACTYS				2	5	7	5	6	12	8	**45**
Silastic HP 100	25	2						1			**28**
Ascension PIP PyroCarbon	22	1				1	1	2			**27**
SR Avanta	16	1	3	1			2				**23**
CapFlex PIP							4	1	1	2	**8**
NeuFlex	7										**7**
MCS	4										**4**
Avanta	4										**4**
Moje	1										**1**
Total	**79**	**4**	**3**	**3**	**5**	**8**	**12**	**10**	**13**	**10**	**147**

Table 12: PIP prostheses in primary operations - Distal

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
TACTYS				2	5	7	5	7	12	8	**46**
Ascension PIP PyroCarbon	22	1				1	1	1			**26**
CapFlex PIP							4	1	1	2	**8**
MCS	4										**4**
Moje	1										**1**
Total	**27**	**1**		**2**	**5**	**8**	**10**	**9**	**13**	**10**	**85**

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
2022										1	1	
2021	4				1					9	3	
2020									4	10	3	
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	9	
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	9	6	2	1		6		21	6	3
1994-06	5	16	15	52	56	6	20	102	9	82	146	14
Total	**16**	**25**	**38**	**81**	**94**	**14**	**30**	**183**	**35**	**174**	**216**	**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
2022								1		1		
2021								1				
2019											1	
2018	1								1			
2016	1											
2008	1	1	1	1	1			2				
2007								1			1	
1994-06	3	2		1	1					1	5	
Total	**6**	**3**	**1**	**2**	**2**	**0**	**0**	**5**	**1**	**2**	**7**	**0**

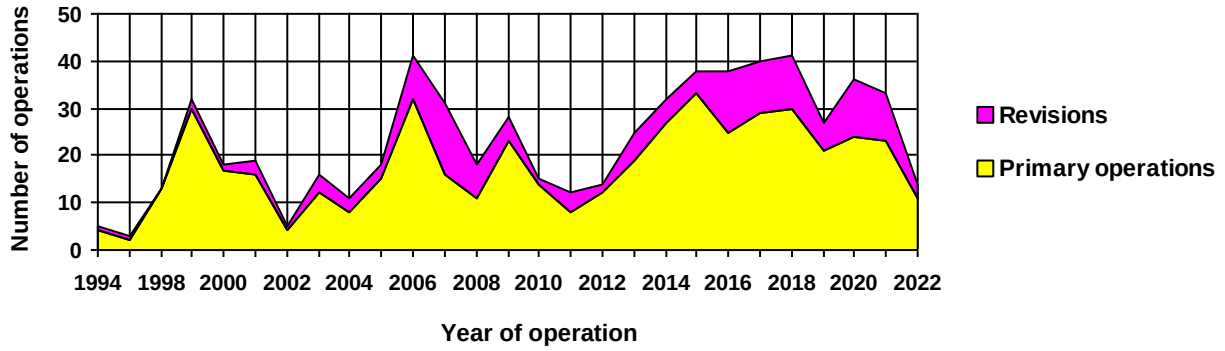
Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

WRIST PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2022	11	(78,6%)	3	(21,4%)	**14**
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**
1994-06	153	(84,5%)	28	(15,5%)	**181**
Total	**479**	**(76,9%)**	**144**	**(23,1%)**	**623**

Figure 1: Annual number of operations



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

Table 2: Wrist diagnosis 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
2022	3	1	2		4			1	
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	
1994-06	13	109	15	1	1			16	
Total	**66**	**155**	**127**	**1**	**91**	**2**	**3**	**58**	**1**

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

Fixation of wrist prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			11 (100,0%)		**11**
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**
1994-06	7 (4,6%)	1 (0,7%)	144 (94,1%)	1 (0,7%)	**153**
Total	**7 (1,6%)**	**1 (0,2%)**	**428 (97,1%)**	**5 (1,1%)**	**441**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			11 (100,0%)		**11**
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**
1994-06	9 (6,2%)		136 (93,8%)		**145**
Total	**9 (1,9%)**		**456 (97,9%)**	**1 (0,2%)**	**466**

Implant brands in Wrist prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Motec Wrist	105	9	17	12	9	19	1	17	16	7	**212**
Biax	90										**90**
Remotion Wrist	16	13	13	8	6		2	1	2	2	**63**
Scheker Radio-ulnar	6	3	1	3	8	2	3		1	2	**29**
Elos[1]	23										**23**
Uhead (Druj)	5	2	1	2	4						**14**
Silastic ulnar head	7										**7**
Eclypse radio-ulnar	2										**2**
TMW	1										**1**
Total	**255**	**27**	**32**	**25**	**27**	**21**	**6**	**18**	**19**	**11**	**441**

Table 6: Primary operations - Distal

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Motec Wrist	105	9	17	12	9	19	1	17	16	7	**212**
Biax	89										**89**
Remotion Wrist	16	13	14	8	6		2	1	2	2	**64**
Scheker Radio-ulnar	4	3	1	3	8	2	3		1	2	**27**
Elos[1]	23										**23**
Herbert UHP						6	7	5	3		**21**
RCPI					2	3	8	1	1		**15**
Uhead (Druj)	5	2	1	2	4						**14**
TMW	1										**1**
Total	**243**	**27**	**33**	**25**	**29**	**30**	**21**	**24**	**23**	**11**	**466**

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
2022	1	1		1				1		1		5
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
1994-06	5	12	1	2	6	3		8				37
Total	**17**	**49**	**4**	**7**	**14**	**9**	**1**	**40**	**6**	**14**	**0**	**161**

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

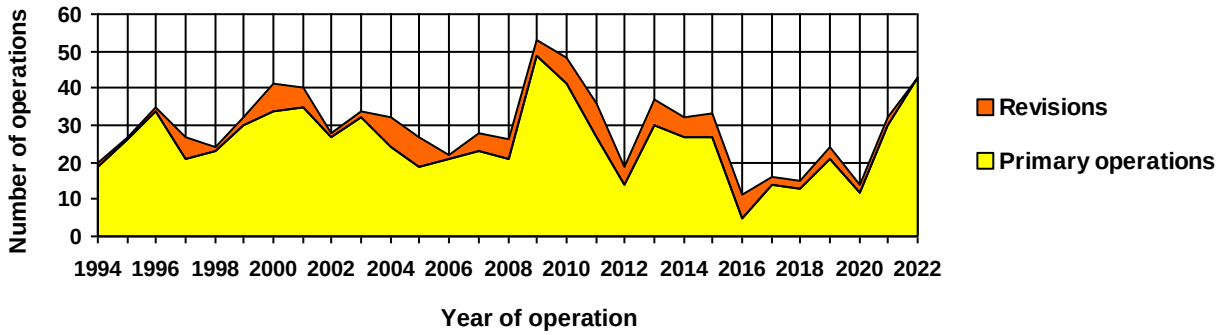
[1]Elos are 3 different development models of Motec Wrist. Motec Wrist was previously sold under the name Gibbon.

CARPOMETACARPAL PROSTHESES (CMC I)

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2022	43	(100,0%)			**43**
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**
1994-06	345	(88,7%)	44	(11,3%)	**389**
Total	**742**	**(86,7%)**	**114**	**(13,3%)**	**856**

Figure 1: Annual number of operations



48,1 % of all operations were performed on the right side. 79,6 % performed in women. Mean age: 62,2 years.

Table 2: Carpometacarpal diagnosis in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2022	43								
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	
1994-06	244	84	2	4				17	
Total	**606**	**112**	**3**	**5**	**2**	**1**	**0**	**21**	**0**

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

Fixation of carpometacarpal prostheses

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

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			43 (100,0%)		**43**
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**
2009-13			176 (97,2%)	5 (2,8%)	**181**
2003-08	1 (0,8%)		118 (99,2%)		**119**
1994-02	2 (0,8%)		246 (98,8%)	1 (0,4%)	**249**
Total	**4 (0,5%)**		**730 (98,5%)**	**7 (0,9%)**	**741**

Carpometacarpal prostheses - Prosthesis brand

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

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Swanson Silastic Trapezium	351	8	5	2	1	1					**368**
Swanson Titanium Basal	72										**72**
Moovis						4	7	8	27	24	**70**
Motec	55										**55**
Elektra	40	5	8	2							**55**
Motec II	19	14	14								**47**
ARPE				1	9	8	10	4	2		**34**
TOUCH										19	**19**
Avanta Trapezium	7										**7**
Pyrocardan							4		1		**5**
Custom made	5										**5**
IVORY					4						**4**
Total	**549**	**27**	**27**	**5**	**14**	**13**	**21**	**12**	**30**	**43**	**741**

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			2	3				1			
1994-06	2		19	3				26	1	8	1
Total	**33**	**0**	**39**	**9**	**0**	**3**	**1**	**46**	**3**	**10**	**1**

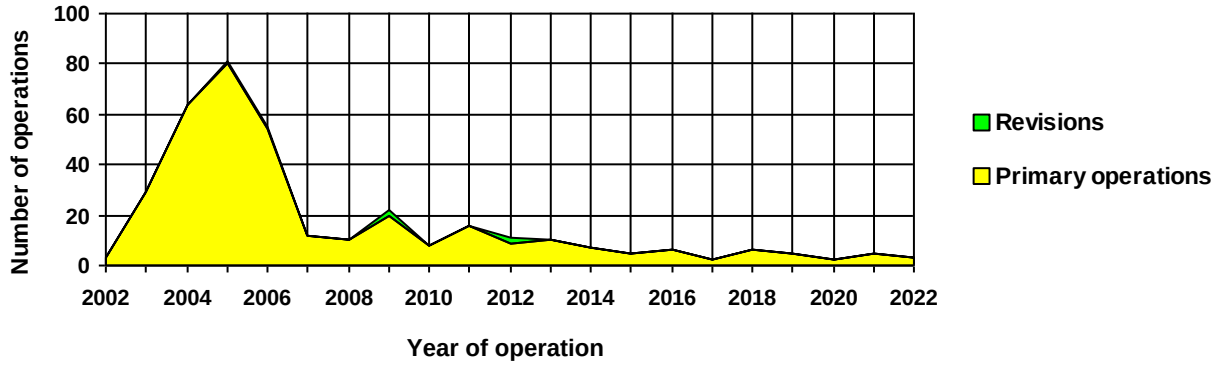
Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

LUMBAR DISC PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2022	3	(100,0%)			**3**
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**
2009-13	73	(94,8%)	4	(5,2%)	**77**
2003-08	239	(99,2%)	2	(0,8%)	**241**
1994-02	3	(100,0%)			**3**
Total	**356**	**(98,3%)**	**6**	**(1,7%)**	**362**

Figure 1: Annual number of operations



60,5 % performed in women. Mean age: 43,3 years.

Table 2: Back diagnosis - Primary operations

Year	Idiopathic osteoarthritis	Sequelae after fracture	Spondylitis	Sequelae after prolapse surgery	Disc degeneration	Sequelae of infection	Other	Missing
2022					3			
2021					5			
2020					2			
2019					5			
2018	1				6			
2017					2			
2016	1				6			
2015					5			
2014			5		2			
2009-13			6	8	60		4	
2003-08	9	1	149	35	51	1	22	
1994-02	1		1				2	
Totalt	**12**	**1**	**161**	**43**	**147**	**1**	**28**	**0**

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

Fixation of lumbar disc prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			3 (100,0%)		**3**
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**
2009-13			73 (100,0%)		**73**
2003-08			239 (100,0%)		**239**
1994-02			3 (100,0%)		**3**
Total			**356 (100,0%)**		**356**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			3 (100,0%)		**3**
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**
2009-13	2 (2,7%)		71 (97,3%)		**73**
2003-08	1 (0,4%)		236 (98,7%)	2 (0,8%)	**239**
1994-02			3 (100,0%)		**3**
Total	**3 (0,8%)**		**351 (98,6%)**	**2 (0,6%)**	**356**

Lumbar disc prostheses - Prosthesis brand

Table 5: Primary operations - Proximal

Prostheses	2002-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Prodisc	253	7	5	6	2	1					**274**
Charité	62										**62**
BAGUERA L						3	5	2	5	3	**18**
Mobidisc L						2					**2**
Total	**315**	**7**	**5**	**6**	**2**	**6**	**5**	**5**	**5**	**3**	**356**

Table 6: Primary operations - Distal

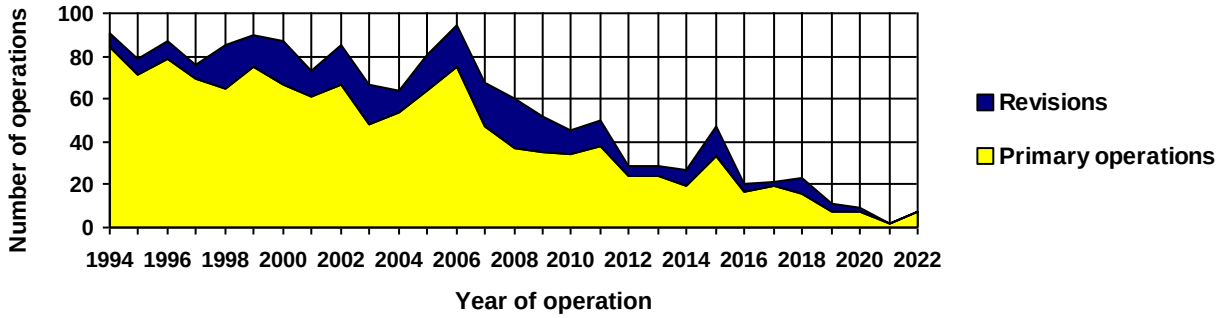
Prostheses	2002-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Prodisc	253	7	5	6	2	1					**274**
Charité	62										**62**
BAGUERA L						3	5	2	5	3	**18**
Mobidisc L						2					**2**
Total	**315**	**7**	**5**	**6**	**2**	**6**	**5**	**5**	**5**	**3**	**356**

TOE JOINT PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2022	7	(100,0%)			**7**
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**
1994-06	879	(83,0%)	180	(17,0%)	**1 059**
Total	**1 245**	**(79,9%)**	**314**	**(20,1%)**	**1 559**

Figure 1: Annual number of operations



52,5 % of all operations were performed on the right side. 82,9 % performed in women. Mean age: 60,2 years.

Table 2: Toe diagnosis in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2022	6	1							
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
1994-06	125	686	15	7	1		1	58	3
Total	**305**	**843**	**20**	**10**	**2**	**1**	**2**	**88**	**4**

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

Fixation of toe joint prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2022			7 (100,0%)		**7**
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%)**		**1 228 (98,9%)**	**8 (0,6%)**	**1 242**

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**

Implant brands in Toe joint prostheses

Table 5: Primary operations - Proximal

Prostheses	2002-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Silastic HP 100	904	11	10	4	6	4				7	**946**
LPT	74	8	20	12		6	6	2			**128**
Toefit-plus	51		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	**1 117**	**19**	**32**	**16**	**19**	**16**	**7**	**7**	**2**	**7**	**1 242**

Table 6: Primary operations - Distal

Prostheses	2002-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Toefit-plus	51		1								**52**
Biomet Total Toe	25										**25**
Moje	18										**18**
Total	**94**	**0**	**1**	**0**	**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		1	
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	10			4	
1994-06	2	15	3	10	44	19	2	73	4	1	57	8
Total	**5**	**21**	**5**	**15**	**69**	**27**	**4**	**124**	**22**	**5**	**85**	**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

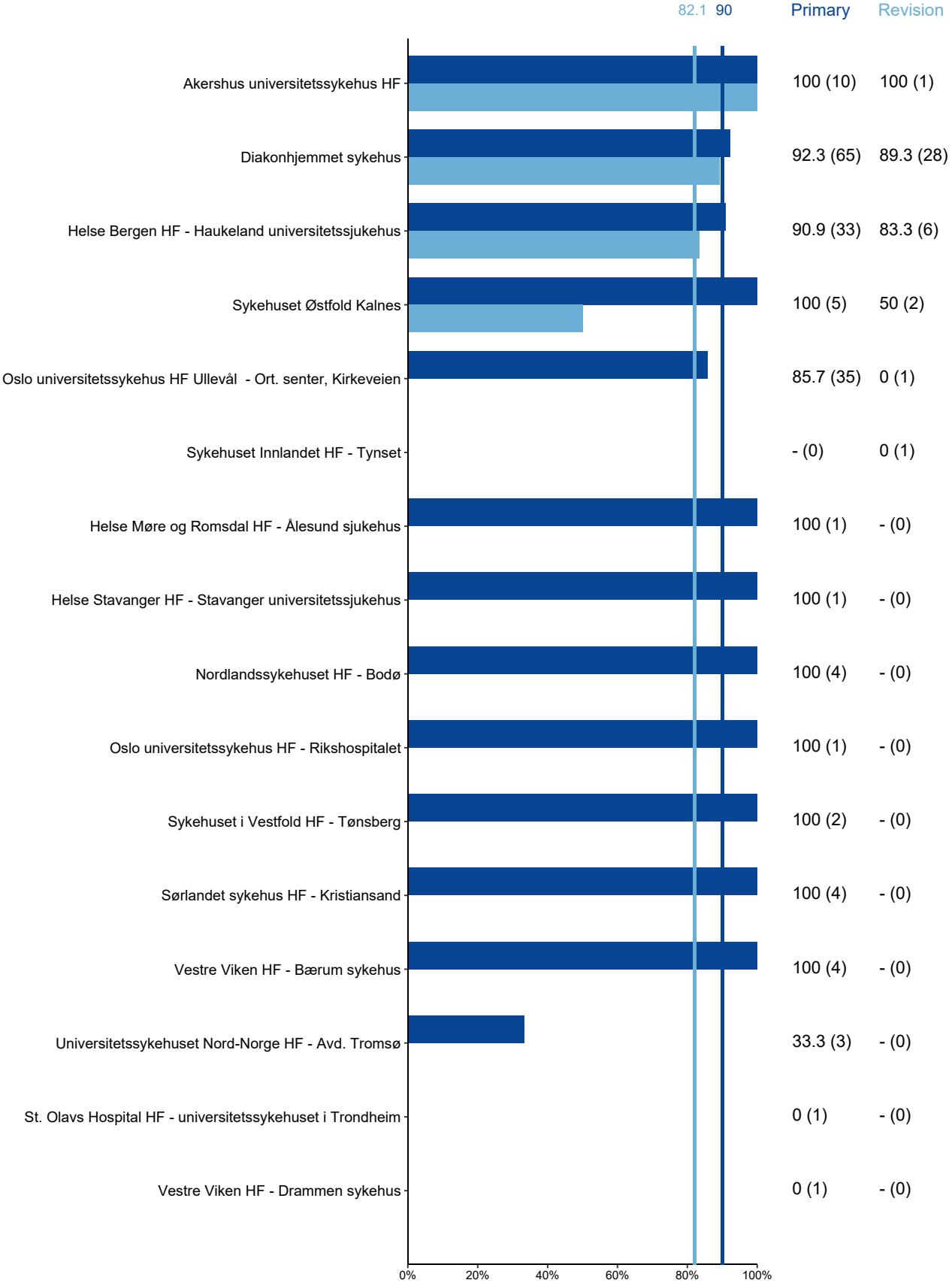
Primary operations. From 2019-2020, 170 primary total elbow arthroplasties were reported to one or both of the registers. 90% were reported to the NAR while 45.3% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of 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 show 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

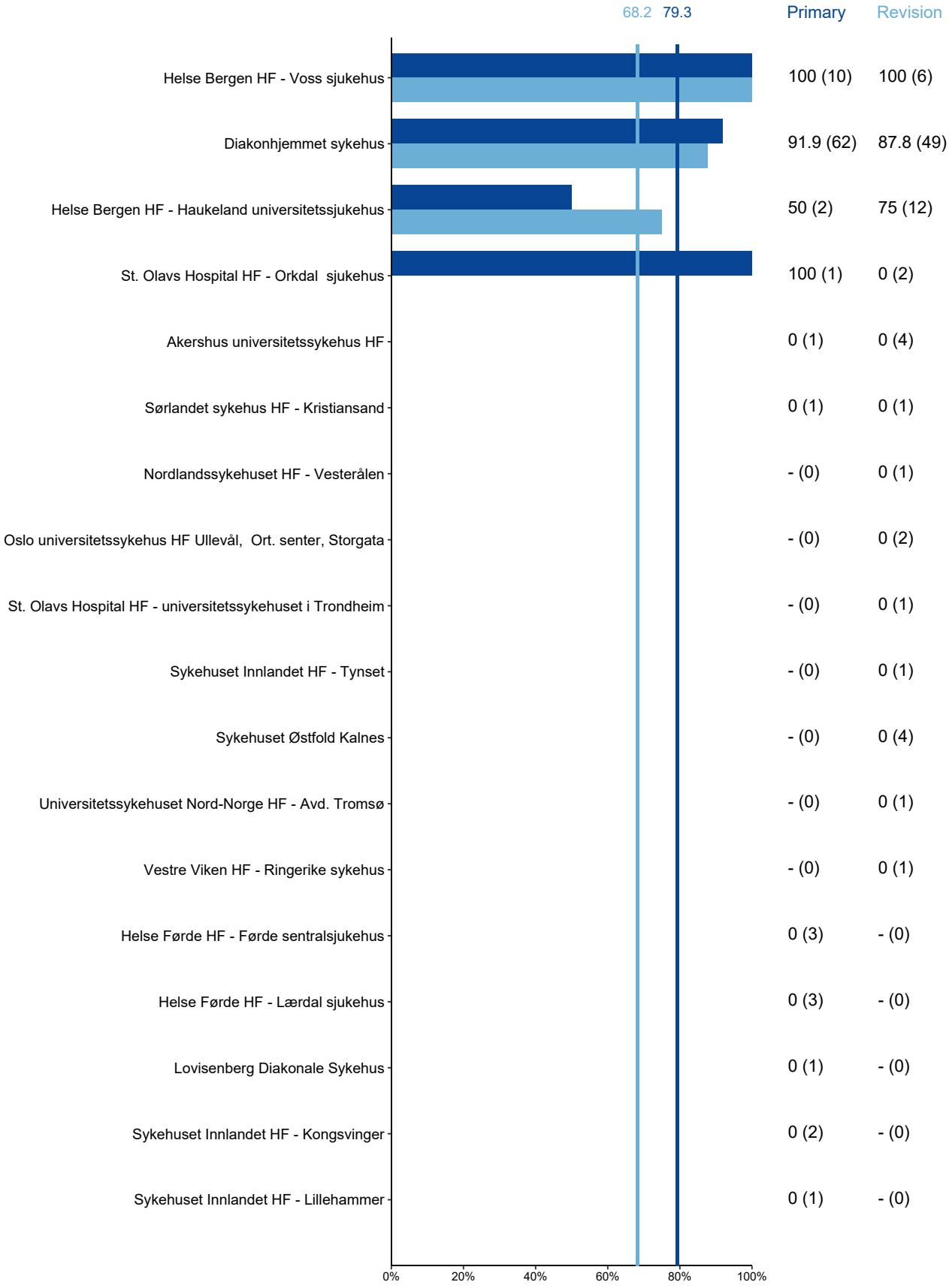
Primary operations. From 2019-2020, 87 primary total ankle arthroplasties were reported to one or both of the registers. 79.3% were reported to the NAR while 98.9% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of 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 show 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

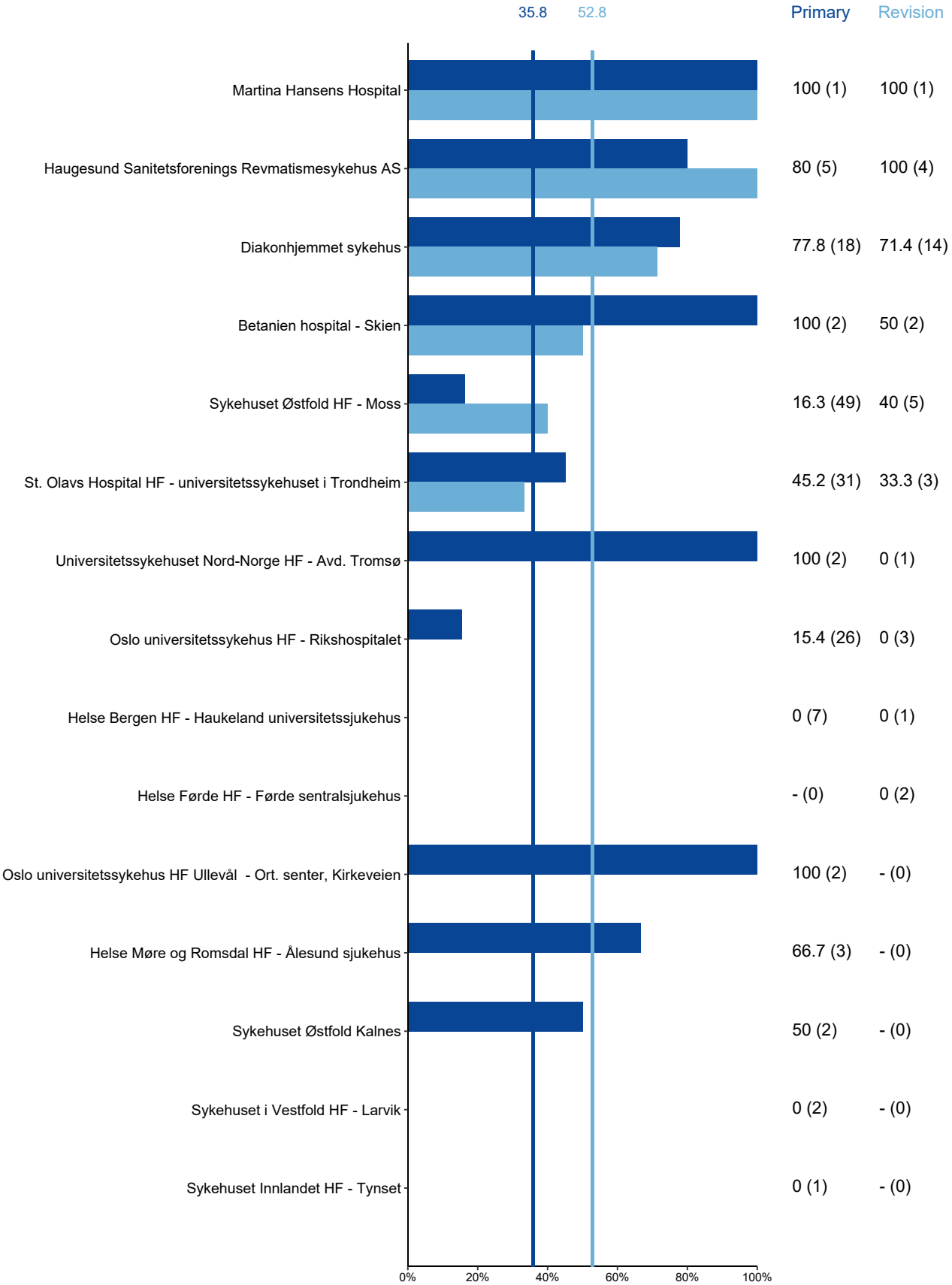
Primary operations. From 2019-2020, 151 primary total finger arthroplasties were reported to one or both of the registers. 35.8% were reported to the NAR while 98.7% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness 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 show 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

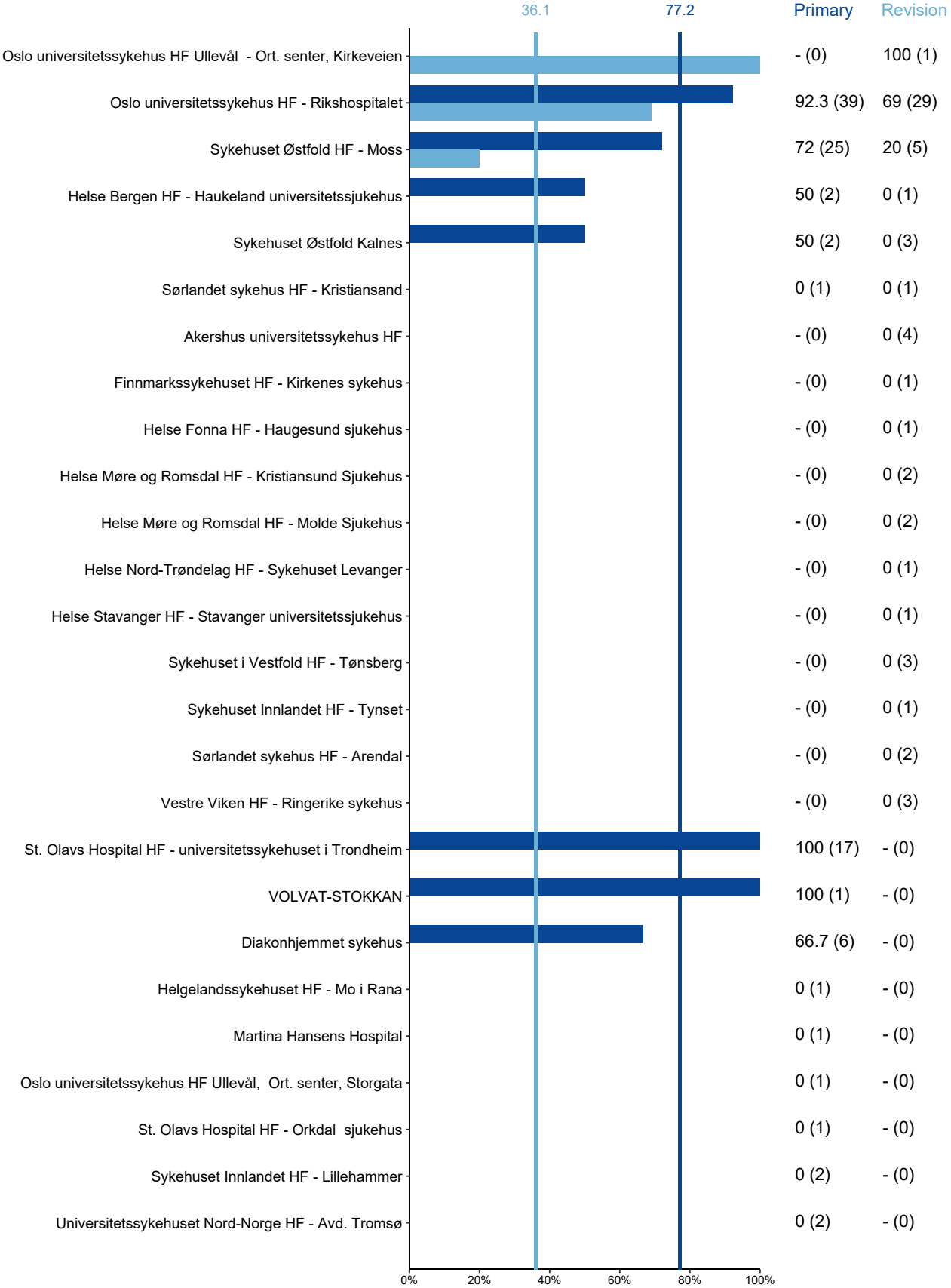
Primary operations. From 2019-2020, 101 primary total wrist/carpus/distal radioulnar joint arthroplasties were reported to one or both of the registers. 77.2% were reported to the NAR while 54.5% were reported to the NPR. Completeness of reporting varies much between the different hospitals.

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 show 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

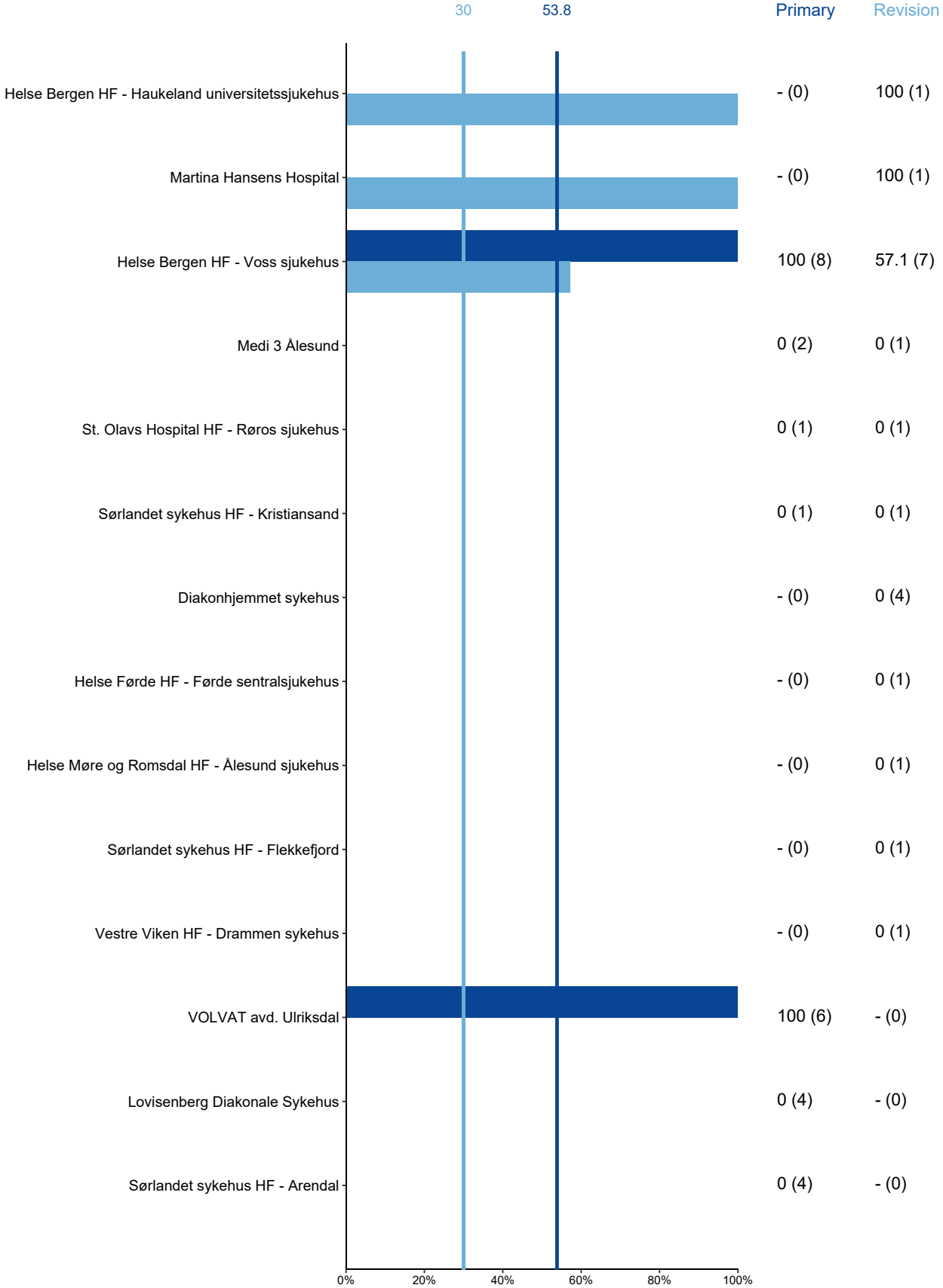
Primary operations. From 2019-2020, 26 primary total toe arthroplasties were reported to one or both of the registers. 53.8% were reported to the NAR while 76.9% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting 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 show the national averages.

CONTENTS

Shoulder prostheses

ANNUAL REPORT SHOULDER ARTHROPLASTY REGISTER

Between 1994 and 2022, a total of 13,492 shoulder prostheses have been registered.

The number of shoulder prostheses has steadily increased in recent years, and in 2022, over 1000 primary shoulder prostheses (1017) were implanted for the first time. 69 revisions account for a proportion of 6.3%.

The completeness of reporting for primary surgeries is 91.4%, and for revisions, it's 84.2%.

We have now established electronic reporting in the Medical Registration System (MRS) within the Norwegian Health Network for hip, knee, and shoulder prostheses. This registration provides individual hospitals with access to their own data, and reports can be directly retrieved from the MRS system. As a surgeon, you need to register as a user in the National Joint Prosthesis Registry on the Norwegian Health Network's website: https://falk.nhn.no. Then, you can log in at mrs.nhn.no and register the patient in the operation form. Instructions can be found on our website.

For shoulders, a new form has been introduced that is more tailored to shoulder prostheses. We have added variables for factors such as glenoid type, access, cuff status, and updated reasons for surgery/reoperation and additional procedures. These changes have been made in collaboration with the other Nordic countries to ensure uniform registration and facilitate cross-country result comparison.

PROM registration for shoulders is underway, and we hope that hospitals establish effective routines for collecting preoperative PROMs. The 1-year PROMs are sent directly to the patient if the surgery is registered in MRS.

The increase in the proportion of reversed prostheses continues, with 75% of all primary shoulder prostheses in Norway now being reversed total prostheses. The use of hemi-prostheses in the shoulder is very limited, and in line with recent literature and international trends, they are only used for selected proximal humerus fractures. Survival curves for reversed and anatomical total prostheses show significant improvement in recent time periods, with 10-year survival now exceeding 90% for both anatomical and reversed total prostheses. However, the curves for hemi-prostheses show a significant decrease in survival in the most recent period. Some of the increased revision rate for hemi-prostheses might be attributed to new platform systems that make revision from hemi-prosthesis to total or reversed prosthesis easier, possibly lowering the threshold for revision.

There is a growing tendency to use reversed prostheses even for primary shoulder arthrosis. Orthopedic surgeons must be aware that there is an increased risk of revision for reversed prostheses in men and in the youngest age group (<60 years). The Swedish registry also demonstrates that the best functional outcomes for arthrosis patients are achieved with anatomical total prostheses.

From the NARA collaboration, we have shown an increased risk of revision due to infection with reversed shoulder prostheses compared to anatomical shoulder prostheses (Moeini 2019). Anatomical prostheses must still be preferred for patients with intact rotator cuff function. We have also demonstrated that the risk of revision after reversed prostheses for proximal

humerus fractures is low (Lehtimäki 2020), but instability remains the main cause of revisions.

Approximately 50% of patients receive thromboprophylaxis during primary shoulder prosthesis surgery. In a study from our registry (Hole 2021), we have shown that thromboprophylaxis for shoulder prosthesis procedures does not reduce the risk of death after surgery, and routine use of thromboprophylaxis can be discussed.

We thank you for the comprehensive reporting. We welcome suggestions for research projects and are open to research collaborations.

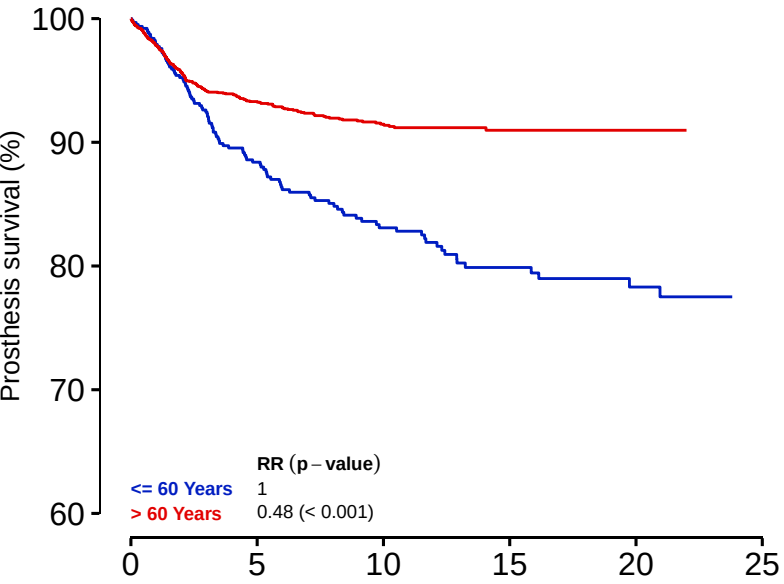
Bergen, June 2023

Randi Hole
Senior Consultant Ortho Surgeon
Shoulder Arthroplasty

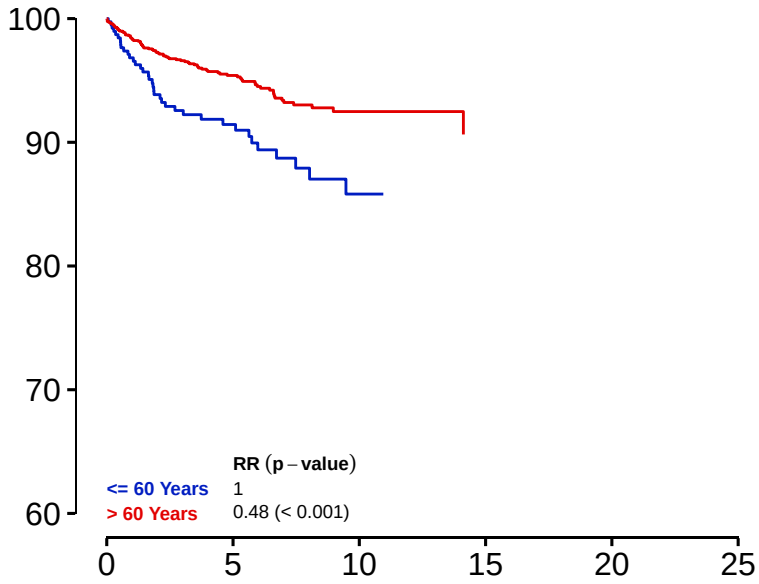
Survival curves of shoulder prosthesis
1994−2022

Norwegian Arthroplasty Register

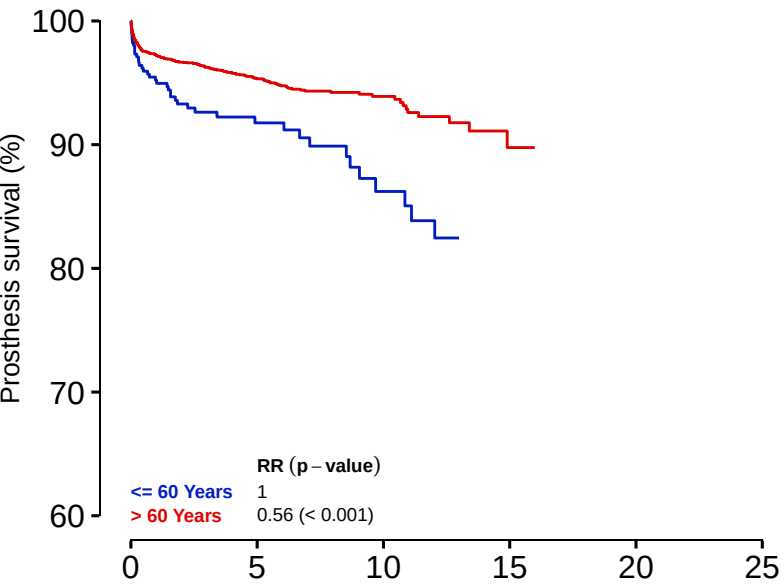
C.8) Hemi standard



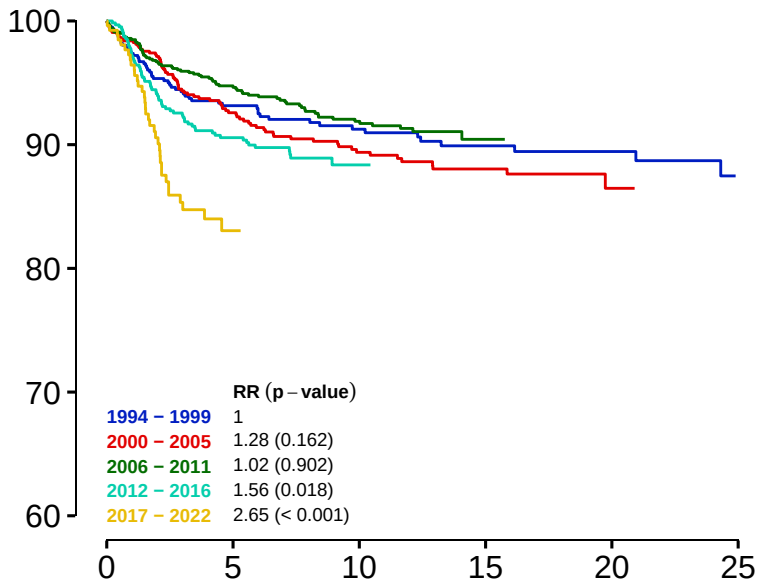
C.9) Anatomical total standard



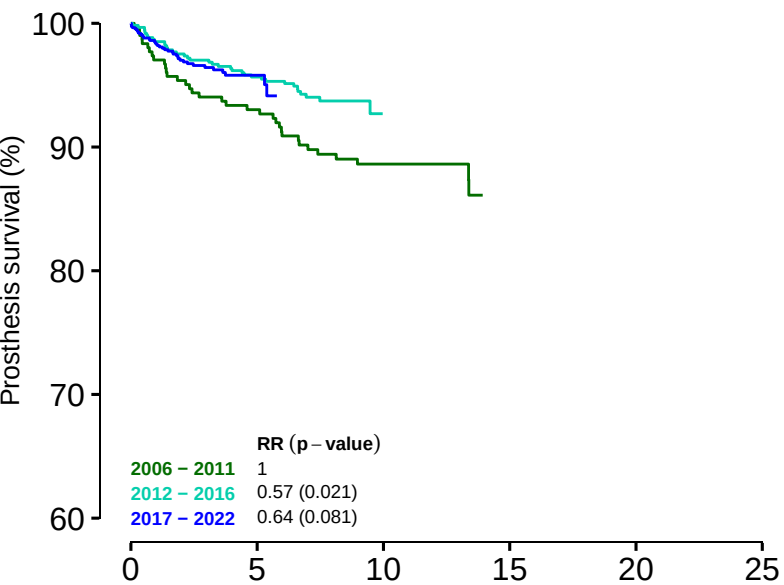
C.10) Reversed total standard



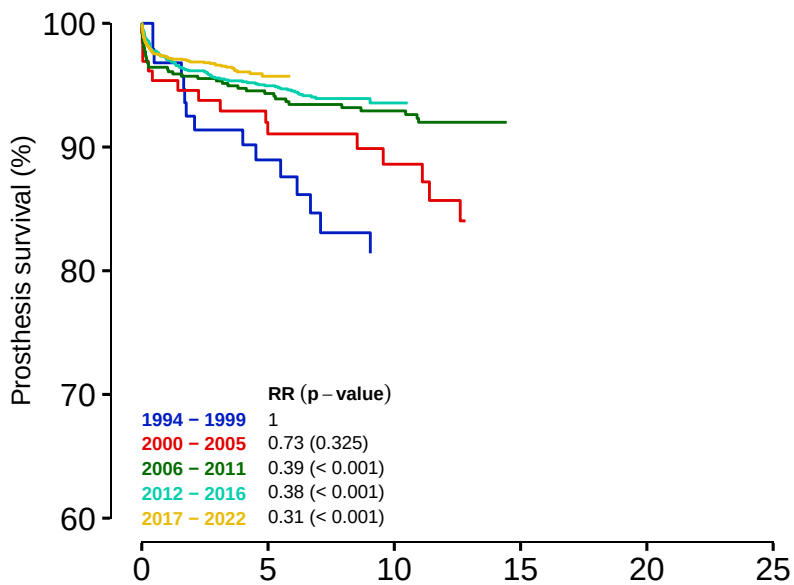
C.11) Hemi standard



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.

PROM, Shoulder Arthroplasty Register

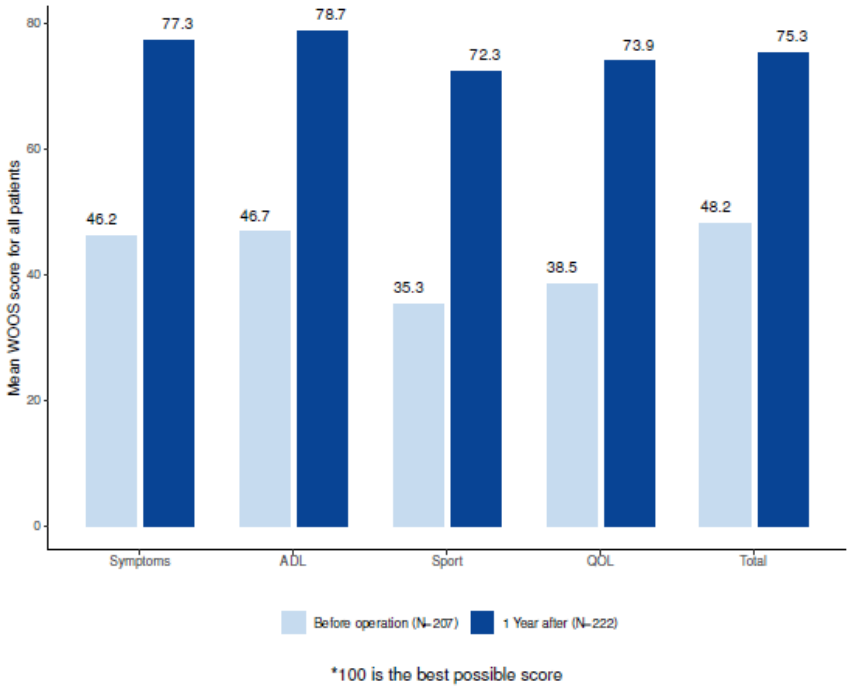
The Shoulder Arthroplasty Register has had electronic collection of patient-reported data (Patient Reported Outcome Measures (PROM)) since 2020. The register aims to focus more on patients' self-perceived quality of life and joint function before and after surgery. Patients complete an electronic questionnaire before surgery and 1, 6 and 10 years after surgery. The data we collect from patients will be compared with the data reported by the surgeons for the same group of patients. This will allow us to emphasize function and quality of life, in addition to a possible revision of the prosthesis.

So far, 424 pre-operative PROM forms and 553 one-year follow-up forms have been reported to the register. In 2022 207 pre-operative PROM forms and 222 one-year follow-up forms were reported. Currently, these are not categorized by diagnosis (fracture/non-fracture), and most likely, there are more questionnaires from elective patients. Reporting procedures for preoperative PROMs for fracture patients are not in place, so the preoperative PROM results are for elective patients, while postoperative results may also include fracture patients. To date, 19 hospitals have started collecting and reporting PROMS (12 in 2022). All hospitals will receive reports containing analyses of their own results. Please feel free to contact our consultant Mikal Solberg at mikal.solberg@helse-bergen.no if you have any questions about electronic PROM registration.

Patient demography	Before Operation	1 Year after
Number of forms (n)	207	222
Men (%)	41.5	35.1
Median age (min-max)	68 (31-88)	71 (45-91)
Body-Mass Index mean (SD)	28.7 (5.2)	27.6 (6.5)
Uses alcohol n (%)	149 (72)	177 (79.7)
Smokes n (%)	11 (5.3)	28 (12.6)
High school education or higher n (%)	74 (35.7)	103 (46.4)
Lives alone n (%)	43 (20.8)	73 (32.9)
UCLA activity* mean (SD)	4.7 (1.9)	5.1 (1.9)
Health** (VAS) mean (SD)	56.8 (22.1)	67.3 (19.7)

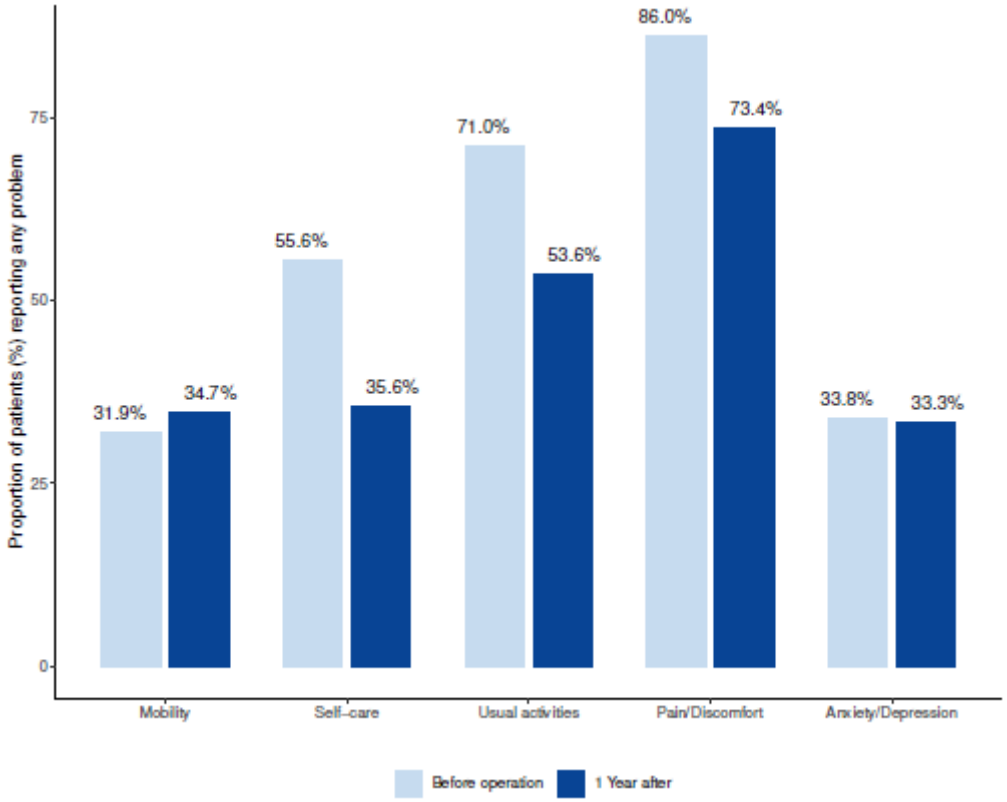
*Beste mulige skår er 10, **100 er best mulig helse

Figure C.14 Average WOOS score before/after operation*



*100 is the best possible score

Figure C.15 Proportion of patients reporting any problems with mobility, self-care, usual activities, Pain/discomfort, or anxiety/depression before/after operation (5Q-5D-5L)



Health Trust	Reporting Hospitals	No. of Preoperative forms
Central Norway Regional Health Authority	2/8	6
South-Eastern Norway Regional Health Authority	5/19	173
Western Norway Regional Health Authority	4/7	21
Private	1/7	7

Figure C.16 Proportion of primary shoulder operations where pre-operative PROMS have been reported in 2021-2022

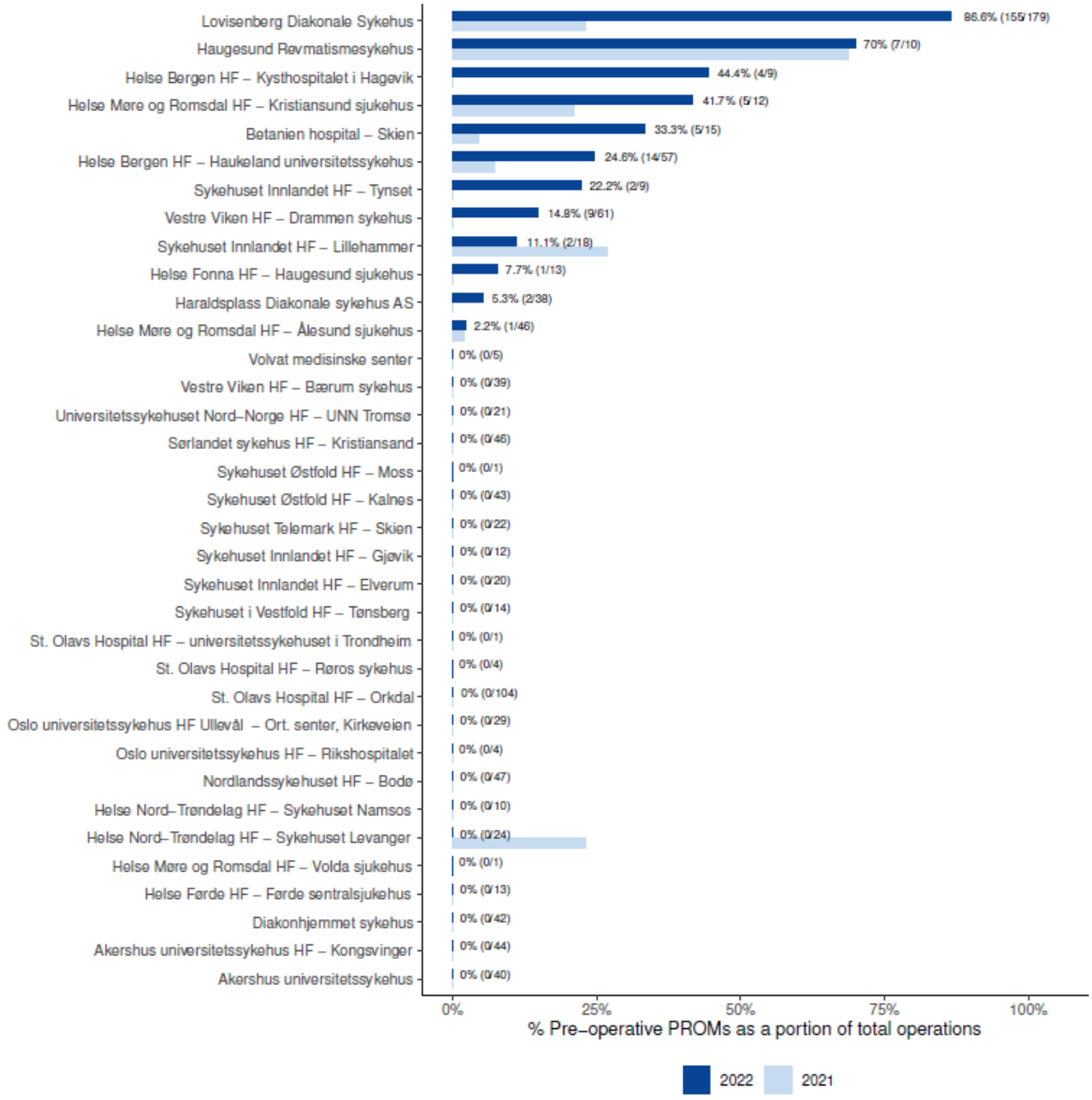
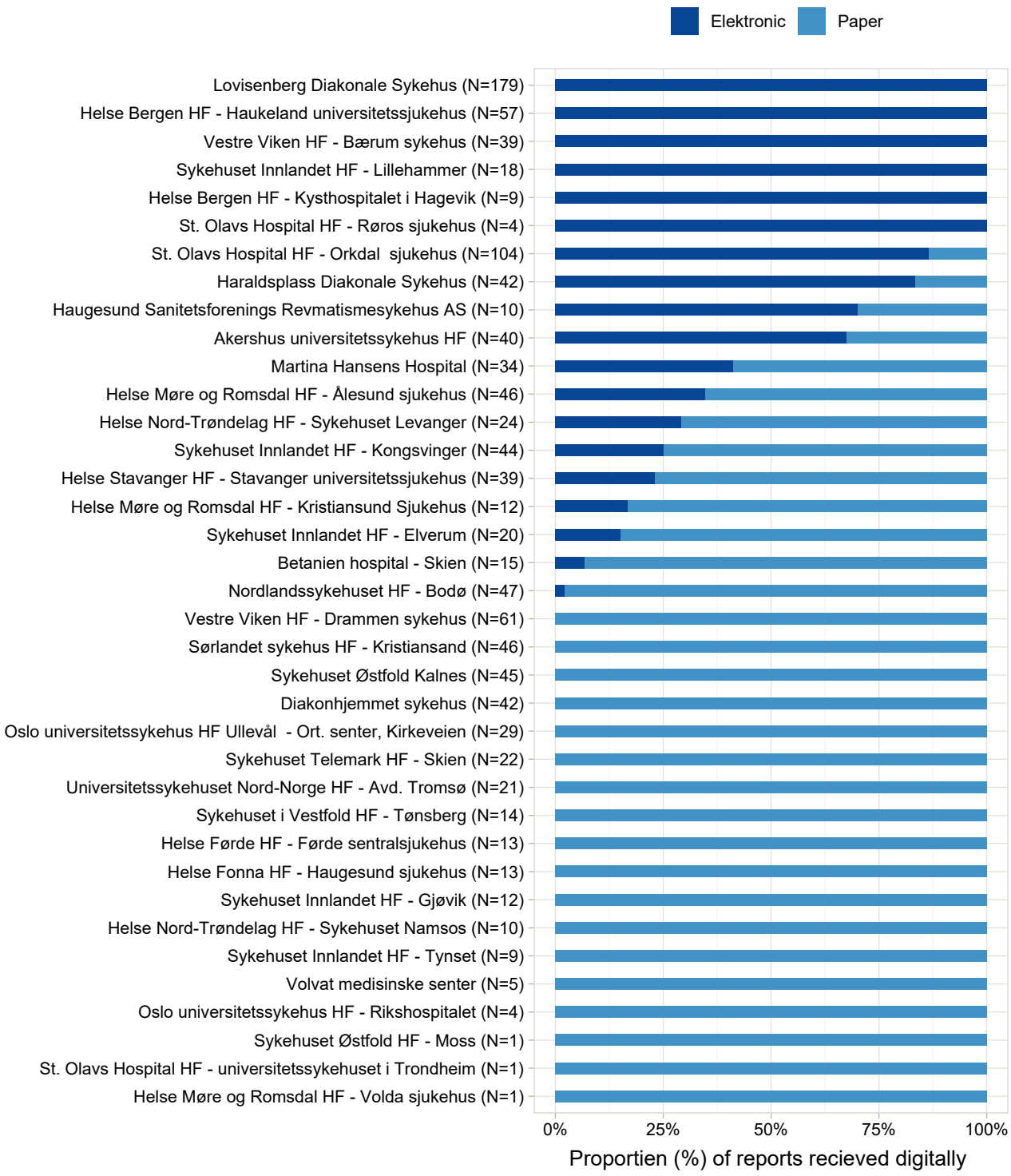


Figure C.16 presents the hospitals that have submitted preoperative PROM questionnaires either on paper or digitally through the web portal in MRS. Reporting is still low, but some hospitals appear to have taken steps to improve reporting. We would like to remind you that any questions regarding reporting in MRS can be sent to the register.

Form registration by format in 2022, all shoulder operations



National average for eletronic form registration in 2022 is 46,7 %.

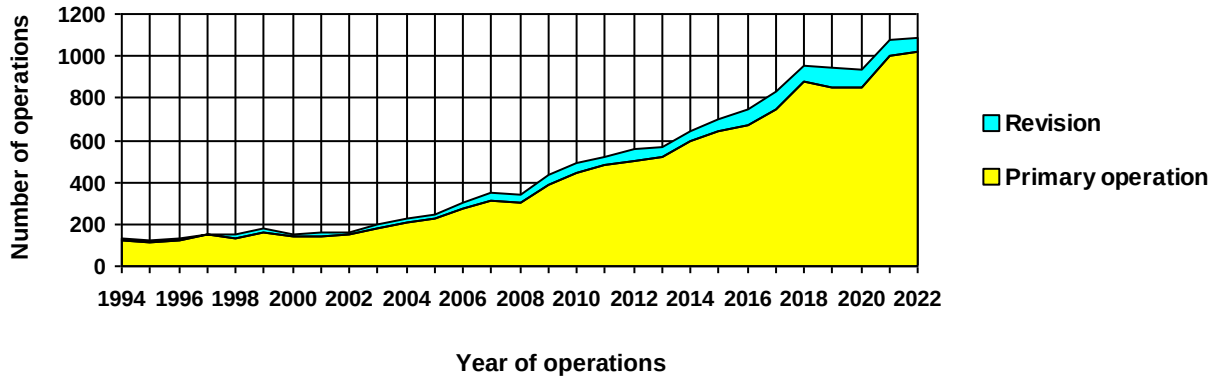
SHOULDER PROSTHESES

Table 1: Annual number of shoulder prostheses

Year	Primary operations		Reoperations *		Revisions		Total
2022	1 017	(93,6%)	2	(0,2%)	68	(6,3%)	**1 087**
2021	997	(92,5%)			81	(7,5%)	**1 078**
2020	854	(90,6%)	4	(0,4%)	85	(9,0%)	**943**
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**
1994-13	5 069	(91,1%)	3	(0,1%)	491	(8,8%)	**5 563**
Total	**12 325**	**(91,4%)**	**11**	**(0,1%)**	**1 155**	**(8,6%)**	**13 491**

* 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



53,7 % of all operations were performed on the right side 68,6 % performed in women. Mean age: 70,3 years.

COVID-19

Figure 1b: Monthly primary operations in 2019 - 2022

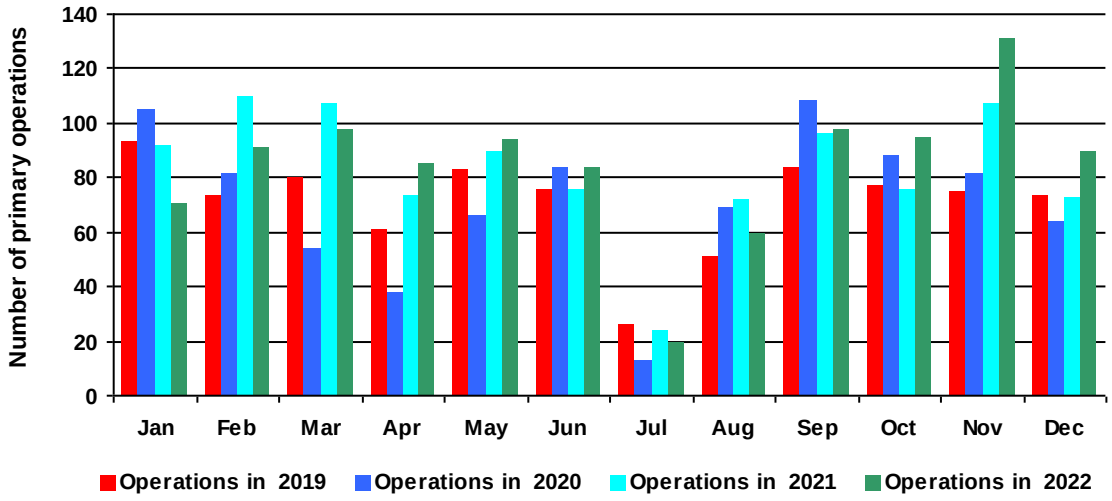


Figure 2a: Prostheses - all operations

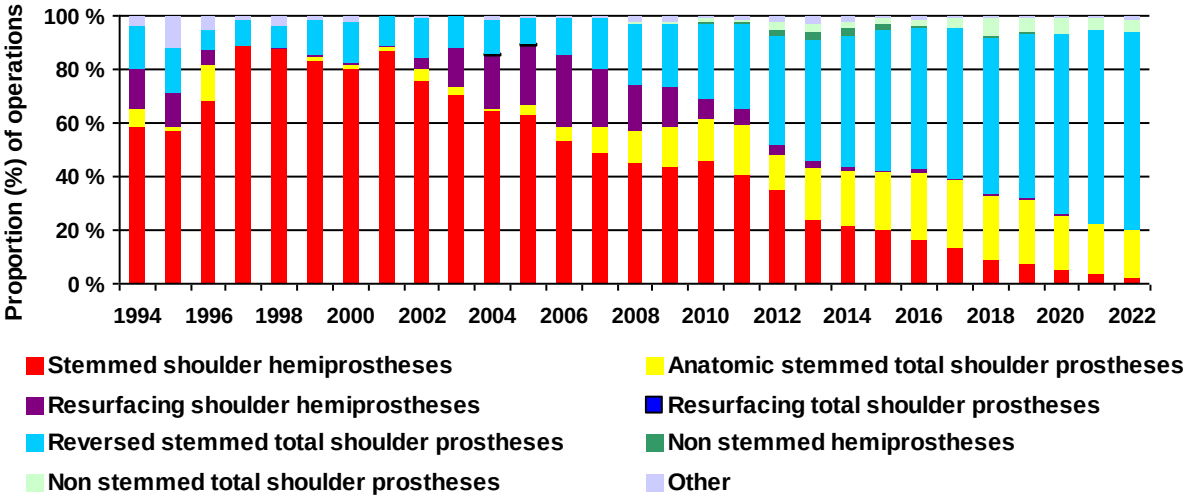


Figure 2b: Prostheses - Idiopathic osteoarthritis

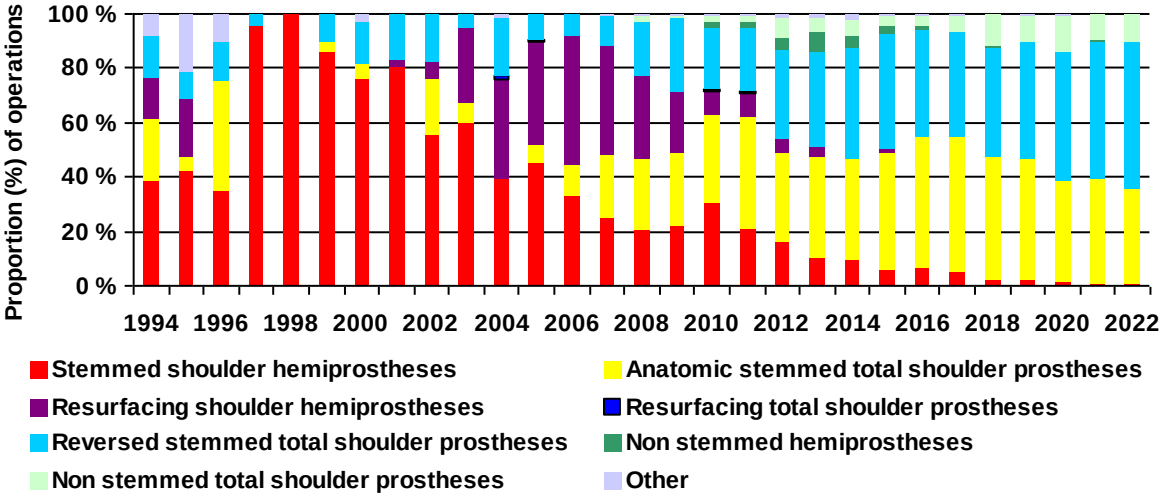


Figure 2c: Prostheses - Acute fracture

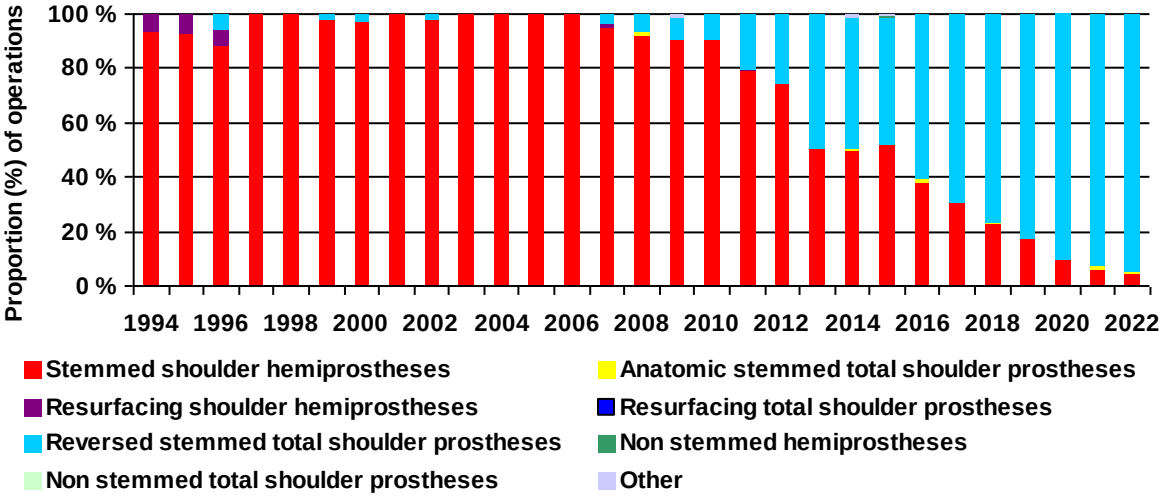


Figure 3: Age at the insertion of primary anatomic total prostheses

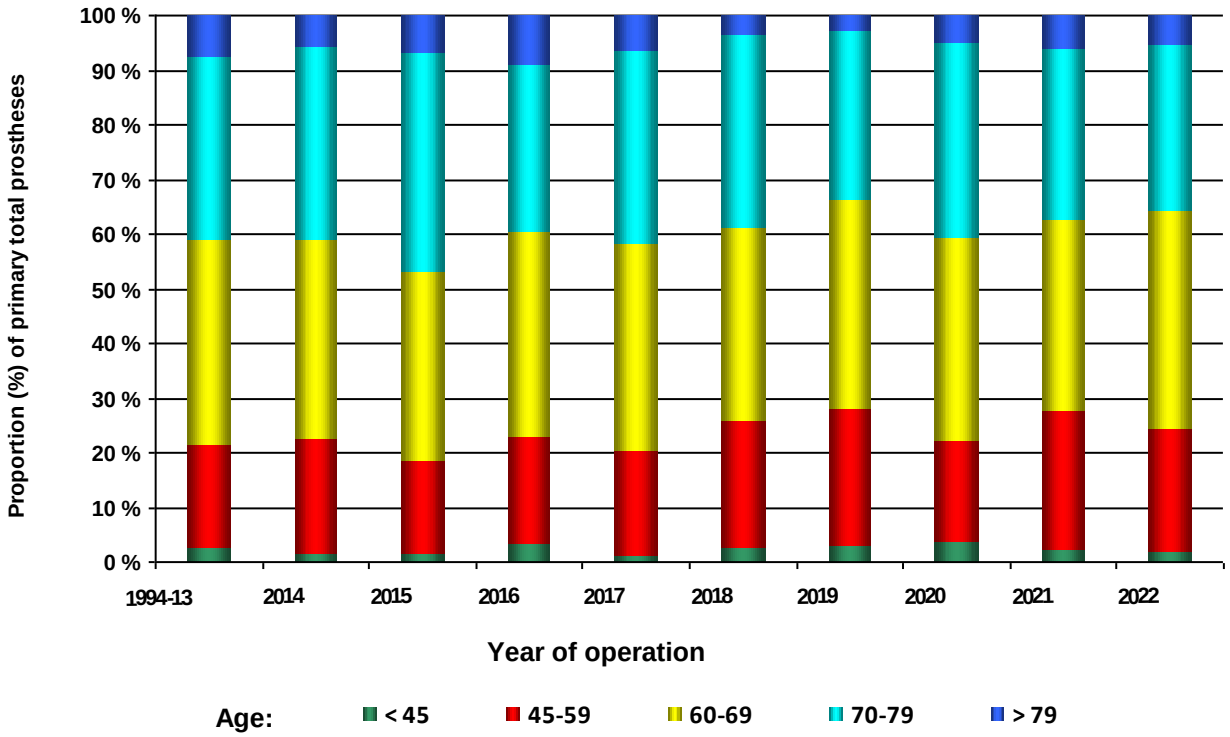


Figure 4: Age at the insertion of primary reversed total prostheses

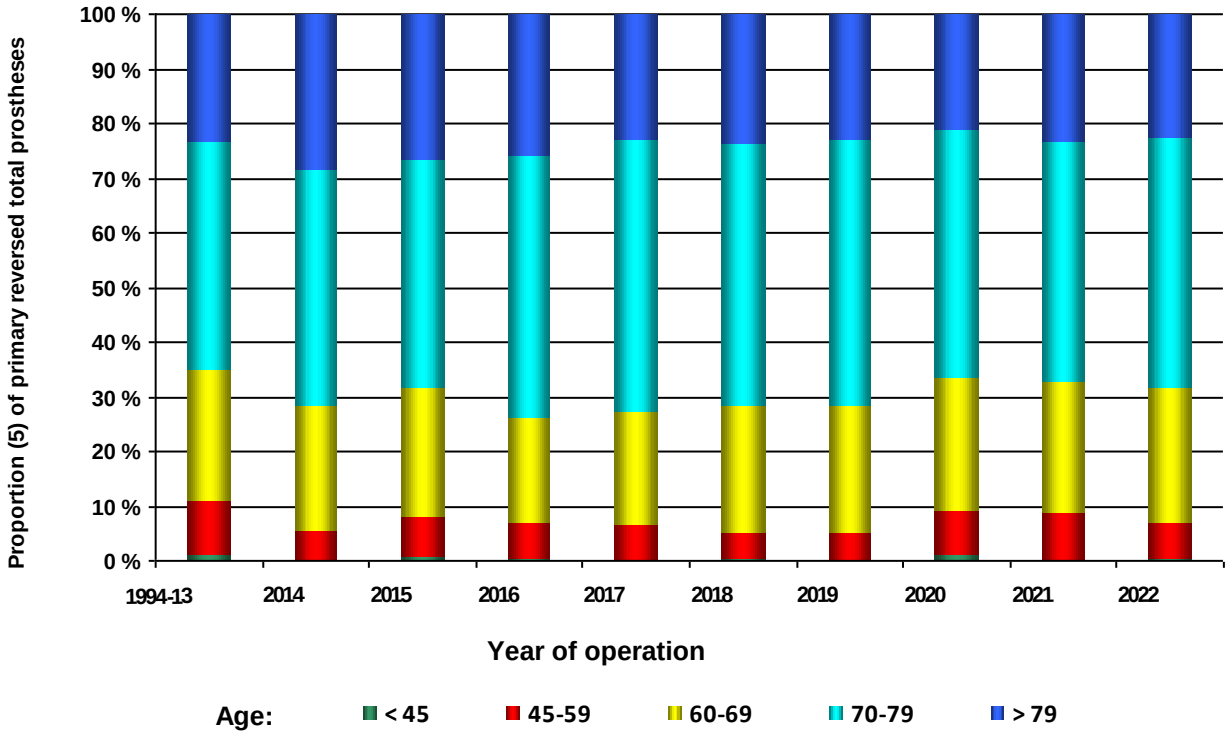


Figure 5: Age at the insertion of primary hemiprostheses

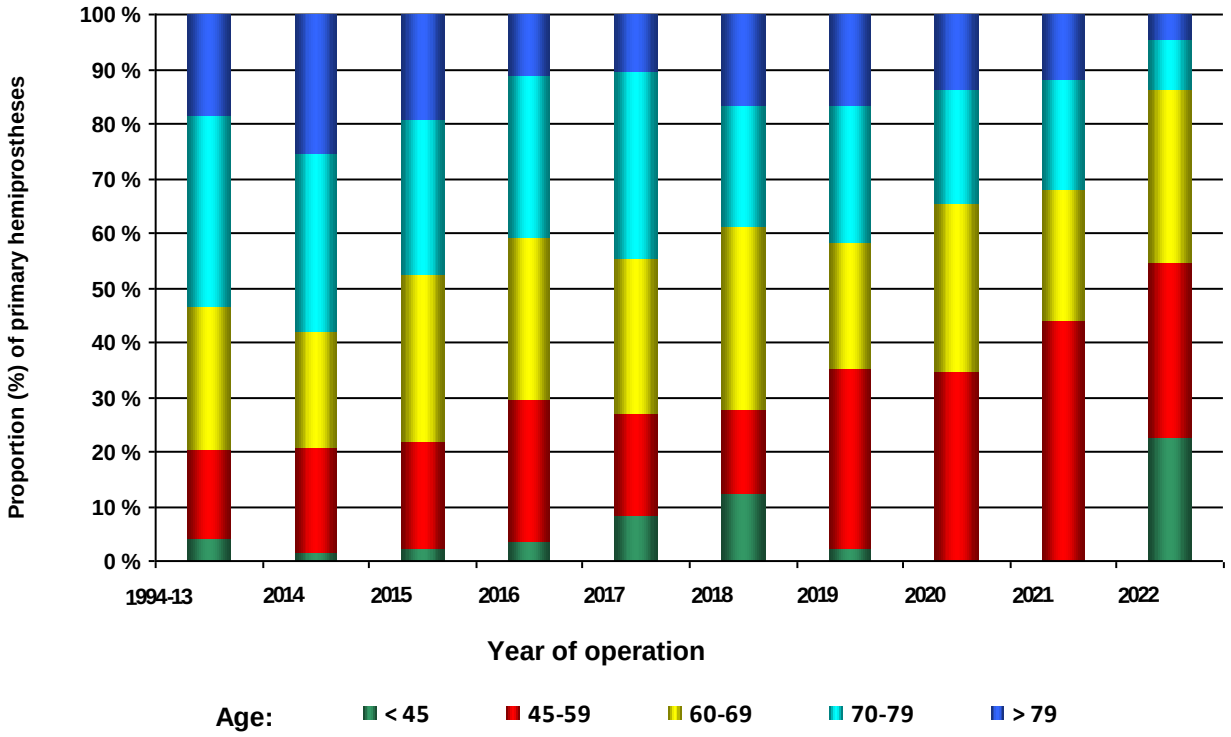


Table 2: Annual number of operations - Stemmed shoulder hemiprostheses

Year	Primary operations		Reoperations *		Revisions		Total
2022	20	(64,5%)	1	(3,2%)	10	(32,3%)	**31**
2021	24	(63,2%)			14	(36,8%)	**38**
2020	29	(59,2%)	2	(4,1%)	18	(36,7%)	**49**
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**
1994-13	2 687	(92,4%)	1	(0,0%)	219	(7,5%)	**2 907**
Total	**3 303**	**(89,3%)**	**5**	**(0,1%)**	**392**	**(10,6%)**	**3 700**

* 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

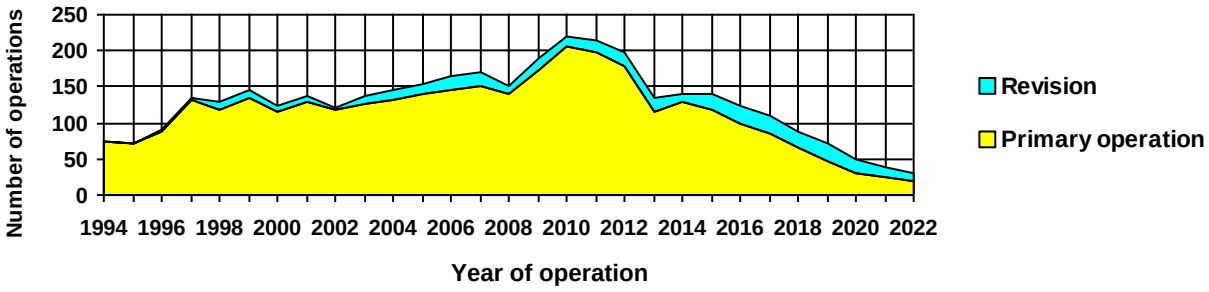


Table 3: Annual number of operations - Anatomic stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2022	176	(93,6%)	12	(6,4%)	**188**
2021	181	(92,3%)	15	(7,7%)	**196**
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**
1994-13	530	(90,6%)	55	(9,4%)	**585**
Total	**2 108**	**(92,2%)**	**178**	**(7,8%)**	**2 287**

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

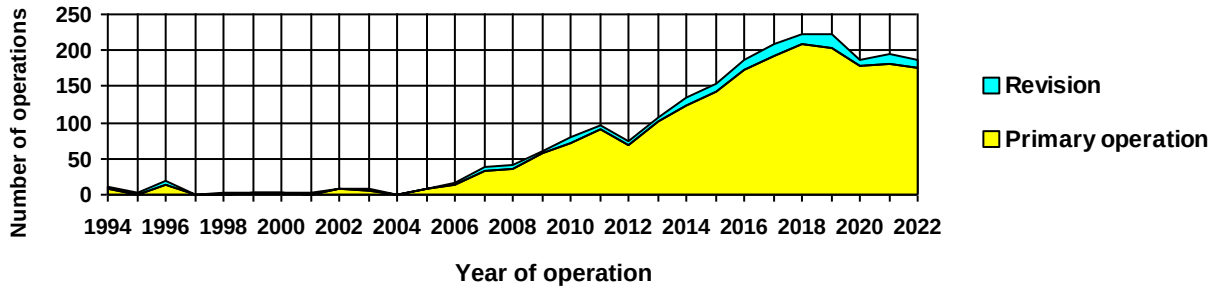


Table 4: Annual number of operations - Resurfacing shoulder hemiprostheses

Year	Primary operations		Revisions		Total
2022			1	(100,0%)	**1**
2021			6	(100,0%)	**6**
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**
1994-13	477	(86,6%)	74	(13,4%)	**551**
Total	**480**	**(78,2%)**	**134**	**(21,8%)**	**614**

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

Year	Primary operations		Revisions		Total
1994-13	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
2022	759	(95,6%)	1	(0,1%)	34	(4,3%)	**794**
2021	739	(94,4%)			44	(5,6%)	**783**
2020	584	(92,0%)	5	(0,8%)	46	(7,2%)	**635**
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	348	(92,3%)			29	(7,7%)	**377**
2014	299	(94,3%)			18	(5,7%)	**317**
1994-13	1 245	(92,2%)	1	(0,1%)	104	(7,7%)	**1 350**
Total	**5 858**	**(93,4%)**	**11**	**(0,2%)**	**402**	**(6,4%)**	**6 271**

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

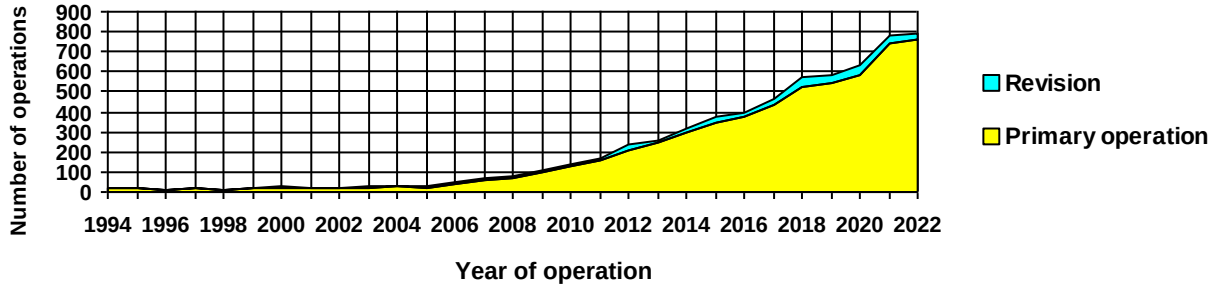


Table 7: Annual number of operations - Non stemmed hemiprostheses

Year	Primary operations		Revisions		Total
2022	2	(100,0%)			**2**
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**
1994-13	41	(97,6%)	1	(2,4%)	**42**
Total	**91**	**(82,0%)**	**20**	**(18,0%)**	**111**

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

Year	Primary operations		Revisions		Total
2022	46	(86,8%)	7	(13,2%)	**53**
2021	44	(89,8%)	5	(10,2%)	**49**
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**
1994-13	42	(95,5%)	2	(4,5%)	**44**
Total	**361**	**(91,9%)**	**32**	**(8,1%)**	**393**

Reasons for primary operations

Table 9: Shoulder diagnosis in primary operations

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotatorcuff arthropathy	Other	Missing
2022	475	25	103	3	2	281	6	193	87	
2021	414	24	101	1	20	295	4	181	53	2
2020	388	23	96	2	21	226	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	30	
2014	267	29	79	2	22	177	2	39	23	
1994-13	1690	886	851	28	80	1351	31	180	220	16
Total	**4 958**	**1 173**	**1 731**	**41**	**231**	**3 249**	**71**	**1 244**	**619**	**18**

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

Table 10: Shoulder diagnosis 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	Rotatorcuff arthropathy	Other	Missing
2022	2		2			13			3	
2021	4					18		1	3	
2020	5		1			21	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	
1994-13	523	448	503	18	8	1161	9	9	111	10
Total	**627**	**454**	**566**	**19**	**9**	**1 587**	**12**	**16**	**147**	**10**

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

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

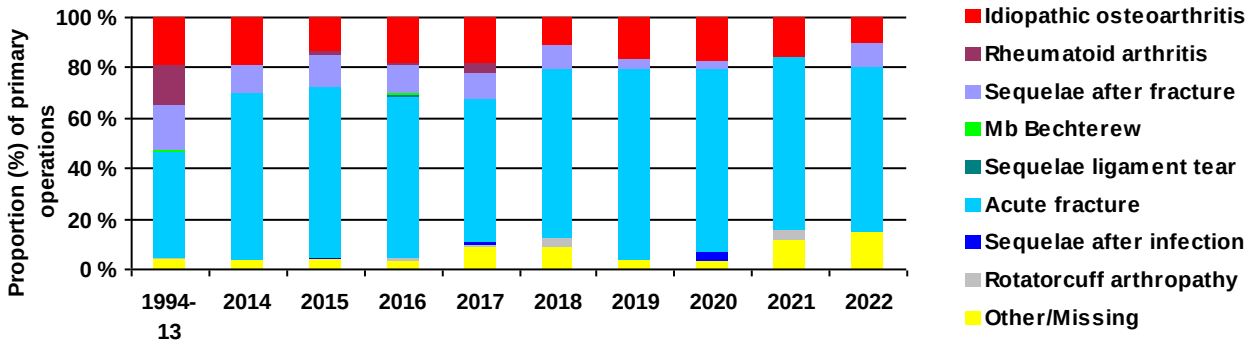


Table 11: Shoulder diagnosis in primary operations - Anatomic stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotatorcuff arthropathy	Other	Missing
2022	163	3	9	1	2	1		1	7	
2021	158	4	9		1	3			10	
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	
1994-13	421	29	56	2	6	1	4		17	1
Total	**1 781**	**81**	**169**	**3**	**30**	**9**	**8**	**4**	**82**	**1**

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

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

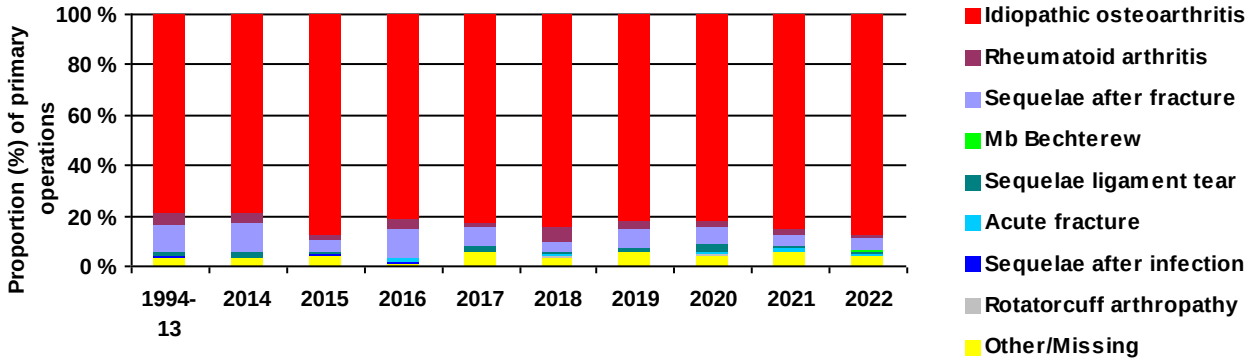


Table 12: Shoulder diagnosis in primary operations - Resurfacing shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotatorcuff arthropathy	Other	Missing
2015	3									
1994-13	296	124	36	4	6	4	3	5	19	3
Total	**299**	**124**	**36**	**4**	**6**	**4**	**3**	**5**	**19**	**3**

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

Table 13: Shoulder diagnosis 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	Rotatorcuff arthropathy	Other	Missing
1994-13	4								1	
Total	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

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

Table 14: Shoulder diagnosis 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	Rotatorcuff arthropathy	Other	Missing
2022	255	17	92	1		266	6	189	72	
2021	206	17	90	1	18	274	4	179	39	2
2020	183	17	81	1	12	204	4	114	37	
2019	169	16	87		10	172	2	121	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	122	29	63	1	17	78	4	59	17	
2014	111	24	45	2	18	86	2	39	9	
1994-13	354	272	244	4	57	185	15	166	62	1
Total	**1 811**	**484**	**916**	**12**	**169**	**1 645**	**45**	**1 195**	**313**	**3**

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

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

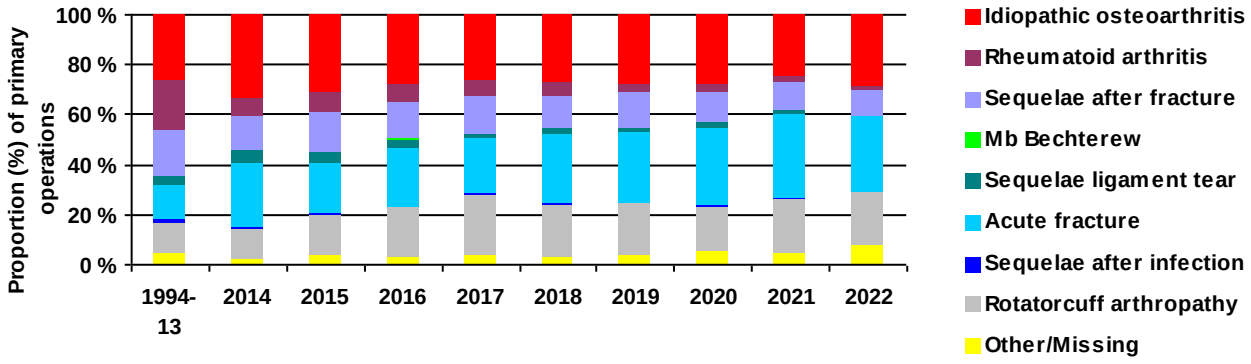


Table 15: Shoulder diagnosis in primary operations - Non stemmed shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotatorcuff arthropathy	Other	Missing
2022	1								2	
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	
1994-13	34	1	5						3	
Total	**66**	**1**	**13**	**0**	**2**	**1**	**1**	**3**	**11**	**0**

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

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

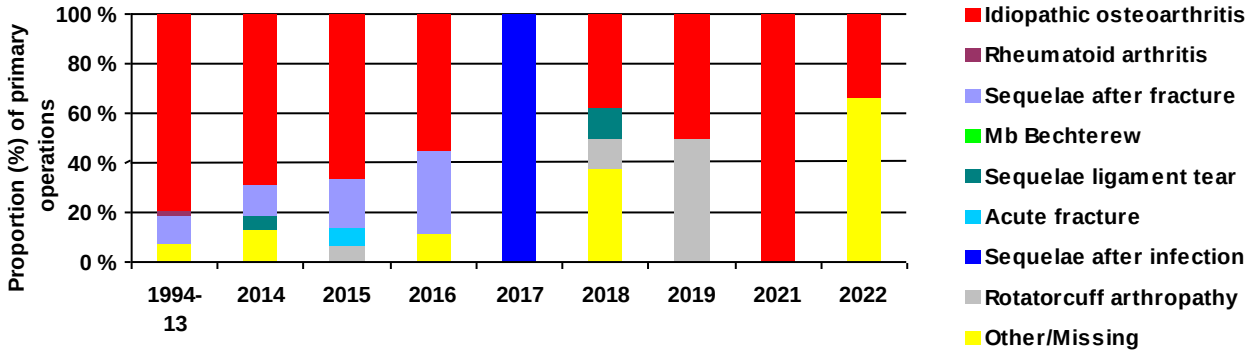
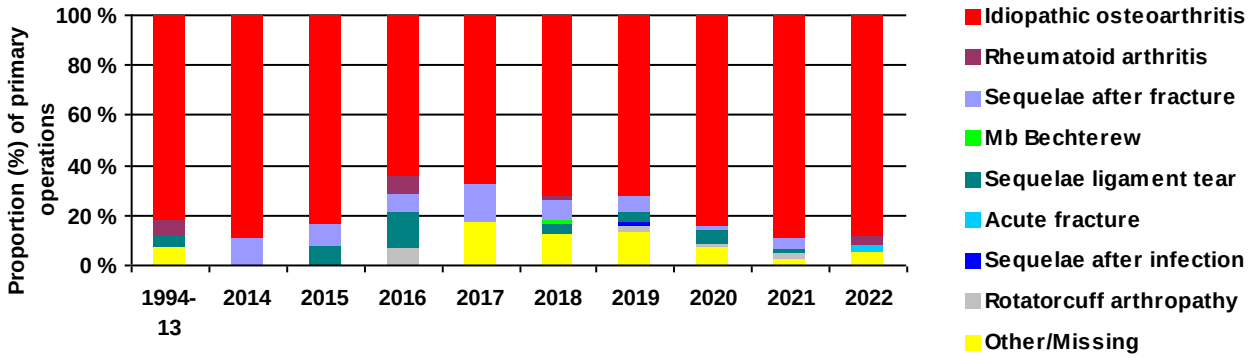


Table 16: Shoulder diagnosis in primary operations - Non stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotatorcuff arthropathy	Other	Missing
2022	45	2				1			3	
2021	40		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							
1994-13	35	3			2				3	
Total	**306**	**7**	**19**	**1**	**14**	**1**	**1**	**4**	**31**	**0**

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

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



Fixation of shoulder prostheses

Figure 14: Stemmed shoulder hemiprostheses - Primary operations - Humerus

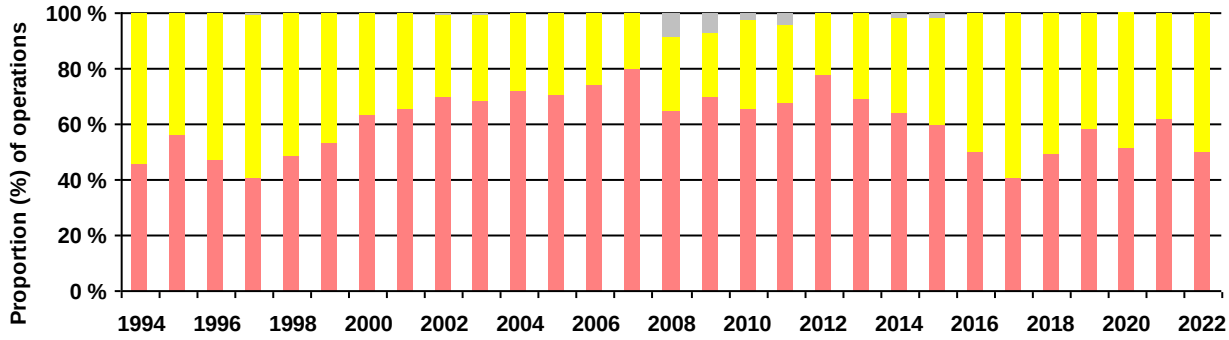


Figure 15: Anatomic stemmed total shoulder prostheses - Primary operations - Glenoid

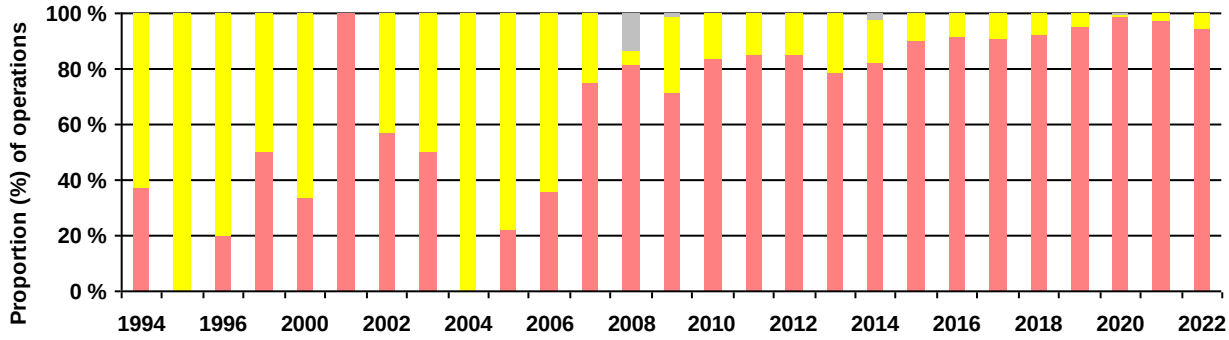


Figure 16: Anatomic stemmed total shoulder prostheses - Primary operations - Humerus

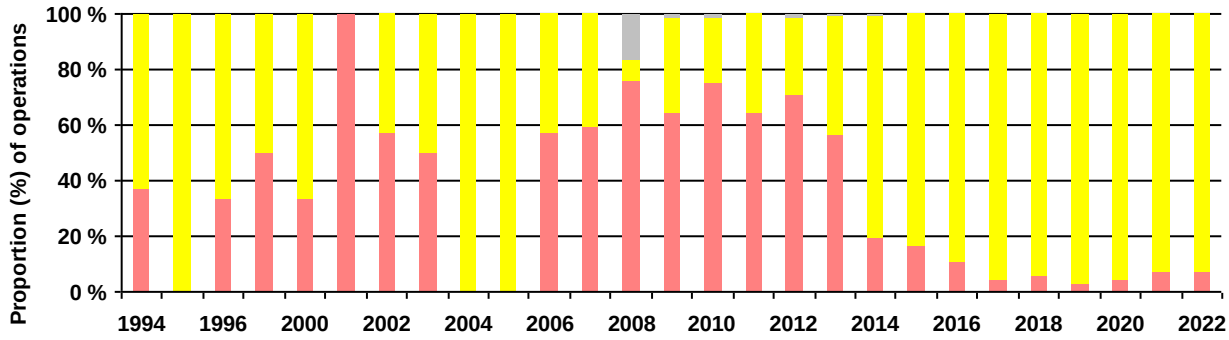


Figure 17: Resurfacing shoulder hemiprostheses - Primary operations - Humerus

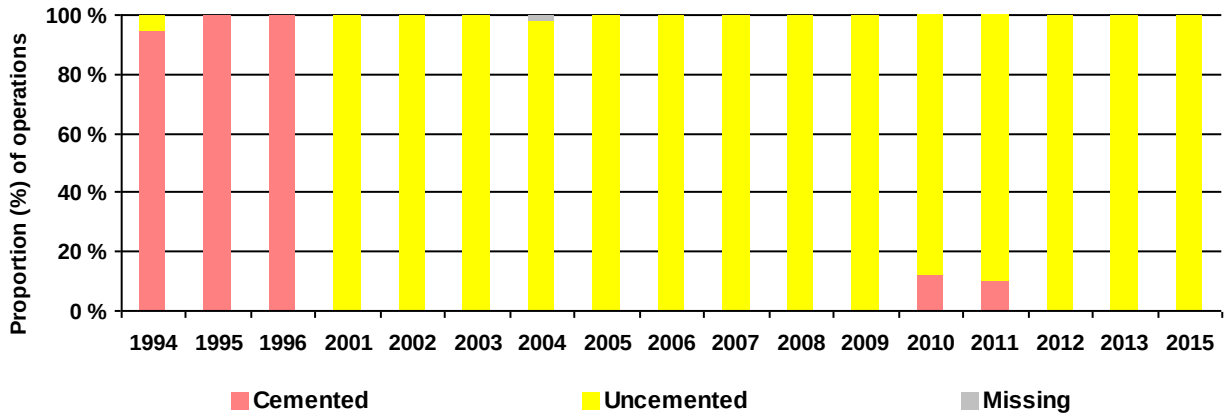


Figure 18: Reversed stemmed total shoulder prostheses - Primary operations - Glenoid

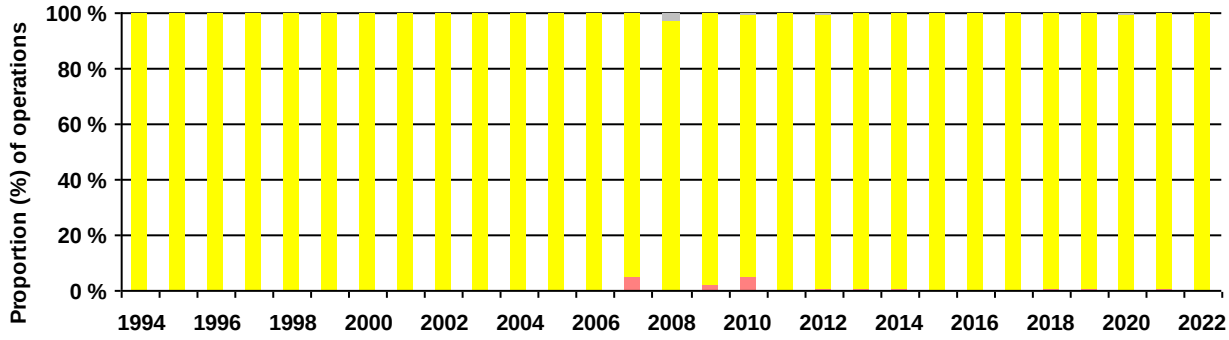


Figure 19: Reversed stemmed total shoulder prostheses - Primary operations - Humerus

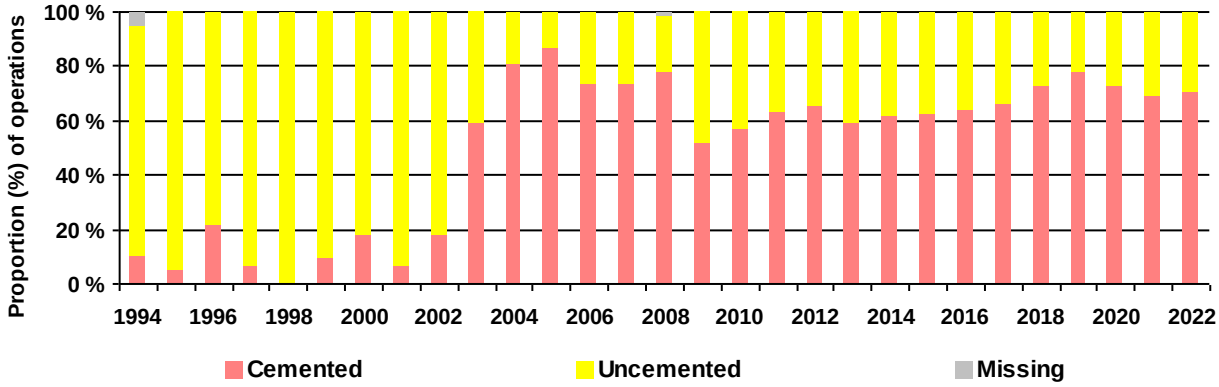


Figure 20: Non stemmed shoulder hemiprostheses - Primary operations - Humerus

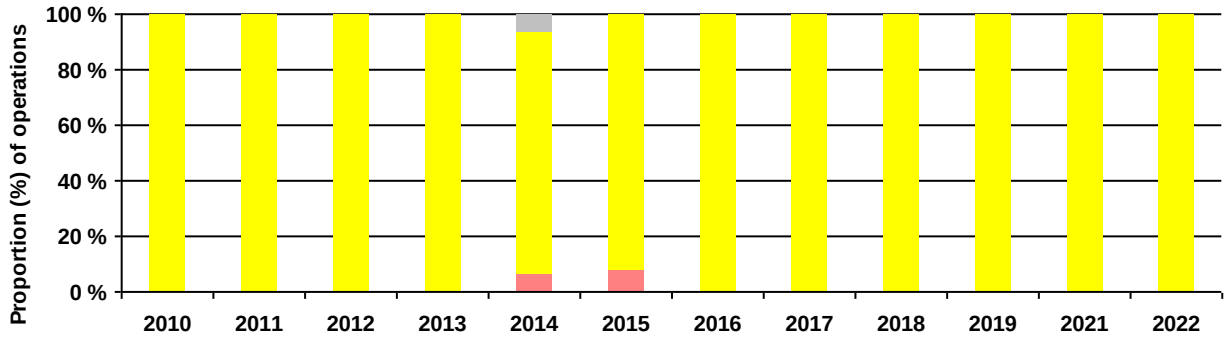


Figure 21: Non stemmed total shoulder prostheses - Primary operations - Glenoid

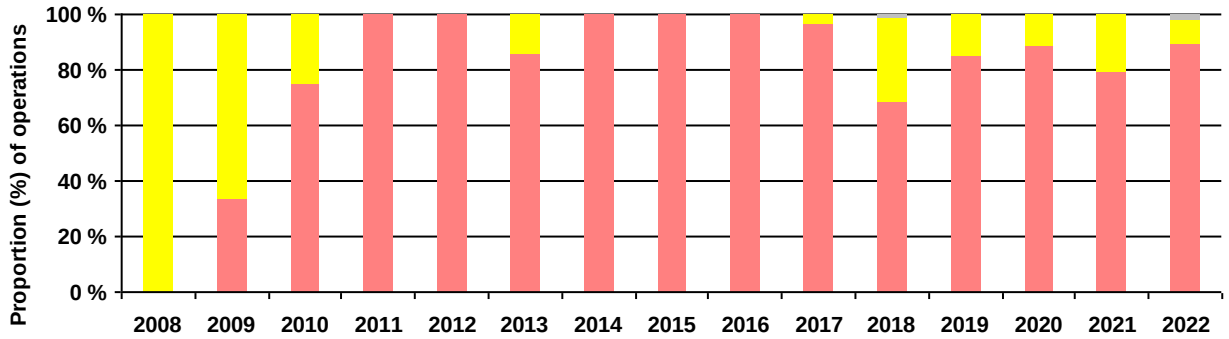
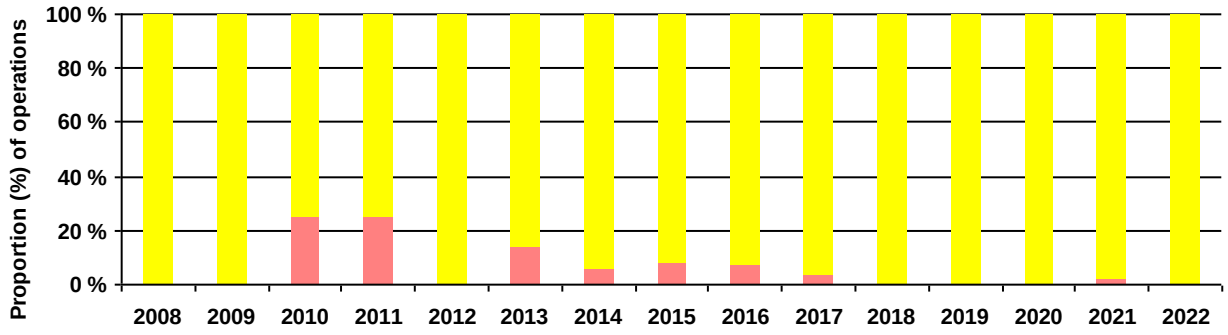


Figure 22: Non stemmed total shoulder prostheses - Primary operations - Humerus



Prosthesis brand

Stemmed hemiprostheses shoulder

Table 17: Primary operations- Humeral head

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Bio - Modular	764	1	2			2					**769**
Global Advantage	641	40	34	15	1						**731**
Global Fx	238	16	13	11			1				**279**
Global	248										**248**
Nottingham	204										**204**
Global Unite	1	14	23	34	31	37	26	13	8	11	**198**
EPOCA	119	21	5								**145**
Tess-Anatomic	71	7	3	5							**86**
Comprehensive	6	6	5	13	16	4	5	7	7	2	**71**
Delta I	63										**63**
SMR- anatomic		1	2	7	13	10	8	4	4	4	**53**
Promos standard	23	11	11	6	2						**53**
Aequalis Ascend Flex Anatomic	1	2	8	2	11	6	4	5	5	3	**47**
Aequalis	44										**44**
Aequalis-Fracture	31	3	1	1	3	2					**41**
Nottingham 1	38										**38**
Modular	33										**33**
Bigliani/Flatow	29		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	**2 580**	**130**	**118**	**100**	**84**	**65**	**46**	**29**	**24**	**20**	**3 196**

Table 18: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Bio - Modular	773	1	2			2					**778**
Global Advantage	446	38	33	15	1						**533**
Global Fx	433	18	14	11			1				**477**
Global	261										**261**
Nottingham	210										**210**
Global Unite	1	14	23	34	31	37	26	13	8	11	**198**
EPOCA	120	21	5								**146**
Tess-Anatomic	70	7	3	5							**85**
Delta I	64										**64**
SMR- anatomic		1	2	7	13	10	8	4	4	4	**53**
Promos standard	22	11	11	6	2						**52**
Neer II	47										**47**
Aequalis Ascend Flex Anatomic	1	2	8	2	11	6	4	5	5	3	**47**
Aequalis-Fracture	35	3	1	1	3	2					**45**
Aequalis	39										**39**
Comprehensive Fracture	7	6	5	3	3	2	3	3	4	2	**38**
Comprehensive				10	13	2	2	4	3		**34**
Modular	33										**33**
Nottingham 1	32										**32**
Bigliani/Flatow	29		1			1	1				**32**
JR-Vaios Anatomic	1	7	9	3	6	2	1				**29**
Other (n < 15)	63	1	1	3	1	1					**70**
Total	**2 687**	**130**	**118**	**100**	**84**	**65**	**46**	**29**	**24**	**20**	**3 303**

Anatomic stemmed total shoulder prostheses

Table 19: Primary operations - Glenoid

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Global unite anatomic		3	82	100	130	137	142	148	135	133	**1 010**
Aequalis	245	3									**248**
Aequalis Ascend Flex Anatomic	12	68	15	30	25	25	10	8	13	14	**220**
Comprehensive	7		1		10	24	41	16	31	20	**150**
Global	114	9	1								**124**
Global Advantage	6	18	27	19	1						**71**
JR-Vaios Anatomic	4	8	8	11	8	8	1				**48**
Tess-Anatomic	33	3	3	4	1	3					**47**
SMR- anatomic		1		4	11	9	7	2	2	8	**44**
Bio - Modular	37										**37**
Promos standard	4	7	6	4	3	3					**27**
Bigliani/Flatow	18	2		1	2	1					**24**
Anatomical shoulder	13	1	1								**15**
Other (n < 15)	37						1	4		1	**43**
Total	**530**	**123**	**144**	**173**	**191**	**210**	**202**	**178**	**181**	**176**	**2 108**

Table 20: Primary operations - Humeral head

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Global unite anatomic		3	82	100	130	136	141	146	133	134	**1 005**
Aequalis	244	6									**250**
Aequalis Ascend Flex Anatomic	13	65	14	30	25	25	10	11	13	14	**220**
Global Advantage	117	27	28	18	1						**191**
Comprehensive	7		1		10	24	41	16	31	20	**150**
JR-Vaios Anatomic	4	8	8	11	8	8	1				**48**
Tess-Anatomic	33	3	3	4	1	3					**47**
Bio - Modular	47										**47**
SMR- anatomic		1		4	11	9	7	2	2	8	**44**
Promos standard	4	7	6	4	3	3					**27**
Bigliani/Flatow	18	2		1	2	1					**24**
Anatomical shoulder	13	1	2								**16**
Nottingham	15										**15**
Other (n < 15)	13			1		1	2	3	2		**22**
Total	**528**	**123**	**144**	**173**	**191**	**210**	**202**	**178**	**181**	**176**	**2 106**

Table 21: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Global unite anatomic		3	82	100	130	136	141	146	133	133	**1 004**
Aequalis	244	6									**250**
Aequalis Ascend Flex Anatomic	13	63	14	30	25	25	10	11	13	14	**218**
Global Advantage	116	26	27	17	1						**187**
Comprehensive	7		1		10	24	41	16	31	20	**150**
Bio - Modular	48										**48**
Tess-Anatomic	33	3	3	4	1	3					**47**
JR-Vaios Anatomic	3	8	8	11	8	8	1				**47**
SMR- anatomic		1		4	11	9	7	2	2	8	**44**
Promos standard	4	7	6	4	3	3					**27**
Bigliani/Flatow	18	2		1	2	1					**24**
Anatomical shoulder	13	1	2								**16**
Nottingham	15										**15**
Other (n < 15)	16	3	1	2		1	2	3	2	1	**31**
Total	**530**	**123**	**144**	**173**	**191**	**210**	**202**	**178**	**181**	**176**	**2 108**

Resurfacing shoulder hemiprostheses

Table 22: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Copeland	304										**304**
Global C.A.P.	97		2								**99**
Scan Shoulder	42										**42**
EPOCA Resurfacing	18		1								**19**
Aequalis Resurfacing	16										**16**
Total	**477**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**480**

Resurfacing total shoulder prostheses

Table 23: Primary operations - Glenoid

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	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	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	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	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Delta Xtend	622	181	222	245	305	394	420	425	527	539	**3 880**
Aequalis Reversed II	71	49	60	45	40	52	38	58	71	76	**560**
Comprehensive Reverse	3	4	8	29	22	20	43	64	103	97	**393**
Delta III	315										**315**
Tess Reversed	145	31	34	27	22	3					**262**
SMR-reverse		2	3	11	31	41	36	35	38	45	**242**
Promos Reverse	36	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	6	3	2		2						**13**
Anatomical shoulder Reversed	5	5									**10**
Other (n < 10)	1		1				2	2		2	**8**
Total	**1 245**	**299**	**348**	**377**	**438**	**524**	**545**	**584**	**739**	**759**	**5 858**

Table 26: Primary operations - Humeral head

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Delta Xtend	623	181	222	245	305	394	420	425	527	540	**3 882**
Comprehensive Reverse	3	4	8	29	22	20	43	64	103	97	**393**
Aequalis Ascend Flex Reversed	16	41	44	34	32	31	27	47	51	50	**373**
Delta III	309										**309**
Tess Reversed	143	31	34	27	22	3					**260**
SMR-reverse		2	4	11	31	41	37	35	38	45	**244**
Aequalis Reversed Fracture	19	8	16	11	8	21	12	13	20	27	**155**
Promos Reverse	36	19	14	17	11	9					**106**
Aequalis-Reversed	50										**50**
JRI-Vaios Inverse	9	5	4	3	5	5	6				**37**
Aequalis Reversed II	14										**14**
Trebecular Metal Reverse Shou	5	3	2		2						**12**
Anatomical shoulder Reversed	5	5									**10**
Other (n < 10)	1										**1**
Total	**1 233**	**299**	**348**	**377**	**438**	**524**	**545**	**584**	**739**	**759**	**5 846**

Table 27: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Delta Xtend	623	181	222	245	305	394	420	425	525	531	**3 871**
Aequalis Ascend Flex Reversed	16	41	44	34	32	31	27	47	51	49	**372**
Delta III	315										**315**
Comprehensive Reverse	3	4	8	27	21	19	33	44	74	66	**299**
Tess Reversed	144	31	34	27	22	3					**261**
SMR-reverse		2	4	11	31	41	37	35	38	45	**244**
Aequalis Reversed Fracture	19	8	16	11	8	21	12	13	20	27	**155**
Promos Reverse	36	19	14	17	11	9					**106**
Comprehensive Fracture				2	1	1	9	20	28	23	**84**
Aequalis-Reversed	61										**61**
JRI-Vaios Inverse	9	5	4	3	5	5	6				**37**
Trebecular Metal Reverse Shou	6	3	2		2						**13**
Anatomical shoulder Reversed	5	5									**10**
Other (n < 10)	8						1		3	18	**30**
Total	**1 245**	**299**	**348**	**377**	**438**	**524**	**545**	**584**	**739**	**759**	**5 858**

Non-stemmed shoulder hemiprostheses

Table 28: Primary operations - Humeral head

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
ECLIPSE TM	35	10	11	3							**59**
Global Icon					1	5	2		1	2	**11**
Simpliciti	4	4		1		1					**10**
Other (n < 10)	2	2	2	4		1					**11**
Total	**41**	**16**	**13**	**8**	**1**	**7**	**2**	**0**	**1**	**2**	**91**

Table 29: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
ECLIPSE TM	35	10	11	3							**59**
Global Icon					1	5	2		1	2	**11**
Simpliciti	4	4		1		1					**10**
Other (n < 10)	2	2	2	4		1					**11**
Total	**41**	**16**	**13**	**8**	**1**	**7**	**2**	**0**	**1**	**2**	**91**

Non-stemmed total shoulder prostheses

Table 30: Primary operations - Glenoid

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Global unite anatomic					9	16	24	34	20	35	**138**
Aequalis Ascend Flex Anatomic		13	7	12	13	24	12	8	15	5	**109**
SMR- anatomic						18	8	7	8	3	**44**
ECLIPSE TM	10	4	5		2	1	2	4	1		**29**
Simpliciti	20										**20**
Tess-Anatomic	10				1						**11**
Other (n < 10)	2	1		2	1	1				3	**10**
Total	**42**	**18**	**12**	**14**	**26**	**60**	**46**	**53**	**44**	**46**	**361**

Table 31: Primary operations - Humeral head

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Global Icon					9	16	24	34	20	37	**140**
Simpliciti	22	13	7	12	13	24	12	8	15	5	**131**
SMR- anatomic						18	8	7	8	4	**45**
ECLIPSE TM	10	4	5		2	1	2	4	1		**29**
Tess-Anatomic	10				1						**11**
Other (n < 10)		1		2	1	1					**5**
Total	**42**	**18**	**12**	**14**	**26**	**60**	**46**	**53**	**44**	**46**	**361**

Table 32: Primary operations - Humerus

Prostheses	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Global Icon					9	16	24	34	20	37	**140**
Simpliciti	22	14	7	12	13	24	11	8	15	5	**131**
SMR- anatomic						18	8	7	8	4	**45**
ECLIPSE TM	10	4	5		2	1	2	4	1		**29**
Tess-Anatomic	10				1						**11**
Other (n < 10)				2	1	1	1				**5**
Total	**42**	**18**	**12**	**14**	**26**	**60**	**46**	**53**	**44**	**46**	**361**

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
2022									1	1	1	
2021				4			1	3			5	
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
1994-06		8	11	10	1	6	3	51			24	1
Total	**0**	**20**	**29**	**40**	**1**	**23**	**17**	**165**	**2**	**23**	**99**	**5**

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

Table 34: Anatomical 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
2022	2						1	1	3	1	5	
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			
1994-06	3		6					4			2	
Total	**31**	**3**	**17**	**20**	**2**	**8**	**4**	**31**	**18**	**1**	**38**	**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
2022										1	1	
2021		1		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	
1994-06		4		1		1	1	7			1	
Total	**0**	**16**	**2**	**8**	**1**	**3**	**5**	**86**	**1**	**19**	**26**	**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
1994-06			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
2022	2	1	5	1		10	5	1			4	
2021	4	5	5			14	4	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				
1994-06	12	5	5	3		6	1	3	1		3	
Total	**46**	**31**	**79**	**19**	**4**	**83**	**34**	**23**	**13**	**0**	**23**	**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
2022	1		1	1		2		2			5	
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	**7**	**2**	**2**	**5**	**0**	**7**	**0**	**5**	**2**	**0**	**12**	**0**

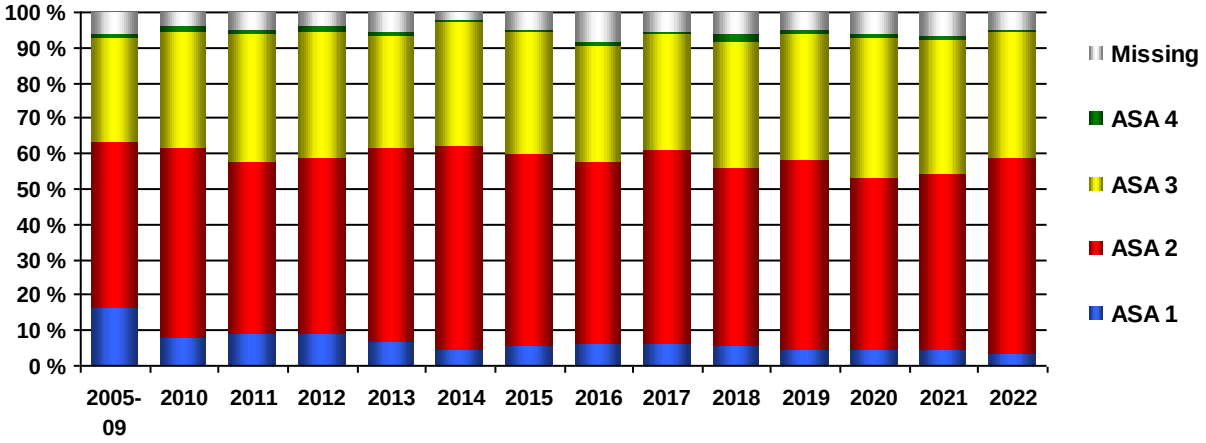
Revision reasons are not mutually exclusive. More than one reason for revision is possible. Only the first reoperation is counted.

ASA classification all shoulder prostheses

Table 40: Primary operations

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2022	34	568	358	8		49	**1 017**
2021	45	499	375	11		67	**997**
2020	39	418	333	13		51	**854**
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**
2005-09	250	704	447	16		92	**1 509**

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.

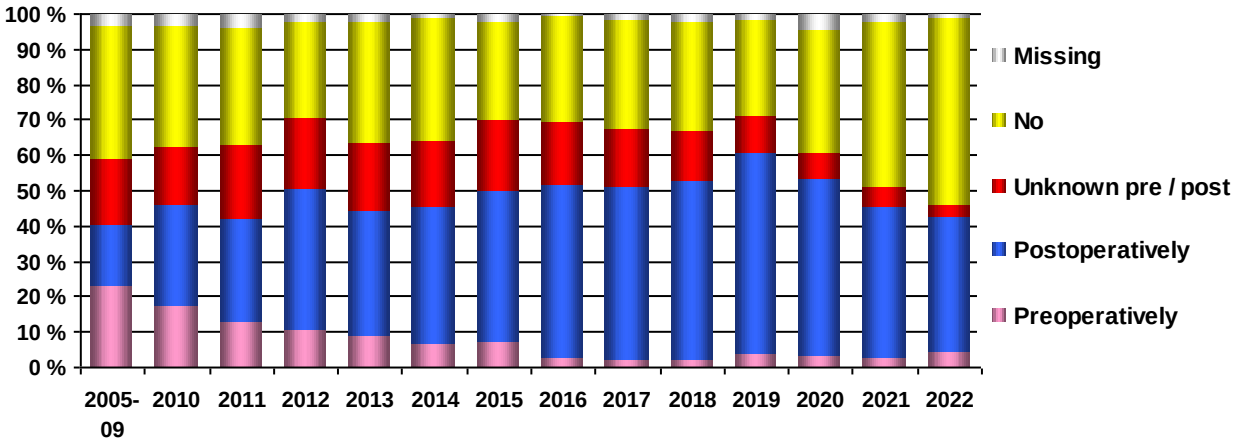
Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 41: Primary operations

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2022	47	389	35	532	14	**1 017**
2021	26	427	59	463	22	**997**
2020	27	431	60	298	38	**854**
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**
2005-09	348	261	277	572	51	**1 509**

Figure 24: Primary operations



Registration of thrombosis prophylaxis started in 2005

Previous operation in relevant joint

Table 42: For primary total prostheses

Type	1994-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Osteosynthesis of intraarticular joint fracture	333	32	45	48	54	49	51	50	47	48	757
Rotator cuff reconstruction	70	13	17	24	29	29	30	24	44	65	345
Synovectomy	142	5	5	5	6	9	4	6	9	6	197
Diagnostic arthroscopy	54	14	10	11	9	28	10	7	11	19	173
Biceps stenotomy / tenotomy	16	3	6	8	11	29	14	2	20	27	136
Subacromial decompression									14	19	33
"Shaving"/Cleanup (Debridement)	13	1		1	5	3		2	1	1	27
Surgery for purulent arthritis	12	1	2	1		2		2	1	4	25
Osteotomy	10	1	1	4	1	3	1	1	1		23
Stabilizing interventions								1	2	17	20
Soft tissue procedure (eg Bankart)								1	2	14	17
Ligament	2		1		6				1		10
Arthrodesis	3			1	1		1		2	1	9
Latarjet										2	2
Other bone block procedure										2	2
Other previous op.	153	28	20	24	36	58	40	39	24	27	449

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

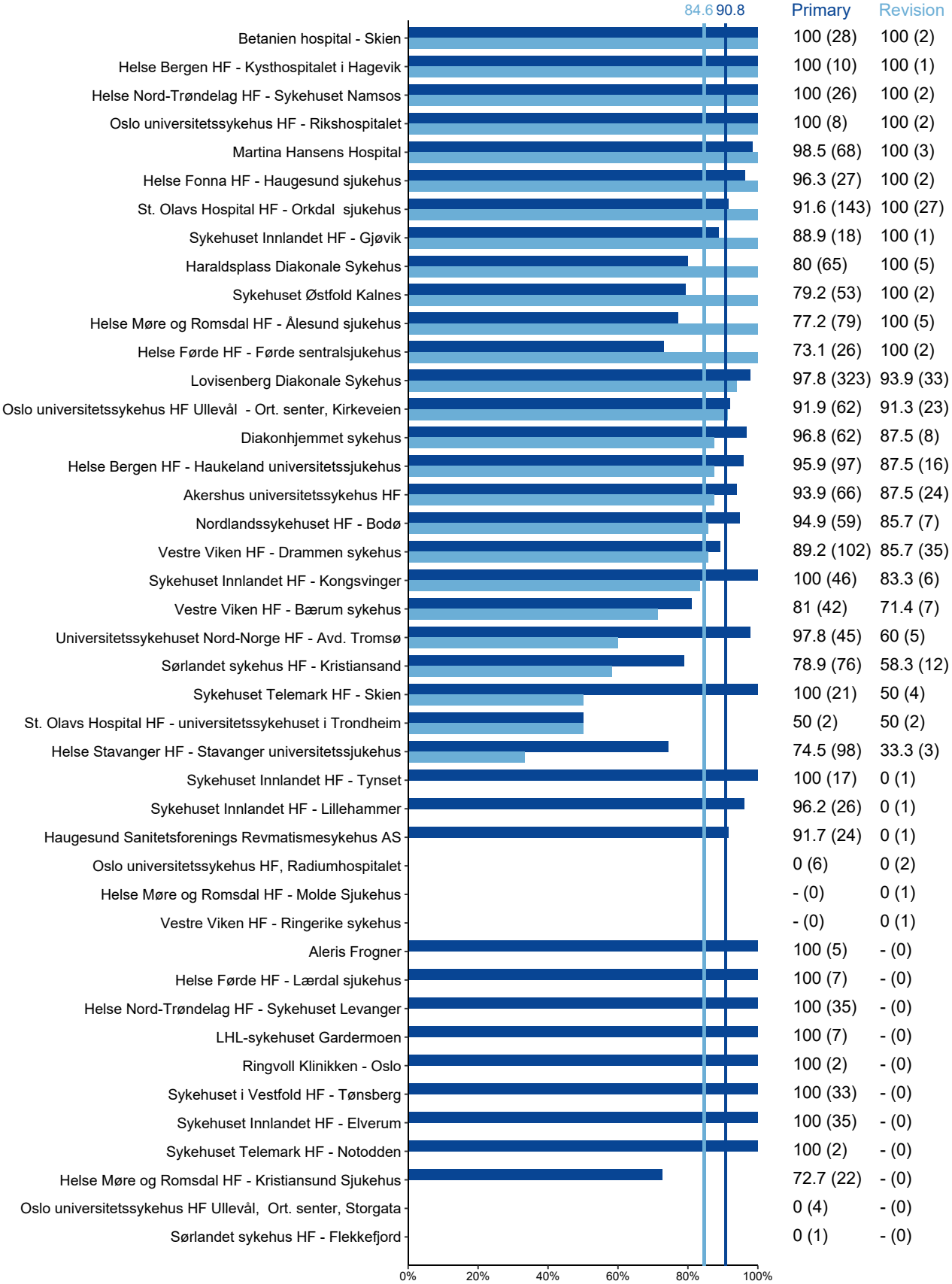
Primary operations. From 2019-2020, 1878 primary total shoulder arthroplasties were reported to one or both of the registers. 90.8% were reported to the NAR while 96.9% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness 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 show the national averages.

CONTENTS

Norwegian Hip Fracture Register

ANNUAL REPORT HIP FRACTURE REGISTER

The Norwegian Hip Fracture Register (NHFR) now contains data from 146,160 primary operations and 15,746 reoperations. In 2021, a total of 8,449 primary operations and 777 reoperations were reported to the registry. This has resulted in an increase in the number of reported primary operations compared to the previous two years. The low number of reported hip fractures in 2020 and 2021 is most likely due to issues related to obtaining patient consent at certain hospitals. Fortunately, after the NHFR transitioned to the opt-out model in 2021, it appears that reporting has improved once again at these hospitals.

This year's report is largely unchanged from previous years and provides a detailed overview of the data within the registry. A new addition this year is that the registry has also created a simplified and more easily readable annual report, emphasizing results that are clinically significant.

We now recommend that all hospitals adopt the electronic registration solution available in MRS (Medical Registration System in the Norwegian Health Network). The solution has already been implemented at many hospitals and seems to be functioning well. There have been some challenges related to the scanning of implants. These issues are being addressed continuously, and it's important that the registry is informed if scanning of certain implants is not functioning properly. The advantage of electronic registration is both more accurate reporting and immediate access to a hospital's own data. Consequently, data from the NHFR can be used to a greater extent for local quality improvement. Hospitals in need of assistance with transitioning to the electronic reporting solution can contact the register nrl-support@helse-bergen.no or phone +47 90 58 31 74). Instructions for electronic reporting are available at www.helse-bergen.no/nrl.

The National Service Environment for Clinical Quality Registries evaluates all medical quality registries in Norway every year. The NHFR has been assessed as a Stage 3A registry. The primary reason that the registry did not achieve a Stage 4 status in last year's evaluation, like the previous year, was the requirement for updated analyses on the validity and reliability of variables in the registry, which is something we are currently working on. Additionally, the registry was encouraged to identify new areas for quality improvement.

The Fragility Fracture Network (FFN) has developed a common international dataset for monitoring the treatment of hip fracture patients. This dataset enables multinational studies with data from various national hip fracture registries. To align the NHFR with this dataset, a new electronic registration form will be introduced in MRS (Medical Registration System) that should be completed by the surgeon upon patient discharge. This dischargeform will include variables such as length of stay, hospital mobilization, fall prevention,osteoporosis treatment, medical complications during the hospital stay, and post-dischargecare level. These variables could serve as the basis for new quality indicators. Hospitals willhave immediate access to their own data, and the results could prove useful in monitoringwhether hip fracture patients are being treated in accordance with Norwegian interdisciplinary guidelines. Unfortunately, the development of the electronic registration solution has taken longer than expected, but the form is expected to be ready for use by the end of 2023.

Since 2017, the NHFR has been providing online interactive results. Hospital-specific results are accessible on www.kvalitetsregistre.no. We hope that these interactive results are being utilized for local quality improvement efforts.

During 2022, 2 candidates successfully completed their PhDs using data from the Norwegian Hip Fracture Register.

Christian Thomas Pollmann defended his PhD thesis titled "Improving outcomes in hip fracture patients" on May 3, 2022, at the University of Oslo.

Cato Kjærvik defended his PhD thesis titled "Hip fracture in Norway. Inequity in treatment and outcomes" on November 11, 2022, at the University of Bergen.

The NHFR extends its congratulations to Christian and Cato for their significant contributions and successful completion of their doctoral defenses.

PUBLICATIONS SINCE JANUARY 2022

Cato Kjærvik's research has examined the factors that influence mortality following hip fracture surgery. Both modifiable (treatment-related) and, to an even greater extent, non-modifiable (patient-related) factors were found to affect mortality. Patients with hip fractures experienced a significant increase in mortality, which persisted over the long term.

Kirsten Marie Larsen Grønhaug has published an article comparing the outcomes of sliding hip screws and intramedullary nails for trochanteric and subtrochanteric fractures. The study found that using intramedullary nails resulted in a lower risk of reoperations after 1 and 3 years compared to sliding hip screws for unstable trochanteric fractures (AO/OTA type A2 and A3) as well as subtrochanteric fractures. Additionally, the 1-year mortality rate was lower when using nails for both stable and unstable fractures.

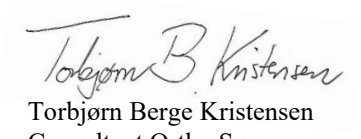
Furthermore, we refer to the dedicated list of publications at the end of this year's report as well as on the registry's website at www.helse-bergen.no/nrl.

The National Hip Fracture Registry is currently collaborating with several hospitals on studies related to both national and local results. It's great to see that the registry's extensive dataset is being used for research purposes. We encourage all researchers who are interested in utilizing data from the Hip Fracture Register to get in touch with us.

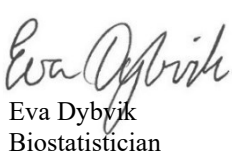
Thank you all for your excellent reporting, and we look forward to continued collaboration!

Bergen, June 2023

Jan-Erik Gjertsen
Senior Consultant Ortho Surgeon
Professor/Head of NHFR



Torbjørn Berge Kristensen
Consultant Ortho Surgeon
Researcher



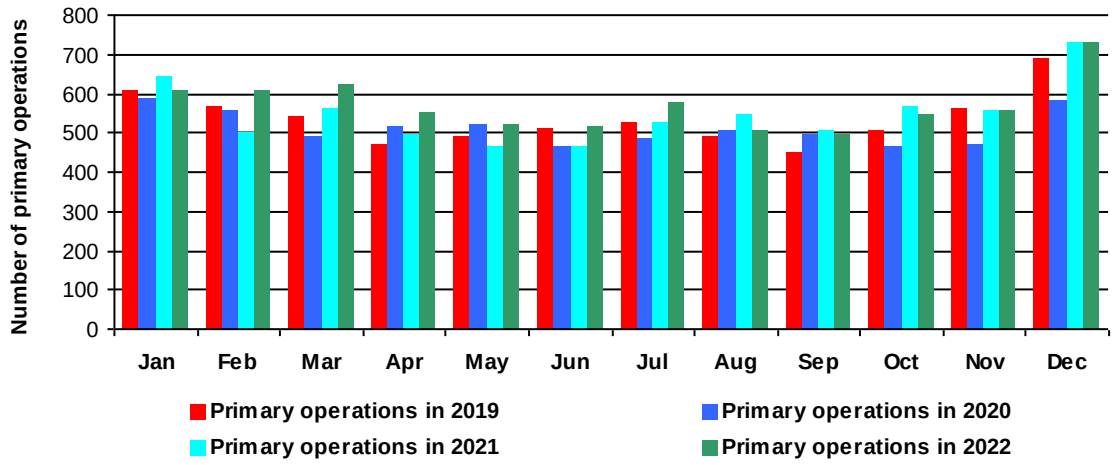
Eva Dybvik
Biostatistician
Researcher

Ruth Gunvor Wasmuth
Consultant

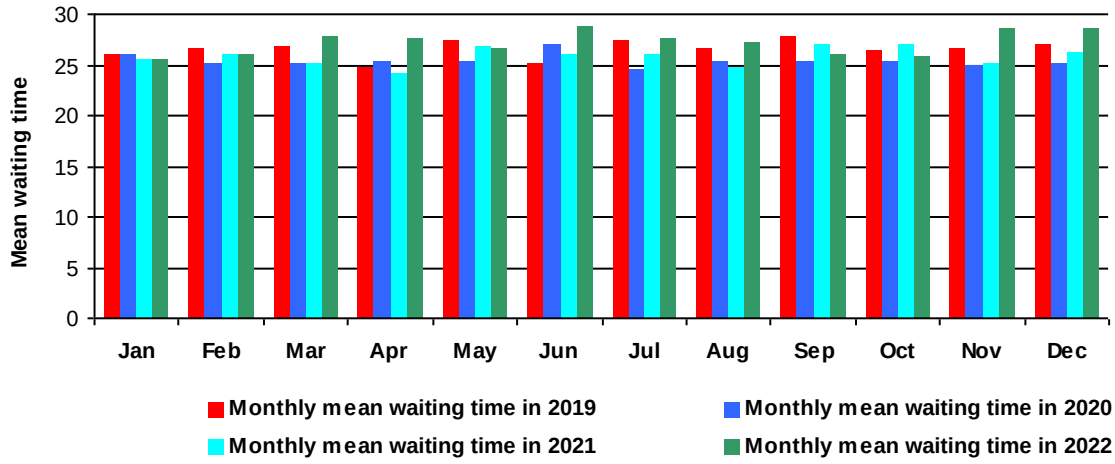
Irina Kvinnesland
IT consultant

COVID-19

Monthly primary operations in 2019 - 2022



Monthly mean waiting time from fracture to surgery (hours) in 2019 - 2022 *

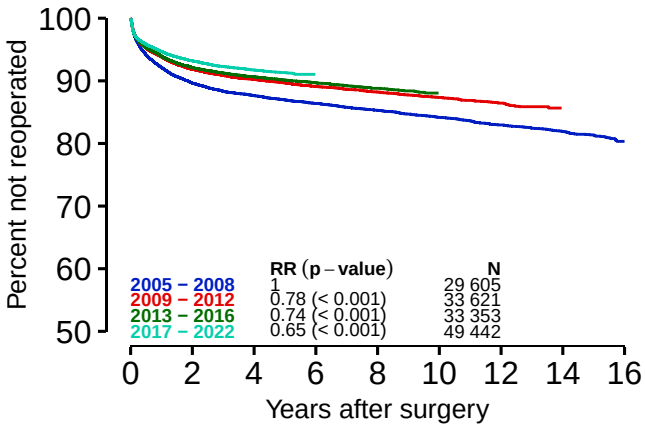


* Only for waiting time <= 96 hours

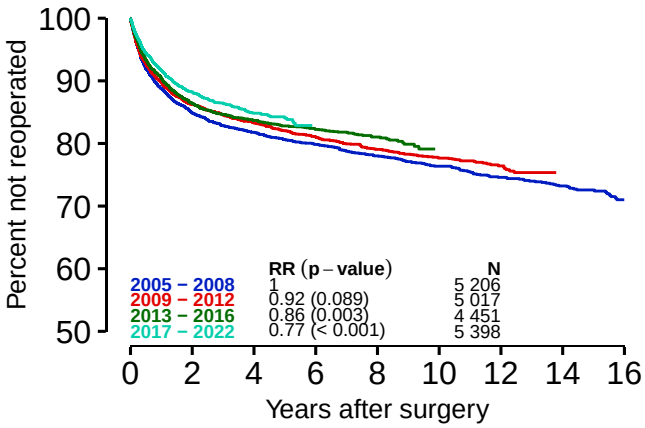
Survival of hip fracture implants 2005−2022

Endpoint: All reoperations

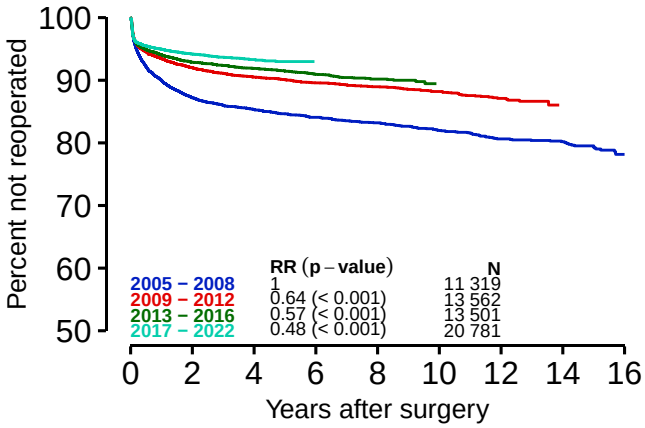
D.1) All hip fractures



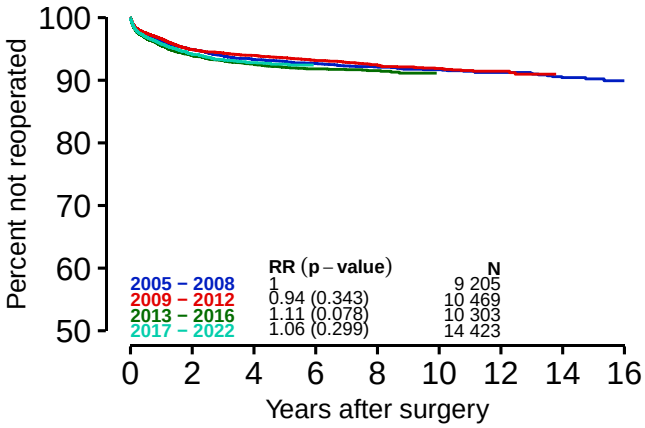
D.2) Undisplaced femoral neck fractures



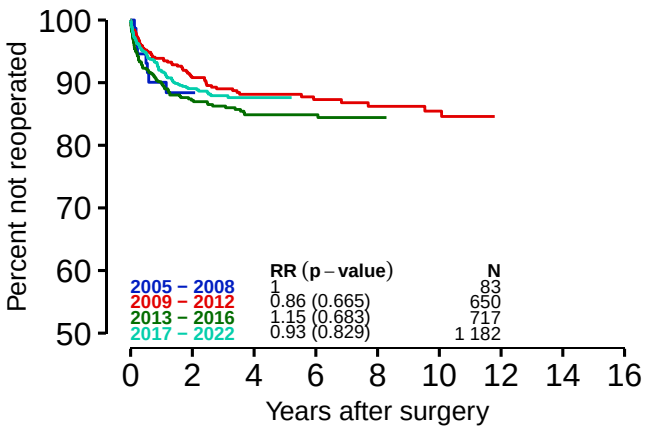
D.3) Displaced femoral neck fractures



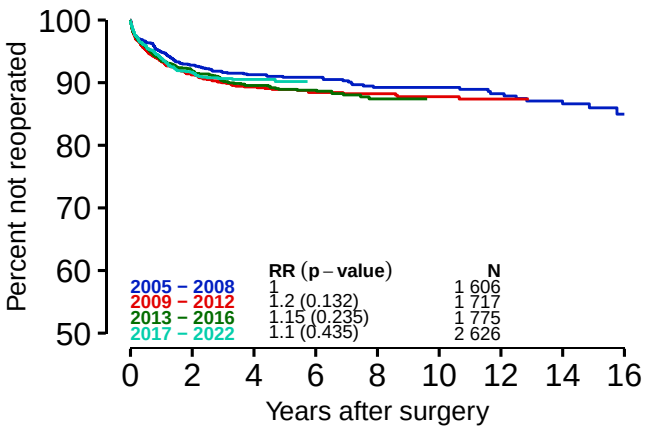
D.4) Trochanteric fractures (AO/OTA A1+A2)



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



D.6) Subtrochanteric fractures

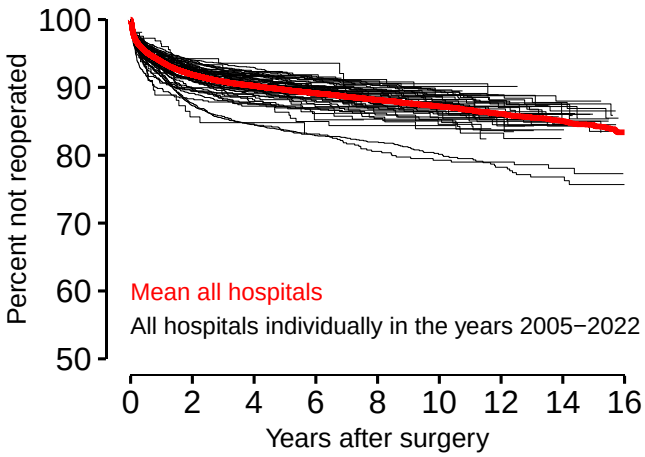


Kaplan−Meier estimated survival curves (unadjusted). Survival is calculated as long as the number of implants at risk of reoperation is greater than 50.

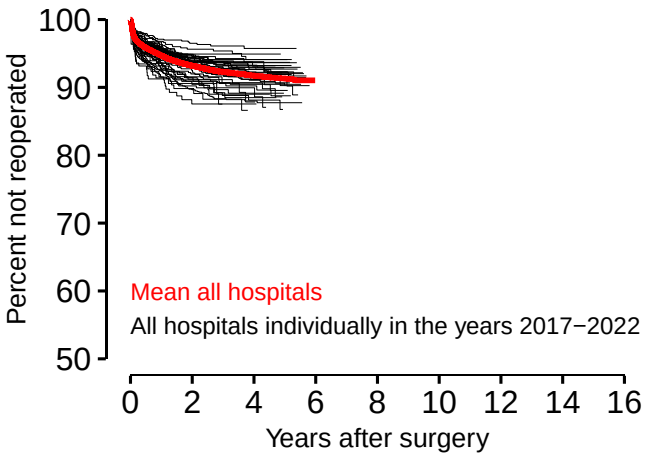
Rate Ratio (RR) is adjusted for age and gender.

Hospital results after hip fractures
Endpoint: All reoperations

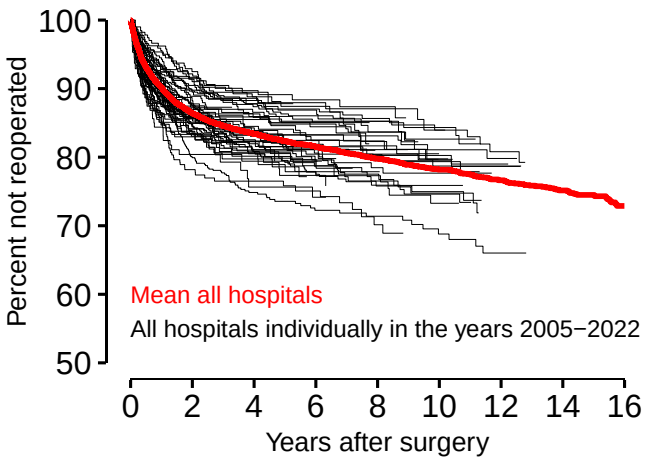
D.7) All hip fractures − 2005−2022



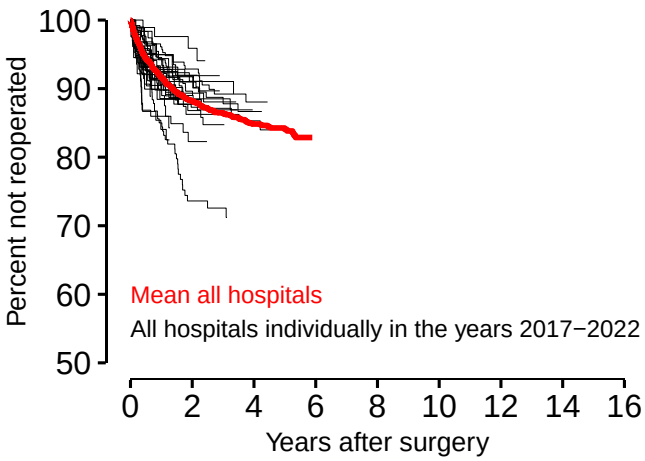
D.8) All hip fractures − 2017−2022



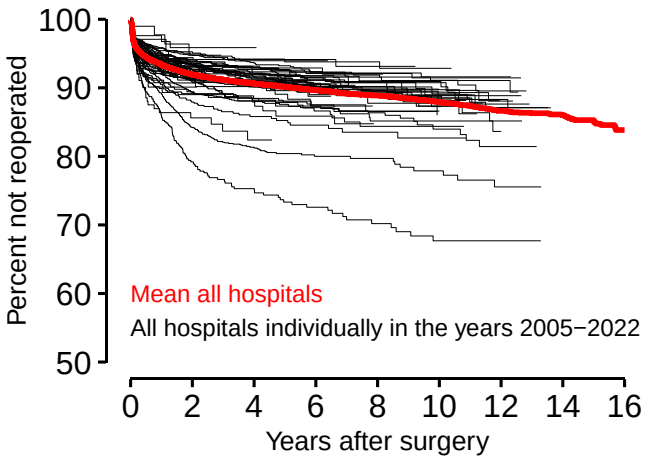
D.9) Undisplaced femoral neck fractures − 2005−2022



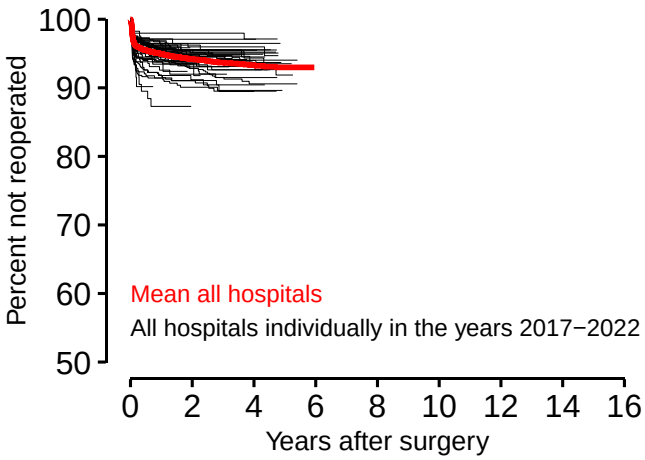
D.10) Undisplaced femoral neck fractures − 2017−2022



D.11) Displaced femoral neck fractures − 2005−2022



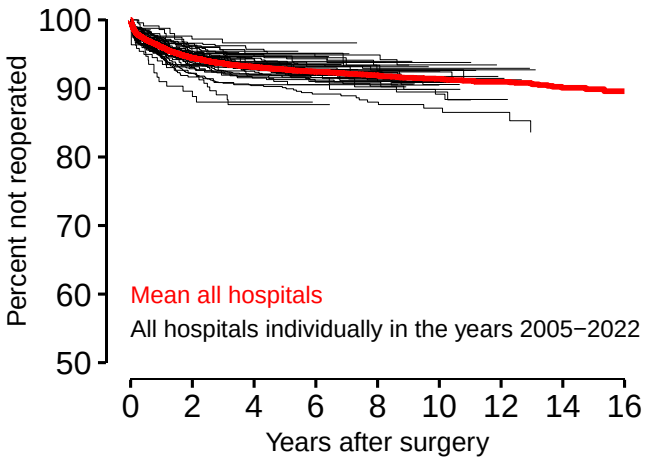
D.12) Displaced femoral neck fractures − 2017−2022



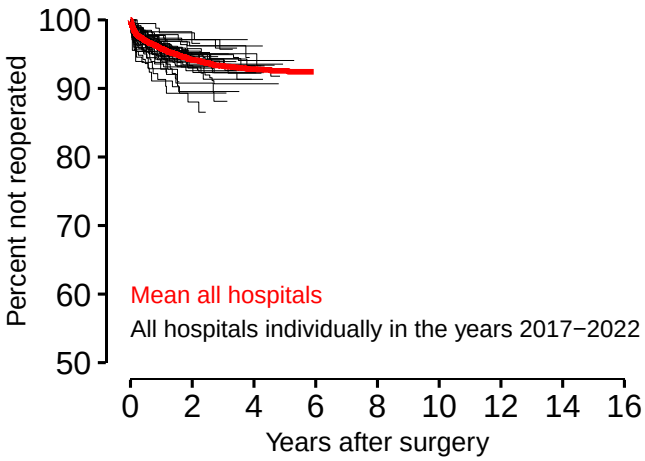
Hospital results after hip fractures

Endpoint: All reoperations

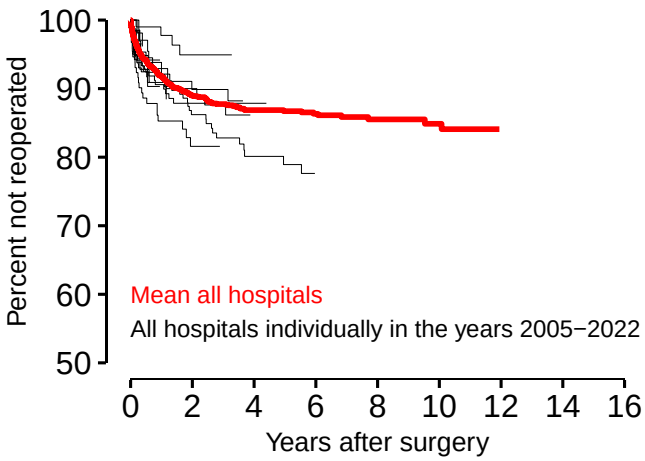
D.13) Trochanteric fractures (AO/OTA A1+A2) 2005−2022



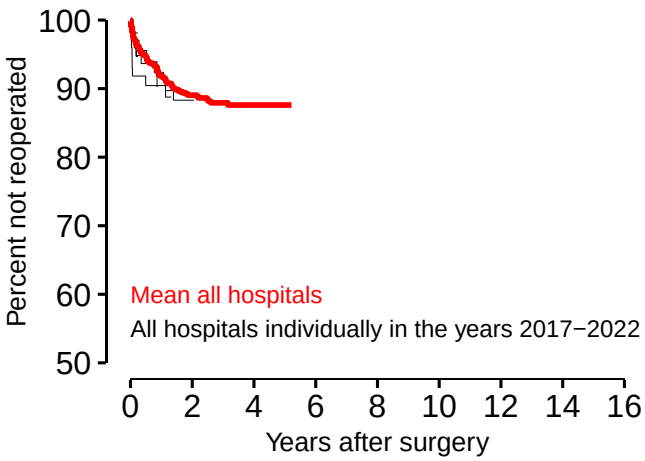
D.14) Trochanteric fractures (AO/OTA A1+A2) 2017−2022



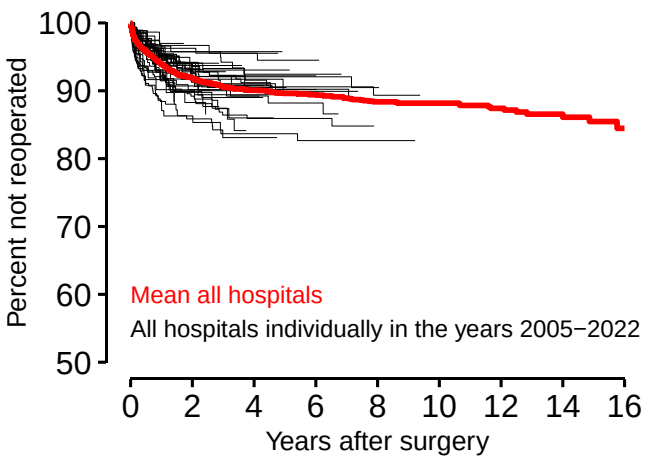
D.15) Intertrochanteric fractures (AO/OTA A3) 2005−2022



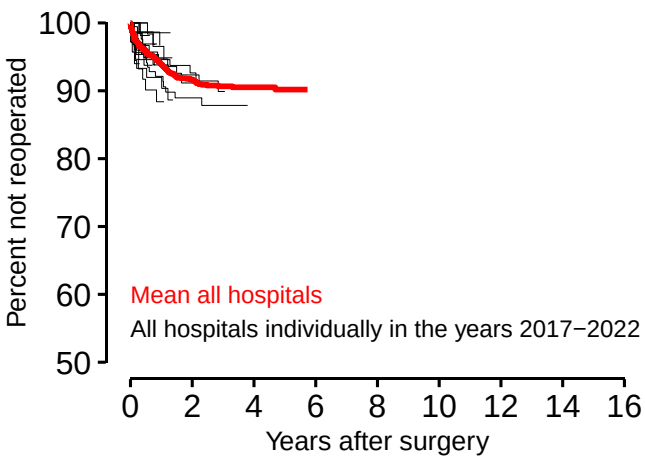
D.16) Intertrochanteric fractures (AO/OTA A3) 2017−2022



D.17) Subtrochanteric fractures − 2005−2022

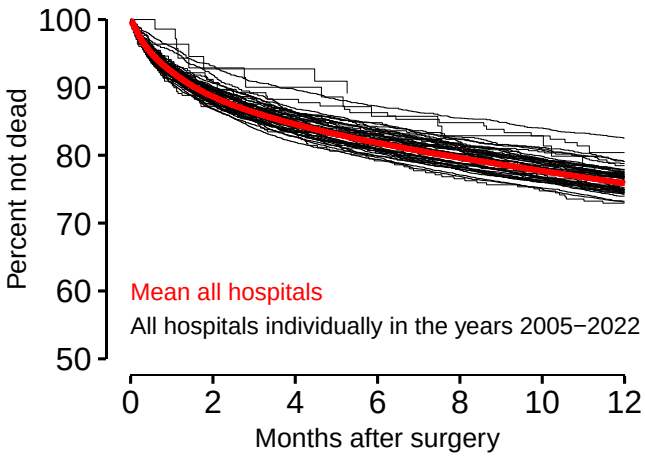


D.18) Subtrochanteric fractures − 2017−2022

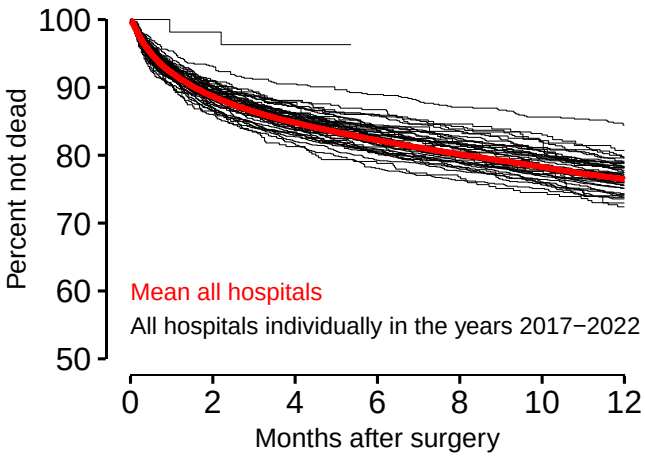


Hospital results after hip fractures
Endpoint: 1-year mortality

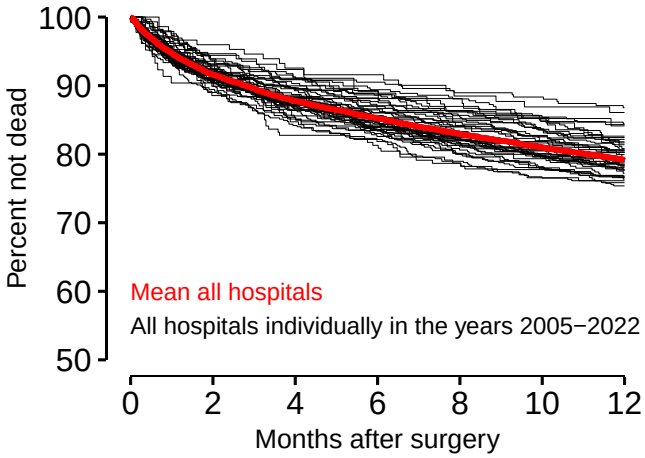
D.19) All hip fractures − 2005−2022



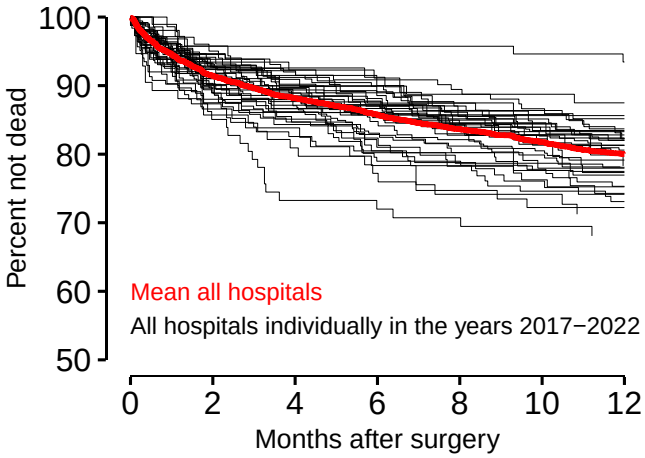
D.20) All hip fractures − 2017−2022



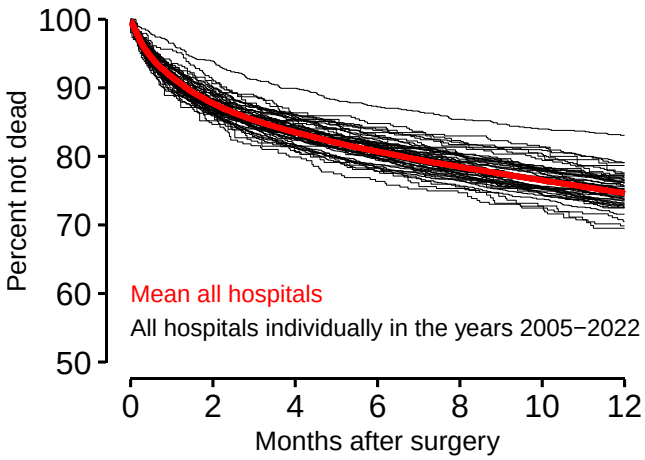
D.21) Undisplaced femoral neck fractures − 2005−2022



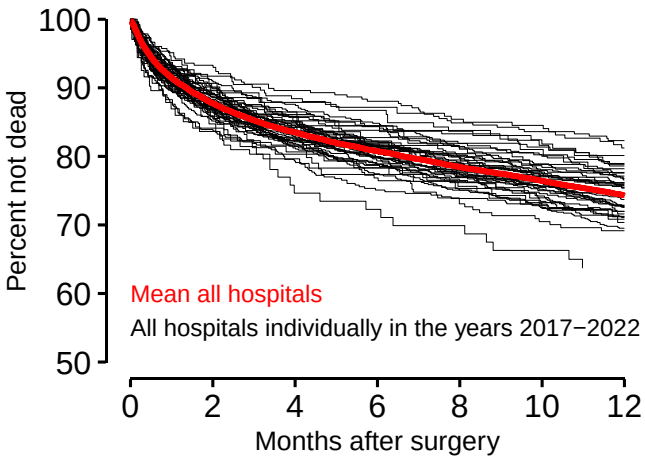
D.22) Undisplaced femoral neck fractures − 2017−2022



D.23) Displaced femoral neck fractures − 2005−2022

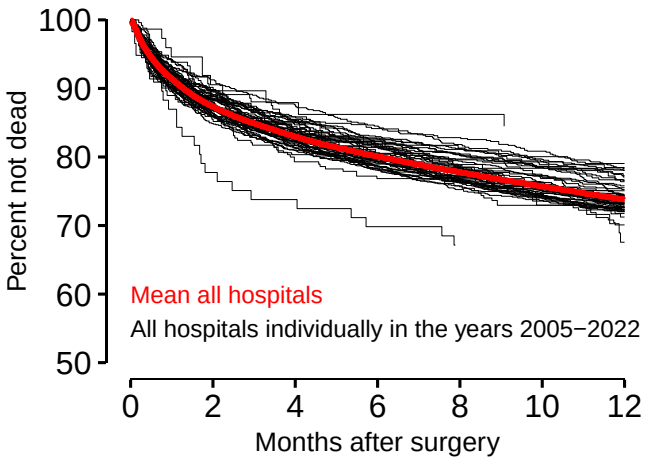


D.24) Displaced femoral neck fractures − 2017−2022

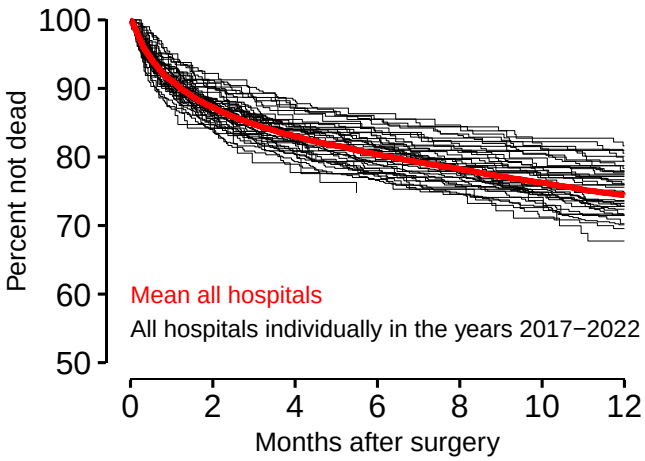


Hospital results after hip fractures
Endpoint: 1-year mortality

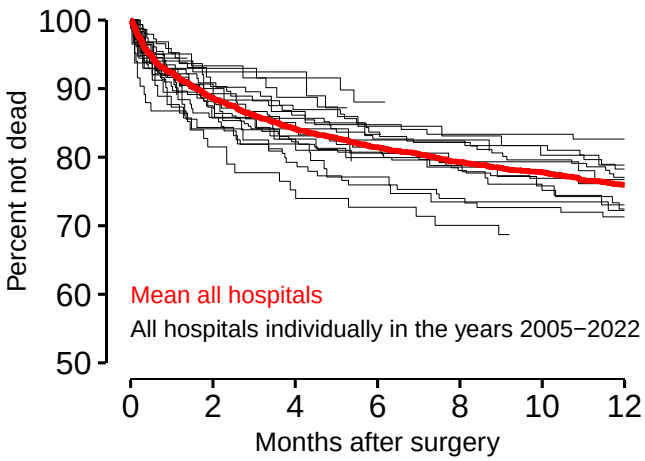
D.25) Trochanteric fractures (AO/OTA A1+A2) 2005−2022



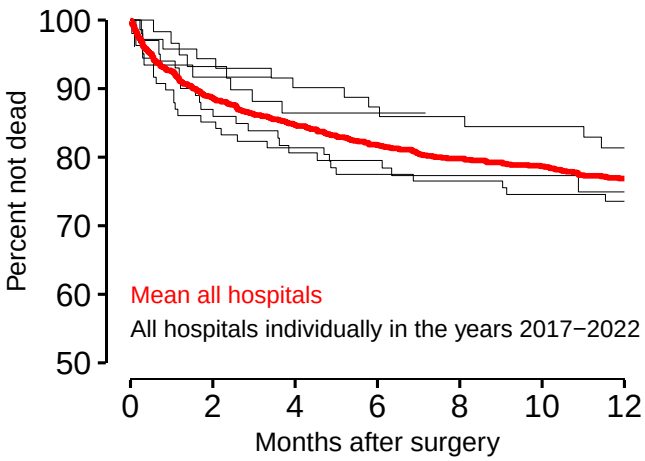
D.26) Trochanteric fractures (AO/OTA A1+A2) 2017−2022



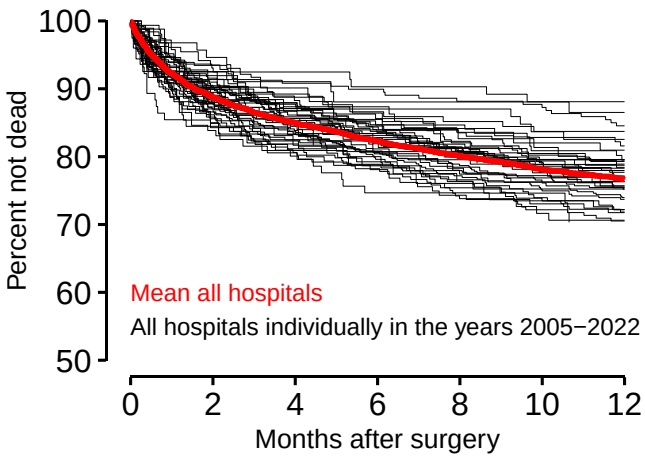
D.27) Intertrochanteric fractures (AO/OTA A3) 2005−2022



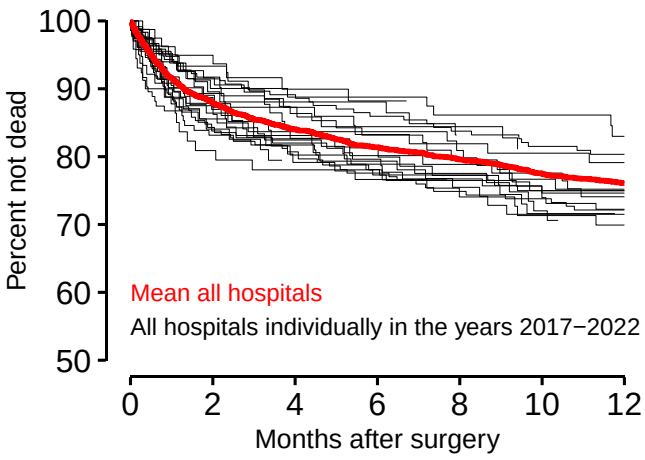
D.28) Intertrochanteric fractures (AO/OTA A3) 2017−2022



D.29) Subtrochanteric fractures 2005−2022



D.30) Subtrochanteric fractures 2017−2022



HIP FRACTURES

Numbers of operations

Table 1: Annual numbers of operations

Year	Primary operations		Reoperations		Total
2022	8 495	(91,5%)	785	(8,5%)	**9 280**
2021	8 296	(91,4%)	777	(8,6%)	**9 073**
2020	7 767	(91,4%)	731	(8,6%)	**8 498**
2019	8 169	(89,9%)	918	(10,1%)	**9 087**
2018	8 427	(90,0%)	940	(10,0%)	**9 367**
2017	8 352	(90,3%)	901	(9,7%)	**9 253**
2016	8 504	(89,6%)	987	(10,4%)	**9 491**
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	8 364	(90,7%)	862	(9,3%)	**9 226**
2009	8 258	(89,5%)	970	(10,5%)	**9 228**
2005-08	29 630	(89,6%)	3 432	(10,4%)	**33 062**
Total	**146 206**	**(90,3%) ***	**15 755**	**(9,7%) ****	**161 961**

49% of primary operations were on the right side. 68% of primary operations were performed on women.
Mean age at primary surgery was 80 years: 82 years for women and 77 years for men.
* 5 789 (4%) were primary operations with total hip prostheses from the Norwegian Arthroplasty Register
** 5 920 (38%) were reoperations with total hip prostheses from the Norwegian Arthroplasty Register.

Figure 1: Annual numbers of operations

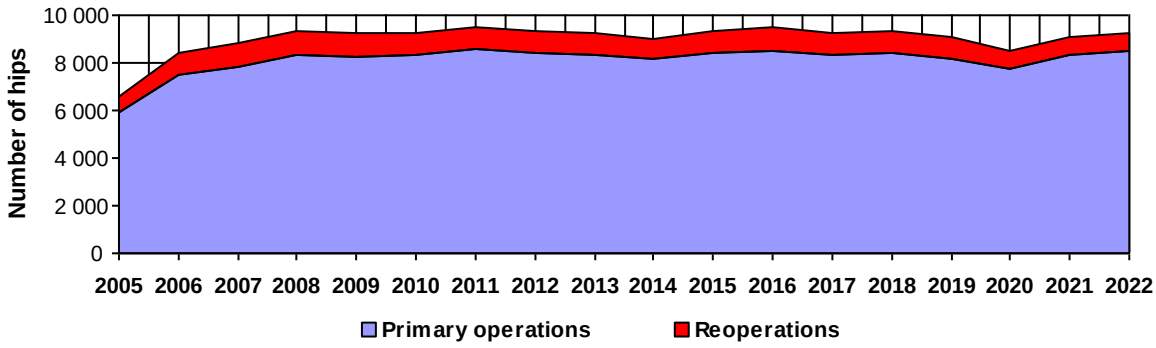
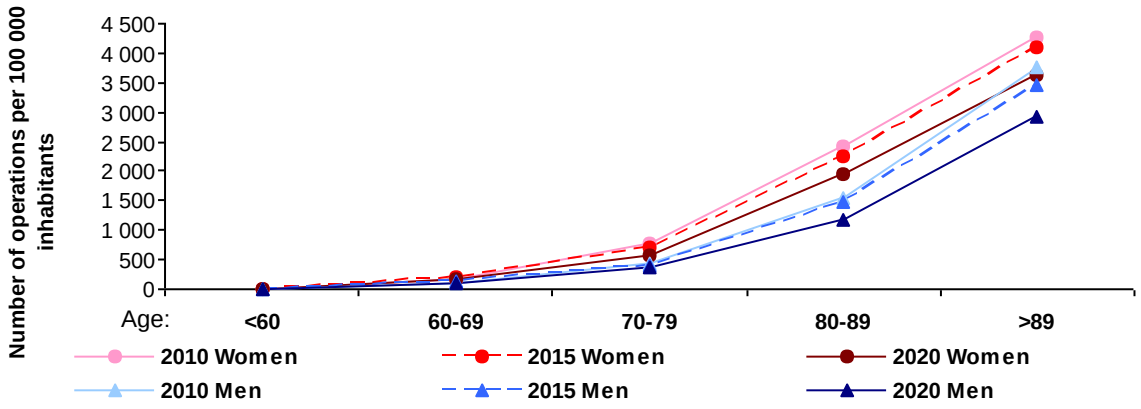


Figure 2: Incidence of primary operation (in 2010, 2015 and 2020)



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
2022	223 (2,8%)	910 (11,5%)	2 798 (35,3%)	2 658 (33,6%)	1 284 (16,2%)	129 (1,6%)	**7 922**
2021	264 (3,4%)	979 (12,6%)	2 901 (37,3%)	2 427 (31,2%)	1 055 (13,6%)	142 (1,8%)	**7 768**
2020	242 (3,3%)	976 (13,5%)	2 776 (38,4%)	2 136 (29,6%)	954 (13,2%)	142 (2,0%)	**7 226**
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%)	1 289 (16,4%)	184 (2,3%)	**7 846**
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**
2005-0	1 747 (6,0%)	5 537 (19,0%)	10 066 (34,6%)	6 903 (23,7%)	4 272 (14,7%)	555 (1,9%)	**29 080**
Total	**5 864 (4,2%)**	**20 725 (14,8%)**	**50 133 (35,7%)**	**39 712 (28,3%)**	**21 108 (15,0%)**	**2 955 (2,1%)**	**140 417**

* Total hip prostheses are not counted

Figure 3: Time from fracture to operation - grouped in hours (n=140 417)

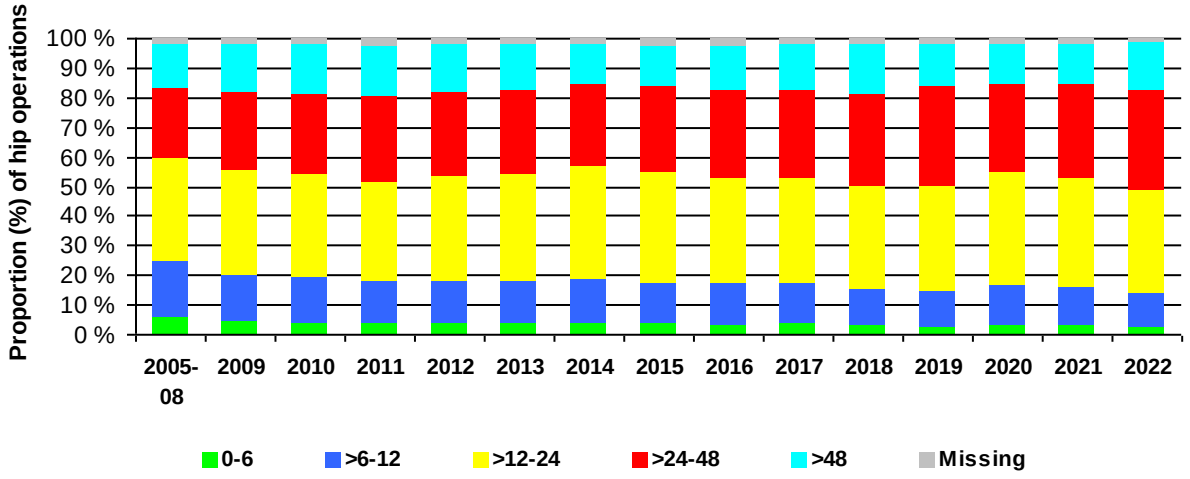
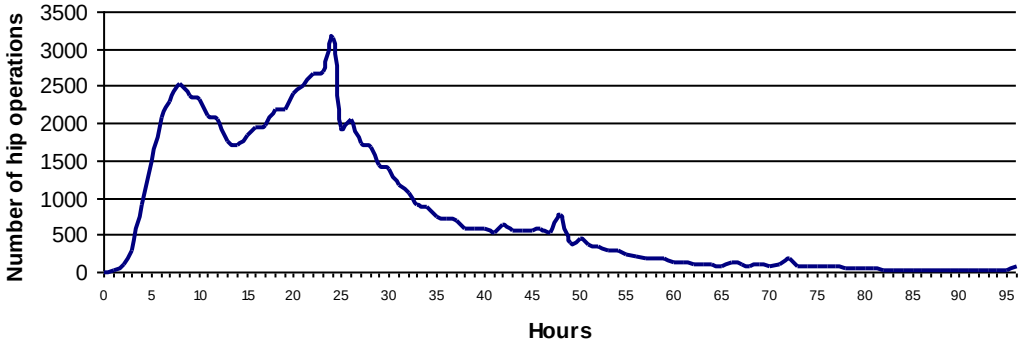


Figure 4: Time from fracture to operation - continuous (n=74 352)



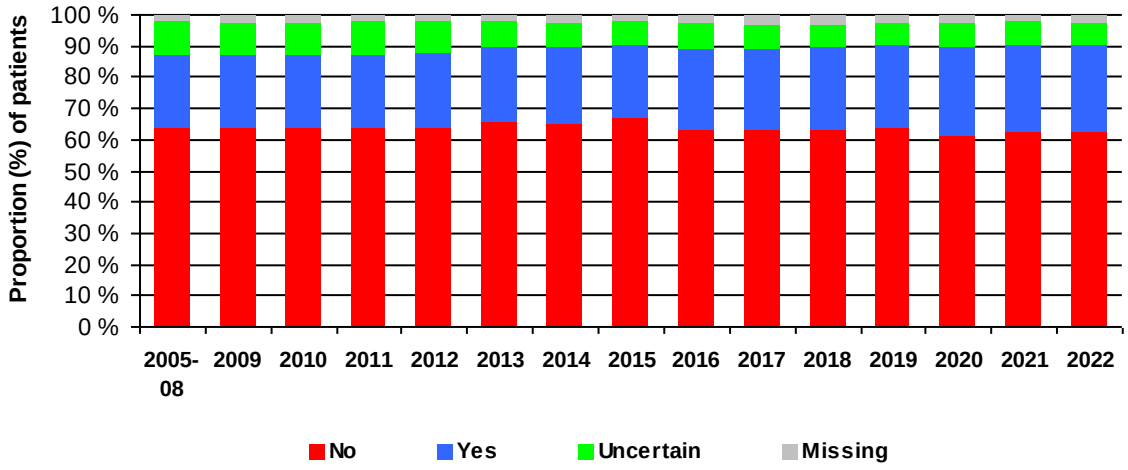
Mean time from fracture to operation was 24 hours (median 21 hours).

Chronic cognitive impairment

Table 3: Chronic cognitive impairment - primary operations*

	No		Yes		Uncertain		Missing		Total
2022	4 964	(62,7%)	2 178	(27,5%)	591	(7,5%)	189	(2,4%)	**7 922**
2021	4 849	(62,4%)	2 172	(28,0%)	576	(7,4%)	171	(2,2%)	**7 768**
2020	4 415	(61,1%)	2 060	(28,5%)	566	(7,8%)	185	(2,6%)	**7 226**
2019	4 810	(63,8%)	2 021	(26,8%)	528	(7,0%)	180	(2,4%)	**7 539**
2018	4 970	(63,3%)	2 072	(26,4%)	561	(7,2%)	243	(3,1%)	**7 846**
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**
2005-08	18 476	(63,5%)	6 959	(23,9%)	2 999	(10,3%)	646	(2,2%)	**29 080**
Total	**89 334**	**(63,6%)**	**35 280**	**(25,1%)**	**12 400**	**(8,8%)**	**3 403**	**(2,4%)**	**140 417**

Figure 5: Chronic cognitive impairment - primary operations*



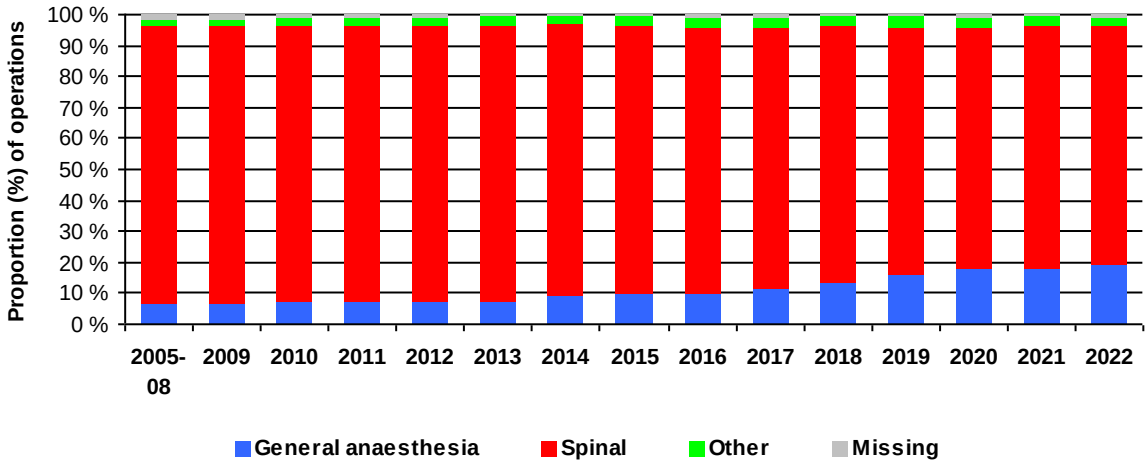
* Total hip prostheses are not counted

Type of anaesthesia

Table 4: Type of anaesthesia - primary operations*

	General anaesthesia		Spinal		Other		Missing		Total
2022	1 521	(19,2%)	6 106	(77,1%)	214	(2,7%)	81	(1,0%)	**7 922**
2021	1 407	(18,1%)	6 079	(78,3%)	227	(2,9%)	55	(0,7%)	**7 768**
2020	1 297	(17,9%)	5 618	(77,7%)	238	(3,3%)	73	(1,0%)	**7 226**
2019	1 185	(15,7%)	6 025	(79,9%)	263	(3,5%)	66	(0,9%)	**7 539**
2018	1 062	(13,5%)	6 483	(82,6%)	230	(2,9%)	71	(0,9%)	**7 846**
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**
2005-08	1 936	(6,7%)	26 005	(89,4%)	629	(2,2%)	510	(1,8%)	**29 080**
Total	**14 456**	**(10,3%)**	**120 429**	**(85,8%)**	**3 847**	**(2,7%)**	**1 685**	**(1,2%)**	**140 417**

Figure 6: Type of anaesthesia in primary operations*



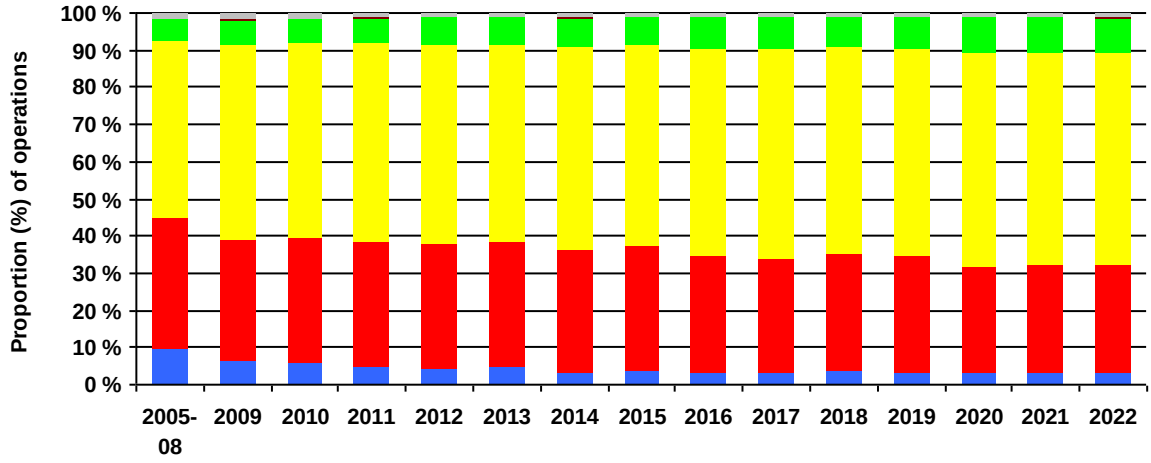
* Total hip prostheses are not counted

ASA classification

Table 5: ASA classification - primary operations

	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2022	263 (3,1%)	2 485 (29,3%)	4 847 (57,1%)	777 (9,1%)	21 (0,2%)	102 (1,2%)	**8 495**
2021	273 (3,3%)	2 405 (29,0%)	4 722 (56,9%)	798 (9,6%)	7 (0,1%)	91 (1,1%)	**8 296**
2020	239 (3,1%)	2 221 (28,6%)	4 476 (57,6%)	742 (9,6%)	11 (0,1%)	78 (1,0%)	**7 767**
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%)	2 654 (31,5%)	4 698 (55,7%)	646 (7,7%)	13 (0,2%)	97 (1,2%)	**8 427**
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%)	4 733 (55,7%)	708 (8,3%)	10 (0,1%)	94 (1,1%)	**8 503**
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%)	2 806 (33,5%)	4 411 (52,7%)	498 (6,0%)	16 (0,2%)	140 (1,7%)	**8 364**
2009	509 (6,2%)	2 720 (32,9%)	4 309 (52,2%)	564 (6,8%)	10 (0,1%)	146 (1,8%)	**8 258**
2005-08	2 804 (9,5%)	10 539 (35,6%)	14 108 (47,6%)	1 666 (5,6%)	42 (0,1%)	471 (1,6%)	**29 630**
Total	**7 459** (5,1%)	**47 777** (32,7%)	**78 114** (53,4%)	**10 761** (7,4%)	**208** (0,1%)	**1 886** (1,3%)	**146 206**

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 5 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 (indication for primary operation)

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 9	Type 6	Type 7	Type 8	Annet	Missing	Total
2022	862	3 651	220	1 082	1 369	193	426	545	28	100	17	**8 495**
	10,1%	43,0%	2,6%	12,7%	16,1%	2,3%	5,0%	6,4%	0,3%	1,2%	0,2%	
2021	835	3 544	195	1 094	1 401	193	404	516	12	83	19	**8 296**
	10,1%	42,7%	2,4%	13,2%	16,9%	2,3%	4,9%	6,2%	0,1%	1,0%	0,2%	
2020	814	3 284	153	1 011	1 283	182	407	529	12	86	6	**7 767**
	10,5%	42,3%	2,0%	13,0%	16,5%	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	1 112	1 295	227	502	576	5	93	3	**8 427**
	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	344	4	94	2	**8 504**
	12,8%	41,7%	2,8%	14,6%	15,5%	1,9%	5,5%	4,0%	0,0%	1,1%	0,0%	
2015	1 153	3 350	243	1 336	1 255	228	442	321	2	79	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	160	2	67	2	**8 364**
	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%	
2005-08	5 214	11 327	1 361	5 150	4 059	83	1 608	539	11	255	23	**29 630**
	17,6%	38,2%	4,6%	17,4%	13,7%	0,3%	5,4%	1,8%	0,0%	0,9%	0,1%	
Total	**20 108**	**59 215**	**4 751**	**22 124**	**22 330**	**2 634**	**7 738**	**5 677**	**112**	**1 418**	**97**	**146 206**
	13,8%	**40,5%**	**3,2%**	**15,1%**	**15,3%**	**1,8%**	**5,3%**	**3,9%**	**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
2022	649	75	3 799	0	680	116	59	12	1 208	15	1 167	573	140	1	**8 495**
	7,6%	0,9%	44,7%	0,0%	8,0%	1,4%	0,7%	0,1%	14,2%	0,2%	13,7%	6,7%	1,6%	0,0%	
2021	692	54	3 689	0	865	125	58	10	1 142	7	1 069	528	55	0	**8 296**
	8,3%	0,7%	44,5%	0,0%	10,4%	1,5%	0,7%	0,1%	13,8%	0,1%	12,9%	6,4%	0,7%	0,0%	
2020	655	58	3 425	0	851	173	62	4	1 051	9	904	541	30	2	**7 767**
	8,4%	0,7%	44,1%	0,0%	11,0%	2,2%	0,8%	0,1%	13,5%	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	1 120	316	79	13	966	18	863	581	19	0	**8 427**
	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	348	39	0	**8 504**
	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	162	60	0	**8 364**
	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%	
2005-08	8 745	226	7 311	176	7 036	2 431	506	171	1 599	23	605	550	243	4	**29 630**
	29,5%	0,8%	24,7%	0,6%	23,7%	8,2%	1,7%	0,6%	5,4%	0,1%	2,0%	1,9%	0,8%	0,0%	
Total	**24 870**	**976**	**53 065**	**321**	**25 515**	**9 844**	**1 786**	**420**	**13 196**	**165**	**9 379**	**5 789**	**862**	**7**	**146 206**
	17,0%	**0,7%**	**36,3%**	**0,2%**	**17,5%**	**6,7%**	**1,2%**	**0,3%**	**9,0%**	**0,1%**	**6,4%**	**4,0%**	**0,6%**	**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

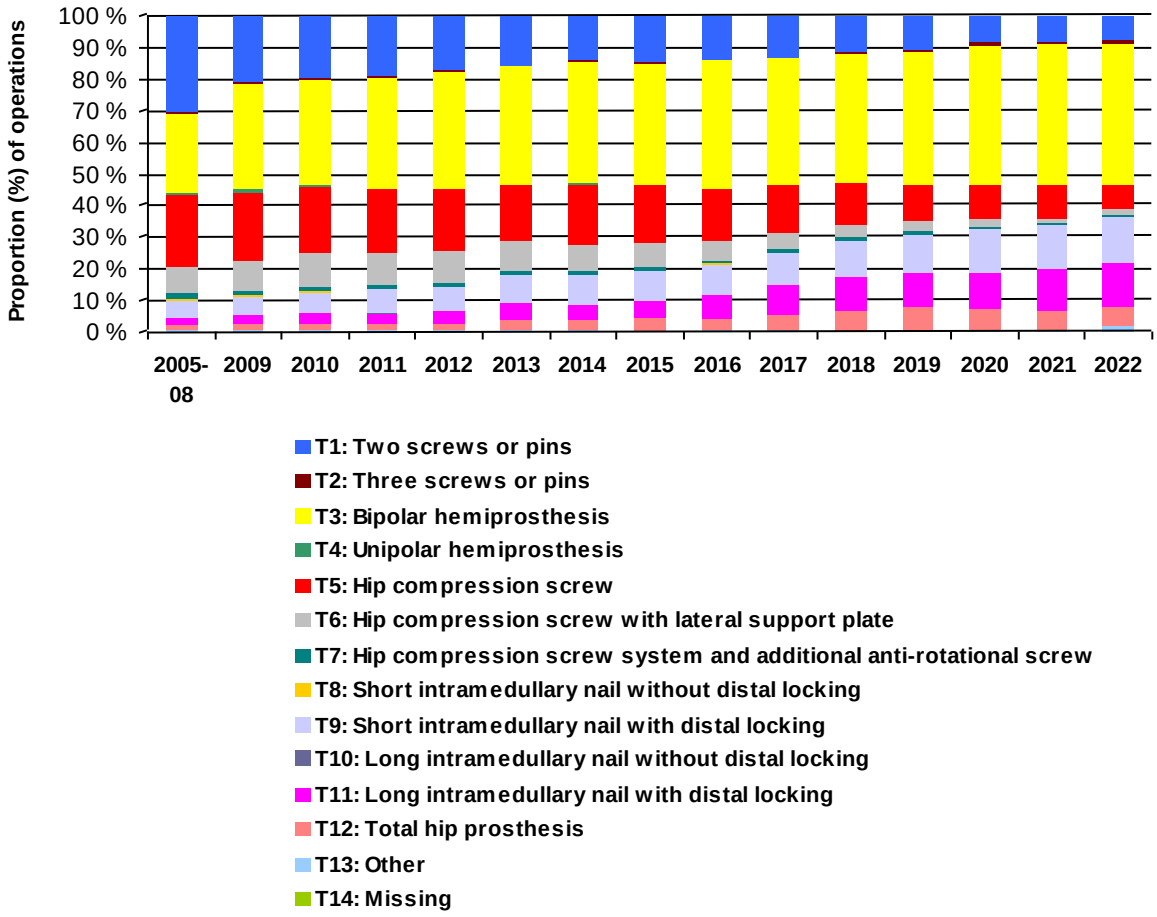


Table 8: Type of primary operation per type of primary fracture

Type of primary fracture	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	Total
Intracapsular fracture, undisplaced	17 321 85,6%	414 2,0%	1 710 8,5%	4 0,0%	421 2,1%	4 0,0%	127 0,6%	8 0,0%	41 0,2%	0 0,0%	5 0,0%	0 0,0%	50 0,2%	0 0,0%	**20 233**
Intracapsular fracture, displaced	7 351 12,4%	553 0,9%	50 062 84,3%	302 0,5%	410 0,7%	13 0,0%	204 0,3%	5 0,0%	63 0,1%	0 0,0%	18 0,0%	0 0,0%	233 0,4%	1 0,0%	**59 419**
Basocervical fracture	146 2,6%	3 0,1%	598 10,8%	12 0,2%	2 473 44,5%	89 1,6%	805 14,5%	30 0,5%	508 9,1%	1 0,0%	35 0,6%	0 0,0%	50 0,9%	0 0,0%	**5 556**
Trochanteric fracture (2 fragments)	13 0,1%	2 0,0%	81 0,4%	0 0,0%	14 394 64,0%	1 053 4,7%	379 1,7%	279 1,2%	5 241 23,3%	16 0,1%	607 2,7%	0 0,0%	52 0,2%	3 0,0%	**22 503**
Trochanteric fracture (multifragment)	4 0,0%	1 0,0%	178 0,8%	0 0,0%	6 476 28,8%	6 087 27,0%	183 0,8%	84 0,4%	6 105 27,1%	47 0,2%	2 915 12,9%	0 0,0%	247 1,1%	1 0,0%	**22 513**
Intertrochanteric fracture *	0 0,0%	0 0,0%	28 1,1%	0 0,0%	188 7,1%	813 30,7%	10 0,4%	5 0,2%	503 19,0%	17 0,6%	1 030 39,0%	0 0,0%	40 1,5%	0 0,0%	**2 644**
Subtrochanteric fracture	5 0,1%	1 0,0%	55 0,7%	0 0,0%	964 12,4%	1 553 20,0%	18 0,2%	6 0,1%	602 7,8%	77 1,0%	4 368 56,3%	0 0,0%	88 1,1%	1 0,0%	**7 756**
Intracapsular fracture, unspecified **	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 0,0%	0 0,0%	0 0,0%	5 677 100,0%	0 0,0%	0 0,0%	**5 677**
Trochanteric fracture unspecified ***	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 0,0%	0 0,0%	0 0,0%	112 100,0%	0 0,0%	0 0,0%	**112**
Other	23 1,6%	1 0,1%	300 20,4%	2 0,1%	175 11,9%	227 15,4%	57 3,9%	3 0,2%	124 8,4%	7 0,5%	396 26,9%	0 0,0%	102 6,9%	0 0,0%	**1 474**
Missing	6 6,0%	1 1,0%	52 52,0%	1 1,0%	14 14,0%	5 5,0%	3 3,0%	0 0,0%	9 9,0%	0 0,0%	5 5,0%	0 0,0%	0 0,0%	1 1,0%	**100**
Total	**24 869** **16,8%**	**976** **0,7%**	**53 064** **35,9%**	**321** **0,2%**	**25 515** **17,2%**	**9 844** **6,7%**	**1 786** **1,2%**	**420** **0,3%**	**13 196** **8,9%**	**165** **0,1%**	**9 379** **6,3%**	**5 789** **3,9%**	**862** **0,6%**	**7** **0,0%**	**147 987**

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

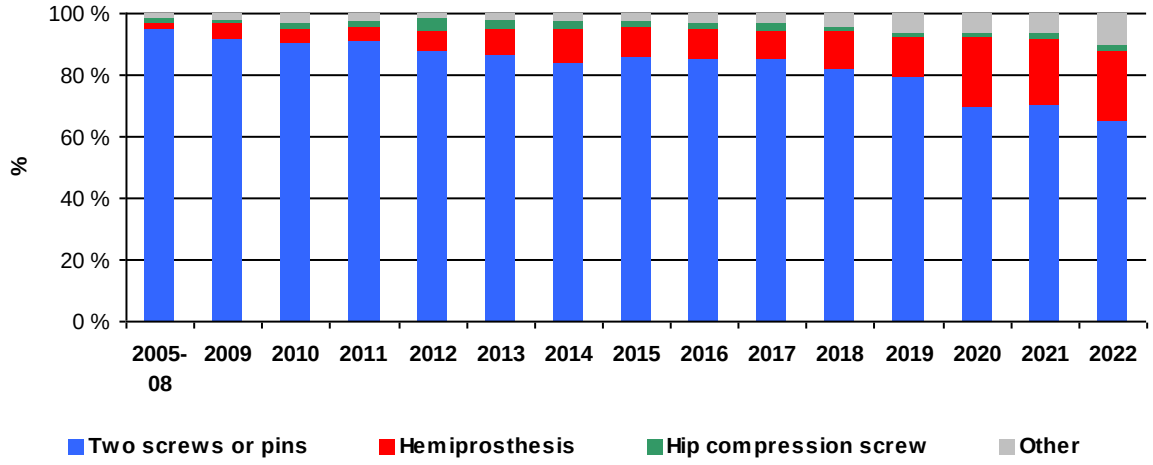
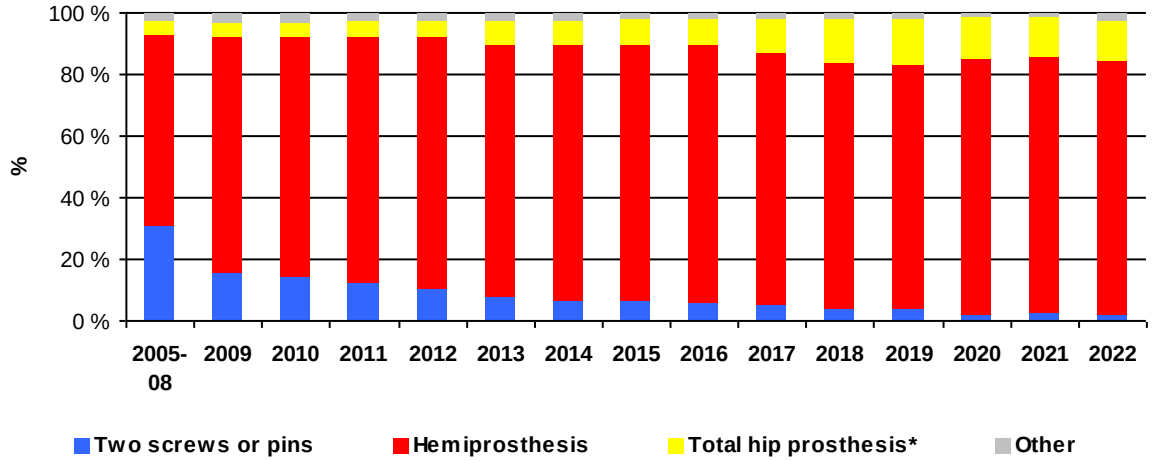


Figure 9b: Time trend for treatment of displaced femoral neck fractures



* 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 fractures

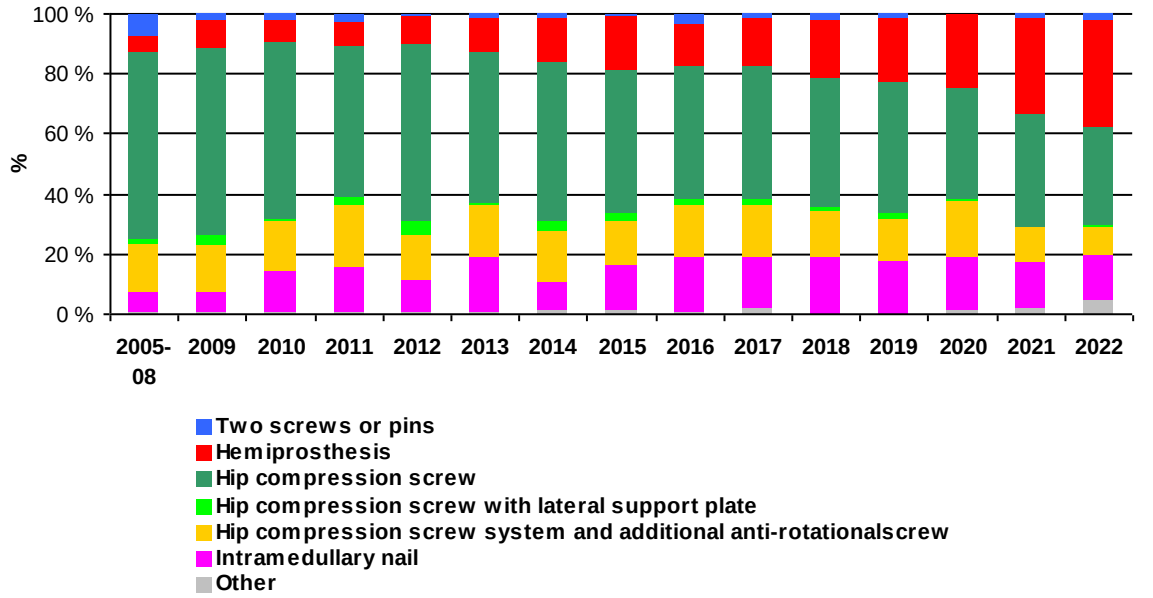


Figure 9d: Time trend for treatment of trochanteric fractures (AO / OTA type A1)

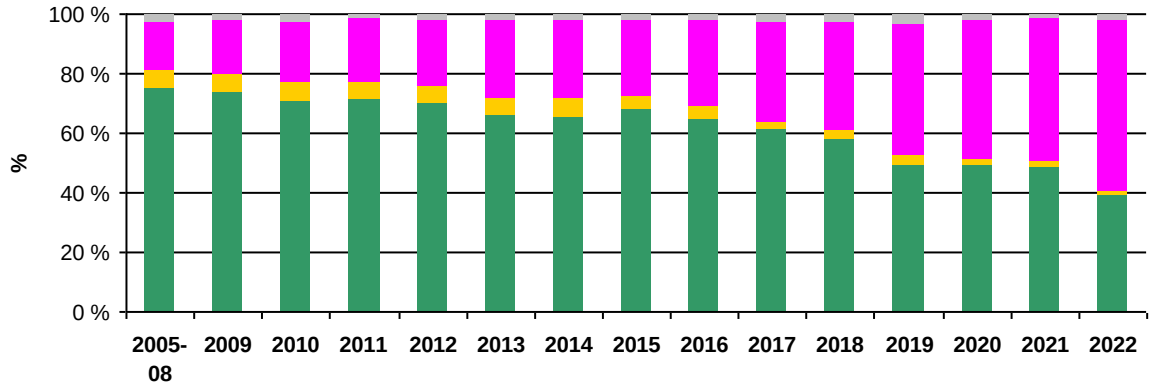


Figure 9e: Time trend for treatment of trochanteric fractures (AO / OTA type A2)

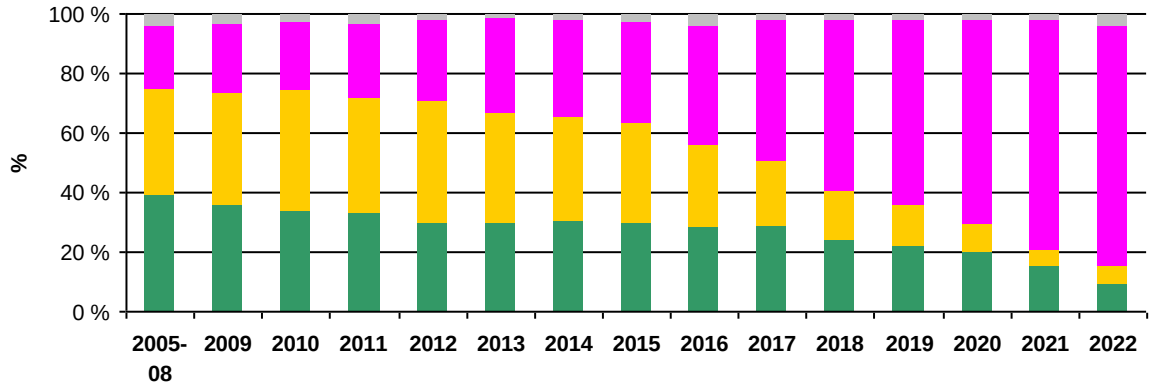
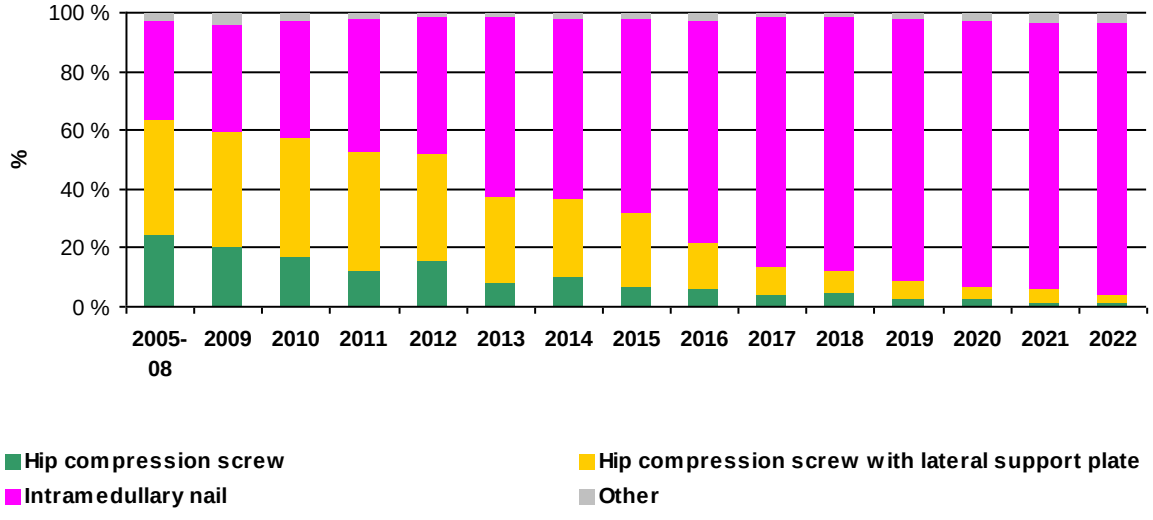


Figure 9f: Time trend for treatment of inter-* and subtrochanteric fractures



* Intertrochanteric fracture (AO / OTA type A3)

Reoperations

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

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	Total
2022	94	38	13	39	2	7	140	2	34	16	76	5	34	385	**885**
	10,6%	4,3%	1,5%	4,4%	0,2%	0,8%	15,8%	0,2%	3,8%	1,8%	8,6%	0,6%	3,8%	43,5%	
2021	74	36	17	43	1	5	157	11	52	17	62	8	50	387	**920**
	8,0%	3,9%	1,8%	4,7%	0,1%	0,5%	17,1%	1,2%	5,7%	1,8%	6,7%	0,9%	5,4%	42,1%	
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	448	**1 084**
	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	350	**1 077**
	14,2%	6,0%	3,5%	7,0%	1,8%	0,8%	17,4%	1,4%	3,2%	2,0%	5,8%	0,4%	4,0%	32,5%	
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	294	**1 020**
	17,4%	7,7%	4,7%	7,7%	1,1%	1,1%	12,9%	1,4%	4,3%	2,5%	5,7%	1,0%	3,6%	28,8%	
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%	
2005-08	1 131	468	283	399	36	40	325	69	117	138	171	28	108	805	**4 118**
	27,5%	11,4%	6,9%	9,7%	0,9%	1,0%	7,9%	1,7%	2,8%	3,4%	4,2%	0,7%	2,6%	19,5%	
Total	**2 915**	**1 264**	**702**	**1 340**	**148**	**162**	**2 705**	**239**	**601**	**462**	**1 183**	**144**	**684**	**6 048**	**18 597**
	15,7%	**6,8%**	**3,8%**	**7,2%**	**0,8%**	**0,9%**	**14,5%**	**1,3%**	**3,2%**	**2,5%**	**6,4%**	**0,8%**	**3,7%**	**32,5%**	

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: Peri-implant fracture
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	685	268	232	353	35	7	160	17	26	70	241	7	133	**2 234**
	30,7%	12,0%	10,4%	15,8%	1,6%	0,3%	7,2%	0,8%	1,2%	3,1%	10,8%	0,3%	6,0%	
Intracapsular fracture, displaced	671	266	172	306	26	91	1 556	138	490	55	387	96	149	**4 403**
	15,2%	6,0%	3,9%	6,9%	0,6%	2,1%	35,3%	3,1%	11,1%	1,2%	8,8%	2,2%	3,4%	
Basocervical fracture	141	66	31	73	8	2	55	5	16	32	24	2	28	**483**
	29,2%	13,7%	6,4%	15,1%	1,7%	0,4%	11,4%	1,0%	3,3%	6,6%	5,0%	0,4%	5,8%	
Trochanteric fracture (2 fragments)	186	65	27	80	16	14	116	16	7	68	93	0	69	**757**
	24,6%	8,6%	3,6%	10,6%	2,1%	1,8%	15,3%	2,1%	0,9%	9,0%	12,3%	0,0%	9,1%	
Trochanteric fracture (multifragment)	422	181	37	161	24	19	300	33	10	118	117	5	110	**1 537**
	27,5%	11,8%	2,4%	10,5%	1,6%	1,2%	19,5%	2,1%	0,7%	7,7%	7,6%	0,3%	7,2%	
Intertrochanteric fracture**	81	37	7	31	5	2	49	8	5	18	12	0	23	**278**
	29,1%	13,3%	2,5%	11,2%	1,8%	0,7%	17,6%	2,9%	1,8%	6,5%	4,3%	0,0%	8,3%	
Subtrochanteric fracture	202	122	9	75	7	7	140	12	5	27	46	3	67	**722**
	28,0%	16,9%	1,2%	10,4%	1,0%	1,0%	19,4%	1,7%	0,7%	3,7%	6,4%	0,4%	9,3%	
Other	36	15	2	10	2	3	35	2	5	9	15	2	13	**149**
	24,2%	10,1%	1,3%	6,7%	1,3%	2,0%	23,5%	1,3%	3,4%	6,0%	10,1%	1,3%	8,7%	
Missing	3	0	0	1	0	0	4	0	0	0	0	0	0	**8**
	37,5%	0,0%	0,0%	12,5%	0,0%	0,0%	50,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	
Total	**2 427**	**1 020**	**517**	**1 090**	**123**	**145**	**2 415**	**231**	**564**	**397**	**935**	**115**	**592**	**10 571**
	23,0%	**9,6%**	**4,9%**	**10,3%**	**1,2%**	**1,4%**	**22,8%**	**2,2%**	**5,3%**	**3,8%**	**8,8%**	**1,1%**	**5,6%**	

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: Peri-implant fracture
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	1 273	485	384	638	53	18	172	22	33	115	302	8	170	**3 673**
	34,7%	13,2%	10,5%	17,4%	1,4%	0,5%	4,7%	0,6%	0,9%	3,1%	8,2%	0,2%	4,6%	
T2	48	22	11	17	2	1	10	1	2	4	12	1	3	**134**
	35,8%	16,4%	8,2%	12,7%	1,5%	0,7%	7,5%	0,7%	1,5%	3,0%	9,0%	0,7%	2,2%	
T3	10	5	3	6	3	78	1 557	132	497	1	327	96	103	**2 818**
	0,4%	0,2%	0,1%	0,2%	0,1%	2,8%	55,3%	4,7%	17,6%	0,0%	11,6%	3,4%	3,7%	
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	440	177	52	145	24	22	203	23	12	101	86	3	91	**1 379**
	31,9%	12,8%	3,8%	10,5%	1,7%	1,6%	14,7%	1,7%	0,9%	7,3%	6,2%	0,2%	6,6%	
T6	241	94	16	108	10	8	257	20	4	60	38	3	57	**916**
	26,3%	10,3%	1,7%	11,8%	1,1%	0,9%	28,1%	2,2%	0,4%	6,6%	4,1%	0,3%	6,2%	
T7	59	28	17	24	6	0	25	1	1	7	7	0	12	**187**
	31,6%	15,0%	9,1%	12,8%	3,2%	0,0%	13,4%	0,5%	0,5%	3,7%	3,7%	0,0%	6,4%	
T8	4	3	3	1	3	0	2	0	0	2	8	0	3	**29**
	13,8%	10,3%	10,3%	3,4%	10,3%	0,0%	6,9%	0,0%	0,0%	6,9%	27,6%	0,0%	10,3%	
T9	164	80	19	69	13	6	55	11	3	59	103	2	57	**641**
	25,6%	12,5%	3,0%	10,8%	2,0%	0,9%	8,6%	1,7%	0,5%	9,2%	16,1%	0,3%	8,9%	
T10	3	1	1	4	0	1	2	0	0	0	1	0	2	**15**
	20,0%	6,7%	6,7%	26,7%	0,0%	6,7%	13,3%	0,0%	0,0%	0,0%	6,7%	0,0%	13,3%	
T11	170	117	10	72	9	6	113	20	3	45	49	1	62	**677**
	25,1%	17,3%	1,5%	10,6%	1,3%	0,9%	16,7%	3,0%	0,4%	6,6%	7,2%	0,1%	9,2%	
T13	14	8	1	6	0	0	6	0	0	3	1	0	32	**71**
	19,7%	11,3%	1,4%	8,5%	0,0%	0,0%	8,5%	0,0%	0,0%	4,2%	1,4%	0,0%	45,1%	
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	**2 427**	**1 020**	**517**	**1 090**	**123**	**145**	**2 415**	**231**	**564**	**397**	**935**	**115**	**592**	**10 571**
	23,0%	**9,6%**	**4,9%**	**10,3%**	**1,2%**	**1,4%**	**22,8%**	**2,2%**	**5,3%**	**3,8%**	**8,8%**	**1,1%**	**5,6%**	

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: Peri-implant fracture
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
2022	34	12	105	0	98	117	23	5	156	380	**930**
	3,7%	1,3%	11,3%	0,0%	10,5%	12,6%	2,5%	0,5%	16,8%	40,9%	
2021	36	15	123	0	80	137	43	5	163	357	**959**
	3,8%	1,6%	12,8%	0,0%	8,3%	14,3%	4,5%	0,5%	17,0%	37,2%	
2020	34	17	87	0	77	122	12	3	155	360	**867**
	3,9%	2,0%	10,0%	0,0%	8,9%	14,1%	1,4%	0,3%	17,9%	41,5%	
2019	70	22	131	0	86	147	16	4	176	428	**1 080**
	6,5%	2,0%	12,1%	0,0%	8,0%	13,6%	1,5%	0,4%	16,3%	39,6%	
2018	71	27	114	0	108	167	16	7	189	423	**1 122**
	6,3%	2,4%	10,2%	0,0%	9,6%	14,9%	1,4%	0,6%	16,8%	37,7%	
2017	70	33	138	0	115	153	18	6	145	369	**1 047**
	6,7%	3,2%	13,2%	0,0%	11,0%	14,6%	1,7%	0,6%	13,8%	35,2%	
2016	90	36	151	0	100	151	14	7	161	422	**1 132**
	8,0%	3,2%	13,3%	0,0%	8,8%	13,3%	1,2%	0,6%	14,2%	37,3%	
2015	75	36	182	0	114	131	19	4	148	372	**1 081**
	6,9%	3,3%	16,8%	0,0%	10,5%	12,1%	1,8%	0,4%	13,7%	34,4%	
2014	48	26	159	0	81	112	7	4	99	352	**888**
	5,4%	2,9%	17,9%	0,0%	9,1%	12,6%	0,8%	0,5%	11,1%	39,6%	
2013	71	32	159	0	117	116	14	6	118	376	**1 009**
	7,0%	3,2%	15,8%	0,0%	11,6%	11,5%	1,4%	0,6%	11,7%	37,3%	
2012	73	42	189	0	91	137	14	9	109	341	**1 005**
	7,3%	4,2%	18,8%	0,0%	9,1%	13,6%	1,4%	0,9%	10,8%	33,9%	
2011	72	34	215	0	97	105	19	13	113	358	**1 026**
	7,0%	3,3%	21,0%	0,0%	9,5%	10,2%	1,9%	1,3%	11,0%	34,9%	
2010	86	40	221	2	89	106	15	11	104	289	**963**
	8,9%	4,2%	22,9%	0,2%	9,2%	11,0%	1,6%	1,1%	10,8%	30,0%	
2009	120	40	254	0	97	129	10	11	94	302	**1 057**
	11,4%	3,8%	24,0%	0,0%	9,2%	12,2%	0,9%	1,0%	8,9%	28,6%	
2005-08	409	133	1 381	43	290	253	32	38	254	791	**3 624**
	11,3%	3,7%	38,1%	1,2%	8,0%	7,0%	0,9%	1,0%	7,0%	21,8%	
Total	**1 359**	**545**	**3 609**	**45**	**1 640**	**2 083**	**272**	**133**	**2 184**	**5 920**	**17 790**
	7,6%	**3,1%**	**20,3%**	**0,3%**	**9,2%**	**11,7%**	**1,5%**	**0,7%**	**12,3%**	**33,3%**	

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
R7: Closed reduction of dislocated hemiprosthesis
R8: Open reduction of dislocated hemiprosthesis
R9: Other
R10: Total hip prosthesis

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

	R1	R2	R3	R4	R5	R6	R9	R10	Total
2022	12	1	28	0	17	2	2	98	**160**
	7,5%	0,6%	17,5%	0,0%	10,6%	1,3%	1,3%	61,3%	
2021	13	0	32	0	19	3	5	84	**156**
	8,3%	0,0%	20,5%	0,0%	12,2%	1,9%	3,2%	53,8%	
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	125	**326**
	13,2%	3,4%	35,0%	0,3%	8,0%	0,6%	1,2%	38,3%	
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%	
2005-08	156	31	676	18	63	10	14	449	**1 417**
	11,0%	2,2%	47,7%	1,3%	4,4%	0,7%	1,0%	31,7%	
Total	**570**	**83**	**1 578**	**19**	**371**	**49**	**73**	**2 178**	**4 921**
	11,6%	**1,7%**	**32,1%**	**0,4%**	**7,5%**	**1,0%**	**1,5%**	**44,3%**	

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 after primary uni/bipolar hemiprosthesis (reasons are not mutually exclusive)

	R2	R3	R6	R7	R8	R9	R10	Total
2022	7 3,0%	22 9,3%	64 27,1%	13 5,5%	3 1,3%	90 38,1%	37 15,7%	**236**
2021	4 1,5%	27 10,4%	77 29,6%	25 9,6%	3 1,2%	91 35,0%	33 12,7%	**260**
2020	3 1,3%	21 9,1%	80 34,5%	5 2,2%	3 1,3%	93 40,1%	27 11,6%	**232**
2019	7 2,5%	33 11,8%	83 29,6%	10 3,6%	3 1,1%	97 34,6%	47 16,8%	**280**
2018	9 2,9%	28 8,9%	105 33,4%	10 3,2%	4 1,3%	113 36,0%	45 14,3%	**314**
2017	9 3,5%	28 10,8%	78 30,1%	8 3,1%	4 1,5%	84 32,4%	48 18,5%	**259**
2016	12 4,5%	20 7,5%	81 30,2%	9 3,4%	6 2,2%	98 36,6%	42 15,7%	**268**
2015	5 2,2%	18 7,9%	66 28,9%	16 7,0%	1 0,4%	74 32,5%	48 21,1%	**228**
2014	9 4,9%	20 10,9%	48 26,1%	5 2,7%	4 2,2%	61 33,2%	37 20,1%	**184**
2013	11 5,0%	15 6,8%	68 30,6%	9 4,1%	4 1,8%	78 35,1%	37 16,7%	**222**
2012	11 5,7%	23 11,9%	55 28,4%	10 5,2%	8 4,1%	56 28,9%	31 16,0%	**194**
2011	10 4,8%	14 6,7%	60 28,6%	16 7,6%	8 3,8%	70 33,3%	32 15,2%	**210**
2010	8 4,3%	17 9,0%	59 31,4%	10 5,3%	9 4,8%	69 36,7%	16 8,5%	**188**
2009	9 6,1%	10 6,8%	44 29,7%	7 4,7%	9 6,1%	49 33,1%	20 13,5%	**148**
2005-08	22 6,1%	19 5,2%	114 31,4%	15 4,1%	28 7,7%	123 33,9%	42 11,6%	**363**
Total	**136** **3,8%**	**315** **8,8%**	**1 082** **30,2%**	**168** **4,7%**	**97** **2,7%**	**1 246** **34,7%**	**542** **15,1%**	**3 586**

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 -13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Cable Ready plate + cerclage	3	2			1	1		2		1	**10**
Cerclage	10	2	3	2	2		4	5		7	**35**
Dall Miles plate + cerclage	8	4	4	3	2	2	1	2	1		**27**
DCP plate + possibly cerclage				3	4	4	2		2	1	**16**
Drainage of haematoma	25			1	1				1		**28**
Fixation of trochanter (Dall Miles)	3			1			1				**5**
NCB plate + possibly cerclage						4	10	8	9	16	**47**
Revision of prosthesis + osteosynthesis	2	1					1			1	**5**
Cement spacer	8	3	4	4	3	1	2	1	3	2	**31**
Exchange of caput/bipolar head	356	43	55	77	67	95	71	74	70	58	**966**
Exchange of caput/bipolar head + osteosynthesis with plate/cerclage	3	1	1			1					**6**
Suture of muscle/fascie	6		1	2	1	1	2			1	**14**
Unspecified plate + cerclage	9	2	5	1	2	2	2				**23**
Other (n<5)	12	3	1	4	1	2	1	1	5	3	**33**
Total	**445**	**61**	**74**	**98**	**84**	**113**	**97**	**93**	**91**	**90**	**1 246**

Implants

Table 15: Cemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	2005 -14	2015	2016	2017	2018	2019	2020	2021	2022	Total
Charnley		Hastings bipolar head	2 695									**2 695**
Charnley Modular	Elite	Hastings bipolar head	1 269									**1 269**
Charnley Modular	Elite	Landos bipolar cup	24									**24**
Charnley Modular	Elite	Self-centering bipolar	417	258	71	45						**791**
Corail	Articul/Eze CoCr	Self-centering bipolar	163	117	93	80	86	62				**601**
Corail	Articul/Eze CoCr	Vario-Cup	58	48	64	7						**177**
Corail	Cobalt chrome (DePuy Synthes)	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	692	786	651	**2 843**
C-Stem	Articul/Eze CoCr	UHR									51	**51**
C-Stem	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar		12	99	97			2			**210**
ETS			296	2	1							**299**
Exeter/V40	Exeter/V40	HIP Bipolar Cup	4	3	2	1	1	1	1	5	4	**22**
Exeter/V40	Exeter/V40	Multipolar				28	113	80	24			**245**
Exeter/V40	Exeter/V40	Self-centering bipolar	415	228	218	46						**907**
Exeter/V40	Exeter/V40	UHR	8 332	1456	1 568	884	1 347	1 542	1 391	1 264	1 287	**19 071**
Lubinus SPII	Articul/Eze CoCr	Self-centering bipolar	18	8		1						**27**
Lubinus SPII	CoCrMo (Link)	Multipolar							61	71	77	**209**
Lubinus SPII	CoCrMo (Link)	Self-centering bipolar	56	70	98	17						**241**
Lubinus SPII	CoCrMo (Link)	UHR	266	218	257	258	261	234	241	454	527	**2 716**
Lubinus SPII	CoCrMo (Link)	Vario-Cup	1 745	90	113	178	270	324	541	628	710	**4 599**
MS-30	Protasul/Metasul	Multipolar				106	265	227	101	91	87	**877**
MS-30	Protasul/Metasul	Self-centering bipolar							33	55	50	**138**
MS-30	Protasul/Metasul	UHR	21									**21**
MS-30	Versys	Multipolar						61	92	142	108	**403**
MS-30	Versys	Self-centering bipolar		11	45	38	11					**105**
MS-30	Versys	UHR					21	35	41	48	39	**184**
MS-30	Zimmer hoder	Multipolar				6	4		7	6	6	**29**
Spectron EF Primary	Articul/Eze CoCr	HIP Bipolar Cup								13	14	**27**
Spectron EF Primary	Cobalt Chrom (S&N)	Biarticular cup	33									**33**
Spectron EF Primary	Cobalt Chrom (S&N)	HIP Bipolar Cup	85	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 Synthes)	Landos bipolar cup	648									**648**
Titan	Cobalt chrome (DePuy Synthes)	Self-centering bipolar	227									**227**
Other	(n < 20)		609	17	40	156	92	51	60	34	111	**1 170**
Unknown			31	2	1	1	2	1	2		3	**43**
Total			**18 765**	**2 564**	**2 771**	**2 886**	**3 096**	**3 203**	**3 297**	**3 600**	**3 725**	**43 907**

Table 16: Uncemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	2005 -13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Accolade II	Exeter/V40	Vario-Cup	2	8	11	4	2		2	2		3	**34**
Arcos	Modular Head (Biomet)	Multipolar					5	2	2		1	2	**12**
Corail	Alumina Biolox (DePuy)	Vario-Cup	10										**10**
Corail	Articul/Eze CoCr	ic-head									1	9	**10**
Corail	Articul/Eze CoCr	Bipolar Ball Head	64										**64**
Corail	Articul/Eze CoCr	HIP Bipolar Cup									6	52	**58**
Corail	Articul/Eze CoCr	Landos bipolar cup	102										**102**
Corail	Articul/Eze CoCr	Multipolar							3	9	10	8	**30**
Corail	Articul/Eze CoCr	Self-centering bipolar	1 805	470	429	486	295	165	106	39	23	20	**3 838**
Corail	Articul/Eze CoCr	UHR	146	82	74	67	33	39	27	10	3	4	**485**
Corail	Articul/Eze CoCr	Vario-Cup	138	17	4	1							**160**
Corail	Articul/Eze Ultamet (M-Spec)	Multipolar						6	4				**10**
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar	310	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 Synthes)	Landos bipolar cup	757										**757**
Corail	Cobalt chrome (DePuy Synthes)	Self-centering bipolar	1 127										**1 127**
Corail	Cobalt chrome (DePuy Synthes)	Tandem	11										**11**
Corail	Cobalt chrome (DePuy Synthes)	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	473	37	44	36	35	63	50	55	46	1	**840**
Filler	Hipball Premium	UHR	10	21	2								**33**
Furlong	Furlong	UHR			21	57	31						**109**
HACTIV	HACTIV head	Moonstone	22										**22**
HACTIV	HACTIV head	Tandem	19										**19**
HACTIV	HACTIV head	UHR		41	22		1						**64**
Polarstem	Cobalt Chrom (S&N)	Tandem	195	16	2								**213**
Polarstem	Cobalt Chrom (S&N)	UHR		25	33	9	12	16	13	9	10	8	**135**
SL-PLUS/ SLRPLUS	HACTIV head	Bipolar Ball Head	16										**16**
SL-PLUS/ SLRPLUS	Metal Ball Head	Bipolar Ball Head	153										**153**
Other	(n < 10)		321	23	22	20	40	34	23	17	16	18	**534**
Unknown			5						1			1	**7**
Total			**6 019**	**820**	**673**	**686**	**455**	**325**	**231**	**141**	**116**	**126**	**9 592**

1 femur is missing in table 15 and 16 due to missing information

Table 17: Cemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	2005 -13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Charnley		Hastings bipolar head	449	3									**452**
Charnley Modular	Elite	Hastings bipolar head	77										**77**
Charnley Modular	Elite	Self-centering bipolar	14	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				4	2	2	3	3	5	6	**25**
ETS			22										**22**
Exeter/V40	Exeter/V40	Self-centering bipolar	11	12	11	6	1						**41**
Exeter/V40	Exeter/V40	UHR	604	42	69	42	31	36	47	25	32	41	**969**
Lubinus SPII	CoCrMo (Link)	UHR	2	12	15	12	11	7	2	2	6	7	**76**
Lubinus SPII	CoCrMo (Link)	Vario-Cup	134	7	4	6	11	2	8	4	10	6	**192**
MS-30	Protasul/Metasul	Multipolar					4	1	4	1	3	2	**15**
Restoration Modular	Exeter/V40	Self-centering bipolar	12		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	119	1									**120**
Titan	Cobalt chrome (DePuy Synthes)	Landos bipolar cup	125										**125**
Other	(n <10)		235	29	21	35	35	31	32	25	33	25	**501**
Unknown			5		1		2						**8**
Total			**1 842**	**114**	**133**	**112**	**104**	**87**	**102**	**62**	**89**	**87**	**2 732**

Table 18: Uncemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	2005 -13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Arcos	Modular Head (Biomet)	Multipolar					4	2	1	2	6	4	**19**
Arcos	Modular Head (Biomet)	Self-centering bipolar		2	3	5							**10**
Arcos	Modular Head (Biomet)	UHR					1	2	6	4	6	3	**22**
Corail	Articul/Eze CoCr	Landos bipolar cup	19										**19**
Corail	Articul/Eze CoCr	Self-centering bipolar	61	11	13	13	6	6	1	4	4	1	**120**
Corail	Articul/Eze CoCr	UHR				4	1						**5**
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar	27	2									**29**
Corail	Cobalt chrome (DePuy Synthes)	Landos bipolar cup	81										**81**
Corail	Cobalt chrome (DePuy Synthes)	Self-centering bipolar	66										**66**
Corail Revisjon/KAR	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar	7										**7**
Corail Revisjon/KAR	Cobalt chrome (DePuy Synthes)	Landos bipolar cup	9										**9**
Corail Revisjon/KAR	Cobalt chrome (DePuy Synthes)	Self-centering bipolar	6										**6**
Filler	Biotechni fem. head	Biarticular cup	18										**18**
Filler	Cobalt chrome (DePuy Synthes)	Biarticular cup	5										**5**
Filler	Hipball Premium	Biarticular cup	56										**56**
Filler	Hipball Premium	HIP Bipolar Cup	49	11	8	7	9	6	1	7	4		**102**
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	2	**13**
Reclaim	Articul/Eze CoCr	Self-centering bipolar	1						1	1		2	**5**
REEF	Cobalt chrome (DePuy Synthes)	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)		181	12	19	5	9	8	13	5	3	7	**262**
Unknown			3				1						**4**
Total			**623**	**45**	**50**	**39**	**34**	**27**	**30**	**25**	**27**	**19**	**919**

Table 19: Screws - primary operations

Product	2005-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Asnis III	1 003	121	120	118	114	119	212	179	221	395	**2 602**
Cannulated screw (DePuy Synthes)							4	6	4	4	**18**
Cannulated screw (S&N)	2					18	82	59	89	59	**309**
Cannulated Screw Zimmer Biomet						1			27	108	**136**
Hansson pin system (LIH)	1 912	41	60	49	79	62	55	37	12	10	**2 317**
LE-screw									17	16	**33**
Olmed screw	9 080	448	483	433	272	196	86	71	71	35	**11 175**
Richards CHP	4 962	547	614	596	658	635	486	359	303	86	**9 246**
Other (n<10)				3	1	2	1				**7**
Unknown		1			1	2	3	2	3	13	**25**
Total	**16 959**	**1 158**	**1 277**	**1 199**	**1 125**	**1 035**	**929**	**713**	**747**	**726**	**25 868**

Table 20: Hip compression screws - primary operations

Product	2005-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
DHS	4 197	13	25	25	29	11	5				**4 305**
LCP DHS	2 627	662	1 357	1 162	1 094	923	765	652	638	611	**10 491**
Omega	111									1	**112**
Omega 3	3	1		2	2			1	1	1	**11**
Richards CHS	15 006	1 564	773	712	534	493	409	369	350	183	**20 393**
Swemac CHS System			8	5	6	9	13	2			**43**
Other (n<10)	2								1		**3**
Total	**21 946**	**2 240**	**2 163**	**1 906**	**1 665**	**1 436**	**1 192**	**1 024**	**990**	**796**	**35 358**

Table 21: Intramedullary nails - primary operations

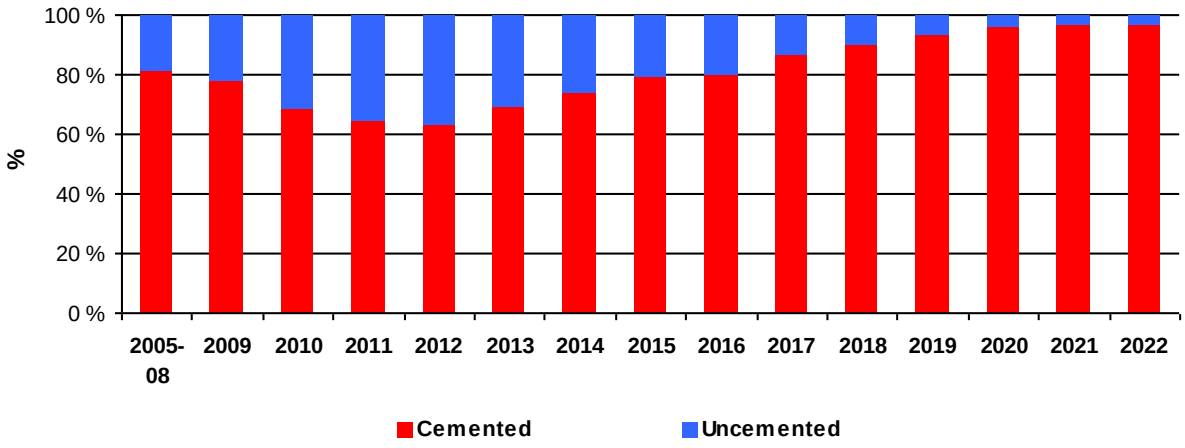
Product	2005-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
ACE	49										**49**
AFFIXUS					5	14	23	29	43	26	**140**
Gamma 3	4 282	710	467	429	369	512	1 053	1 218	1 476	1 668	**12 184**
IMHS	27										**27**
IMHS CP	10										**10**
LFN	55	7	4	3	5	2	7	1	2	1	**87**
PFN	26										**26**
PFNA	449	117	174	200	186	231	129	142	120	141	**1 889**
T2	11	2	1				1	1	1	1	**18**
T2 recon	149	33	24	28	34	31	39	72	75	21	**506**
TFNA femoral nail						1	171	137	146	185	**640**
T-Gamma	507										**507**
Trigen Intertan	1 412	285	561	744	990	994	415	351	366	374	**6 492**
Trigen TAN/FAN	226	22	62	65	88	76	49	20	8	14	**630**
Other (n<10)	5					2	1		5	7	**20**
Unknown	3	2	1				1	1	3	4	**15**
Total	**7 211**	**1 178**	**1 294**	**1 469**	**1 677**	**1 863**	**1 889**	**1 972**	**2 245**	**2 442**	**23 240**

Fixation of hemiprostheses

Table 22: Primary operations

	Uncemented		Cement with antibiotics		Cement without antibiotics		Missing		Total
2022	138	(3,6%)	3 707	(96,4%)	0	(0,0%)	0	(0,0%)	**3 845**
2021	118	(3,2%)	3 597	(96,8%)	1	(0,0%)	1	(0,0%)	**3 717**
2020	142	(4,1%)	3 296	(95,9%)	0	(0,0%)	0	(0,0%)	**3 438**
2019	232	(6,8%)	3 202	(93,2%)	0	(0,0%)	0	(0,0%)	**3 434**
2018	332	(9,7%)	3 086	(90,2%)	1	(0,0%)	2	(0,1%)	**3 421**
2017	455	(13,6%)	2 886	(86,4%)	0	(0,0%)	0	(0,0%)	**3 341**
2016	687	(19,9%)	2 769	(80,1%)	0	(0,0%)	1	(0,0%)	**3 457**
2015	674	(20,8%)	2 562	(79,1%)	1	(0,0%)	0	(0,0%)	**3 237**
2014	822	(25,8%)	2 362	(74,0%)	3	(0,1%)	4	(0,1%)	**3 191**
2013	943	(30,4%)	2 154	(69,4%)	0	(0,0%)	6	(0,2%)	**3 103**
2012	1 141	(36,2%)	1 964	(62,4%)	10	(0,3%)	33	(1,0%)	**3 148**
2011	1 063	(35,1%)	1 928	(63,7%)	6	(0,2%)	29	(1,0%)	**3 026**
2010	880	(31,3%)	1 898	(67,5%)	7	(0,2%)	27	(1,0%)	**2 812**
2009	614	(21,6%)	2 175	(76,6%)	8	(0,3%)	41	(1,4%)	**2 838**
2005-08	1 397	(18,7%)	5 952	(79,5%)	16	(0,2%)	120	(1,6%)	**7 485**
Total	**9 638**	**(18,0%)**	**43 538**	**(81,4%)**	**53**	**(0,1%)**	**264**	**(0,5%)**	**53 493**

Figure 10: Time trend for fixation of primary hemiprostheses *



* 264 operations with missing information on fixation were excluded

Table 23: Type of cement - primary operations

Product	Manufacturer	2005-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Cemex System Genta FAST	Alere	524	86	29								**639**
Cemex system genta ID green	Alere	1			16	126	106	75	6	1		**331**
Cemex w/gentamicin	Alere	61	10	71	111			1				**254**
Copal G + C	Heraeus							1			103	**104**
Copal G + V	Heraeus		1	1	2	8	4	6	2	8	88	**120**
Optipac Refobacin Bonecement R	Biomet	3 015	911	1 248	1 040	949	770	44		1		**7 978**
Optipac Refobacin Bonecement R-3	Zimmer Bio							16				**16**
Optipac Refobacin Revision	Biomet	61	67									**128**
Palacos R + G	Heraeus	8 039	882	956	1 007	763	883	563	265	317	257	**13 932**
Palacos R+G pro	Heraeus	1		1	93	374	1 078	2 362	2 935	3 260	3 235	**13 339**
Palacos w/gentamicin	Heraeus/Sc	353										**353**
Refobacin Bone Cement R	Biomet	3 340	380	221	367	524	77					**4 909**
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				2		**7**
Missing information		219	25	30	93	108	147	123	48	2	24	**819**
Total		**16 071**	**2 362**	**2 561**	**2 769**	**2 886**	**3 086**	**3 202**	**3 296**	**3 597**	**3 707**	**43 537**

Table 24: Hydroxyapatite (HA) - uncemented prostheses

	With HA		Without HA		Missing		Total
2022	124	(97,6%)	3	(2,4%)	0	(0,0%)	**127**
2021	115	(98,3%)	2	(1,7%)	0	(0,0%)	**117**
2020	142	(100,0%)	0	(0,0%)	0	(0,0%)	**142**
2019	228	(98,3%)	4	(1,7%)	0	(0,0%)	**232**
2018	327	(98,5%)	5	(1,5%)	0	(0,0%)	**332**
2017	452	(99,3%)	3	(0,7%)	0	(0,0%)	**455**
2016	681	(99,1%)	6	(0,9%)	0	(0,0%)	**687**
2015	673	(99,9%)	1	(0,1%)	0	(0,0%)	**674**
2014	822	(100,0%)	0	(0,0%)	0	(0,0%)	**822**
2013	941	(99,9%)	1	(0,1%)	0	(0,0%)	**942**
2012	1 139	(99,9%)	1	(0,1%)	0	(0,0%)	**1 140**
2011	1 060	(99,9%)	1	(0,1%)	0	(0,0%)	**1 061**
2010	871	(99,0%)	9	(1,0%)	0	(0,0%)	**880**
2009	577	(94,1%)	36	(5,9%)	0	(0,0%)	**613**
2005-08	1 250	(89,5%)	146	(10,5%)	0	(0,0%)	**1 396**
Total	**9 402**	**(97,7%)**	**218**	**(2,3%)**	**0**	**(0,0%)**	**9 620**

Pathological fractures

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

	No		Yes		Missing		Total
2022	6 837	(85,8%)	120	(1,5%)	1 015	(12,7%)	**7 972**
2021	6 750	(87,0%)	110	(1,4%)	900	(11,6%)	**7 760**
2020	6 250	(86,5%)	86	(1,2%)	890	(12,3%)	**7 226**
2019	6 509	(86,4%)	82	(1,1%)	946	(12,6%)	**7 537**
2018	6 812	(86,8%)	86	(1,1%)	948	(12,1%)	**7 846**
2017	6 875	(86,6%)	96	(1,2%)	969	(12,2%)	**7 940**
2016	7 098	(87,0%)	85	(1,0%)	973	(11,9%)	**8 156**
2015	7 106	(87,9%)	88	(1,1%)	893	(11,0%)	**8 087**
2014	6 944	(88,0%)	57	(0,7%)	893	(11,3%)	**7 894**
2013	7 031	(87,7%)	89	(1,1%)	893	(11,1%)	**8 013**
2012	7 233	(87,9%)	64	(0,8%)	932	(11,3%)	**8 229**
2011	7 548	(89,7%)	76	(0,9%)	790	(9,4%)	**8 414**
2010	7 637	(93,1%)	67	(0,8%)	498	(6,1%)	**8 202**
2009	7 333	(90,5%)	81	(1,0%)	687	(8,5%)	**8 101**
2005-08	26 268	(90,3%)	221	(0,8%)	2 591	(8,9%)	**29 080**
Total	**124 231**	**(88,4%)**	**1 408**	**(1,0%)**	**14 818**	**(10,5%)**	**140 457**

* Patients operated with total hip prostheses were excluded

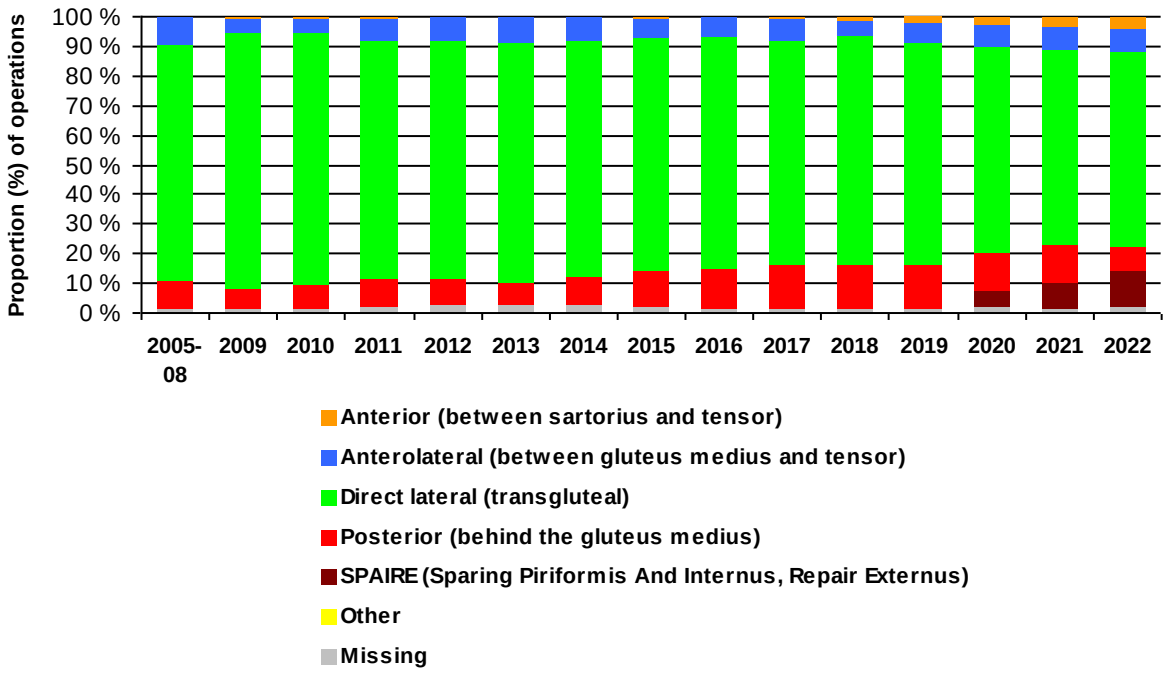
Surgical approach used in hemiarthroplasty

Table 26: Surgical approach used in hemiarthroplasty

	Anterior		Anterolateral		Direct lateral		Posterior		SPAIRE *		Other		Missing		Total
2022	155	(4,0%)	309	(8,0%)	2 530	(65,7%)	309	(8,0%)	477	(12,4%)	3	(0,1%)	67	(1,7%)	**3 850**
2021	136	(3,7%)	300	(8,1%)	2 424	(65,2%)	488	(13,1%)	307	(8,3%)	4	(0,1%)	58	(1,6%)	**3 717**
2020	102	(3,0%)	252	(7,3%)	2 392	(69,6%)	442	(12,9%)	186	(5,4%)	0	(0,0%)	64	(1,9%)	**3 438**
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**
2005-08	2	(0,0%)	692	(9,2%)	6 010	(80,3%)	702	(9,4%)	0	(0,0%)	0	(0,0%)	81	(1,1%)	**7 487**
Total	**612**	**(1,1%)**	**3 931**	**(7,3%)**	**41 281**	**(77,2%)**	**5 837**	**(10,9%)**	**974**	**(1,8%)**	**11**	**(0,0%)**	**855**	**(1,6%)**	**53 501**

* SPAIRE (Sparing Piriformis And Internus, Repair Externus)

Figure 11: Surgical approach used in hemiarthroplasty



Intraoperative complications

Table 27: Intraoperative complications - primary operations

	Yes		No		Missing		Total
2022	205	(2,4%)	8 066	(95,0%)	224	(2,6%)	**8 495**
2021	215	(2,6%)	7 852	(94,7%)	229	(2,8%)	**8 296**
2020	212	(2,7%)	7 317	(94,2%)	238	(3,1%)	**7 767**
2019	226	(2,8%)	7 709	(94,4%)	234	(2,9%)	**8 169**
2018	268	(3,2%)	7 910	(93,9%)	249	(3,0%)	**8 427**
2017	268	(3,2%)	7 863	(94,2%)	221	(2,7%)	**8 352**
2016	335	(3,9%)	7 909	(93,0%)	260	(3,1%)	**8 504**
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%)	7 762	(92,8%)	280	(3,4%)	**8 364**
2009	302	(3,7%)	7 684	(93,1%)	272	(3,3%)	**8 258**
2005-08	1 070	(3,6%)	27 664	(93,4%)	896	(3,0%)	**29 630**
Total	**5 036**	**(3,4%)**	**136 612**	**(93,4%)**	**4 558**	**(3,1%)**	**146 206**

Antibiotic prophylaxis

Table 28: Antibiotic prophylaxis in primary screw fixation

	Yes		No		Missing		Total
2022	704	(97,2%)	17	(2,3%)	3	(0,4%)	**724**
2021	733	(98,3%)	8	(1,1%)	5	(0,7%)	**746**
2020	698	(97,9%)	12	(1,7%)	3	(0,4%)	**713**
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**
2005-08	3 180	(35,4%)	5 640	(62,9%)	151	(1,7%)	**8 971**
Total	**16 421**	**(63,5%)**	**9 128**	**(35,3%)**	**297**	**(1,1%)**	**25 846**

Table 29: Antibiotic prophylaxis in primary hemiprosthesis operations

	Yes		No		Missing		Total
2022	3 788	(99,7%)	2	(0,1%)	9	(0,2%)	**3 799**
2021	3 681	(99,8%)	2	(0,1%)	6	(0,2%)	**3 689**
2020	3 404	(99,4%)	1	(0,0%)	20	(0,6%)	**3 425**
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**
2005-08	7 433	(99,3%)	31	(0,4%)	23	(0,3%)	**7 487**
Total	**53 156**	**(99,6%)**	**75**	**(0,1%)**	**155**	**(0,3%)**	**53 386**

Table 30: Antibiotic prophylaxis in primary hip compression screw operations

	Yes		No		Missing		Total
2022	788	(99,0%)	0	(0,0%)	8	(1,0%)	**796**
2021	983	(99,3%)	0	(0,0%)	7	(0,7%)	**990**
2020	1 017	(99,3%)	0	(0,0%)	7	(0,7%)	**1 024**
2019	1 187	(99,6%)	0	(0,0%)	5	(0,4%)	**1 192**
2018	1 422	(99,0%)	2	(0,1%)	12	(0,8%)	**1 436**
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**
2005-08	8 902	(94,0%)	502	(5,3%)	63	(0,7%)	**9 467**
Total	**34 537**	**(97,7%)**	**653**	**(1,8%)**	**169**	**(0,5%)**	**35 359**

Table 31: Antibiotic prophylaxis in primary Intramedullary nail operations

	Yes		No		Missing		Total
2022	2 392	(99,6%)	1	(0,0%)	9	(0,4%)	**2 402**
2021	2 221	(99,7%)	0	(0,0%)	7	(0,3%)	**2 228**
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**
2005-08	2 120	(88,4%)	263	(11,0%)	15	(0,6%)	**2 398**
Total	**22 462**	**(97,0%)**	**573**	**(2,5%)**	**124**	**(0,5%)**	**23 159**

Table 32: Antibiotic prophylaxis in reoperations

	Yes		No		Missing		Total
2022	692	(88,2%)	87	(11,1%)	6	(0,8%)	**785**
2021	657	(84,6%)	108	(13,9%)	12	(1,5%)	**777**
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	740	(85,8%)	110	(12,8%)	12	(1,4%)	**862**
2009	801	(82,6%)	151	(15,6%)	18	(1,9%)	**970**
2005	2 896	(84,4%)	486	(14,2%)	50	(1,5%)	**3 432**
Total	**13 703**	**(87,0%)**	**1 848**	**(11,7%)**	**204**	**(1,3%)**	**15 755**

Table 33: Type of antibiotics - primary operations

Antibiotics (generic name)	2005-13	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Cefalotin (Keflin)	51 675	6 947	7 305	7 838	7 032	5 831	828	850	1 265	1 652	91 223
	83,6%	85,8%	87,1%	92,0%	84,5%	69,5%	10,1%	11,0%	15,2%	19,5%	67,0%
Cefazolin (Cephazolin)	3	1		2	748	2 073	6 388	6 274	6 560	6 402	28 451
	0,0%	0,0%		0,0%	9,0%	24,7%	78,2%	80,9%	79,0%	75,4%	20,9%
Klindamycin (Dalacin, Clindamycin)	1 762	338	366	397	394	376	391	363	383	332	5 102
	2,9%	4,2%	4,4%	4,7%	4,7%	4,5%	4,8%	4,7%	4,6%	3,9%	3,7%
Kloksacillin (Ekvacillin)	2 162	532	510	80	15	9	445	181	13	11	3 958
	3,5%	6,6%	6,1%	0,9%	0,2%	0,1%	5,4%	2,3%	0,2%	0,1%	2,9%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	2 781	87	31	27	21	6	30	9	10	2	3 004
	4,5%	1,1%	0,4%	0,3%	0,3%	0,1%	0,4%	0,1%	0,1%	0,0%	2,2%
Dikloksacillin (Diclocil, Dicillin)	2 232	18	18	14	3	12	13	8	7	6	2 331
	3,6%	0,2%	0,2%	0,2%	0,0%	0,1%	0,2%	0,1%	0,1%	0,1%	1,7%
Other *	966	133	121	130	75	68	70	61	49	72	1 745
	1,6%	1,6%	1,4%	1,5%	0,9%	0,8%	0,9%	0,8%	0,6%	0,8%	1,3%
Missing information	236	38	34	28	30	12	3	10	13	13	417
	0,4%	0,5%	0,4%	0,3%	0,4%	0,1%	0,0%	0,1%	0,2%	0,2%	0,3%
Total	**61 817**	**8 094**	**8 385**	**8 516**	**8 318**	**8 387**	**8 168**	**7 756**	**8 300**	**8 490**	**136 231**

* 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
2022	8 176	(96,3%)	292	(3,1%)	27	(0,7%)	**8 495**
2021	7 991	(96,3%)	276	(2,9%)	29	(0,8%)	**8 296**
2020	7 502	(96,6%)	239	(2,7%)	26	(0,7%)	**7 767**
2019	7 939	(97,2%)	194	(2,0%)	36	(0,8%)	**8 169**
2018	8 209	(97,4%)	190	(2,0%)	28	(0,6%)	**8 427**
2017	8 149	(97,6%)	182	(1,9%)	21	(0,5%)	**8 352**
2016	8 282	(97,4%)	186	(1,9%)	36	(0,7%)	**8 504**
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	8 238	(98,5%)	94	(1,1%)	32	(0,4%)	**8 364**
2009	8 150	(98,7%)	78	(0,9%)	30	(0,4%)	**8 258**
2005-08	28 937	(97,7%)	561	(1,9%)	132	(0,4%)	**29 630**
Total	**142 712**	**(97,6%)**	**3 007**	**(2,1%)**	**487**	**(0,3%)**	**146 206**

Table 35: Number of drugs in antithrombotic prophylaxis

	One drug		Two drugs		Total
2022	7 870	(96,3%)	306	(3,7%)	**8 176**
2021	7 692	(96,3%)	299	(3,7%)	**7 991**
2020	7 296	(97,3%)	206	(2,7%)	**7 502**
2019	7 716	(97,2%)	223	(2,8%)	**7 939**
2018	8 025	(97,8%)	184	(2,2%)	**8 209**
2017	7 965	(97,7%)	184	(2,3%)	**8 149**
2016	8 102	(97,8%)	180	(2,2%)	**8 282**
2015	7 962	(97,0%)	247	(3,0%)	**8 209**
2014	7 750	(97,3%)	216	(2,7%)	**7 966**
2013	7 904	(96,8%)	259	(3,2%)	**8 163**
2012	8 138	(97,9%)	172	(2,1%)	**8 310**
2011	8 405	(99,0%)	86	(1,0%)	**8 491**
2010	8 204	(99,6%)	34	(0,4%)	**8 238**
2009	8 132	(99,8%)	18	(0,2%)	**8 150**
2005-08	28 875	(99,8%)	62	(0,2%)	**28 937**
Total	**140 036**	**(98,1%)**	**2 676**	**(1,9%)**	**142 712**

Table 36: Antithrombotic prophylaxis if one drug - primary operation (n=140 003)

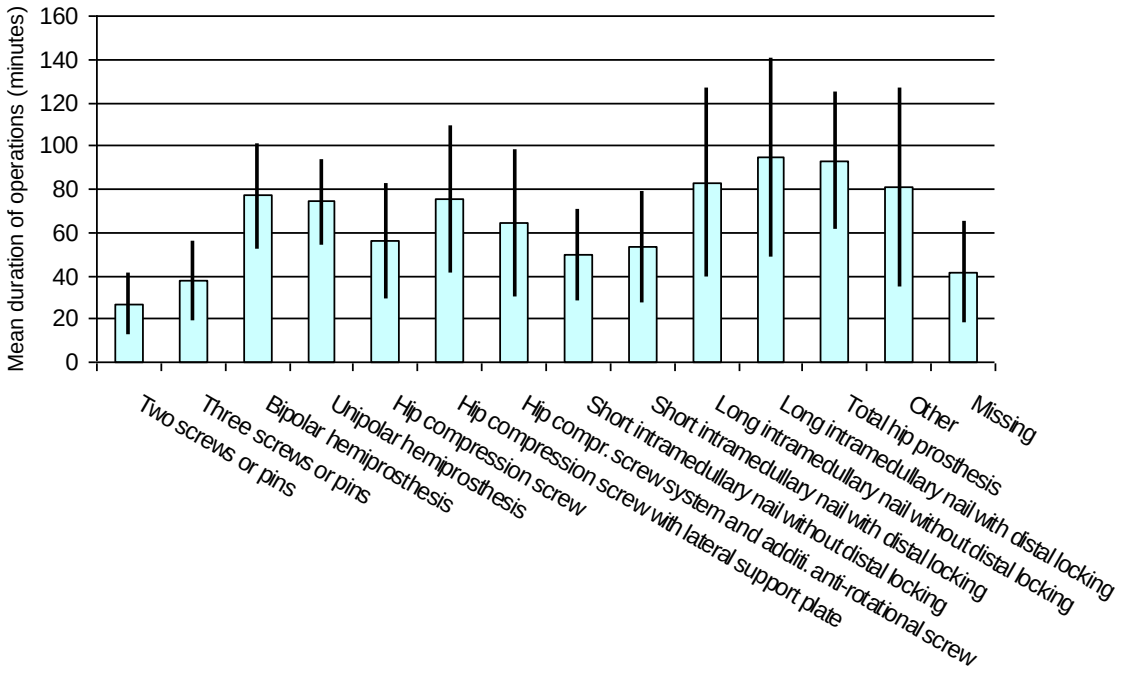
	2005-13	2014	2015	2016	2017	2018	2019	2020	2021	2022
Dalteparin (Fragmin)	57,2%	51,1%	59,8%	64,8%	70,5%	71,6%	59,3%	56,5%	57,8%	59,4%
Enoksaparin (Klexane)	42,4%	48,0%	39,1%	34,3%	28,2%	27,5%	39,7%	42,1%	40,8%	38,5%
Other	0,1%	0,4%	0,5%	0,4%	0,5%	0,5%	0,7%	1,1%	1,1%	1,5%
Missing information	0,3%	0,6%	0,6%	0,6%	0,7%	0,4%	0,3%	0,3%	0,4%	0,7%
Totalt	**69 642**	**7 748**	**7 962**	**8 099**	**7 964**	**8 024**	**7 704**	**7 292**	**7 685**	**7 864**

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

	Preoperatively		Postoperatively		Missing		Total
2022	2 203	(27,0%)	5 034	(61,6%)	940	(11,5%)	**8 177**
2021	1 896	(23,8%)	5 130	(64,2%)	965	(12,0%)	**7 991**
2020	1 895	(25,3%)	4 739	(63,2%)	868	(11,5%)	**7 502**
2019	2 154	(27,1%)	4 954	(62,4%)	832	(10,4%)	**7 940**
2018	2 407	(29,3%)	4 937	(60,2%)	865	(10,5%)	**8 209**
2017	2 346	(28,9%)	4 847	(59,5%)	956	(11,7%)	**8 149**
2016	2 594	(31,4%)	4 762	(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%)	3 585	(43,5%)	1 344	(10,5%)	**8 238**
2009	3 760	(46,2%)	3 046	(37,4%)	1 344	(12,1%)	**8 150**
2005-08	11 553	(40,1%)	8 043	(27,8%)	9 341	(19,6%)	**28 937**
Total	**48 619**	**(34,1%)**	**70 797**	**(49,6%)**	**23 298**	**(16,3%)**	**142 714**

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	23 718	27	14
Three screws or pins	912	37	18
Bipolar hemiprosthesis	51 235	77	25
Unipolar hemiprosthesis	301	74	20
Hip compression screw	24 405	56	27
Hip compression screw with lateral support plate	9 450	75	34
Hip compression screw system and additional anti-rotational screw	1 710	65	34
Short intramedullary nail without distal locking	389	49	21
Short intramedullary nail with distal locking	12 598	53	26
Long intramedullary nail without distal locking	156	83	43
Long intramedullary nail with distal locking	9 021	95	46
Total hip prosthesis	5 655	93	32
Other	828	81	46
Missing	6	42	23

PROM (Patient Reported Outcome Measures)

Table 39a: Number of issued and answered patient questionnaires - The Norwegian Hip Fracture Register

	4 months *			12 months *			36 months *			Total		
	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)
2022	6 582	3 227	(49,0%)	5 496	2 943	(53,5%)	3 831	1 972	(51,5%)	**15 909**	**8 144**	(51,2%)
2021	6 054	3 219	(53,2%)	5 441	2 945	(54,1%)	4 248	2 143	(50,4%)	**15 743**	**8 307**	(52,8%)
2020	5 849	3 288	(56,2%)	5 418	3 078	(56,8%)	4 261	2 250	(52,8%)	**15 528**	**8 616**	(55,5%)
2019	6 224	3 333	(53,6%)	5 820	3 349	(57,5%)	4 233	2 221	(52,5%)	**16 277**	**8 903**	(54,7%)
2018	6 787	3 777	(55,7%)	5 973	3 435	(57,5%)	4 338	2 377	(54,8%)	**17 098**	**9 589**	(56,1%)
2017	6 662	3 800	(57,0%)	5 929	3 417	(57,6%)	4 082	2 251	(55,1%)	**16 673**	**9 468**	(56,8%)
2016	6 692	3 734	(55,8%)	6 067	3 518	(58,0%)	4 203	2 325	(55,3%)	**16 962**	**9 577**	(56,5%)
2015	6 614	3 752	(56,7%)	5 837	3 345	(57,3%)	4 379	2 390	(54,6%)	**16 830**	**9 487**	(56,4%)
2014	6 579	3 649	(55,5%)	5 991	3 265	(54,5%)	4 330	2 349	(54,2%)	**16 900**	**9 263**	(54,8%)
2013	6 679	3 777	(56,6%)	6 084	3 510	(57,7%)	4 383	2 395	(54,6%)	**17 146**	**9 682**	(56,5%)
2012	7 485	4 129	(55,2%)	6 774	3 807	(56,2%)	1 663	963	(57,9%)	**15 922**	**8 899**	(55,9%)
2011	6 323	3 462	(54,8%)	5 491	3 070	(55,9%)	1 303	728	(55,9%)	**13 117**	**7 260**	(55,3%)
2010	4 907	2 760	(56,2%)	2 138	1 212	(56,7%)	3 601	2 024	(56,2%)	**10 646**	**5 996**	(56,3%)
2009	2 418	1 387	(57,4%)	2 234	1 265	(56,6%)	4 023	2 156	(53,6%)	**8 675**	**4 808**	(55,4%)
2008	2 124	1 195	(56,3%)	1 789	1 000	(55,9%)	3 106	1 774	(57,1%)	**7 019**	**3 969**	(56,5%)
2007	3 405	1 895	(55,7%)	4 971	2 771	(55,7%)				**8 376**	**4 666**	(55,7%)
2006	6 034	3 513	(58,2%)	4 752	2 719	(57,2%)				**10 786**	**6 232**	(57,8%)
2005	2 769	1 611	(58,2%)							**2 769**	**1 611**	(58,2%)
Total	**100 187**	**55 508**	**(55,4%)**	**86 205**	**48 649**	**(56,4%)**	**55 984**	**30 318**	**(54,2%)**	**242 376**	**134 475**	**(55,5%)**

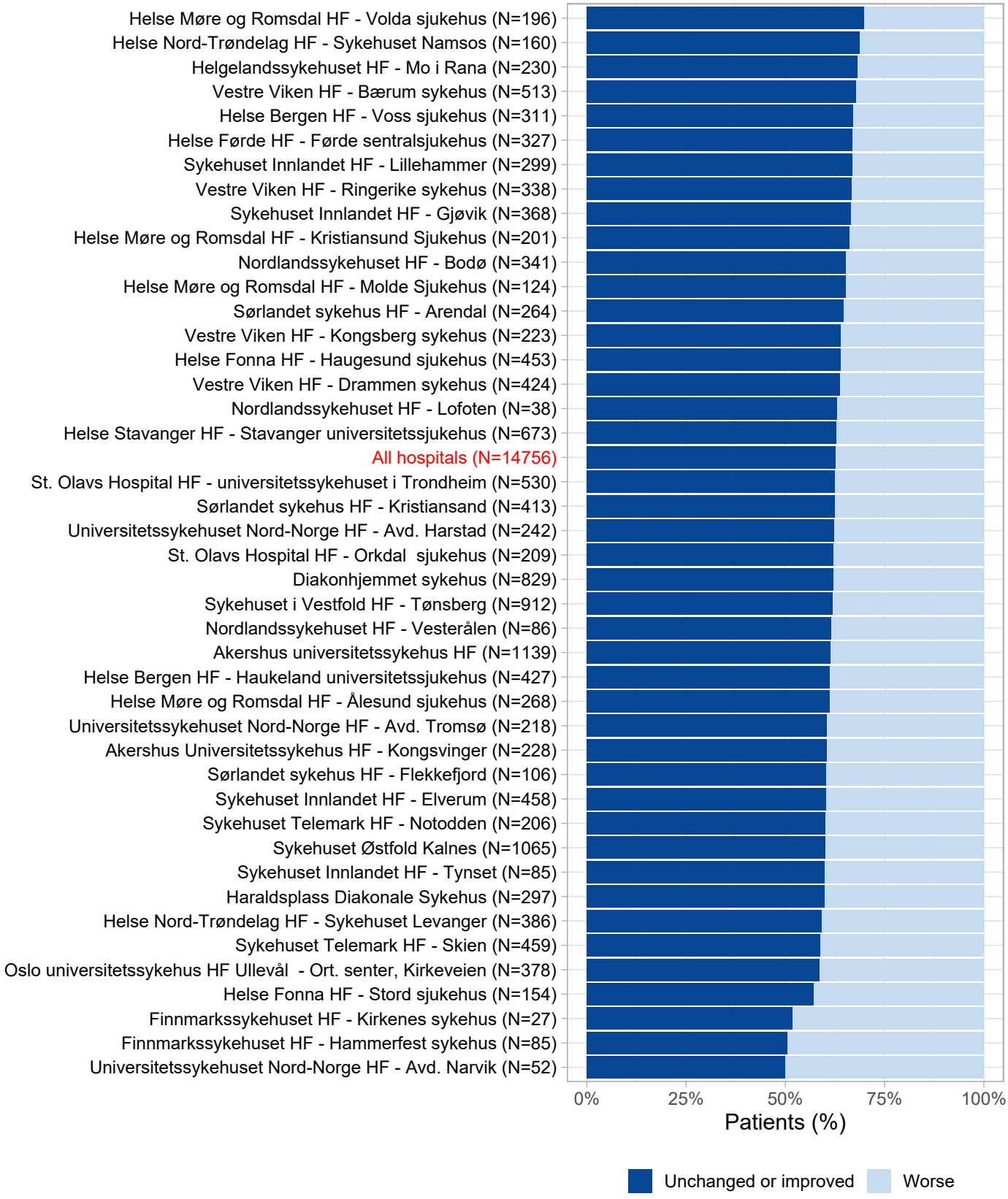
* The register sends questionnaires to patients 4, 12 and 36 months post-operatively

Table 39b: Number of issued and answered patient questionnaires - The Hip Prosthesis Register

	4 months *			12 months *			36 months *			Total		
	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)
2022	501	344	(68,7%)	26	2	(7,7%)	7	4	(57,1%)	**534**	**350**	(65,5%)
2021	495	375	(75,8%)	24	2	(8,3%)	10	7	(70,0%)	**529**	**384**	(72,6%)
2020	524	365	(69,7%)	17	1	(5,9%)	46	7	(15,2%)	**587**	**373**	(63,5%)
2019	524	397	(75,8%)	19	4	(21,1%)	8	3	(37,5%)	**551**	**404**	(73,3%)
2018	542	393	(72,5%)	23	3	(13,0%)	8	3	(37,5%)	**573**	**399**	(69,6%)
2017	348	261	(75,0%)	25	3	(12,0%)	9	4	(44,4%)	**382**	**268**	(70,2%)
2016	319	228	(71,5%)	10	2	(20,0%)	3	1	(33,3%)	**332**	**231**	(69,6%)
2015	305	228	(74,8%)	7	1	(14,3%)	5	3	(60,0%)	**317**	**232**	(73,2%)
2014	238	175	(73,5%)	13	7	(53,8%)	2	1	(50,0%)	**253**	**183**	(72,3%)
2013	223	178	(79,8%)	14	7	(50,0%)	63	46	(73,0%)	**300**	**231**	(77,0%)
2012	90	73	(81,1%)	11	9	(81,8%)	132	88	(66,7%)	**233**	**170**	(73,0%)
2011	141	94	(66,7%)	128	98	(76,6%)	109	88	(80,7%)	**378**	**280**	(74,1%)
2010	80	67	(83,8%)	133	99	(74,4%)	153	111	(72,5%)	**366**	**277**	(75,7%)
2009	144	100	(69,4%)	136	102	(75,0%)	74	52	(70,3%)	**354**	**254**	(71,8%)
2008	151	111	(73,5%)	114	84	(73,7%)	76	43	(56,6%)	**341**	**238**	(69,8%)
2007	98	72	(73,5%)	97	63	(64,9%)				**195**	**135**	(69,2%)
2006	129	94	(72,9%)	98	65	(66,3%)				**227**	**159**	(70,0%)
2005	50	29	(58,0%)							**50**	**29**	(58,0%)
Total	**4 902**	**3 584**	**(73,1%)**	**895**	**552**	**(61,7%)**	**705**	**461**	**(65,4%)**	**6 502**	**4 597**	**(70,7%)**

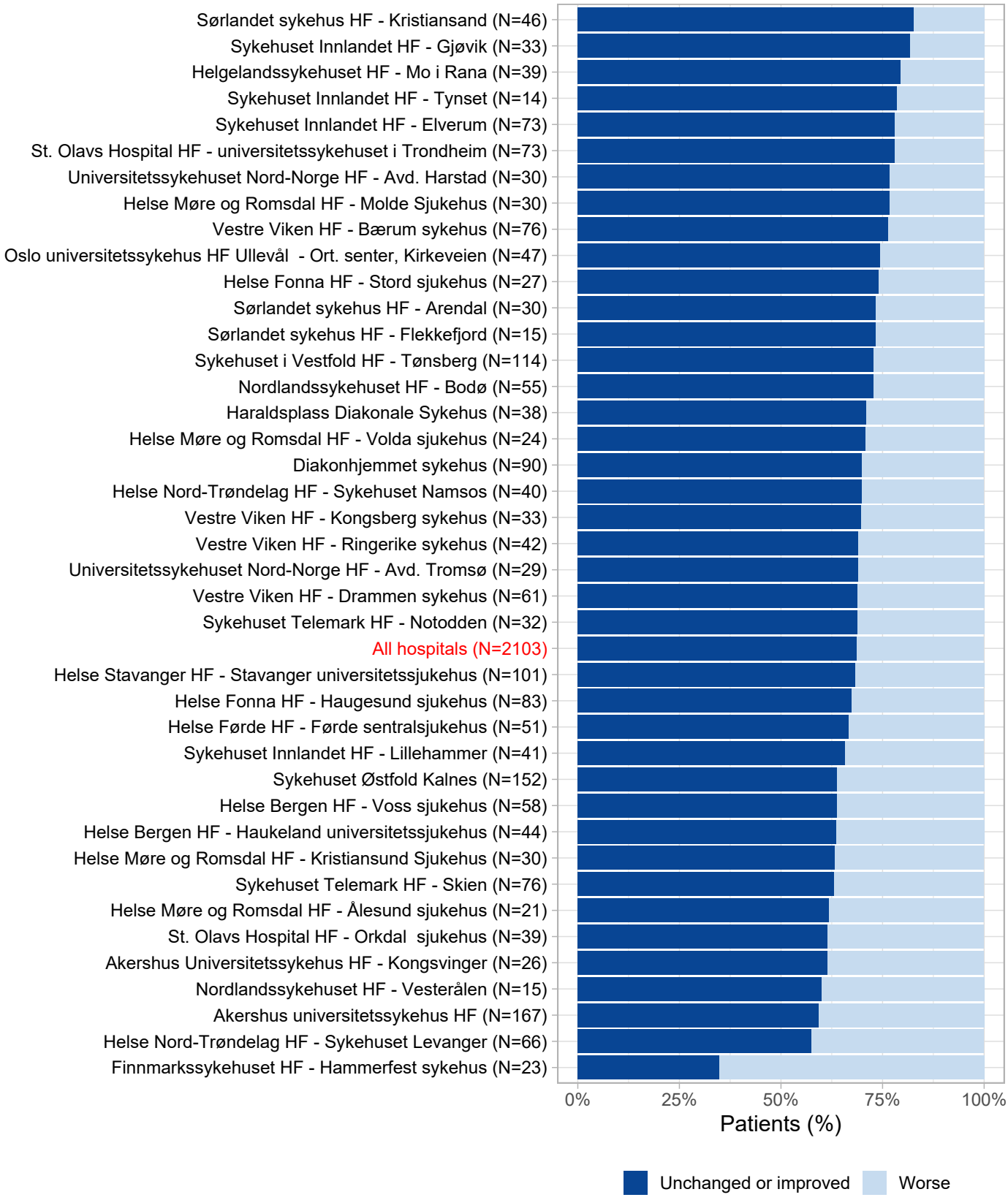
* The register sends questionnaires to patients 4, 12 and 36 months post-operatively with a total prosthesis from The Norwegian Arthroplasty Register

Figure D.31: Walking ability after hip fracture, 2016-2021 - all hip fractures



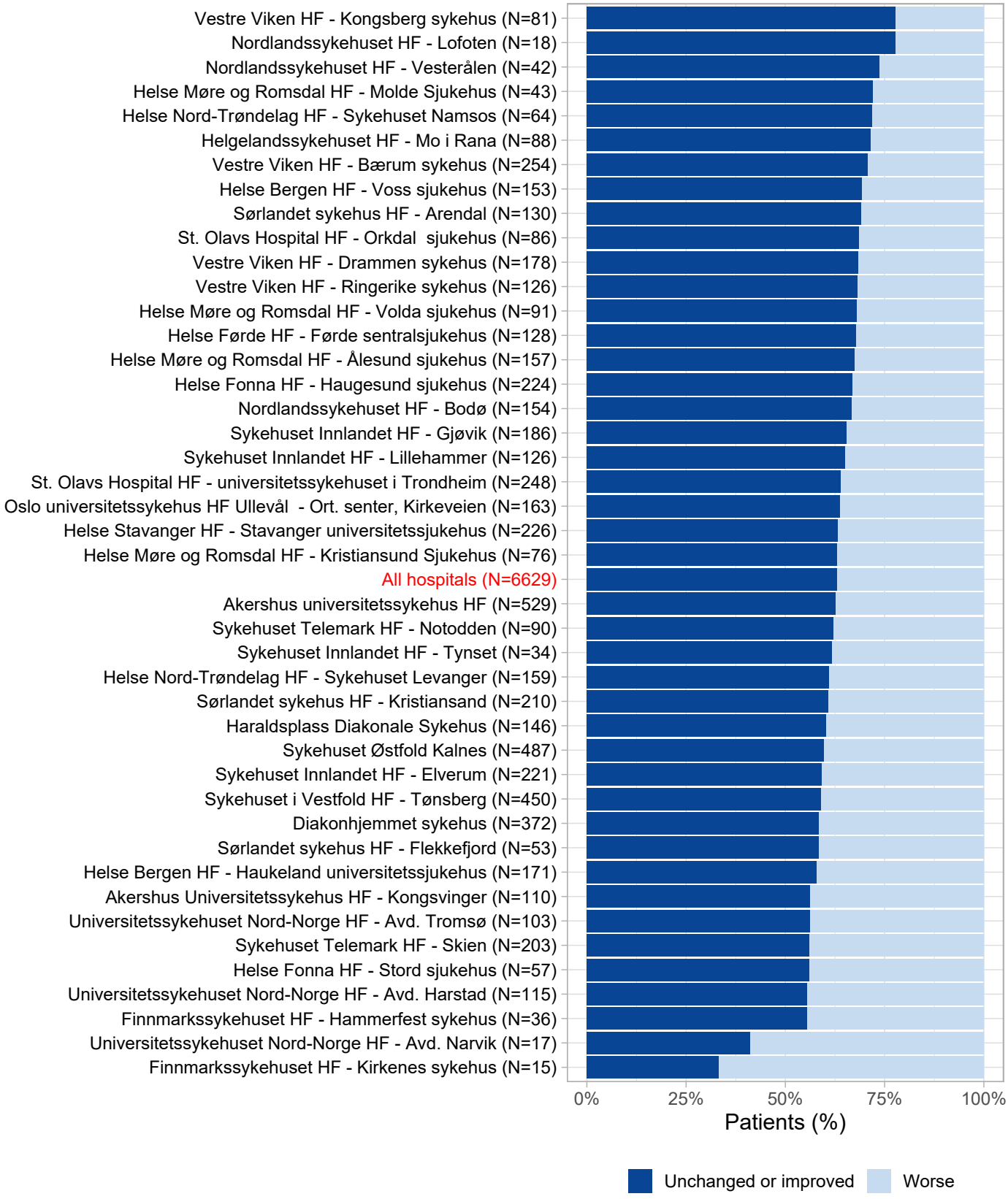
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.32: Walking ability after hip fracture, 2016-2021 - undisplaced femoral neck fractures



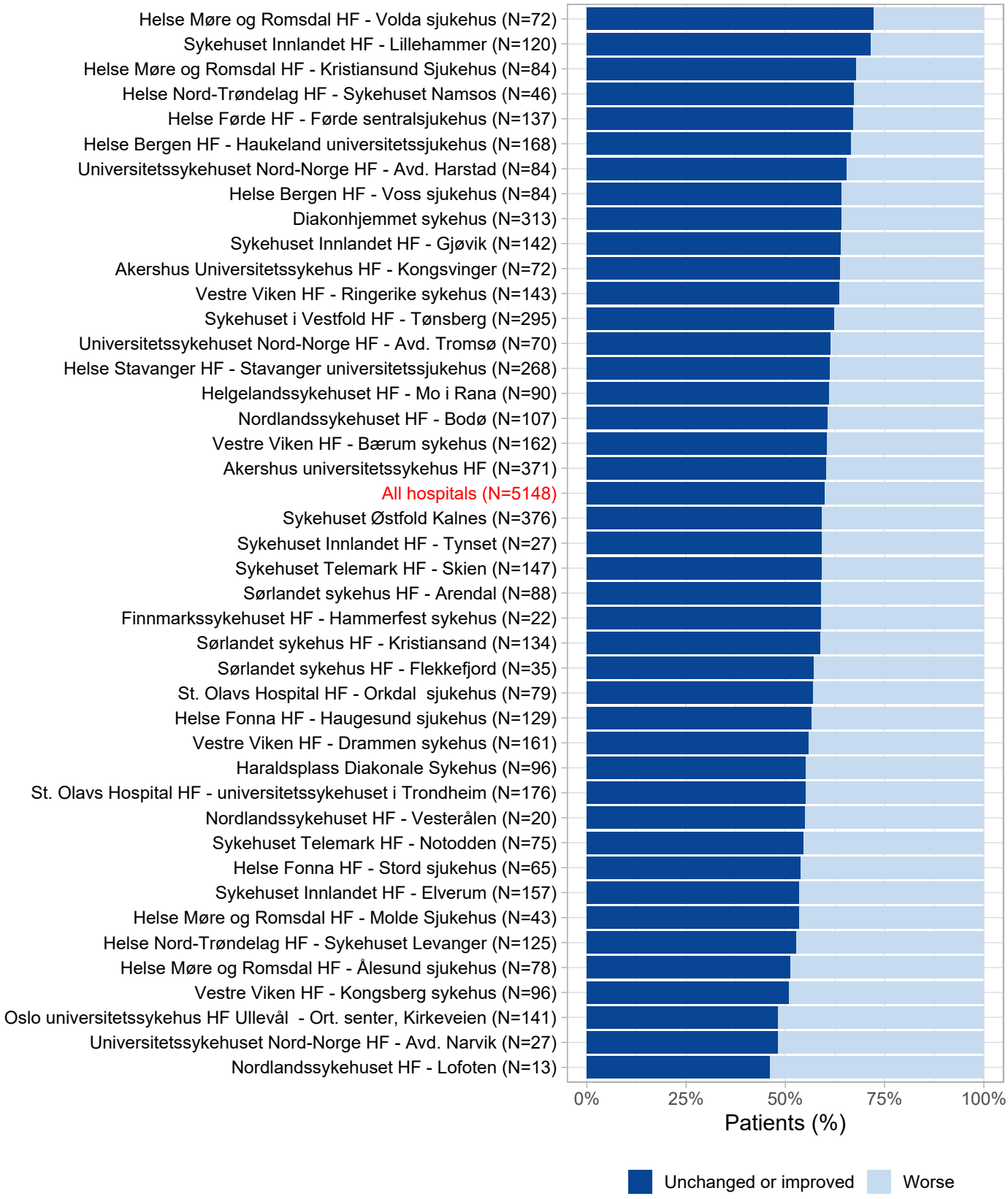
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.33: Walking ability after hip fracture, 2016-2021 - displaced femoral neck fractures



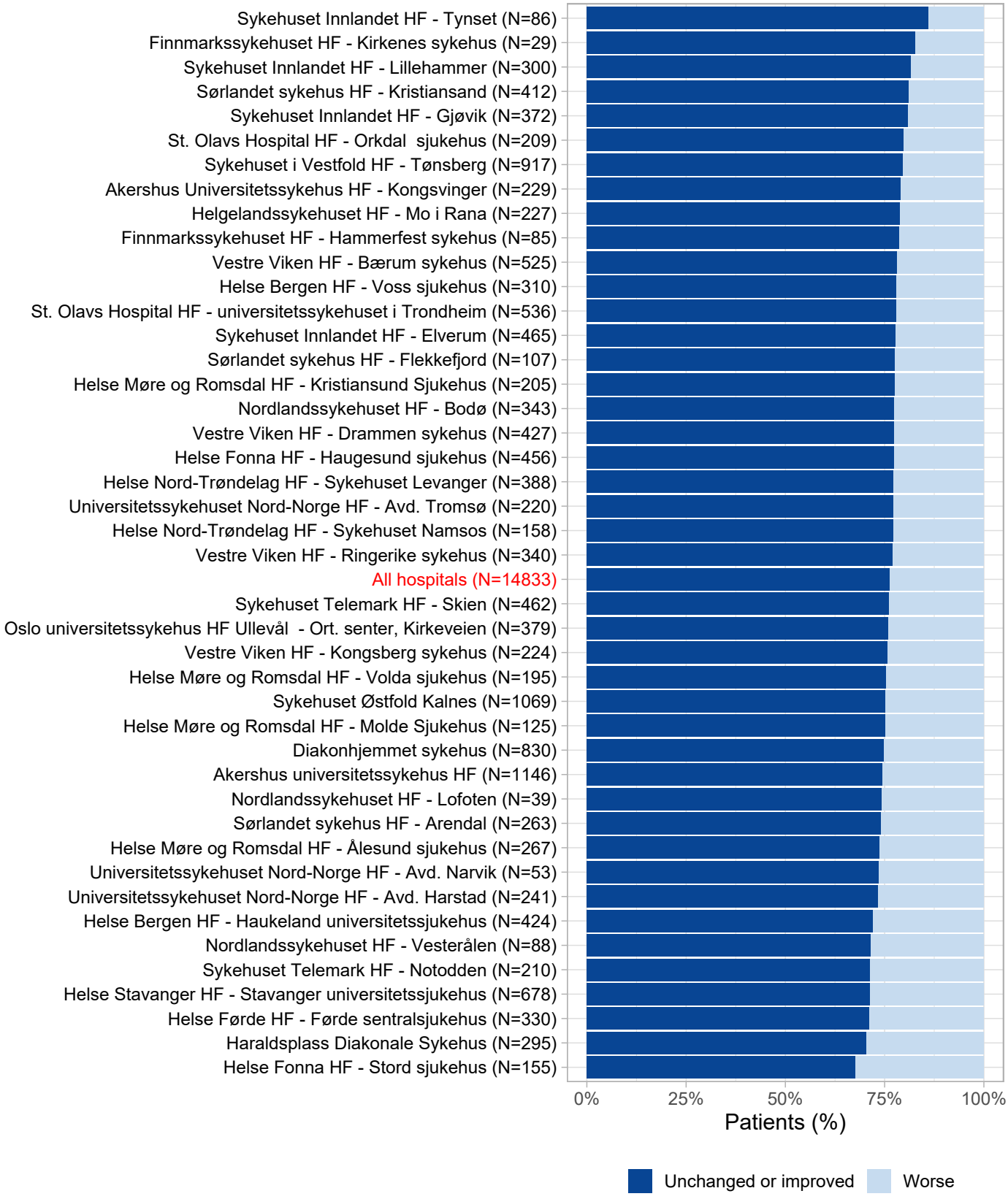
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.34: Walking ability after hip fracture, 2016-2021 - trochanteric/subtrochanteric fractures



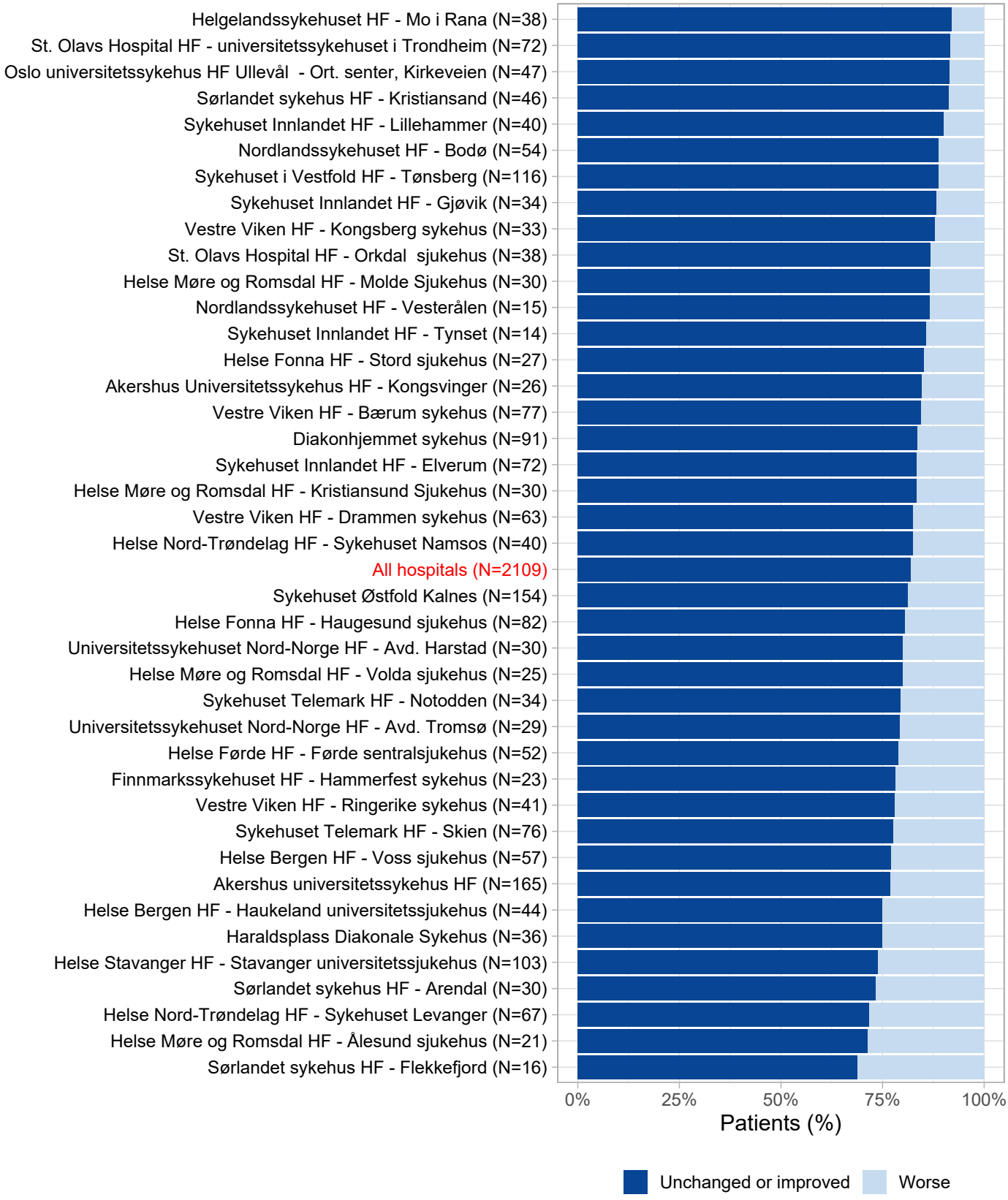
The figure shows the proportion of patients who report unchanged or improved walking ability from preoperatively to 4 months postoperatively assessed on the basis of the 1st dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.35: Self-care after hip fracture, 2016-2021 - all hip fractures



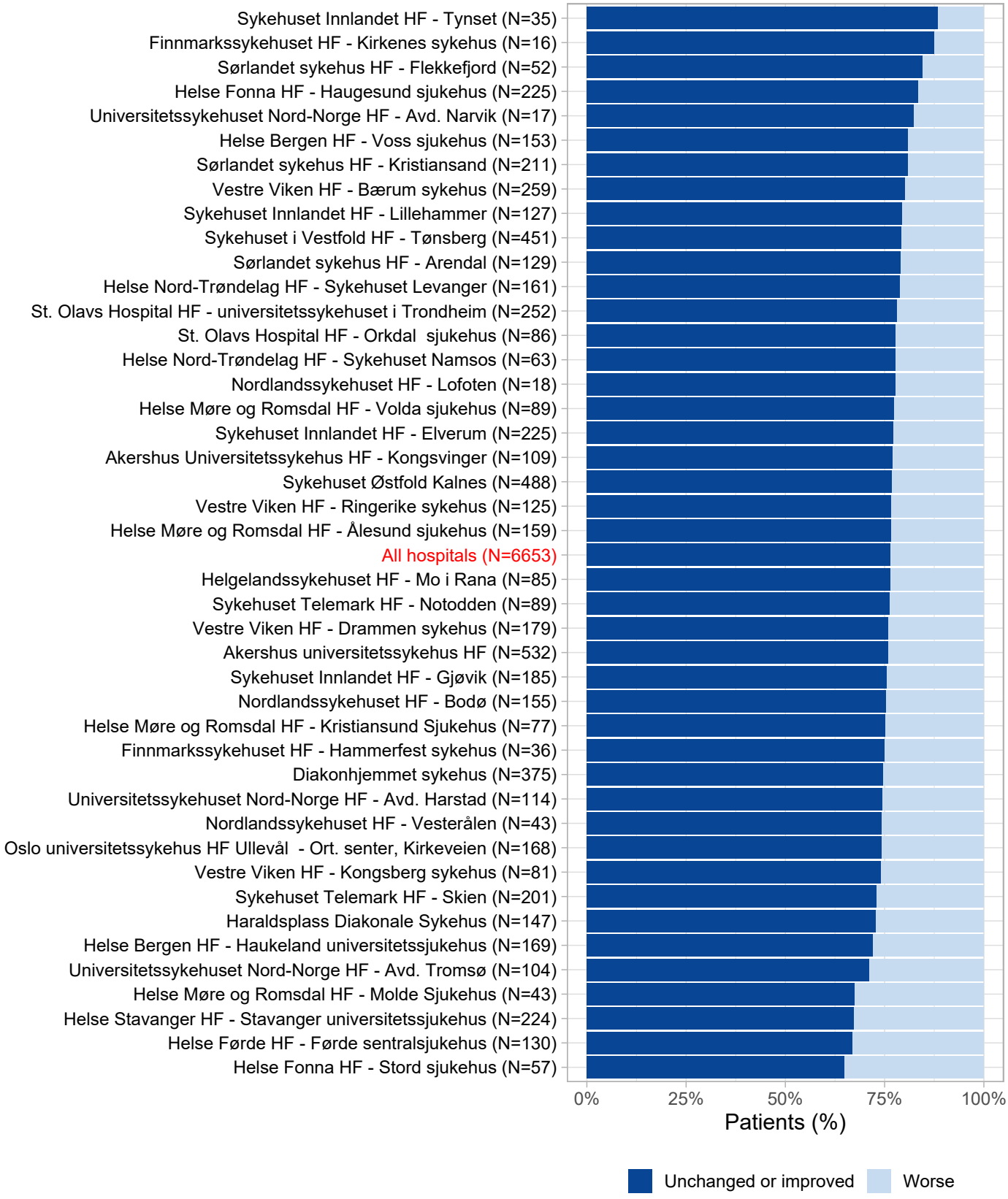
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 2nd dimensionof EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.36: Self-care after hip fracture, 2016-2021 - undisplaced femoral neck fractures



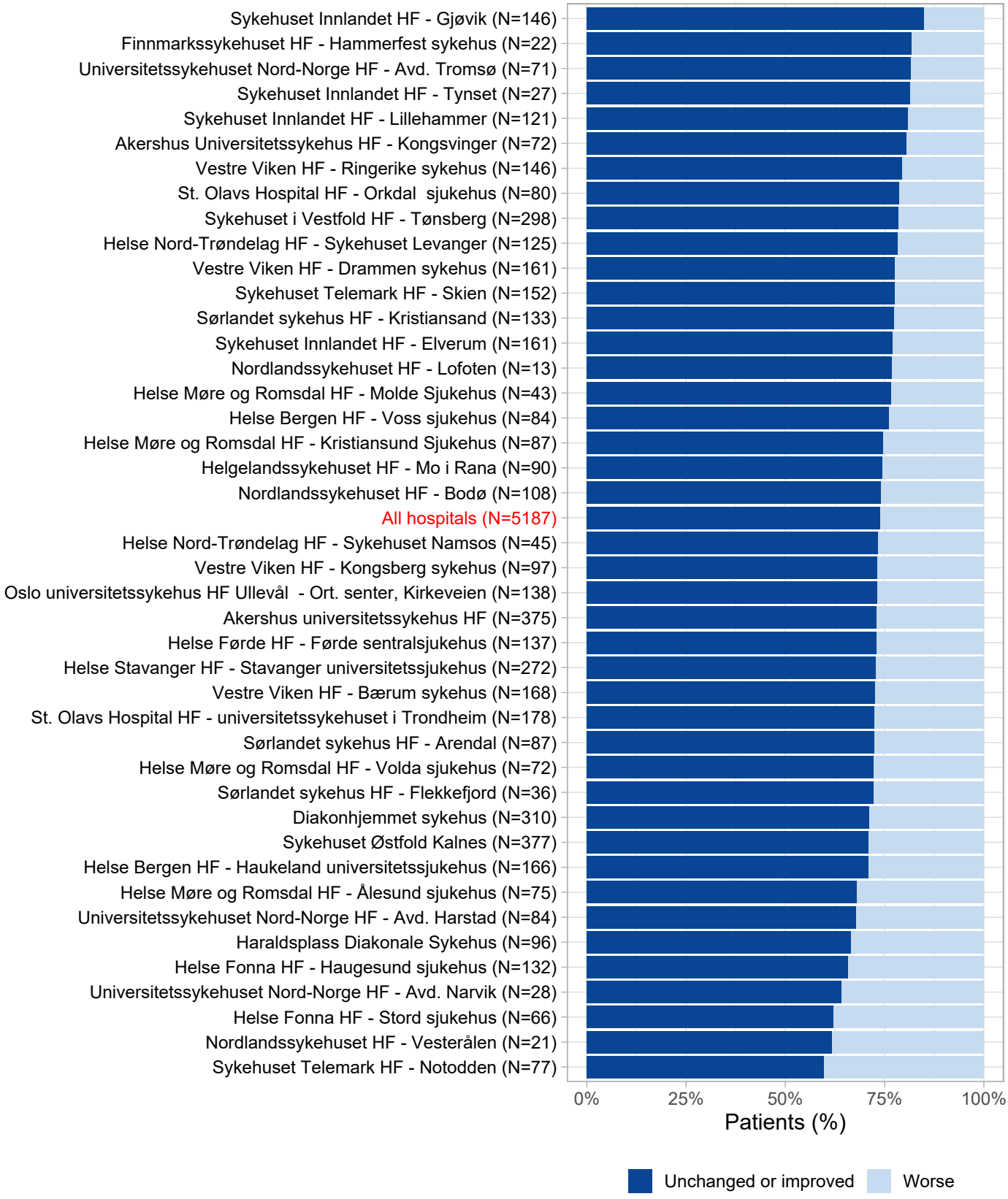
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 2nd dimensionof EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.37: Self-care after hip fracture, 2016-2021 - displaced femoral neck fractures



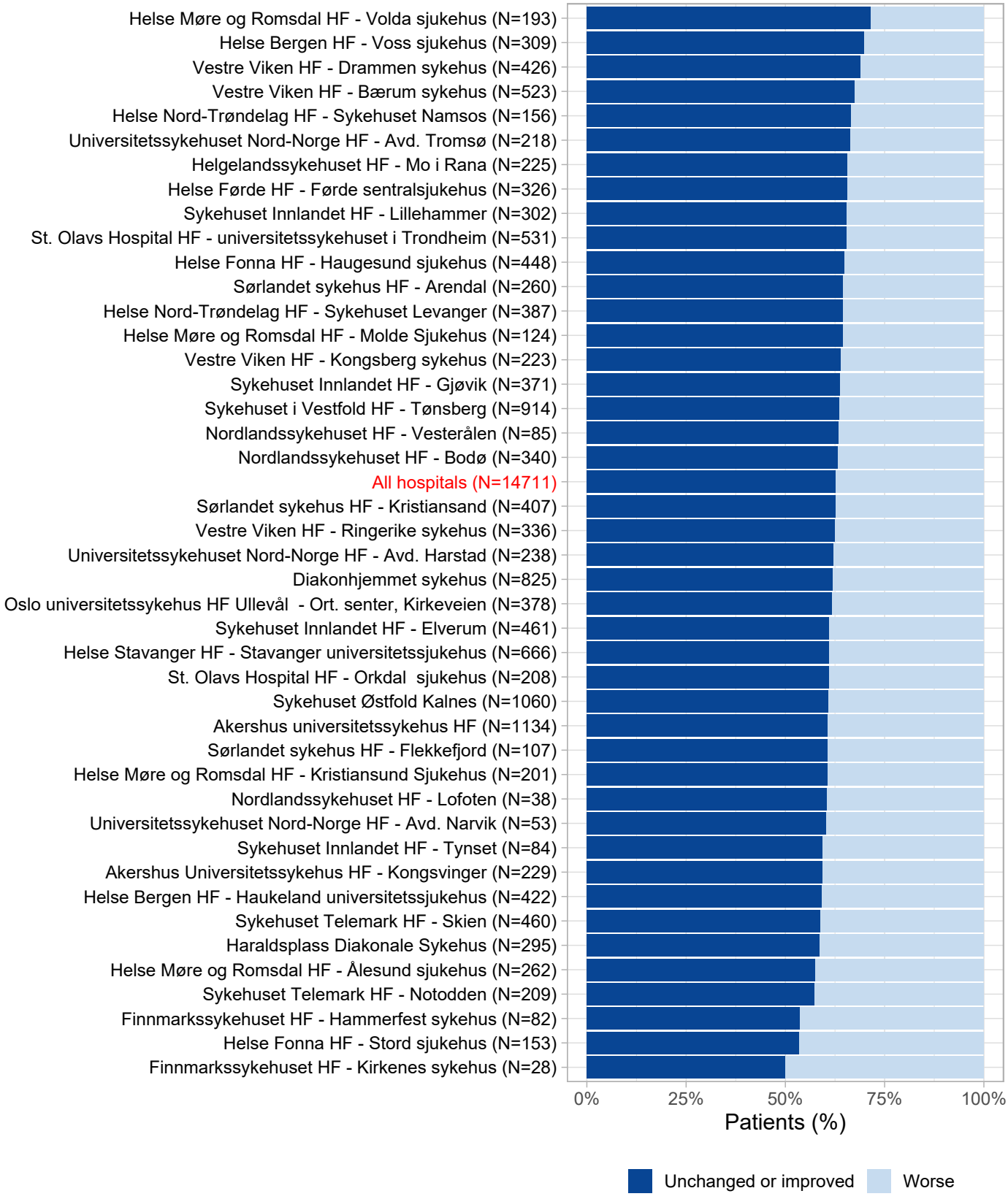
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 2nd dimensionof EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.38: Self-care after hip fracture, 2016-2021 - trochanteric/subtrochanteric fractures



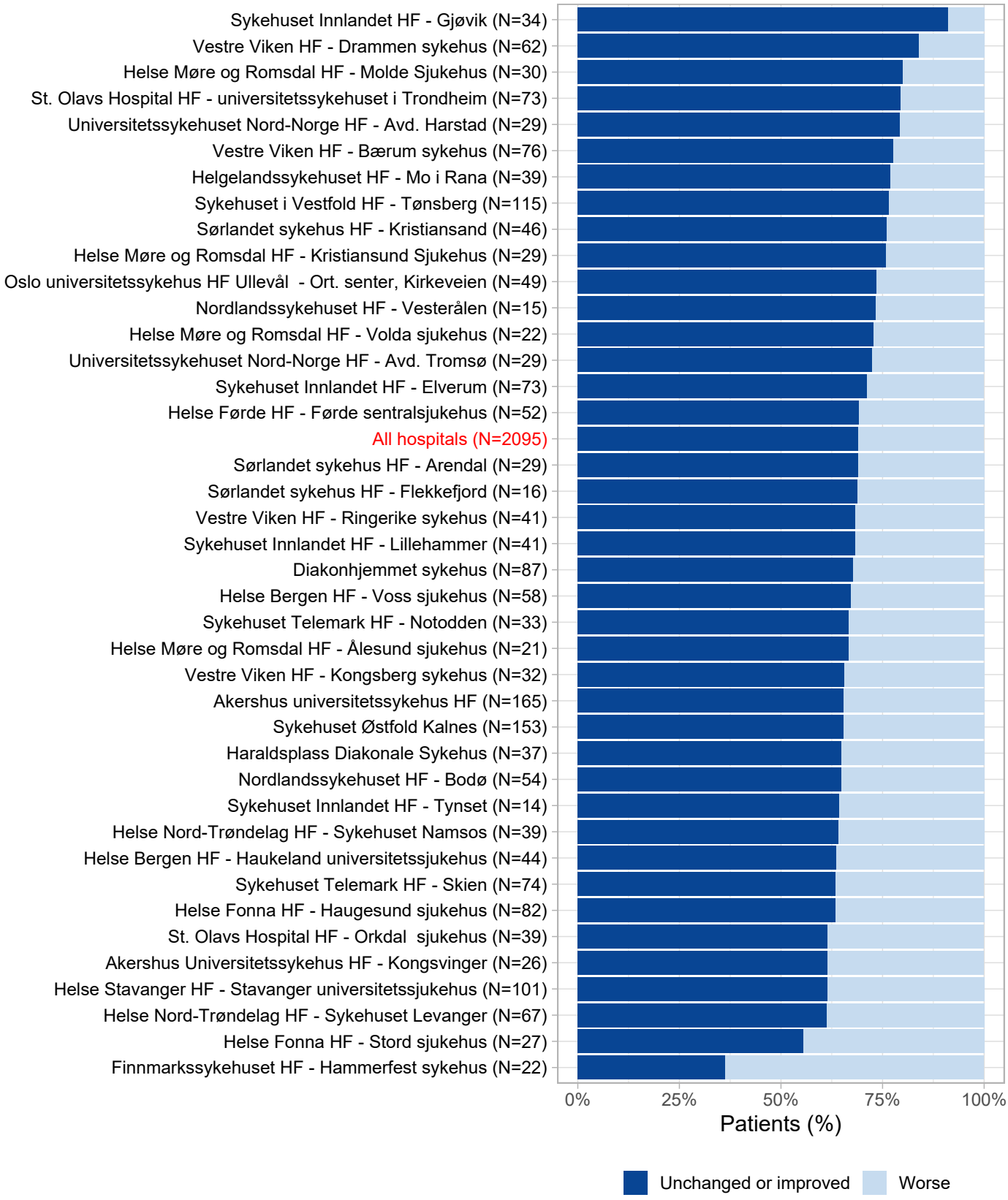
The figure shows the proportion of patients who report unchanged or improved ability to perform self-care from preoperatively to 4 months postoperatively assessed on the basis of the 2nd dimensionof EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.39: Usual activities after hip fracture, 2016-2021 - all hip fractures



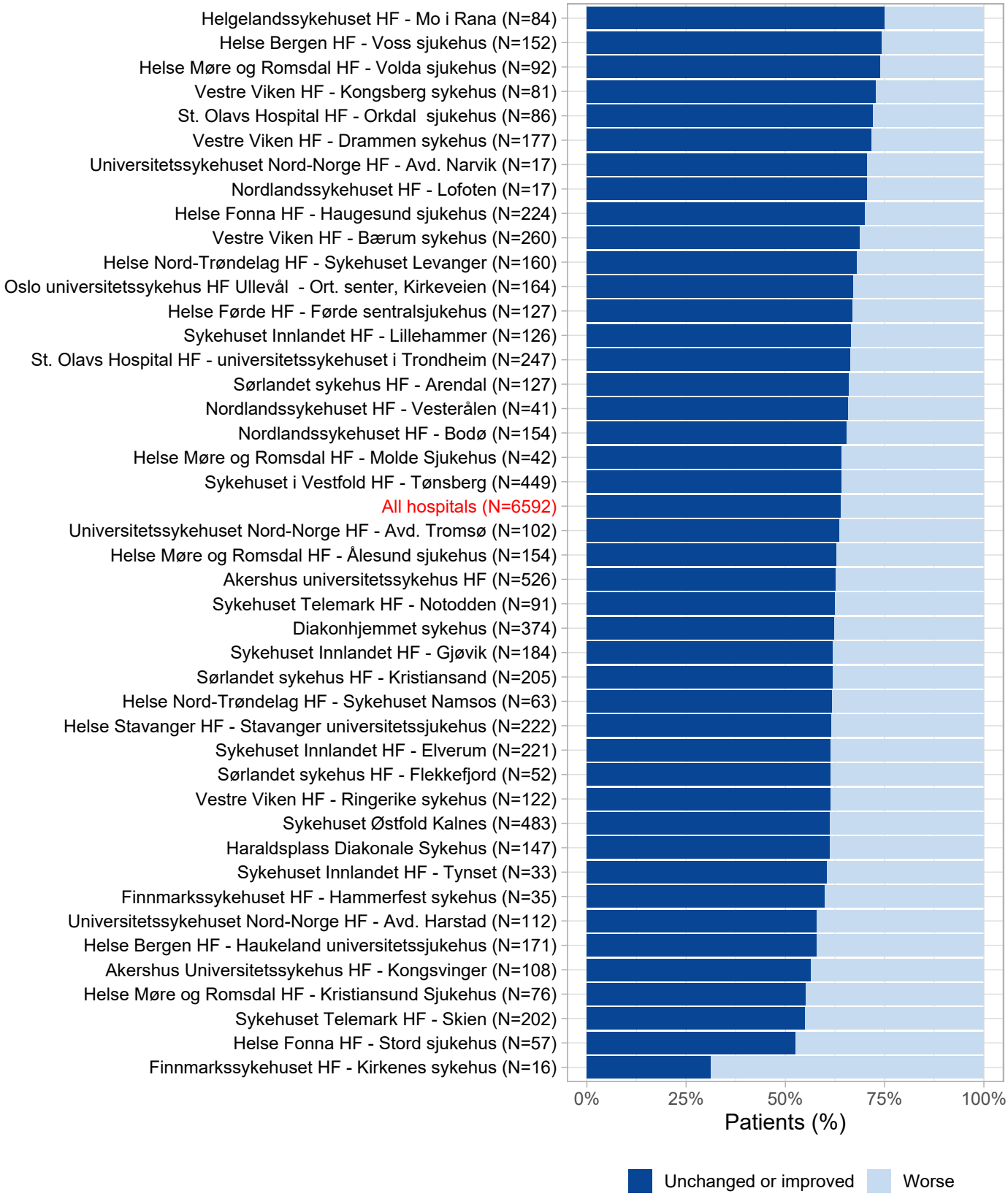
The figure shows the proportion of patients who report unchanged or improved ability to perform usual activities from preoperatively to 4 months postoperatively assessed on the basis of the 3rd dimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.40: Usual activities after hip fracture, 2016-2021 - undisplaced femoral neck fractures



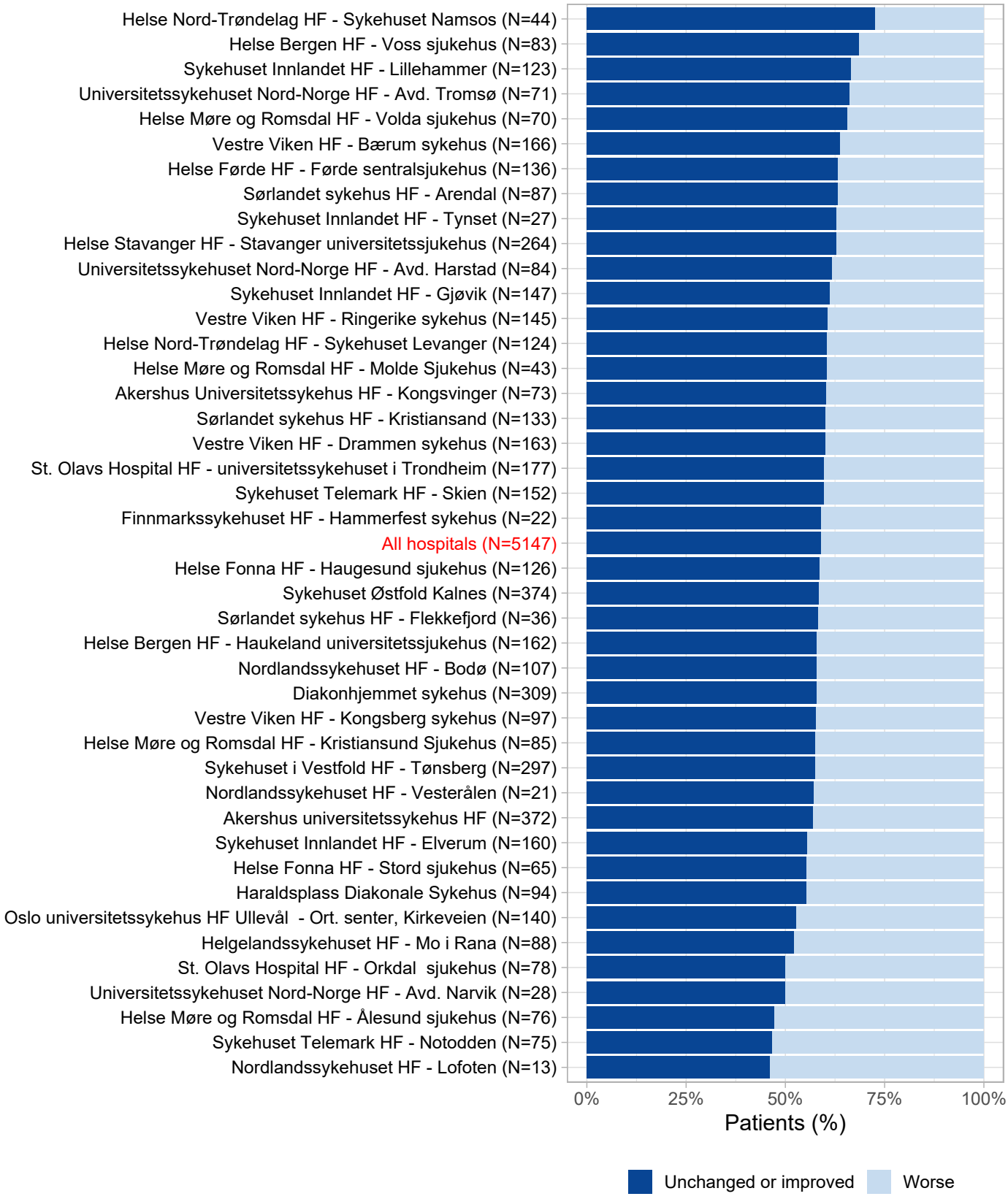
The figure shows the proportion of patients who report unchanged or improved ability to perform usual activities from preoperatively to 4 months postoperatively assessed on the basis of the 3rddimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.41: Usual activities after hip fracture, 2016-2021 - 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 3rddimension of EQ-5D-3L. Only hospitals with 10 or more patients are displayed.

Figure D.42: Usual activities after hip fracture, 2016-2021 - 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 3rddimension 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 2020-2022.

Figure D.43: Number of primary operations in 2022 at each hospital

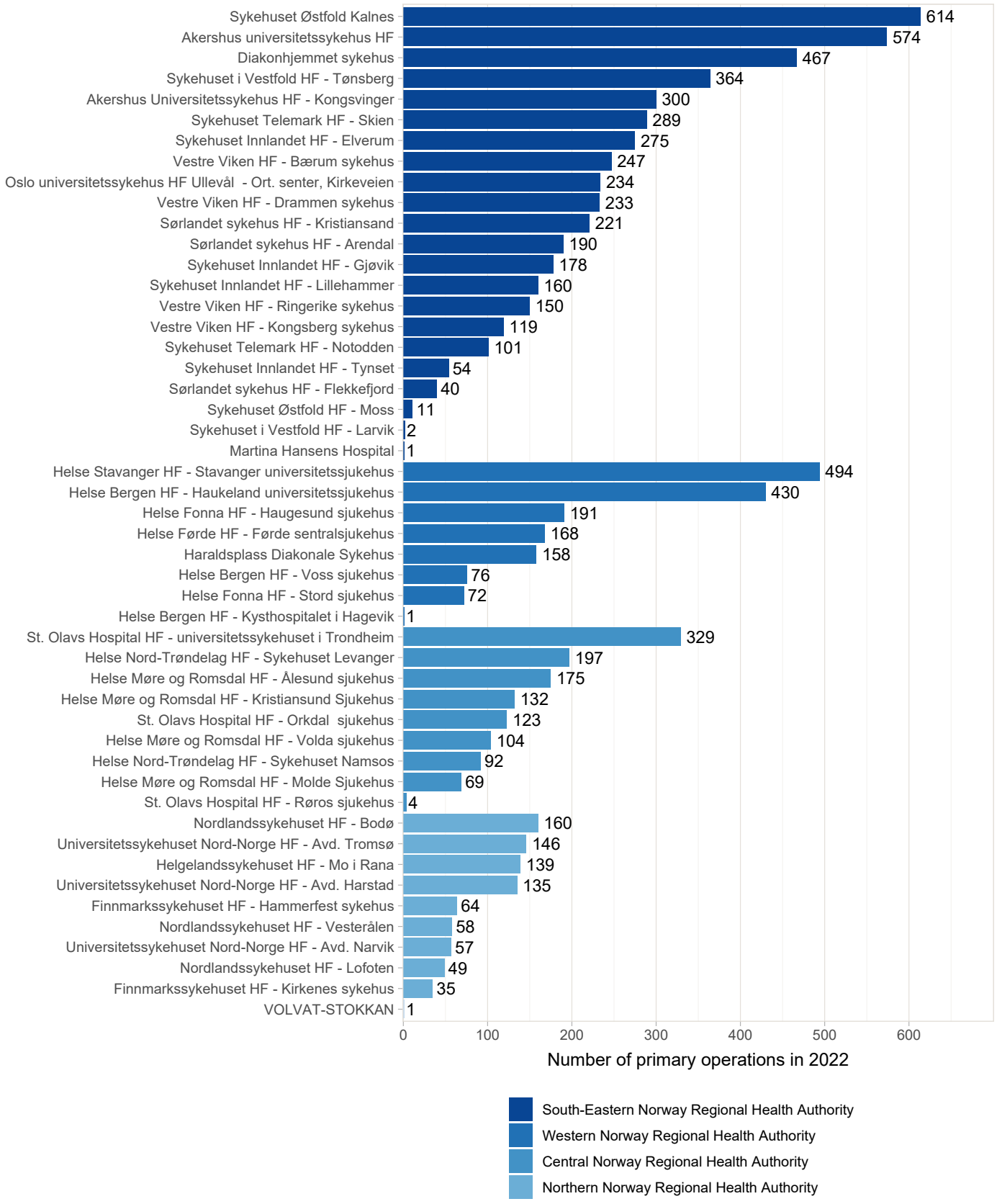


Figure D.44: Treatment of displaced femoral neck fractures in patients over 70 years of age

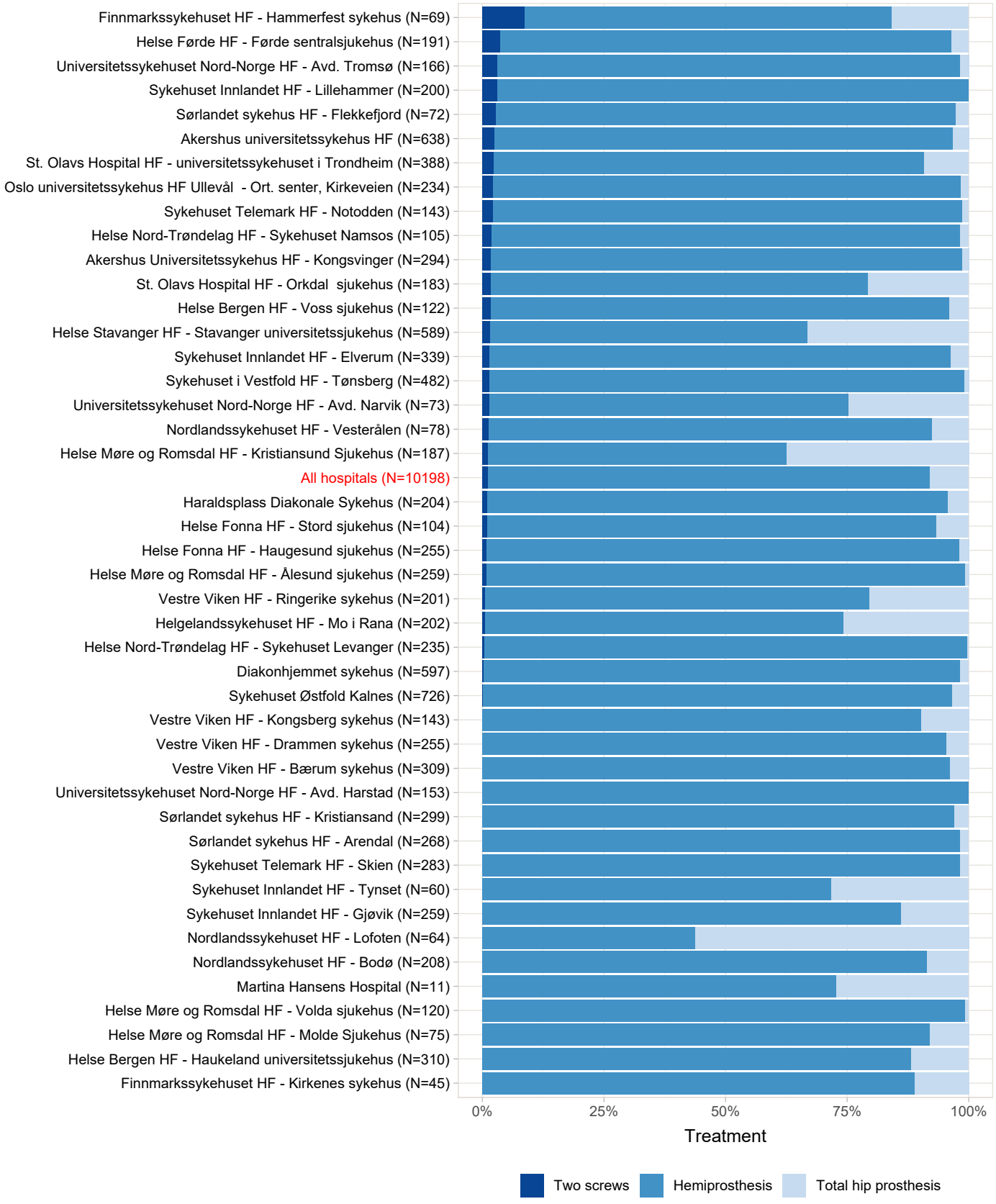


Figure D.44 shows the proportion of patients treated with screw osteosynthesis/hemiprosthesis/total hip prosthesis at each hospital in the period 2020-2022. Hospitals with n<10 have been excluded.

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

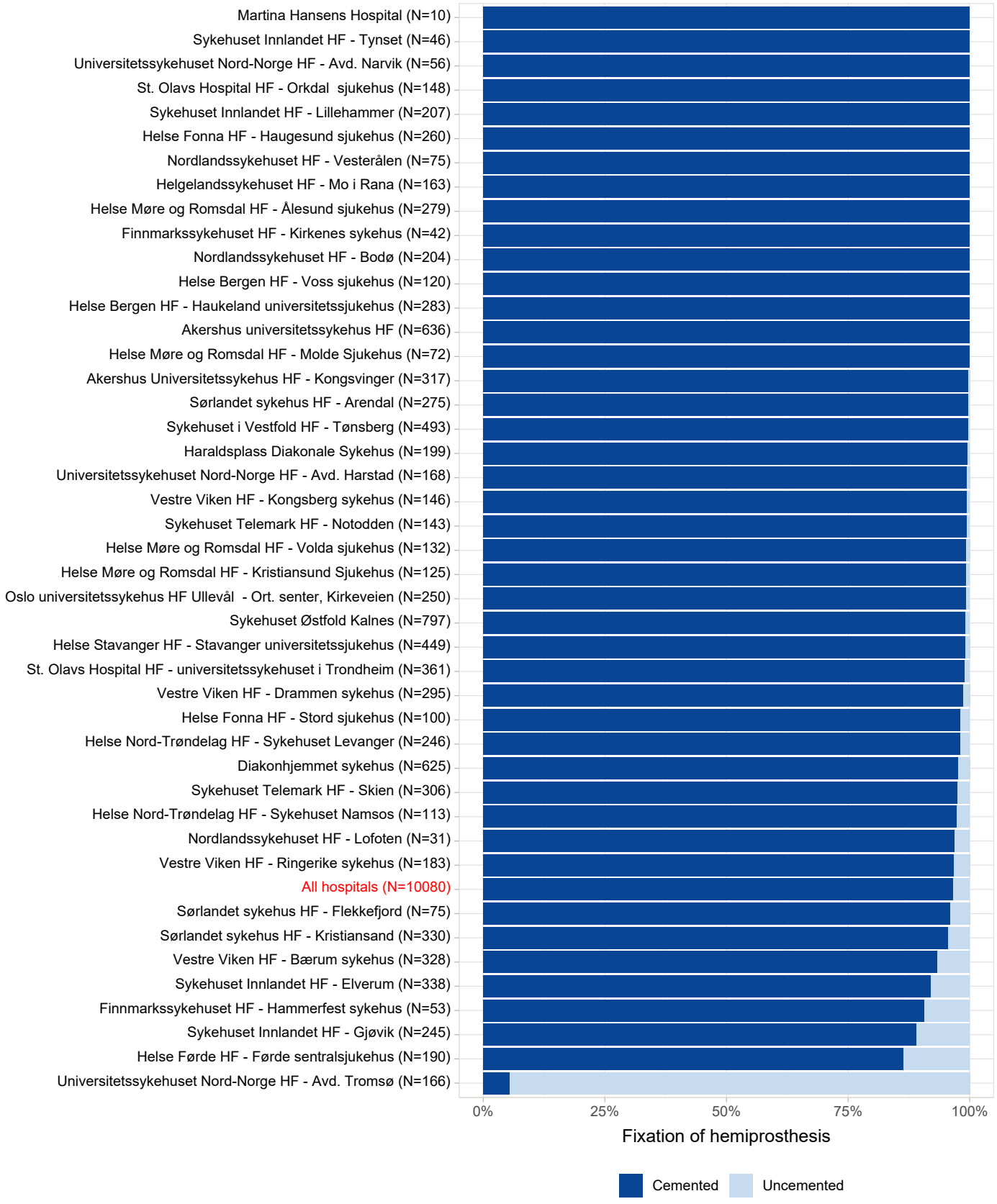


Figure D.45 shows the proportion of patients treated with cemented/uncemented hemiprosthesis, sorted by proportion of cemented hemiarthroplasties at each hospital in the period 2020-2022. Hospitals with n<10 have been excluded.

Figure D.46: Waiting time from fracture to surgery

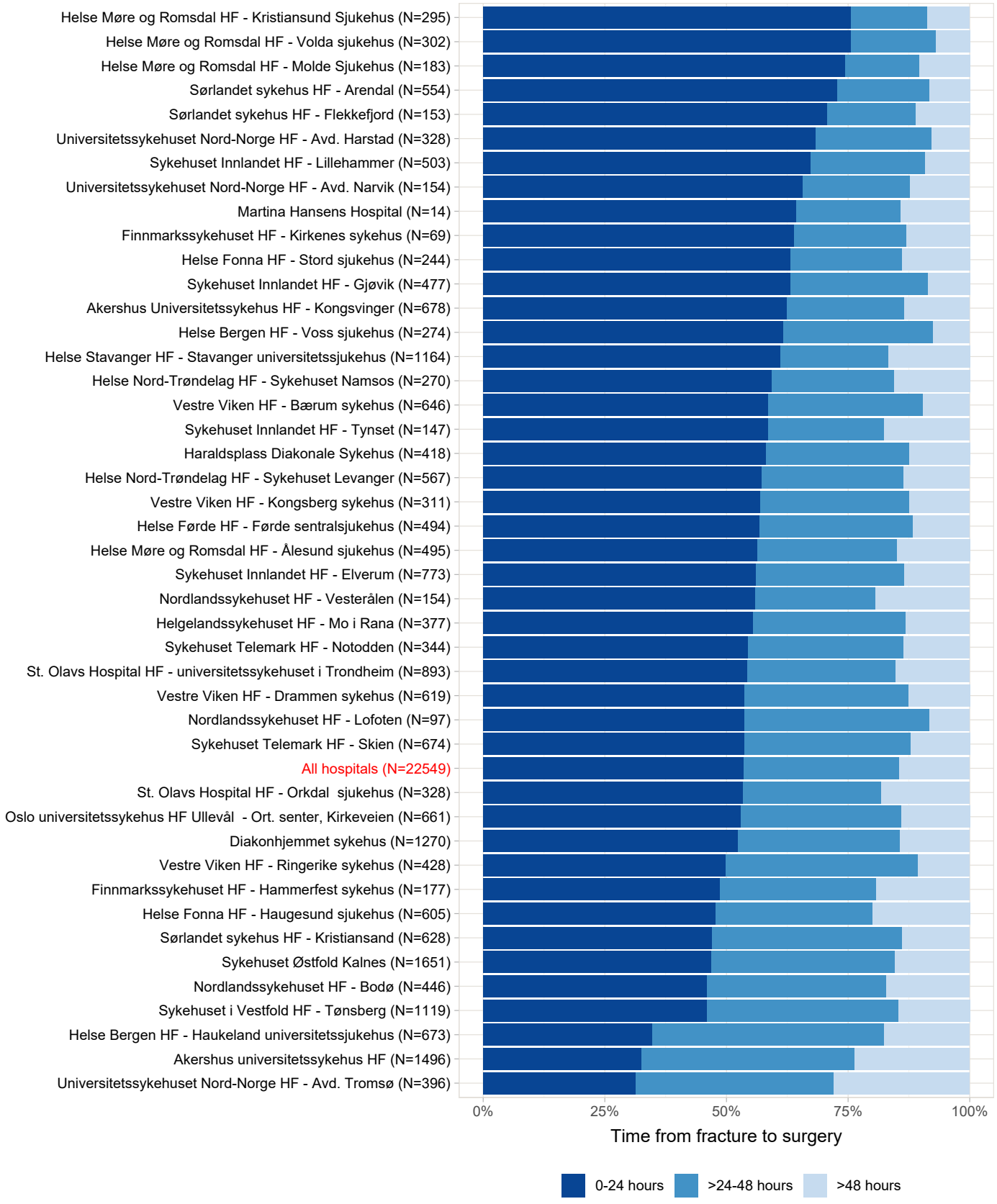


Figure D.46 shows waiting time, sorted by proportion of fractures treated within 24 hours after the fracture at the different hospitals in the period 2020-2022. Hospitals with n<10 have been excluded.

Figure D.47: Reoperations in the period 2020-2022. All hip fractures.

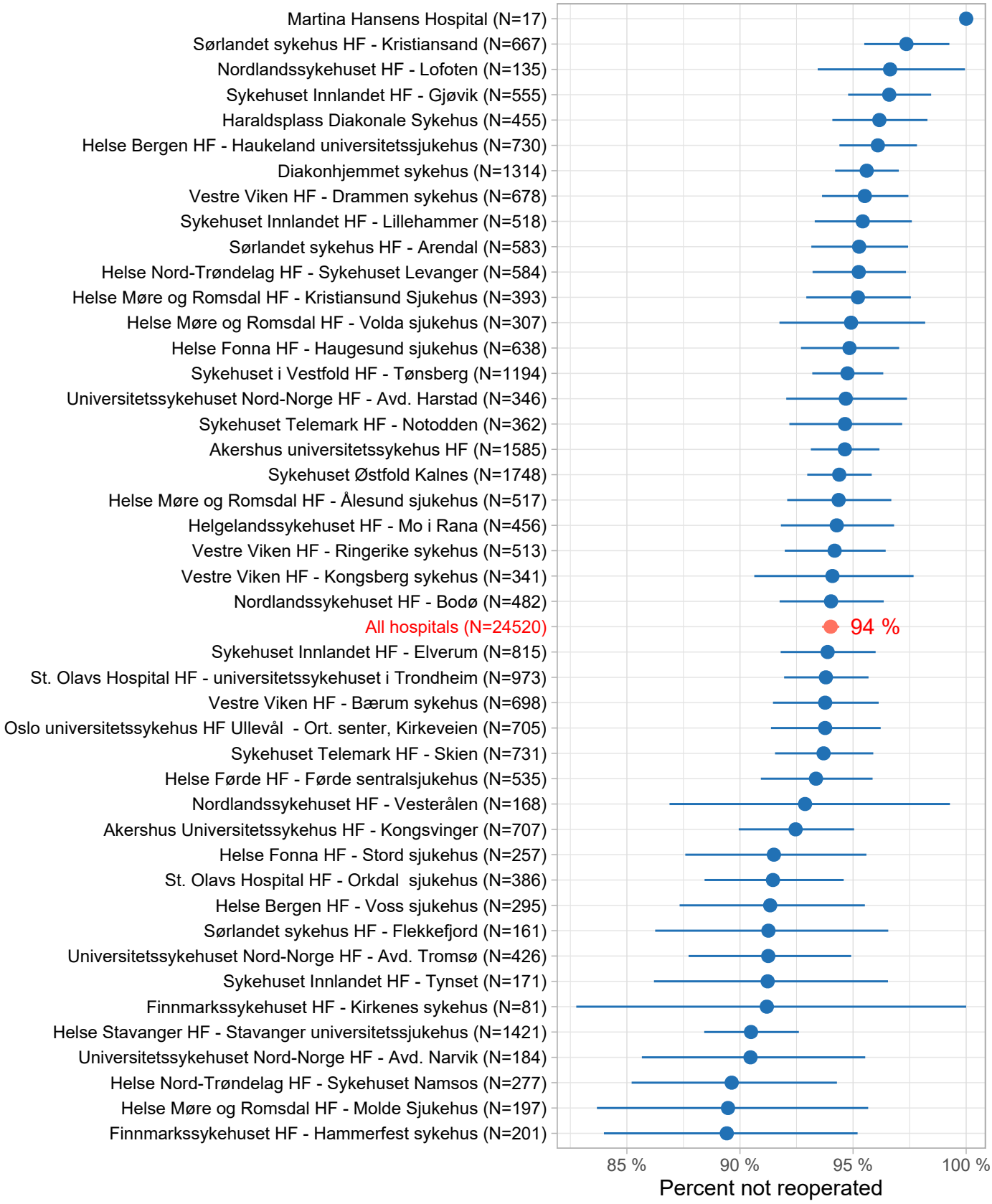


Figure D.47 shows proportion of patients not reoperated at each hospital. Hospitals with n<10 have been excluded.

Figure D.48: Reoperations in the period 2020-2022. Displaced femoral neck fractures in patients over 70 years of age, regardless of type of primary operation.

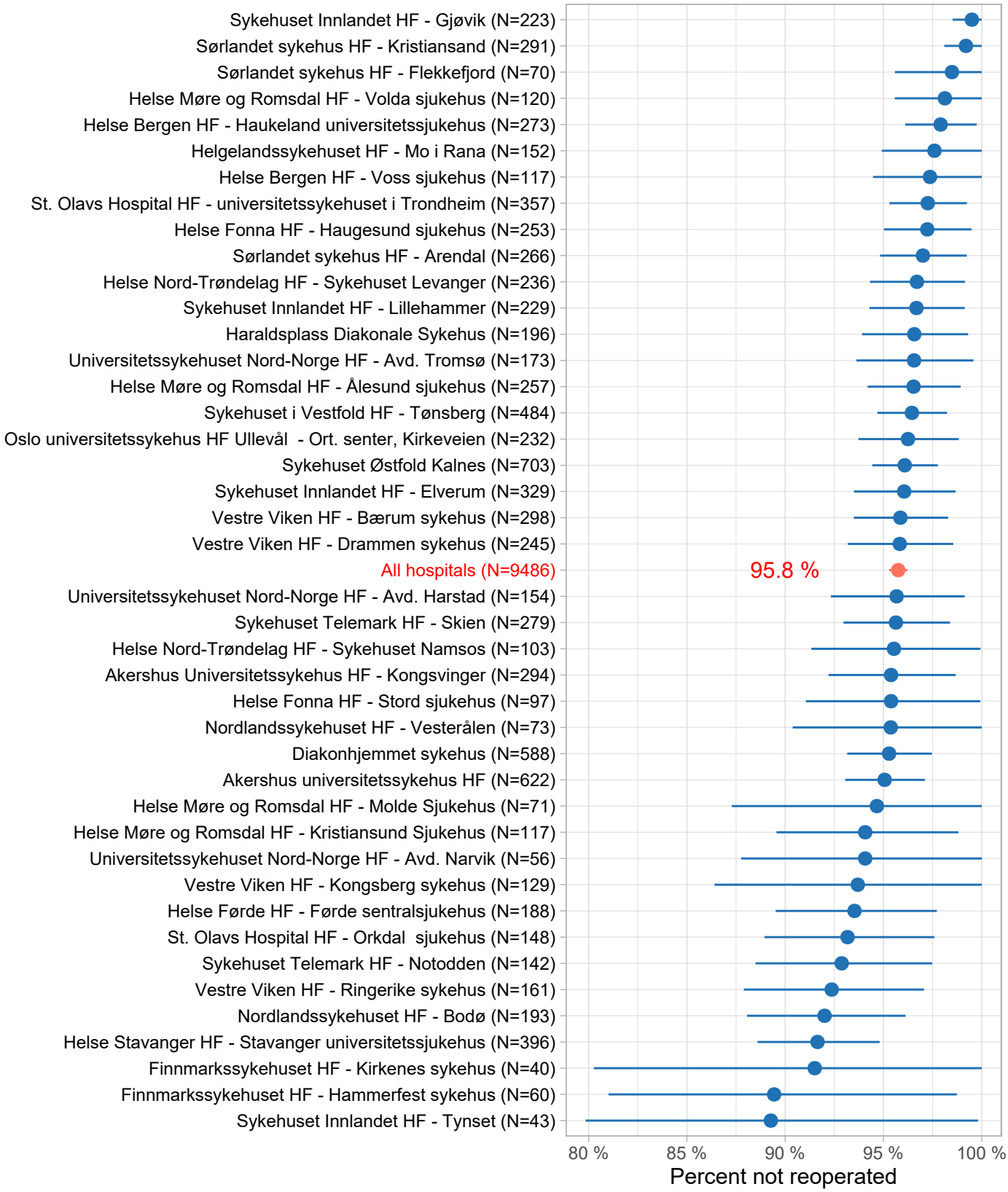
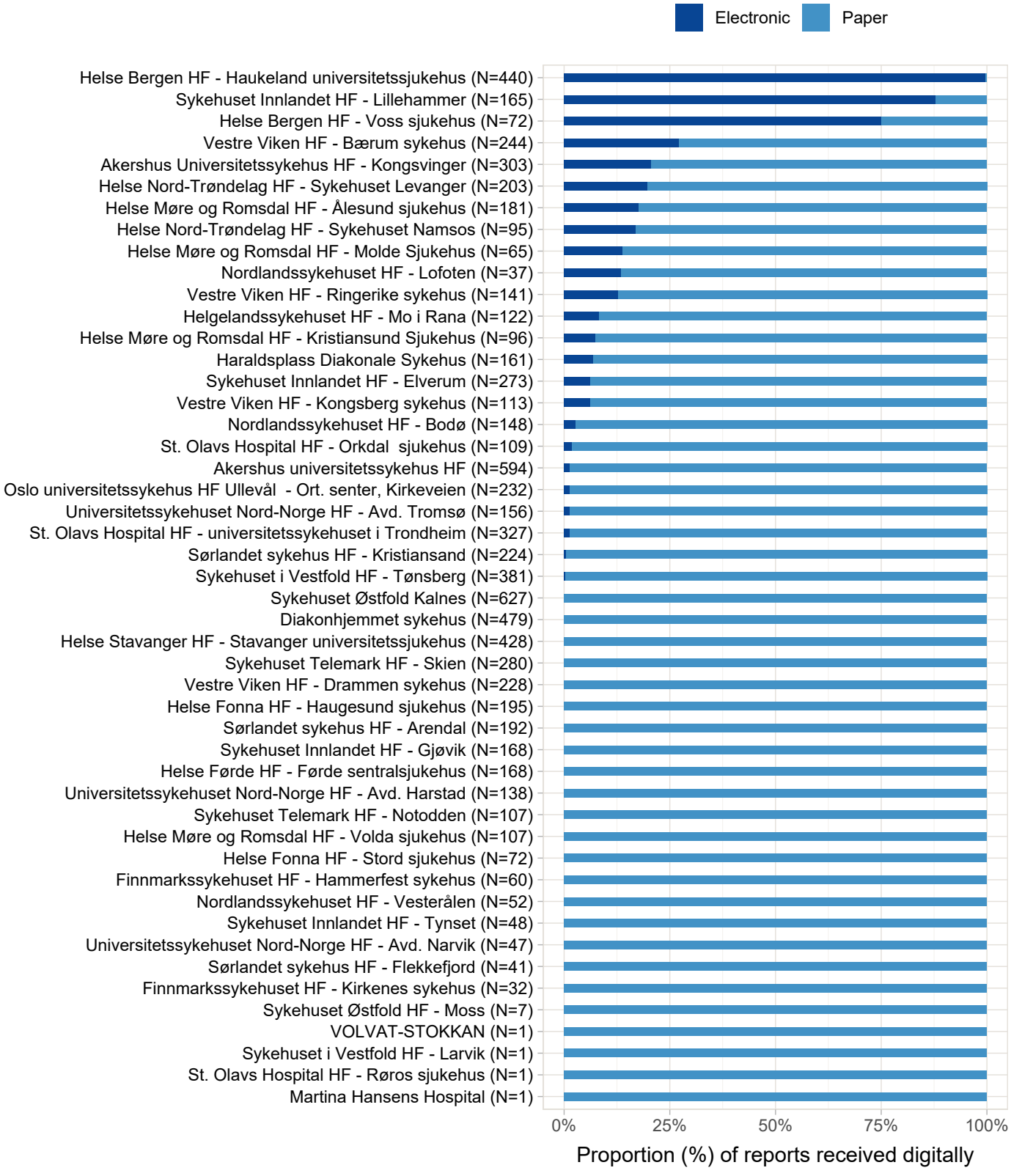


Figure D.48 shows proportion of patients not reoperated at each hospital. Hospitals with n<10 have been excluded.

Figure D.49: Registration of operation forms by format in 2022, all operations



National average for reporting on electronic forms in 2022 is 12%

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:

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

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

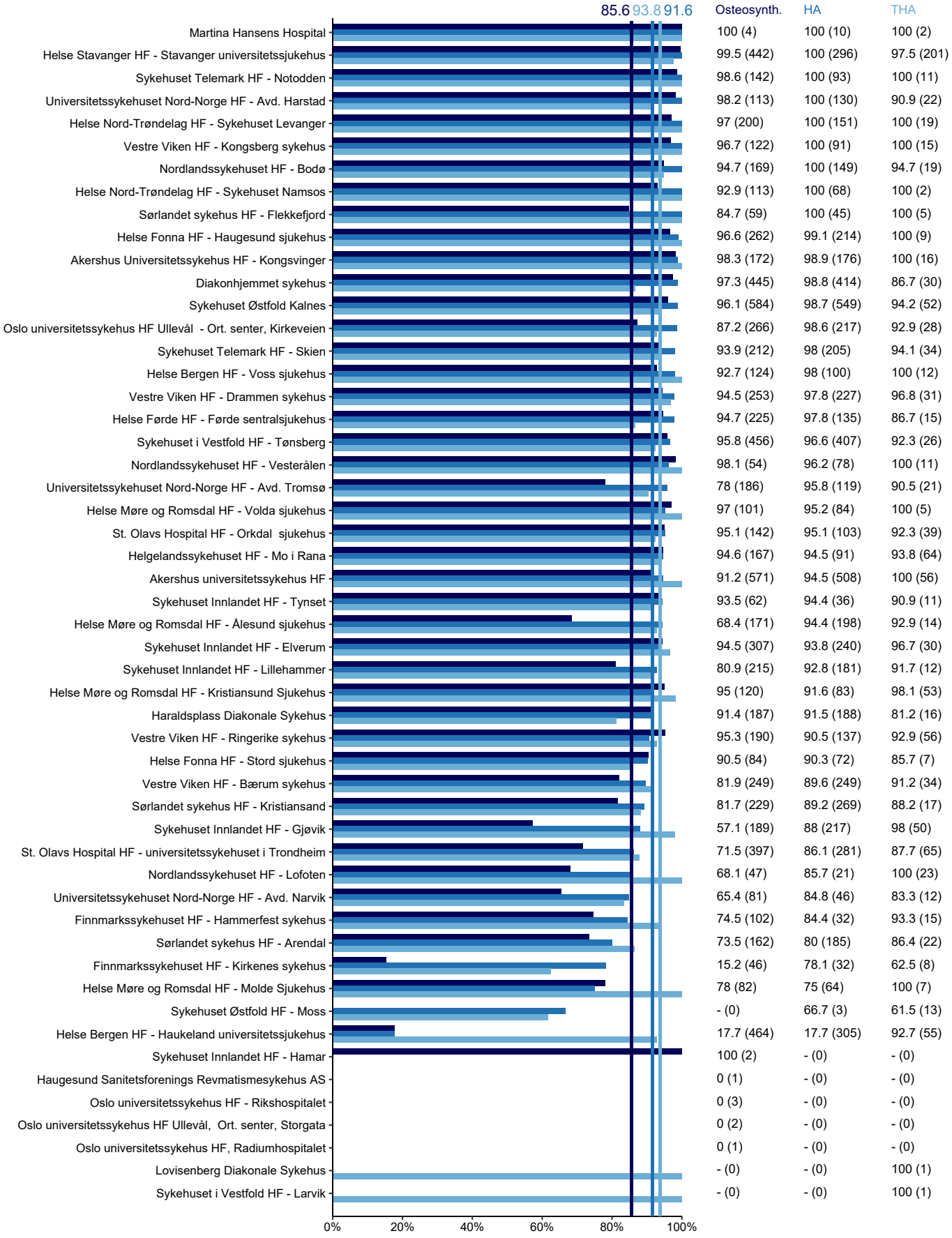
For details of the NSCP and ICD-10 codes used when extracting data from the NPR for comparison of primary operations and reoperations in the NHFR and for the complete results, please consult the Completeness Analysis Report, which will be published atwww.helsedirektoratet.no.

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 %, for hemiarthroplasty 92 % and for total arthroplasty 94 %. 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 %, after hemiarthroplasty 88 %, and after total arthroplasty 95 %. 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**.

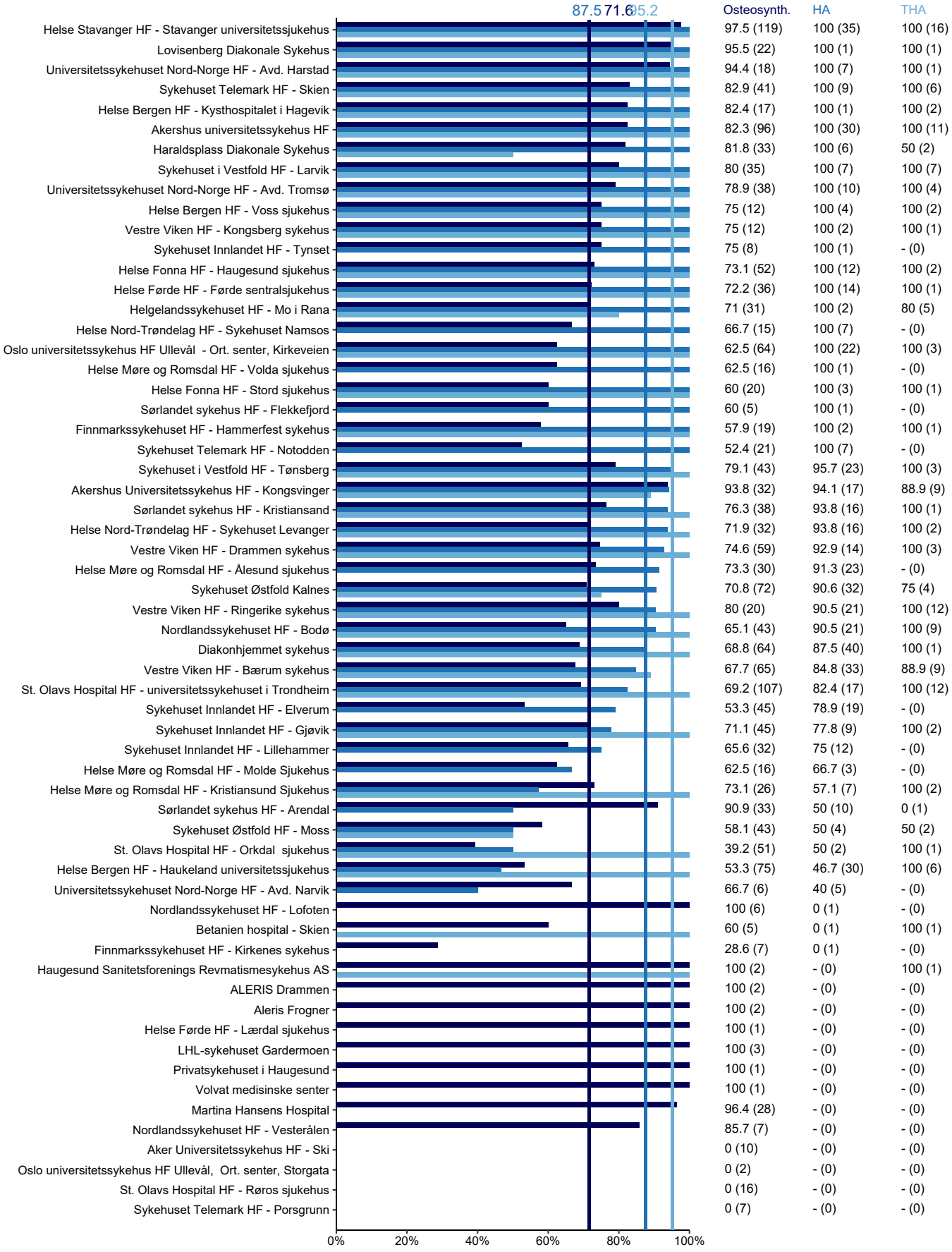
The following pages show the hospital-based completeness analysis for primary operations and reoperations. We urge hospitals with low completeness to review their coding practices and routines in reporting to the registers.

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

ANNUAL REPORT KNEE LIGAMENT REGISTER

The leadership and secretariat of the Norwegian Knee Ligament Register (NKLR) are proud to present the report for 2022. The data from the register is presented in an extensive professional report that includes a detailed description of the collected data. This report is made accessible to all hospitals and contacts within the registry's scope. New for this year is also a shortened version of the report, presented in a new graphic format as part of a new and more reader-friendly report from the Norwegian National Advisory Unit on Arthroplasty and Hip Fracture.

In 2022, a total of 1,857 patients underwent primary reconstruction of the anterior cruciate ligament nationwide, bringing the numbers back to approximately the same level as before the COVID-19 pandemic. As for revisions, these have consistently accounted for between 8-9% of the total number of reconstructions. While there has been a trend towards fewer revisions in recent years, the numbers now appear to have stabilized. Surgeons register the presumed reason for the patient undergoing revision surgery. The most reported cause is "new trauma," accounting for 42% of cases, followed by "graft failure" at 31%. "Misplaced tunnels" are a significant reason for occasionally having to perform a revision in multiple sessions, often involving bone grafting to allow for a satisfactory repositioning of graft tunnels. With the introduction of electronic registration since 2019, more detailed data are now collected on whether revisions are performed in one or two stages. In 2022, almost half of the revisions were carried out as single-stage revisions (74), while 74 and 56 first and second-stage revision constructions were reported.

The majority of individuals undergoing ACL reconstruction are young; the average age in Norway for primary reconstruction is 28 years. In 2022, men accounted for 55% of cases. Among women, most surgeries occurred between the ages of 10-19, while most men were operated on between the ages of 20-29. However, this gender difference tends to disappear in the elderly patient population. The incidence of ACL surgeries has been increasing from 2005 to the present day, especially among young women.

Although football is the most common cause of injury leading to reconstruction, this doesn't necessarily reflect the risk of injury per sport. Instead, it's more indicative of the proportion of the Norwegian population participating in various sports. There are no clear trends over time in reported activity at the time of injury, which seems to remain relatively constant in recent years.

Regarding graft choice, the use of patellar tendon graft (BPTB) has remained consistently high – it was used in 69% of all surgeries in 2022 (Figure 6). The use of hamstring graft is 14%, while the use of quadriceps graft (7%) is becoming more frequent.

Since the introduction of electronic registration in 2019, the quality of meniscal injury registration has also improved. Previously, only whether the injury was resected, sutured, or trepanned was registered. Now, information on the specific types of meniscal injuries that were sutured, the number of sutures placed, and the types of suture anchors used are also collected. Updated figures show the distribution of rupture types for 2022. We now have documented the proportion of patients who also undergo a meniscal-capsular repair or root repair.

Patients fill out questionnaires – KOOS scores – 2.5 and 10 years after the surgery. Table 59 shows the percentage of patients who responded. These results (Figures E.3 and E.4) indicate that patients' condition improves after surgery, as KOOS scores increase significantly from before surgery to all follow-up time points.

An important mandate of the NKLR is to contribute to high-quality national treatment practices. In collaboration with the Norwegian Arthroscopy Association, "Best Clinical Practices" for the treatment of anterior cruciate ligament injuries were developed in 2022.

It's important to identify areas of our practice where there's broad agreement on what represents good quality. These areas can function as quality indicators – providing an indication of the measured areas. New for this year is the registration of whether the patient was operated with a "well-documented graft." This is defined as hamstring, patellar tendon, and quadriceps tendon grafts. This implies that other grafts should not be used for primary ACL surgeries – or only used in study contexts.

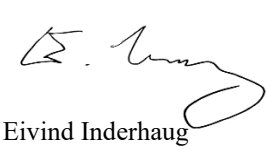
Other quality indicators registered in the Norwegian Knee Ligament Register include the use of antibiotic prophylaxis, revision rate after primary surgery, and completed physiotherapy before reconstruction.

Regarding research, good studies with data from our registry were published in 2022 as well. Two studies utilizing artificial intelligence, specifically machine learning (RR Kyle Martin et al.), have garnered international attention and won several awards for innovative use of registry data. It's also gratifying to see that the national register-randomized trial where patients are randomized between early surgery or active rehabilitation is approaching its inclusion target through the recruitment of new centers. Several similar studies will follow in the wake of this.

The steering group for the Norwegian Knee Ligament Register is composed of Jon Olav Drogset (Chair), Lars Engebretsen, Stig Heir, Ann Kristin Hansen, Ove Furnes, Jonas Meling Fevang, and user representative Sigrun Marit Hansen.

We especially thank all surgeons and patients who fill out the forms and thus contribute to the continuous data collection, quality improvement, and research in the Norwegian Knee Ligament Register.

Bergen, June 2023



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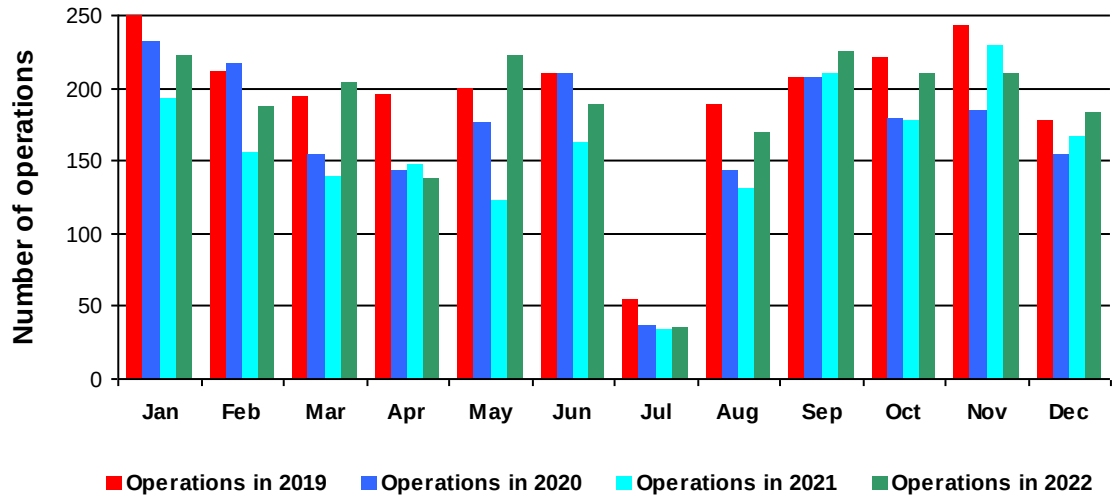
Sigurd Stenvik
Biostatistician

Irina Kvinnesland
IT consultant

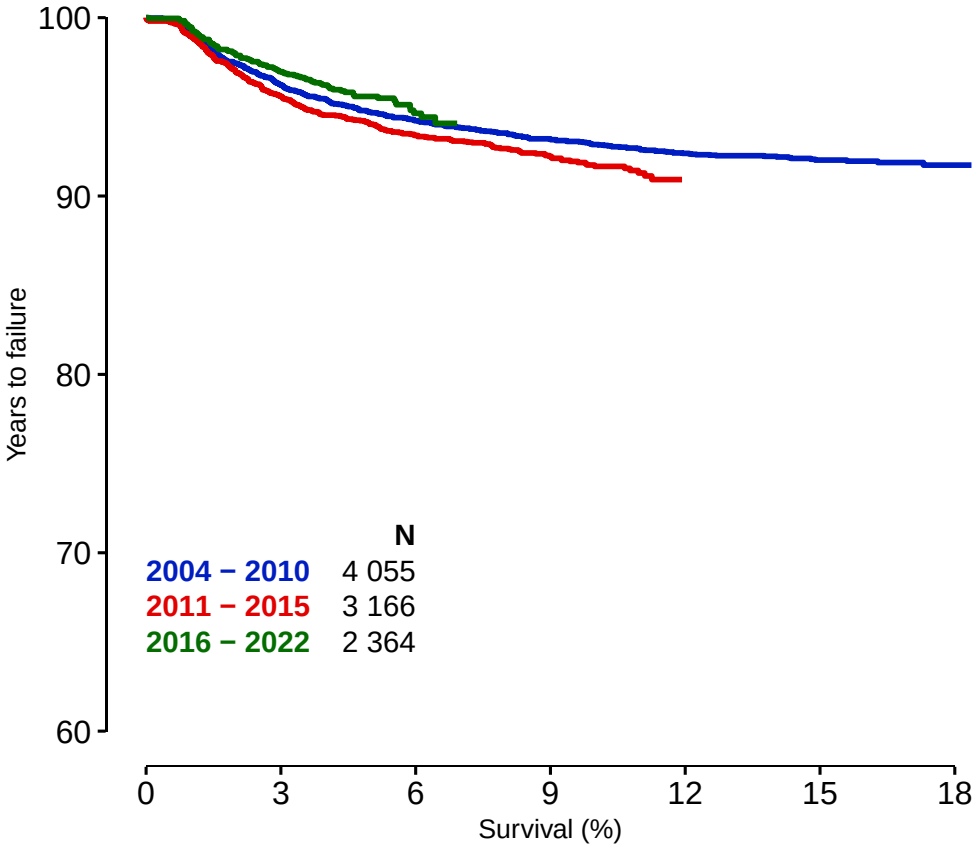
COVID-19

Figure: Monthly number of operations in 2019 - 2022

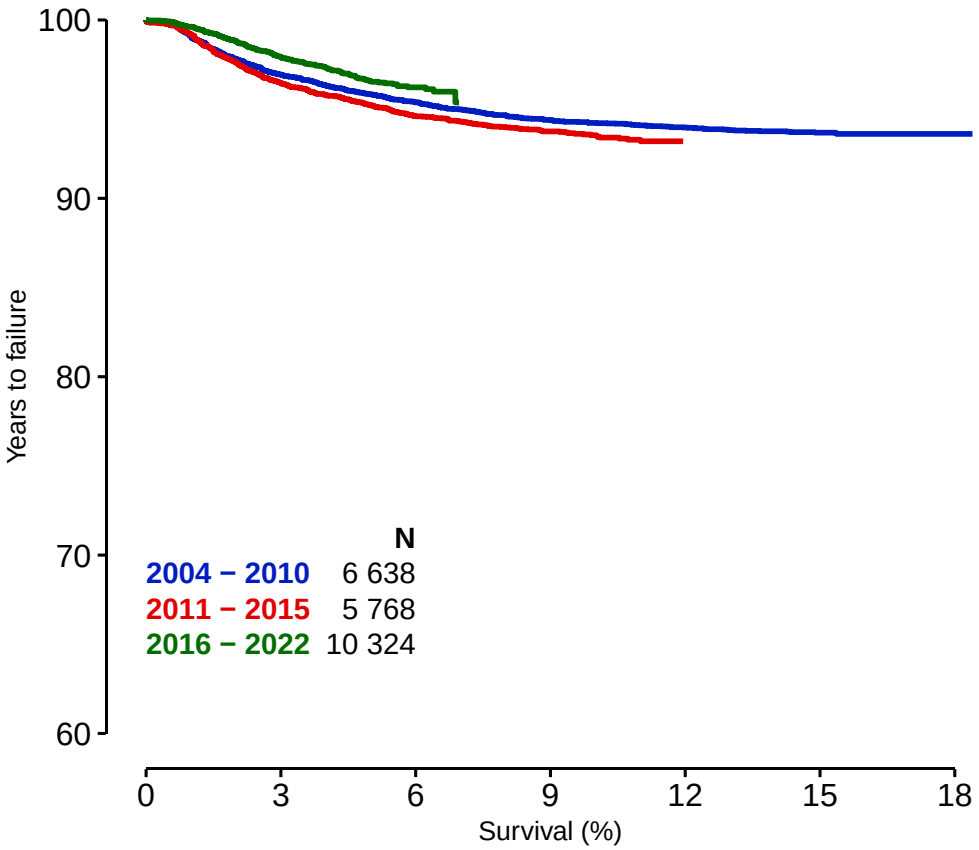


Survival of cruciate ligament operations
2004–2022

E.1) ACL reconstruction without additional injuries

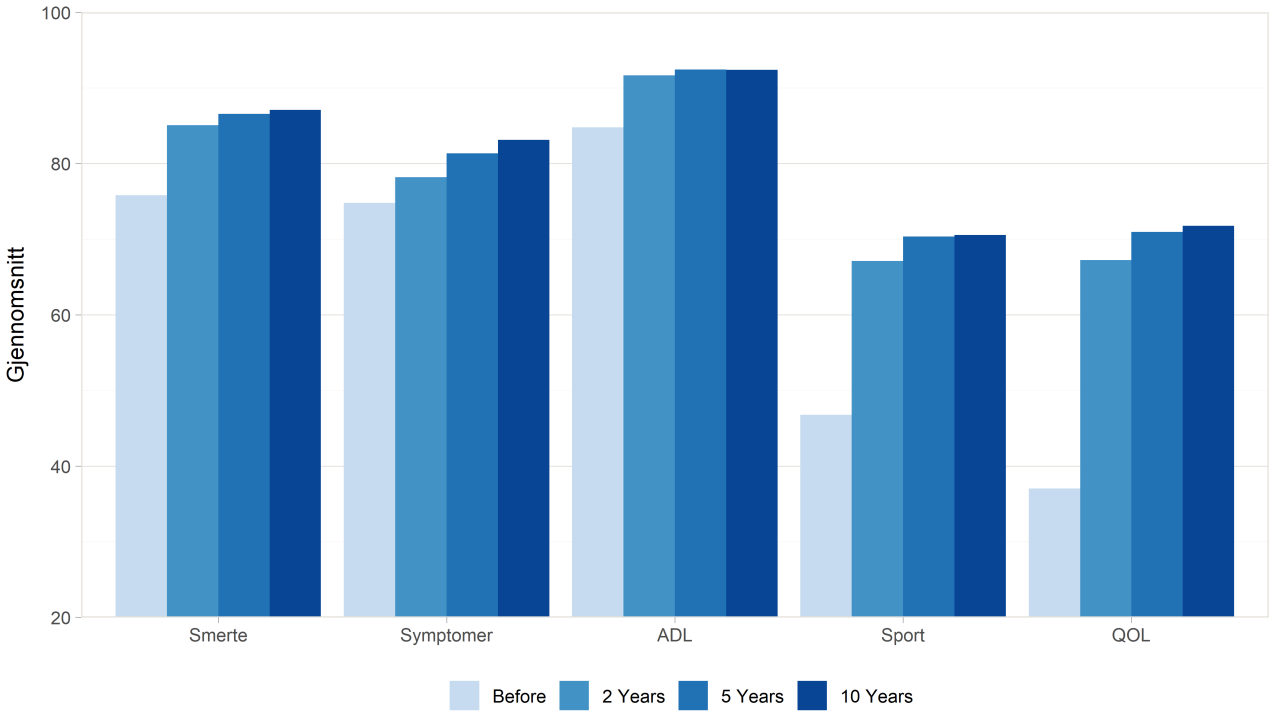


E.2) ACL reconstruction with additional injuries

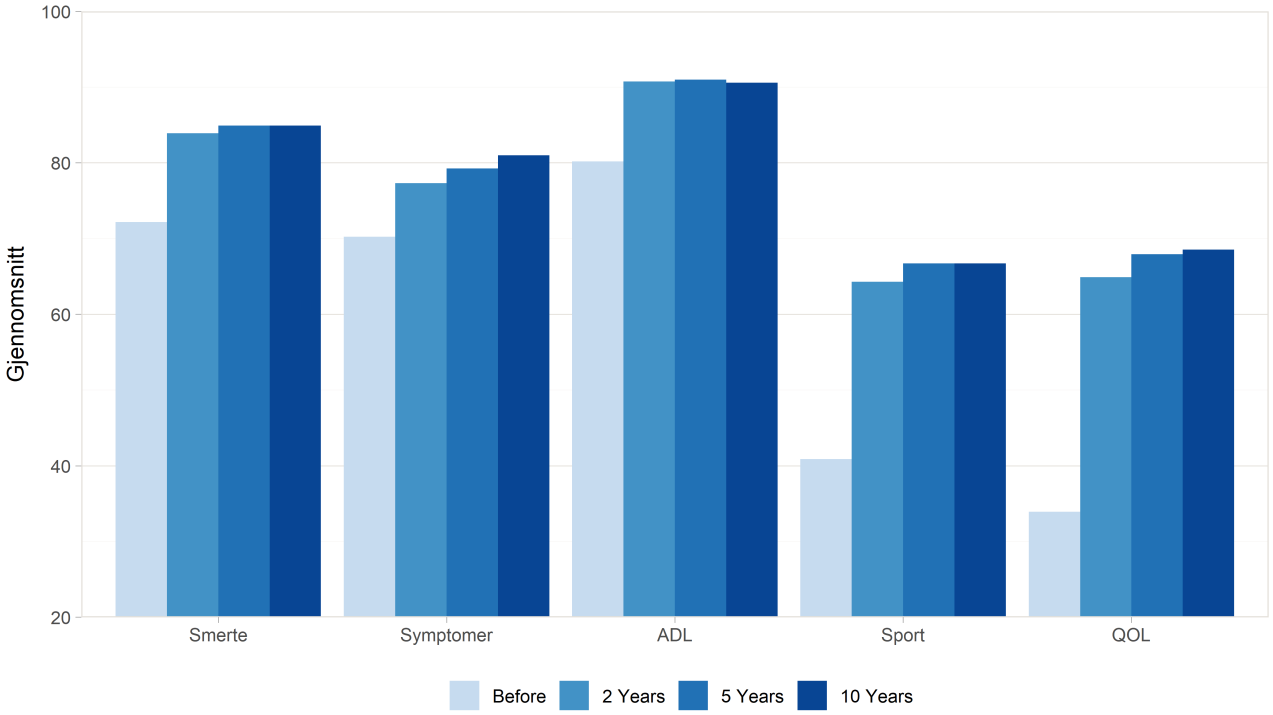


Survival estimate is given as long as >50 reconstructions remain at risk.

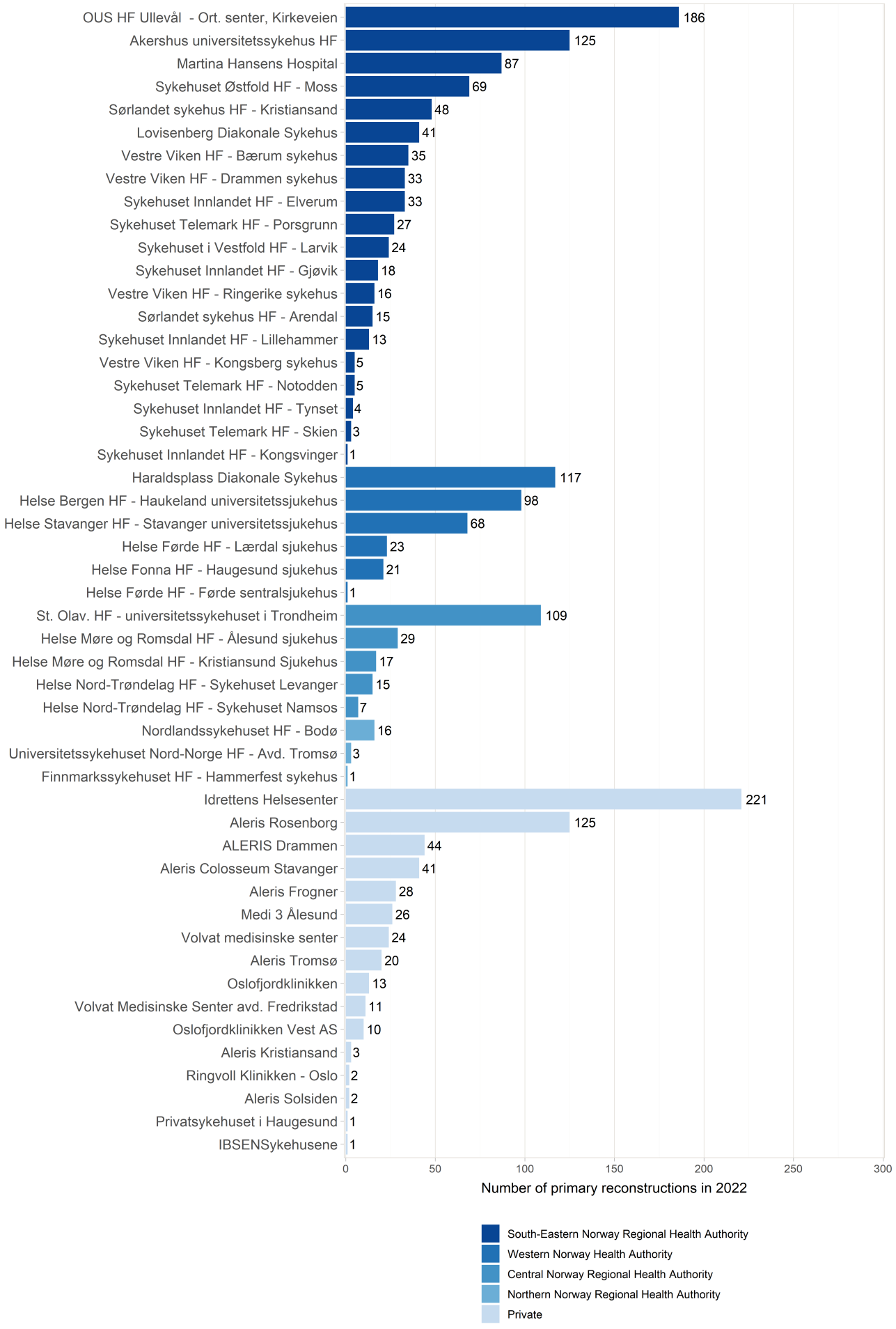
Figur E.3: KOOS in primary ACL reconstruction without additional injury



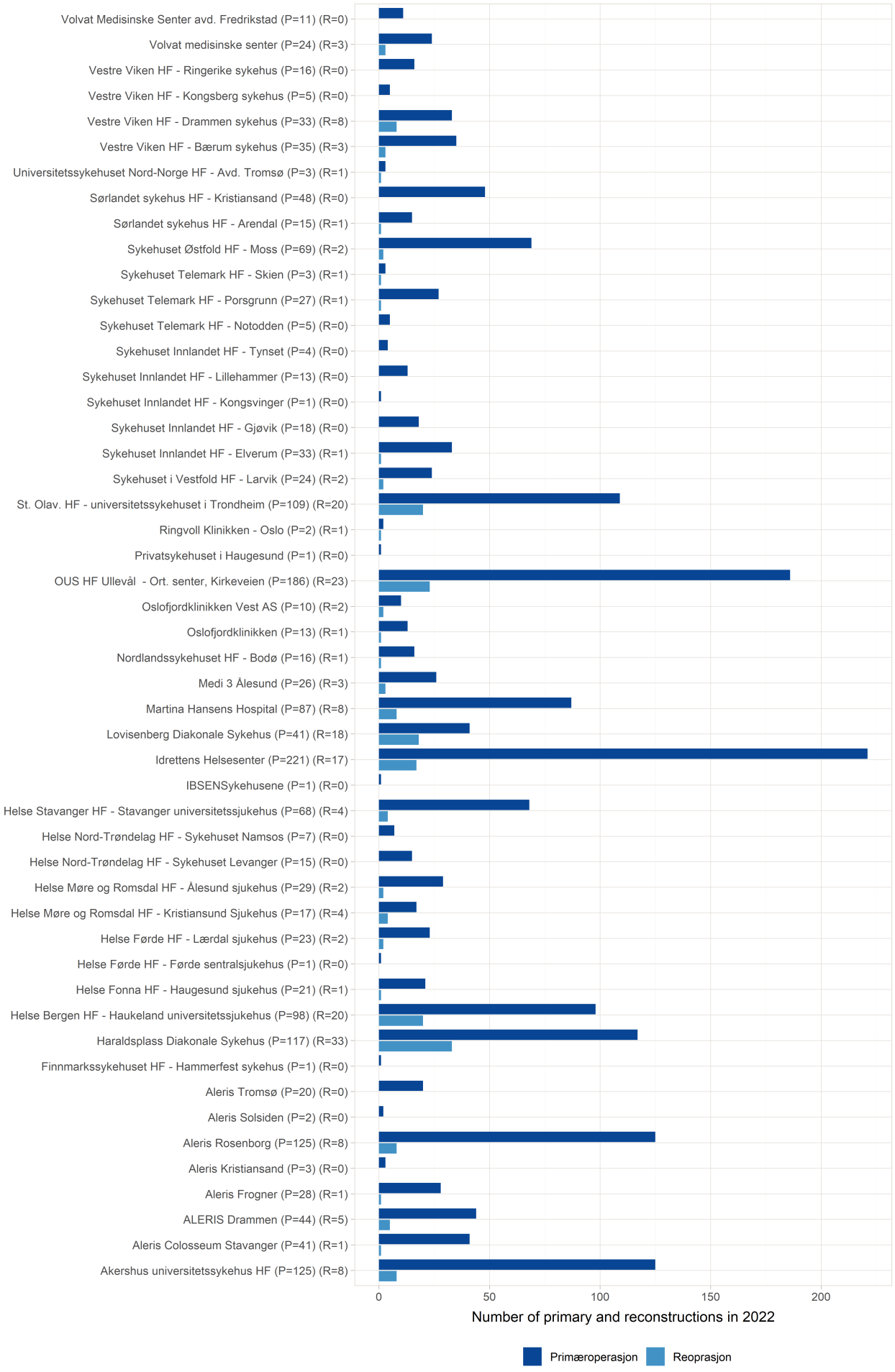
Figur E.4: KOOS in primary ACL reconstruction with additional injury



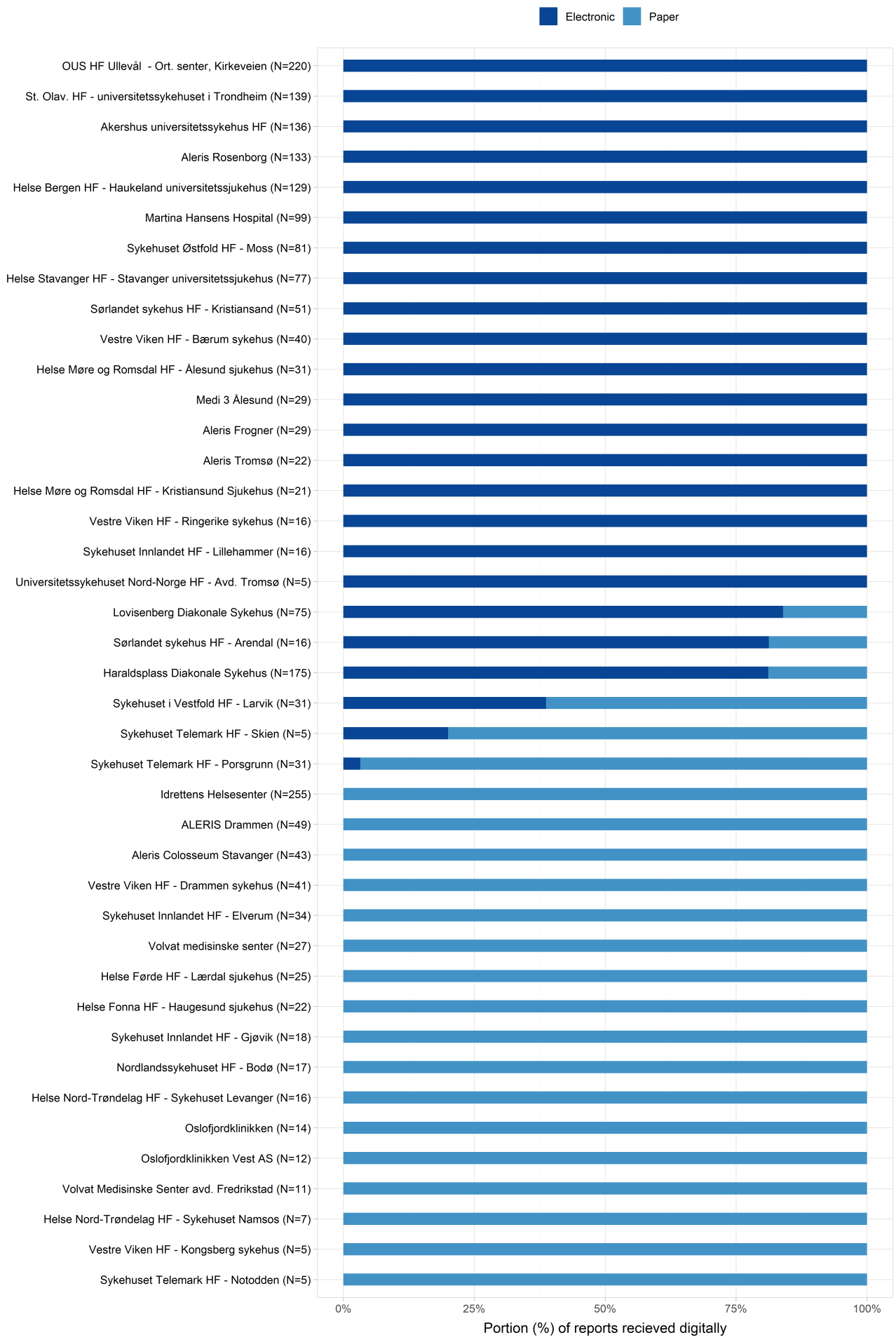
Figur E.5: Annual number of cruciate ligament primary reconstructions in 2022



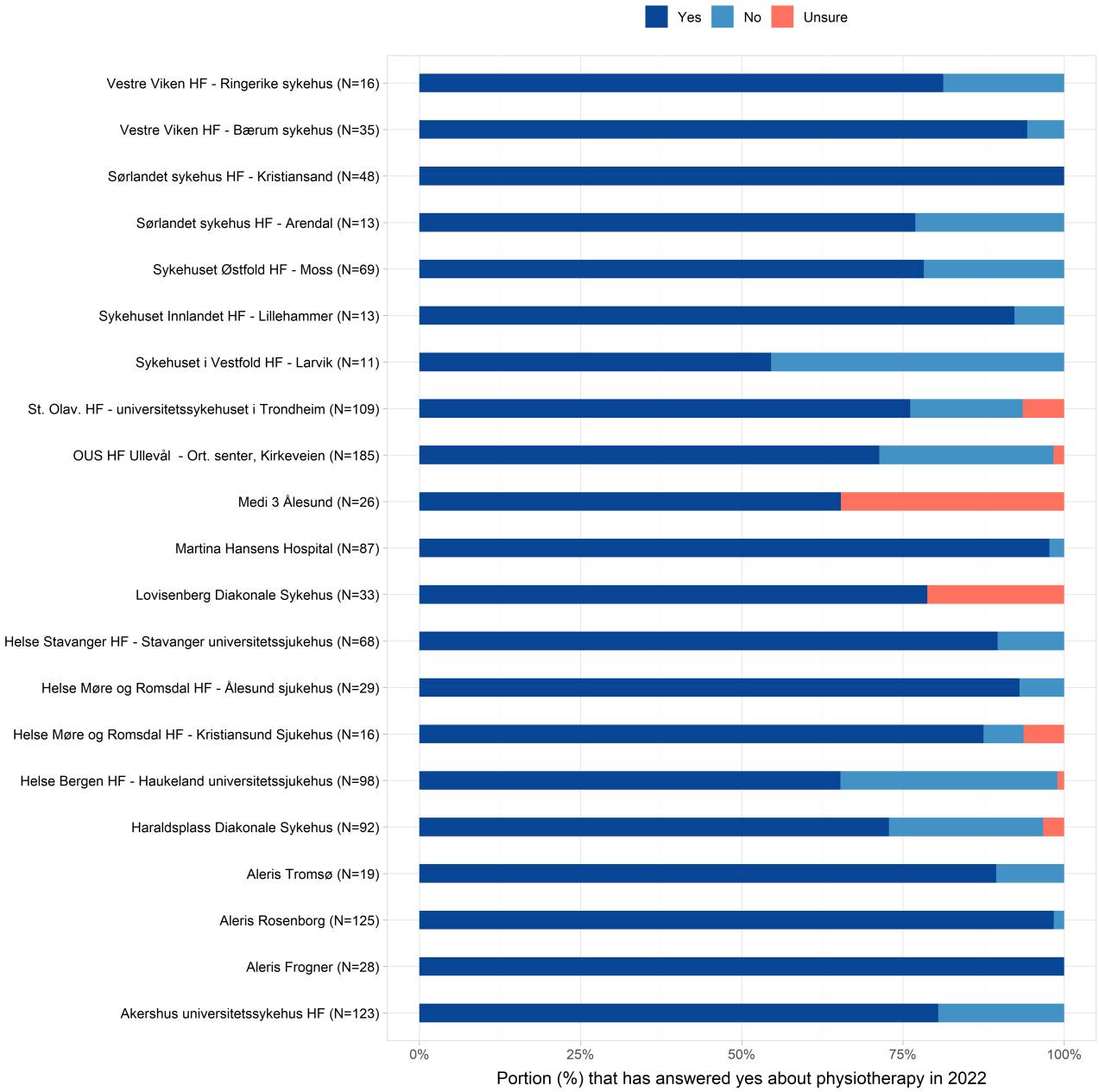
Figur E.6: Annual number of cruciate ligament primary and revision reconstructions for each hospital in 2022



Figur E.7: Form registration by format in 2022

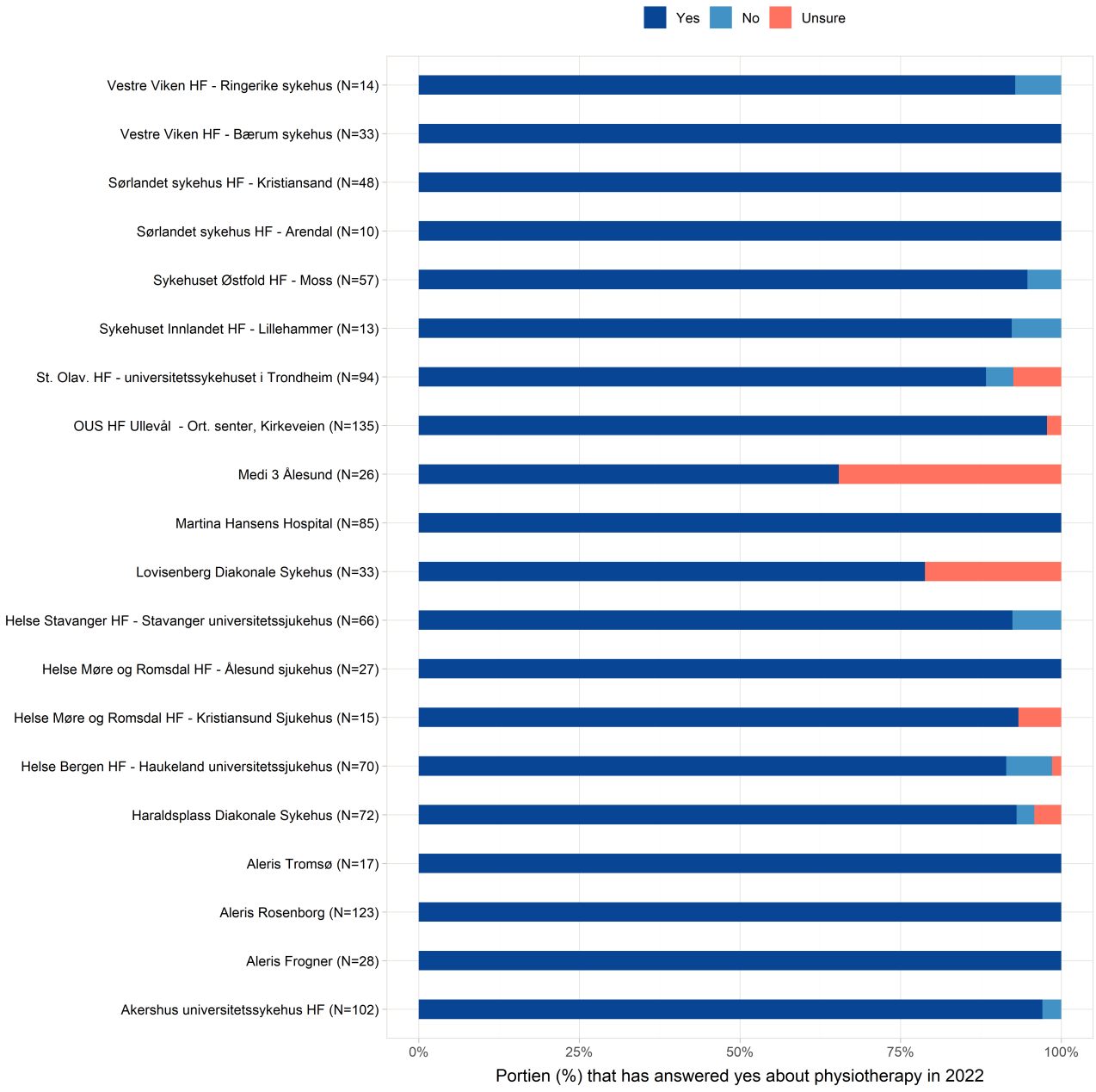


Figur E.8: Number of answers about physiotherapy in 2022

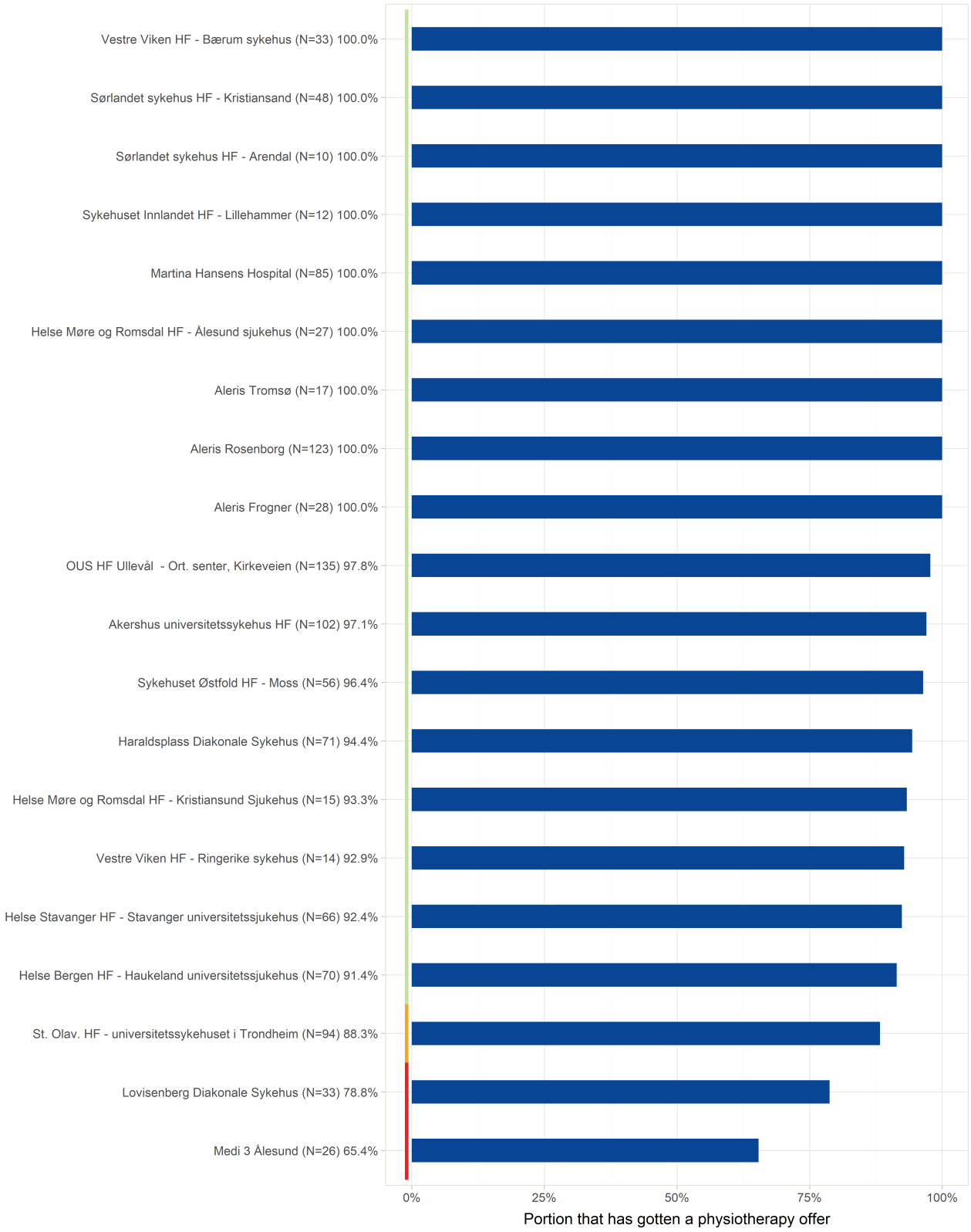


From 2020, it is registered in MRS if the elective patients had undergone physiotherapy before surgery. This was defined as a new quality indicator in 2021. If the patient answers no, a follow up question for the reason has to be answered. Including this year, 864 patients have undergone physiotherapy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

Figur E.9: Number of answers about physiotherapy 2022 without acute patients

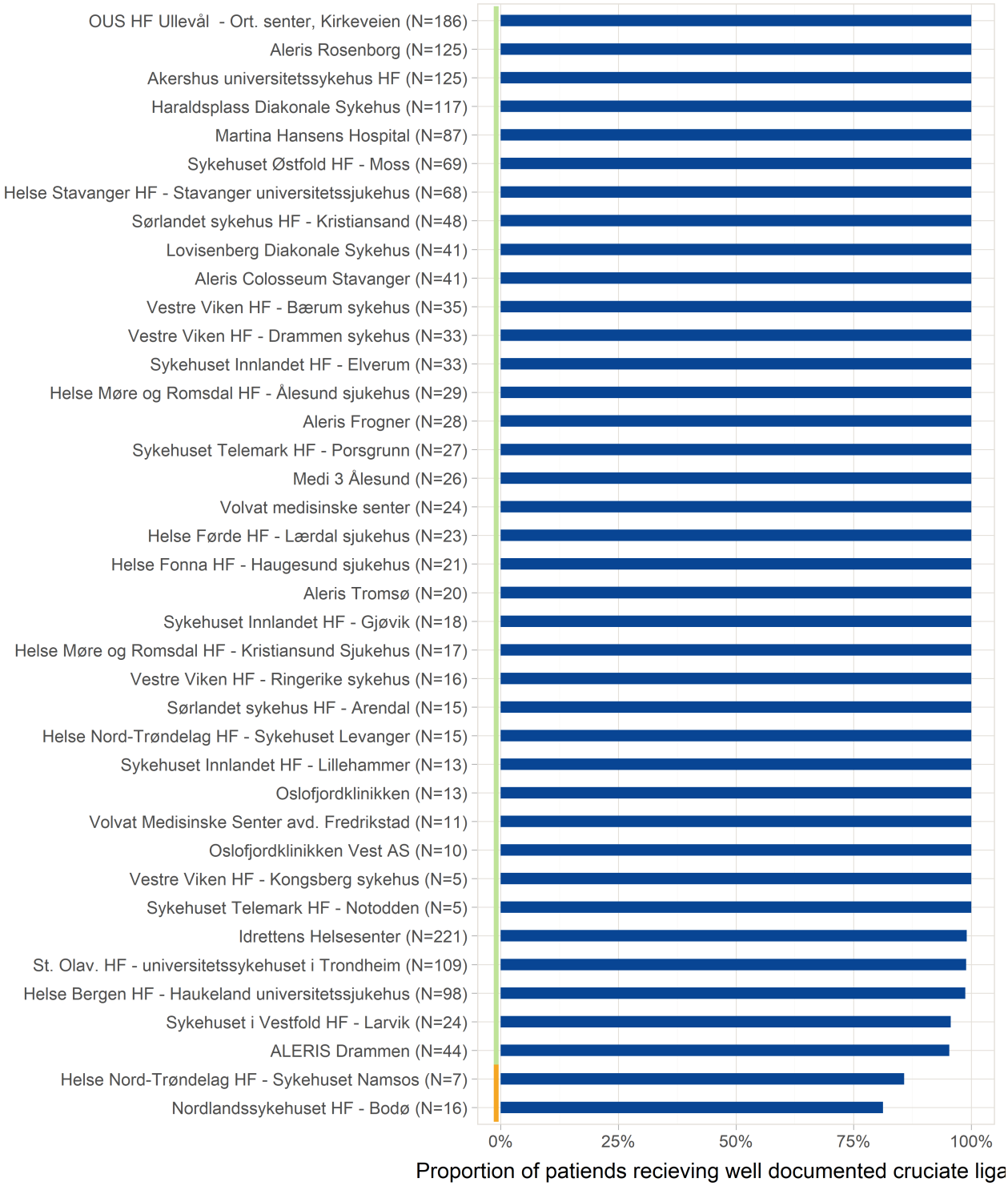


Figur E.10: Proportion of patients receiving physiotherapy in 2022 without acute patients

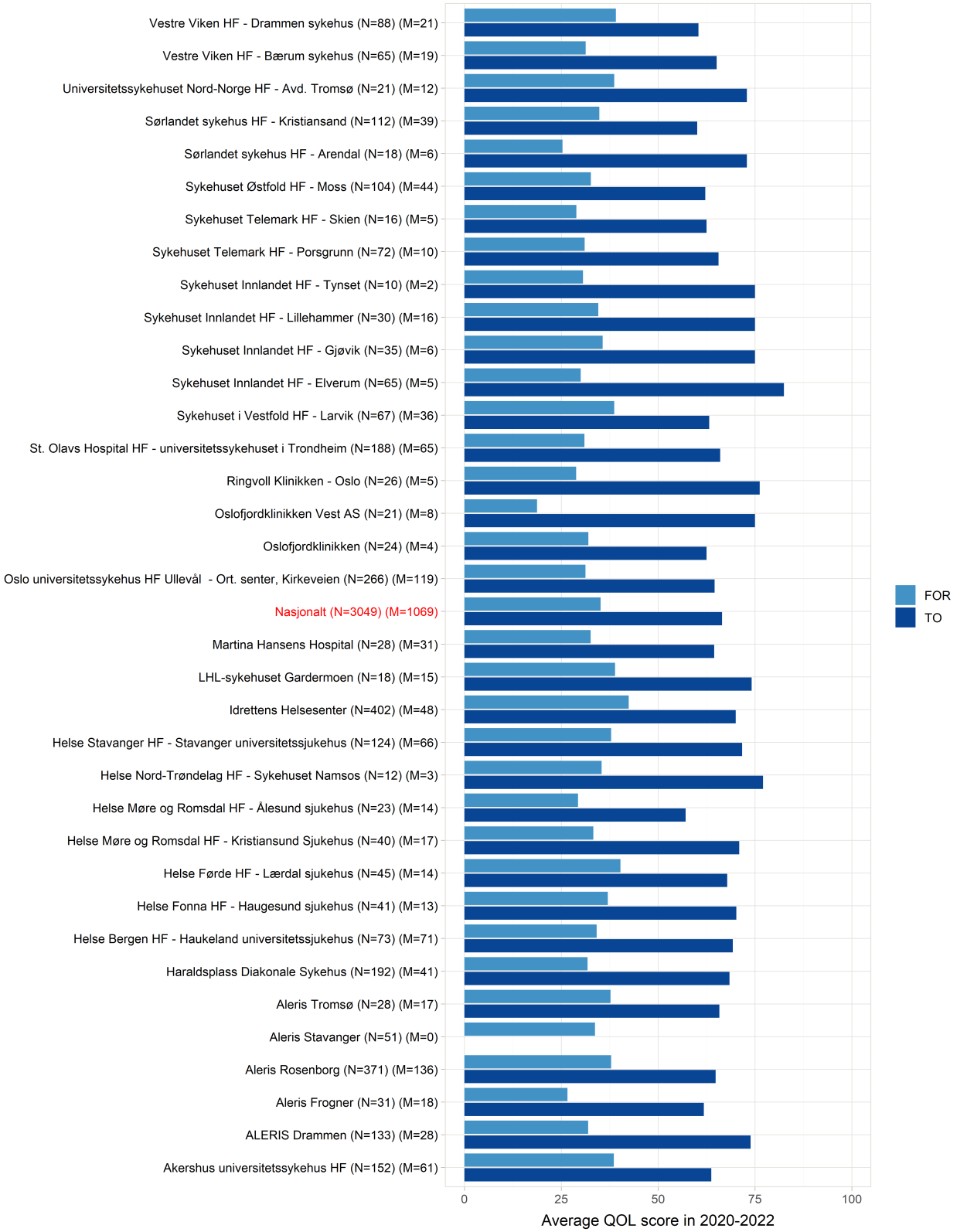


It is 95,2 % that has received an physiotherapy offer if we exclude the acute patients, and those that does not want physiotherapy in the first place.

Figur E.11: Number of patients with well documented grafts in 2022

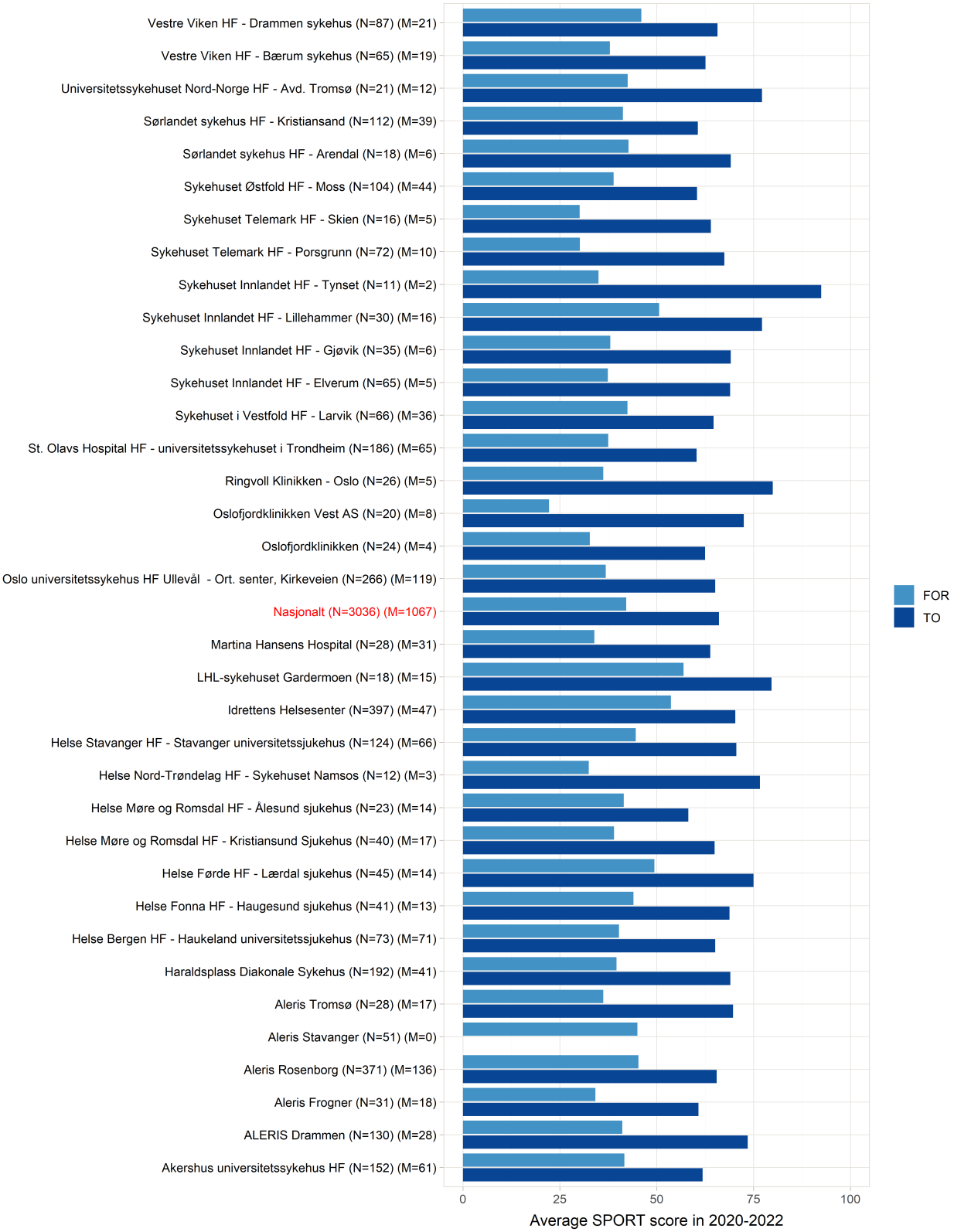


Figur E.12: KOOS score for QOL for each hospital in 2020-2022



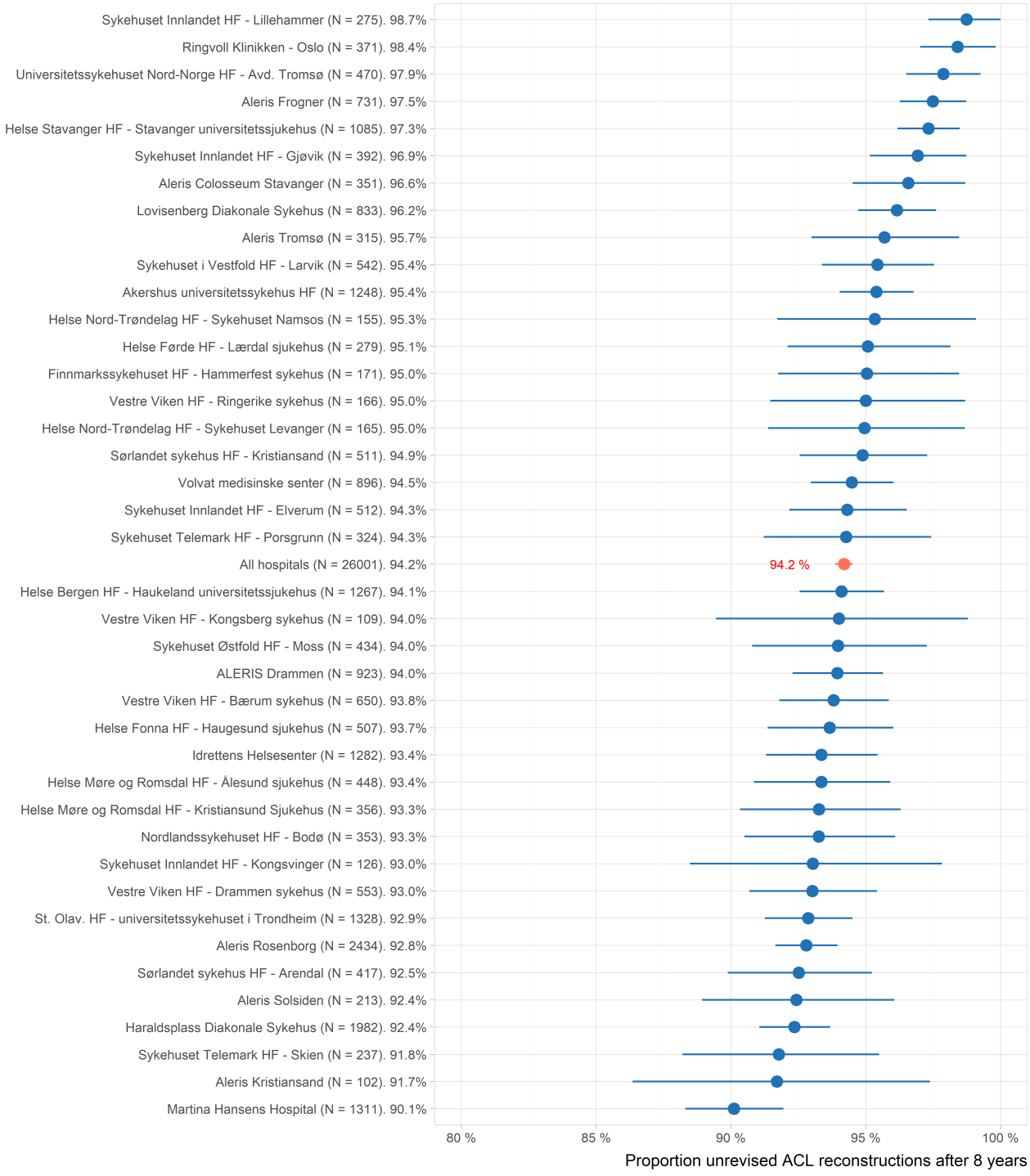
National numbers for KOOS QOL are 35.2 before the operation (FOR) and 66.5 two years later (TO).

Figur E.13: KOOS score for SPORT for each hospital in 2020-2022



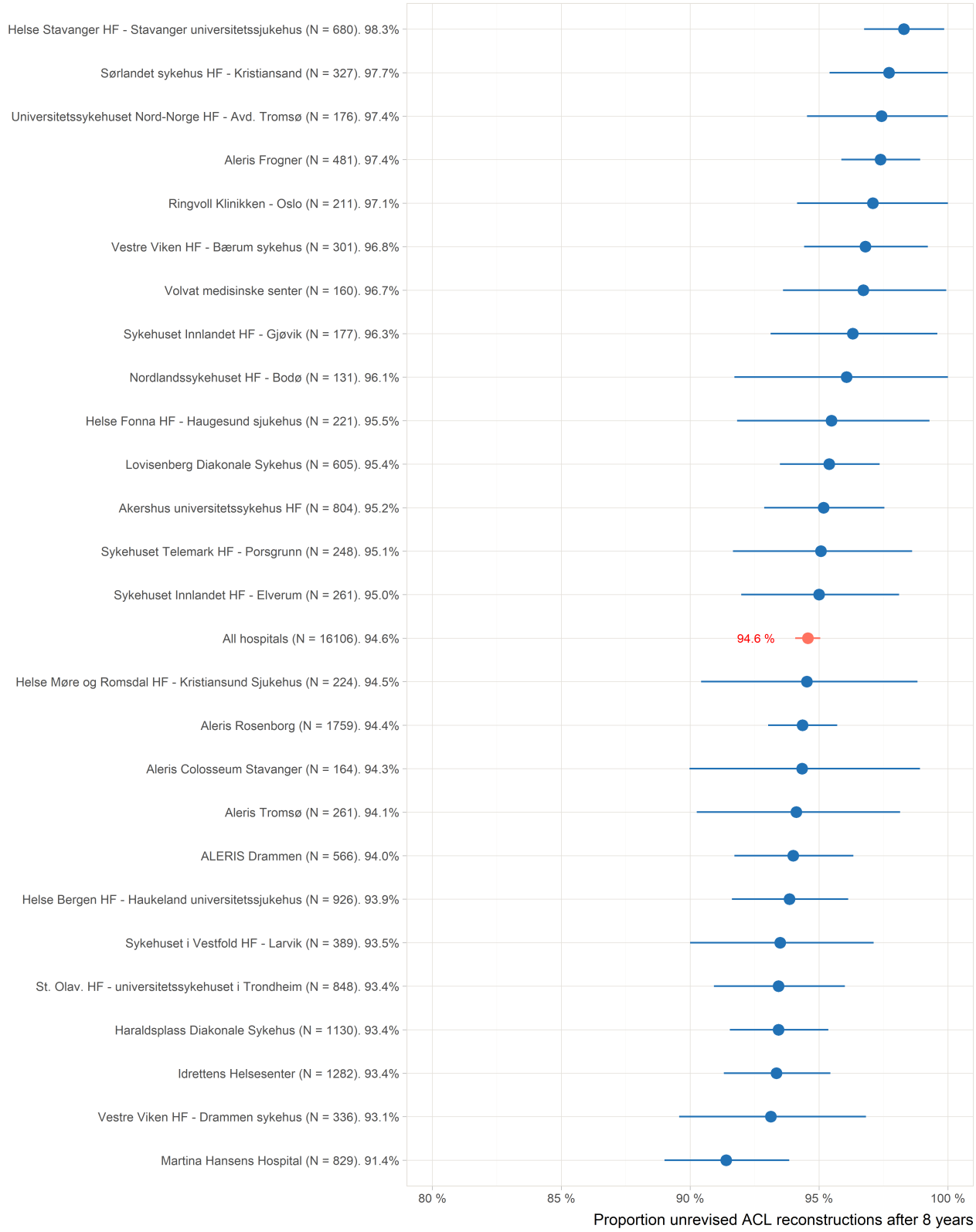
National numbers for KOOS SPORT are 42.2 before the operation (FOR) and 66.1.

Figur E.14: The proportion of unrevised anterior cruciate ligament (ACL) reconstructions after 8 years in the period from 2004-2022



The figure shows the proportion of patients who have not undergone reoperation in the first 8 years after the primary surgery. In the national average, 94.2% of patients have avoided reoperations. In clinical practice, some hospitals may operate on patients with the lowest risk of complications and reoperations, while others, with better expertise in handling problems, may operate on patients with a higher risk of complications. In such cases, there is a chance that the latter hospitals may achieve less favorable results when attempting to compare hospital outcomes.

Figur E.15: The proportion of unrevised anterior cruciate ligament (ACL) reconstructions after 8 years in the period from 2013-2022



The figure depicts the proportion of patients who have not undergone reoperations in the first 8 years after primary surgeries during the period from 2013. We have done this to provide more current data and to see if the revision rate has changed in the latest period. 94.6% of the patients have avoided reoperations.

Cruciate Ligament

All categories of operations

Table 1: Annual number of operations

	Primary reconstruction		Revision reconstruction		Only other procedures		Total
2022	1 857	(84,6%)	204	(9,3%)	135	(6,2%)	**2 196**
2021	1 529	(81,8%)	176	(9,4%)	164	(8,8%)	**1 869**
2020	1 674	(82,1%)	158	(7,8%)	206	(10,1%)	**2 038**
2019	1 972	(83,8%)	188	(8,0%)	193	(8,2%)	**2 353**
2018	1 902	(81,3%)	218	(9,3%)	219	(9,4%)	**2 339**
2004-17	23 384	(85,2%)	2 293	(8,4%)	1 761	(6,4%)	**27 438**
Total	**32 318**	**(84,5%)**	**3 237**	**(8,5%)**	**2 678**	**(7,0%)**	**38 233**

Registration complete from 2005. 49.4% of the operations were performed on the right side. 45.3% of the operations were performed on females. 7.6% of the patients had a previous ACL/PCL-injury in the opposite knee. (8.9% was missing). Mean age was 28.1 years, 26.7 years for women and 29.2 years for men. Standard deviation of age was 10.6 years, 11.3 years for women and 10.0 years for men.
Median value for duration of primary ACL reconstruction was 75 minutes.

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

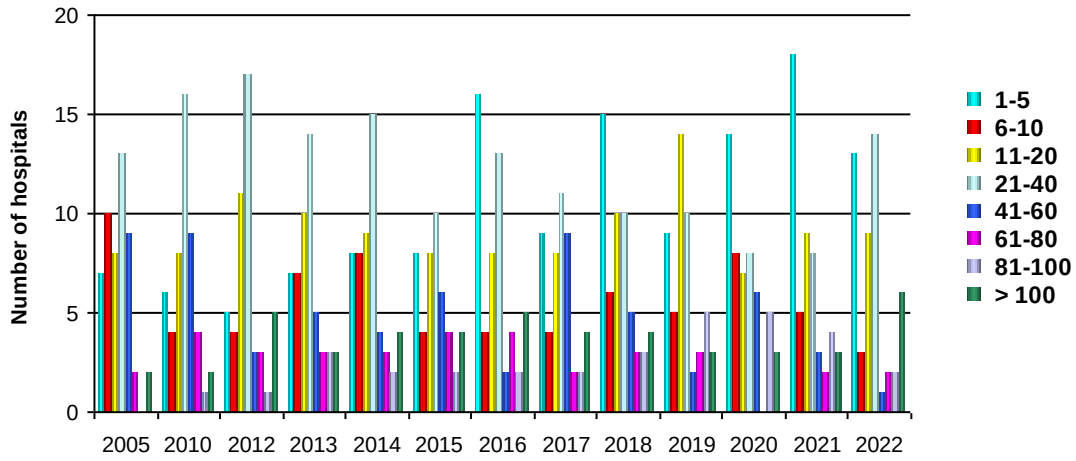
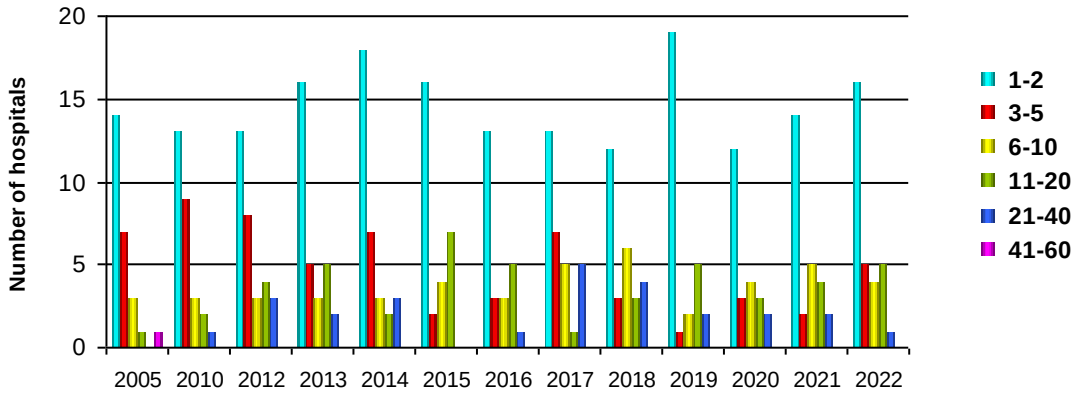


Figure 2: Distribution of hospitals by surgery volumes, revision reconstructions ACL



Incidence of primary reconstruction of cruciate ligament for 2005, 2010, 2015, 2022

Figure 3a: For women

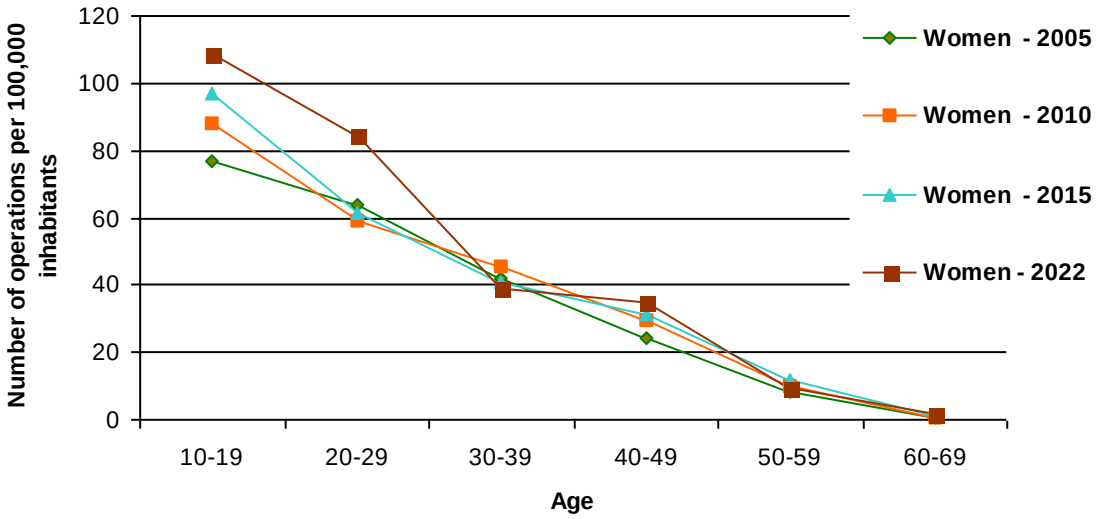
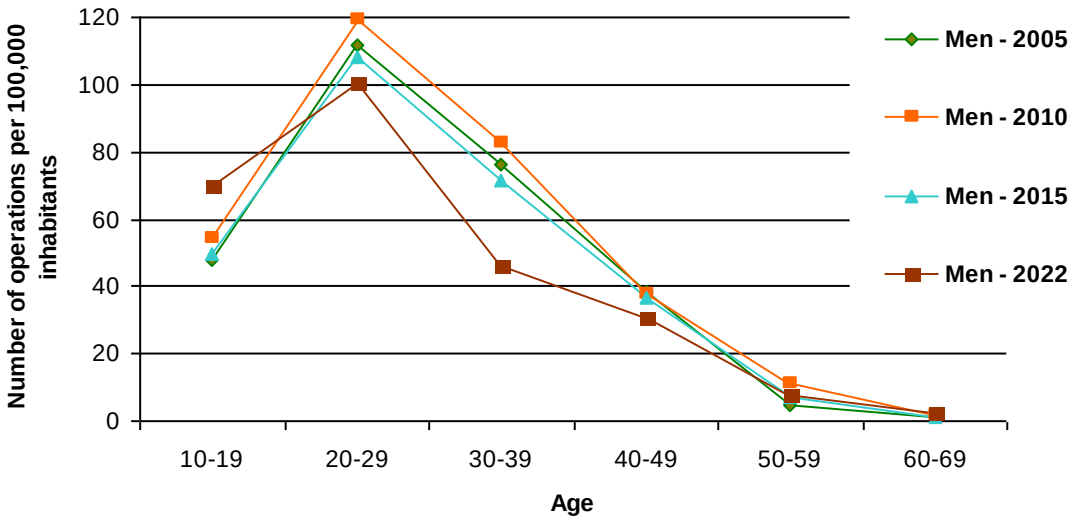


Figure 3b: For men



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
2022	450	20	20	32	14	1	48	39	8	13	3	0	2	0	96
2021	432	21	26	37	6	11	41	25	17	19	3	0	1	4	60
2020	483	21	21	44	5	6	48	21	8	28	1	1	1	5	33
2019	846	31	32	52	4	4	50	20	8	110	2	0	0	1	15
2018	1 086	25	44	69	8	6	47	28	5	99	0	0	2	0	0
2004-17	11 864	1 004	495	833	106	82	598	327	27	592	36	0	0	0	0
Total	**15 161**	**1 122**	**638**	**1 067**	**143**	**110**	**832**	**460**	**73**	**861**	**45**	**1**	**6**	**10**	**204**

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
18 441							
11 873	x						
453	x	x					
265		x					
257	x					x	
254						x	
120							x
94				x			
92	x		x				
88			x				
81	x			x			
70							
30	x	x		x			
23					x		
22	x			x		x	
22				x		x	
16	x	x				x	
16		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
1 616						
769	x					
154			x			
139			x	x		
118				x		
73						x
61	x		x			
53		x				
39					x	
35	x			x		
34	x		x	x		
31	x	x				
22	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
977	x							
374								
252				x				
167							x	
105	x			x				
105			x					
71		x						
62						x		
60	x		x					
50				x	x			
40	x	x						
37			x	x				
30				x			x	
28	x						x	
27			x		x			
24	x		x	x				
24							x	x
21		x		x				
21					x			
18				x			x	x
17			x	x	x			
14								x
14				x		x		
12	x	x	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.

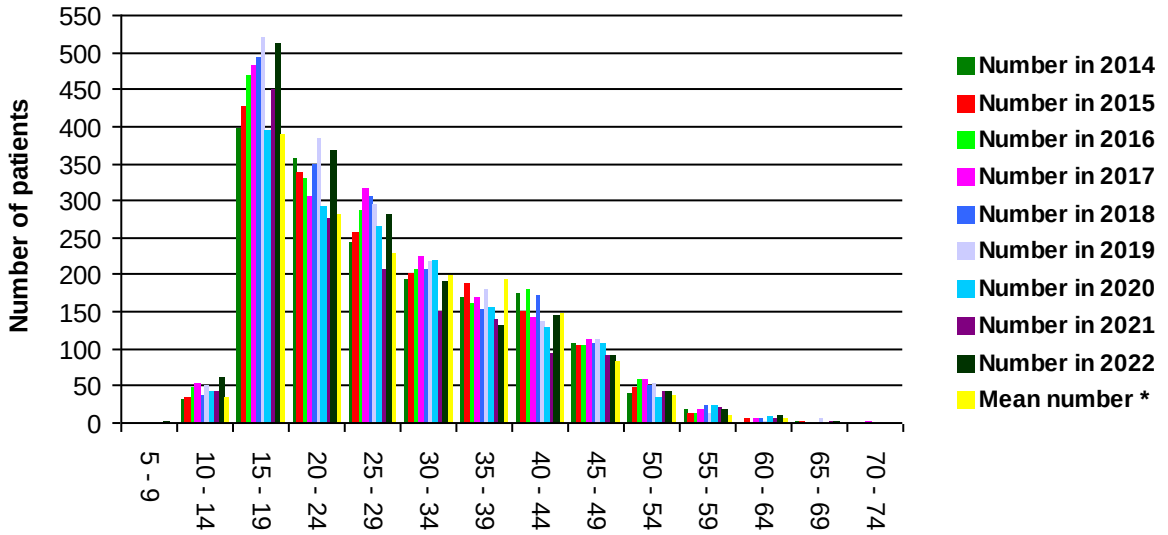
Intraoperative complications

Table 6: Intraoperative complications for all categories of surgeries

	Yes		No		Missing		Total
2022	54	(2,5%)	2 117	(96,4%)	25	(1,1%)	**2 196**
2021	41	(2,2%)	1 798	(96,2%)	30	(1,6%)	**1 869**
2020	39	(1,9%)	1 976	(97,0%)	23	(1,1%)	**2 038**
2019	46	(2,0%)	2 269	(96,4%)	37	(1,6%)	**2 353**
2018	46	(2,0%)	2 236	(95,6%)	57	(2,4%)	**2 339**
2004-17	808	(2,9%)	25 977	(94,7%)	651	(2,4%)	**27 438**
Total	**1 034**	**(2,7%)**	**36 373**	**(95,1%)**	**823**	**(2,2%)**	**38 233**

Primary reconstruction of cruciate ligament

Figure 4: Age by primary operation



* Mean number of primary operations for 2004 - 2013

Figure 5a: Activity that led to injury

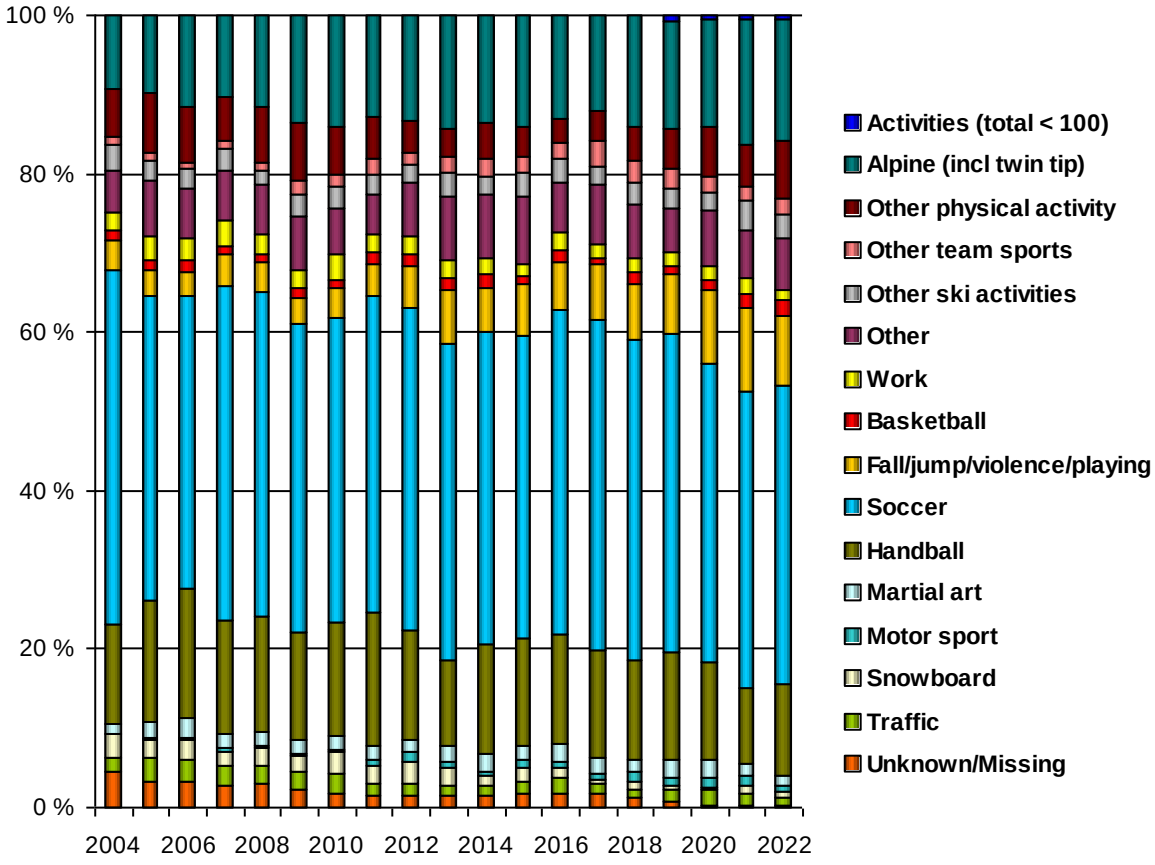
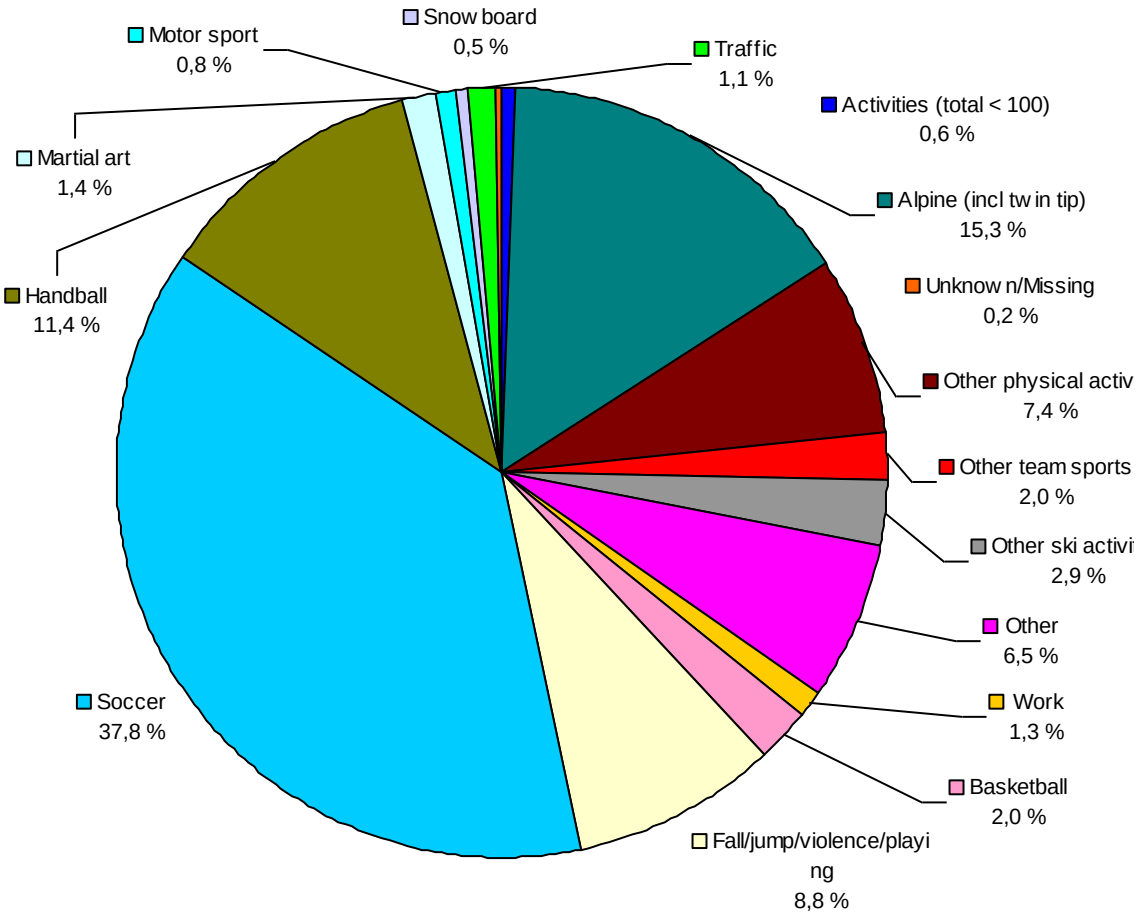


Figure 5b: Activity that led to injury in 2022



Actual injury

Table 7: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2022	1 832	51	117	47	19	430	1 208
2021	1 511	46	110	40	17	420	993
2020	1 652	43	102	25	11	442	1 093
2019	1 941	61	200	52	27	486	1 278
2018	1 877	59	232	55	22	512	1 194
2004-17	23 135	600	1 831	431	260	5 477	12 048
Total	**31 948**	**860**	**2 592**	**650**	**356**	**7 767**	**17 814**

* 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
11 455	x					x	
10 639	x						
4 690	x					x	x
1 967	x						x
755	x		x				
709	x		x			x	
445	x		x			x	x
212	x		x				x
136	x			x			
113	x	x	x				
72	x			x		x	
63	x			x	x		
58	x	x	x				x
39	x	x					
36	x			x			x
28	x				x		
24	x	x		x	x		
22	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
146		x					
113	x	x	x				
58	x	x	x				x
47		x					x
45	x	x	x			x	
39	x	x					
39	x	x	x			x	x
35		x	x				
26	x	x				x	
24	x	x		x	x		
22		x				x	
19	x	x				x	x
19	x	x		x	x	x	
16		x				x	x
15	x	x			x		
15	x	x		x	x		x
14		x	x				x
13		x		x	x		
13		x			x		
13	x	x		x	x	x	x
11	x	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	Total
2022	1 379	0	0	0	0	**1 379**
2021	1 104	0	1	0	0	**1 105**
2020	1 219	0	0	1	0	**1 220**
2019	1 362	0	1	0	0	**1 363**
2018	1 321	4	1	1	0	**1 327**
2004-17	8 622	27	1	0	0	**8 650**
Total	**15 007**	**31**	**4**	**2**	**0**	**15 044**

Table 11: HAMSTRING

	ACL	PCL	MCL	LCL	PLC	Total
2022	284	10	46	18	3	**361**
2021	272	4	37	10	2	**325**
2020	328	10	31	3	0	**372**
2019	426	13	48	8	6	**501**
2018	430	6	34	6	2	**478**
2004-17	14 069	330	202	59	33	**14 693**
Total	**15 809**	**373**	**398**	**104**	**46**	**16 730**

Table 12: ALLOGRAFT

	ACL	PCL	MCL	LCL	PLC	Total
2022	14	34	4	11	6	**69**
2021	22	35	6	13	11	**87**
2020	10	25	5	6	8	**54**
2019	4	34	0	9	10	**57**
2018	8	28	2	7	10	**55**
2004-17	51	116	30	68	88	**353**
Total	**109**	**272**	**47**	**114**	**133**	**675**

Table 13: Quadriceps Graft (QTC + QTB)

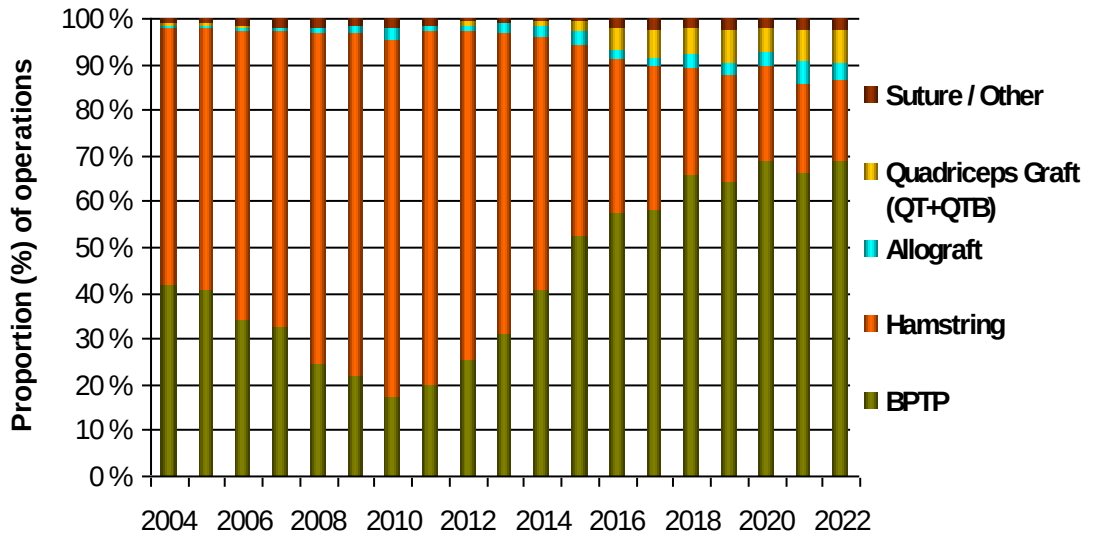
	ACL	PCL	MCL	LCL	PLC	Total
2022	145	0	0	0	0	**145**
2021	108	0	1	0	0	**109**
2020	92	1	0	0	0	**93**
2019	142	2	0	0	0	**144**
2018	113	2	0	0	0	**115**
2004-17	305	9	0	0	1	**315**
Totalt	**905**	**14**	**1**	**0**	**1**	**921**

Table 14: Suture / Other

	ACL	PCL	MCL	LCL	PLC	Total
2022	8	4	26	10	5	**53**
2021	5	3	24	6	2	**40**
2020	3	4	20	9	0	**36**
2019	6	9	27	9	7	**58**
2018	4	13	14	5	6	**42**
2004-17	64	41	129	78	59	**371**
Total	**90**	**74**	**240**	**117**	**79**	**600**

There were 22 forms where it was registered product for ACL og 23 forms where it was registered product 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	2004-17	2018	2019	2020	2021	2022	Total
Endobutton CL Ultra	6 934	283	253	196	119	131	**7 916**
SoftSilk	3 032	445	469	352	378	400	**5 076**
Endobutton CL BTB	1 071	218	346	272	165	170	**2 242**
Sheated Cannulated Int	438	212	173	127	112	157	**1 219**
ACL TightRope	320	87	94	67	125	148	**841**

Table 16: Tibia ACL (The 5 most common for the last 5 years)

Product	2004-17	2018	2019	2020	2021	2022	Total
SoftSilk	3 527	541	762	671	602	693	**6 796**
RCI Screw	4 336	183	171	154	73	86	**5 003**
Full Thread Interference	145	130	143	181	150	307	**1 056**
Peek Interference Scre	404	109	117	109	96	98	**933**
Tightrope ABS	93	78	53	42	169	178	**613**

Table 17: Femur PCL (The 5 most common for the last 5 years)

Product	2004-17	2018	2019	2020	2021	2022	Total
Endobutton CL Ultra	210	7	6	4	3	6	**236**
SoftSilk	74	21	27	17	17	10	**166**
RCI Screw	52	7	6	2		3	**70**
ACL TightRope	4	4	7	5	5	6	**31**
Ultrabutton				10	9	8	**27**

Table 18: Tibia PCL (The 5 most common for the last 5 years)

Product	2004-17	2018	2019	2020	2021	2022	Total
RCI Screw	244	23	18	14	16	18	**333**
Biosure HA Interferenc	29	3	6	1	2	1	**42**
Peek Interference Scre	3	3	5	4	9	8	**32**
BioComposite SwiveLo	2	4	6	2	2	5	**21**
Biosure Regenesorb Int			2	3	7	2	**14**

Table 19: Femur and tibia ACL (The 5 most common for the last 5 years)

Femur	Tibia	2004-17	2018	2019	2020	2021	2022	Total
SoftSilk	SoftSilk	2 626	370	405	290	315	337	**4 343**
Endobutton CL Ultra	RCI Screw	2 242	131	112	103	36	36	**2 660**
Endobutton CL BTB	SoftSilk	706	129	265	253	145	143	**1 641**
Peek Interference Screw	Peek Interference Screw	235	96	81	83	84	82	**661**
ACL TightRope	Tightrope ABS	51	70	42	41	156	161	**521**

Meniscal lesion

Table 20: Actual treatment of meniscal lesion

		Resection			Suture	Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
		OLD	Total	Partial						
2022	Lateral			188	391	3		6	49	**637**
2022	Medial		6	197	515	2			39	**759**
2021	Lateral		2	157	319	2		5	46	**531**
2021	Medial		6	187	395	4			35	**627**
2020	Lateral			215	284	1		8	54	**562**
2020	Medial		5	241	435	2		1	48	**732**
2019	Lateral		1	243	366		1	3	62	**676**
2019	Medial		12	239	506	2	1	4	58	**822**
2018	Lateral		1	275	309			10	80	**675**
2018	Medial		8	249	430		1	10	62	**760**
2004-17	Lateral	2 040	13	2 027	1 281	84	5	117	914	**6 481**
2004-17	Medial	2 371	41	2 146	2 314	265	5	95	857	**8 094**
Total		**4 411**	**95**	**6 364**	**7 545**	**365**	**13**	**259**	**2 304**	**21 356**

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 7a: Treatment of meniscal lesions in primary reconstructions

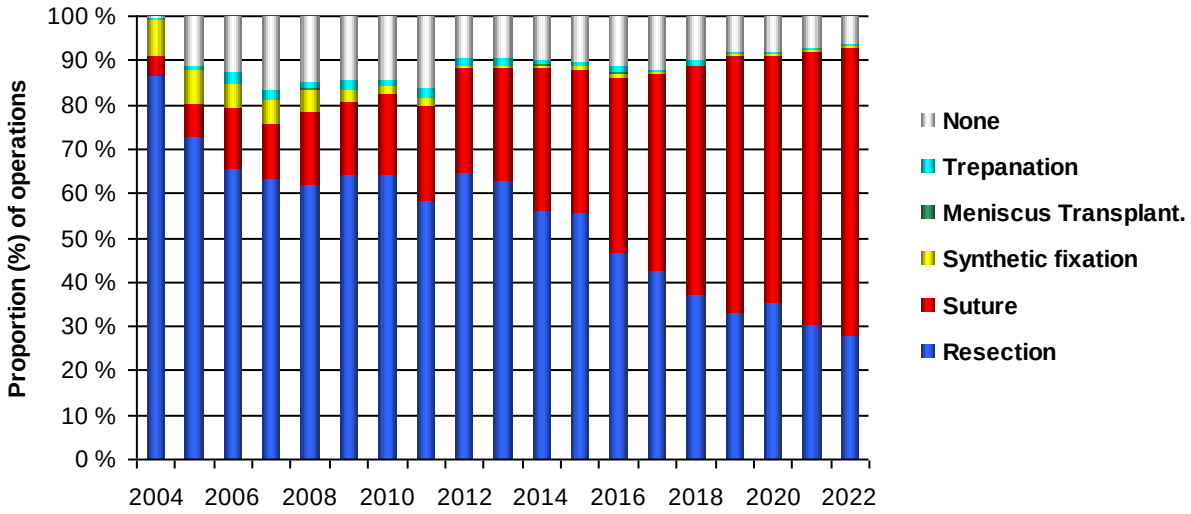


Figure 7b: Distribution of medial meniscal rupture types

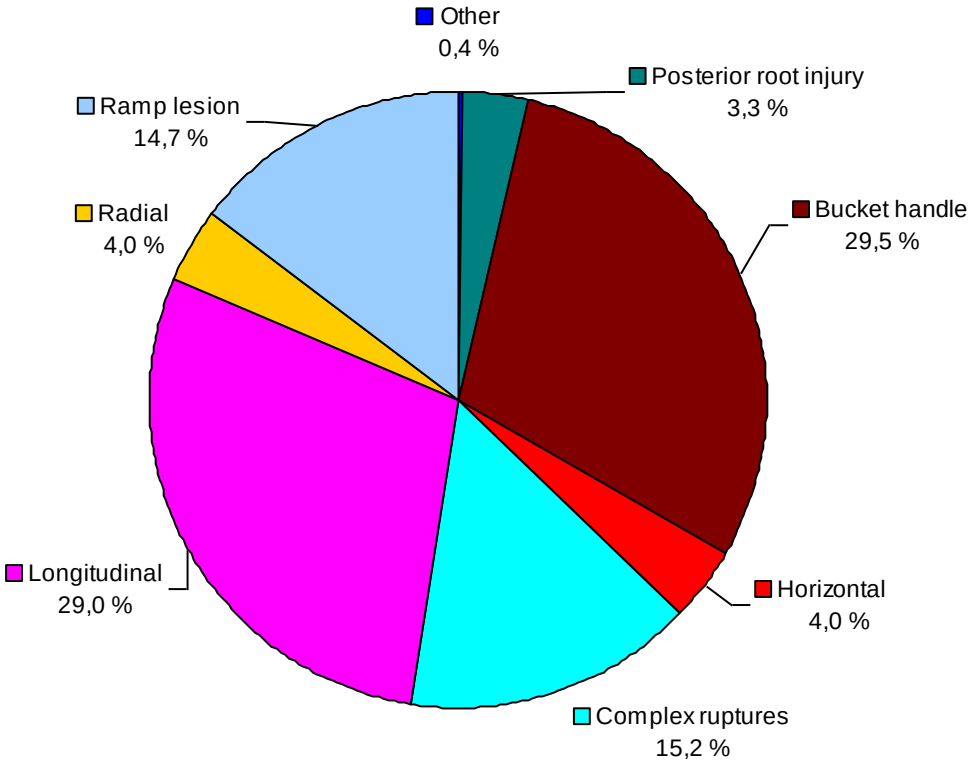
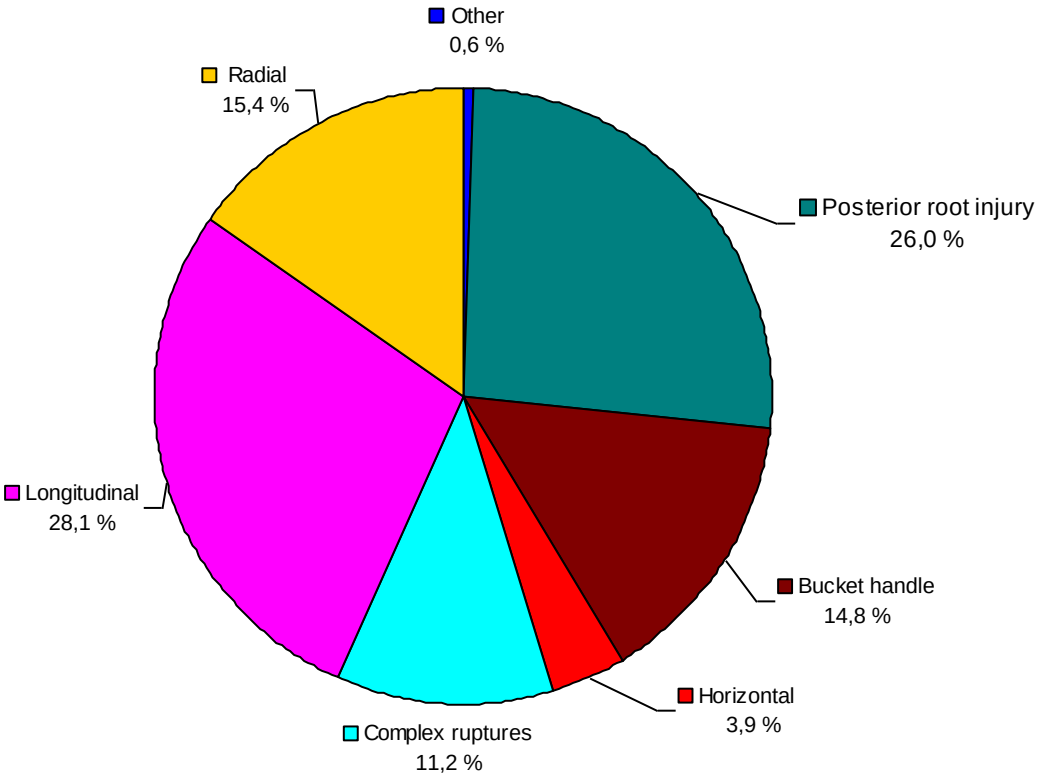


Figure 7c: Distribution of lateral meniscal rupture types



Meniscal fixation

Table 21: Synthetic

Product	2004-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Contour Meniscus arrow	143													**143**
FAST-FIX	1	6	3		1		4	1			1	3	2	**22**
Meniscal Dart	19													**19**
Meniscal Dart Stick	23	1												**24**
Meniscus arrow	28	2		1										**31**
Truespan Meniscal Repair System										1			1	**2**
Unknown	16	11	4	4	7	10	9							**61**
Total	**230**	**20**	**7**	**5**	**8**	**10**	**13**	**1**		**1**	**1**	**3**	**3**	**302**

Table 22: Suture

Product	2004-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
BioComposite SwiveLock C w/Fiber Tape								9	7	11	7	12	8	**54**
Bio-Tenodesis Screw System											1			**1**
Coated Braided Polyester Ssuture												3	2	**5**
Endobutton (BOX OF 1) Str									1	14	5	13	12	**45**
Endobutton CL BTB													2	**2**
Endobutton CL Ultra										4	2	3	3	**12**
Endobutton Tape Polyester											1			**1**
FAST-FIX	477	194	208	203	280	319	406	459	538	625	527	513	608	**5 357**
FiberStitch Implant Suture											11	9	11	**31**
FiberTak System Implant													1	**1**
Gastro-urological guidewire												1		**1**
JuggerKnot Soft Anchors													1	**1**
Meniscal Cinch										7	5	1		**13**
Meniscal Dart Stick	1								1					**2**
Meniscal Root Repair System												2	1	**3**
Meniscus arrow	3	4												**7**
Orthocord w/Double-Armed Meniscal Needles									1	29	11	24	44	**109**
PDS II (polydioxanone) sutur								8			1			**9**
Rapidloc	72			2										**74**
Screw Softsilk											1			**1**
SharpShoter													2	**2**
Sutur Vicryl									1					**1**
Suture Buttons										12	6	1	6	**25**
Suture Washer Ster.									4	11	7	6	6	**34**
SutureTape										1		2	12	**15**
Tightrope ABS Button										2	2	5	7	**16**
Truespan Meniscal Repair System										21	28	17	68	**134**
Unknown	10	48	40	43	49	54	65	23	12	1	3	4	1	**353**
Xtendobutton Fixation Device												1		**1**
Total	**563**	**246**	**248**	**248**	**329**	**373**	**471**	**499**	**565**	**738**	**618**	**617**	**795**	**6 310**

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
2022	29,2%	51,5%	15,8%	3,0%	0,5%
2021	30,1%	49,1%	16,5%	3,8%	0,5%
2020	40,5%	41,3%	15,2%	2,3%	0,7%
2019	42,6%	38,9%	15,1%	2,1%	1,2%
2018	44,2%	38,1%	13,5%	2,7%	1,5%
2004-17	36,1%	42,1%	16,2%	4,3%	1,2%

Table 24: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2022	12,6%	0,8%	84,7%	0,4%	1,4%
2021	7,9%	0,6%	86,6%	0,9%	3,9%
2020	5,7%	0,9%	87,5%	1,0%	5,0%
2019	5,3%	0,7%	87,8%	0,5%	5,7%
2018	6,6%	1,3%	84,3%	0,5%	7,3%
2004-17	11,4%	3,0%	67,1%	0,9%	17,6%

Cartilage injuries registered in primary reconstructions

Figure 8: All Cartilage injuries (total)

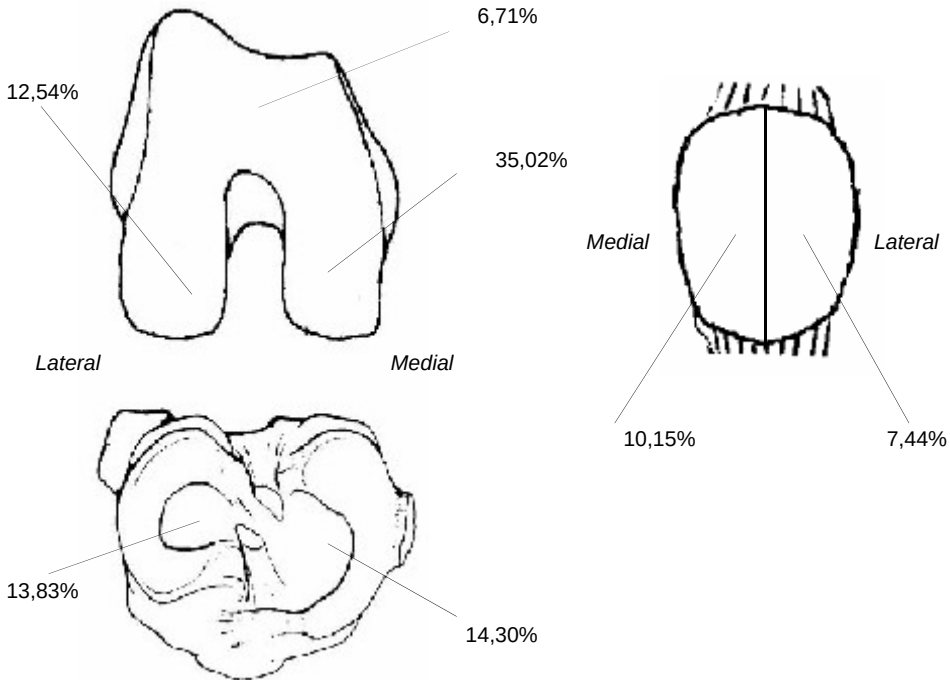
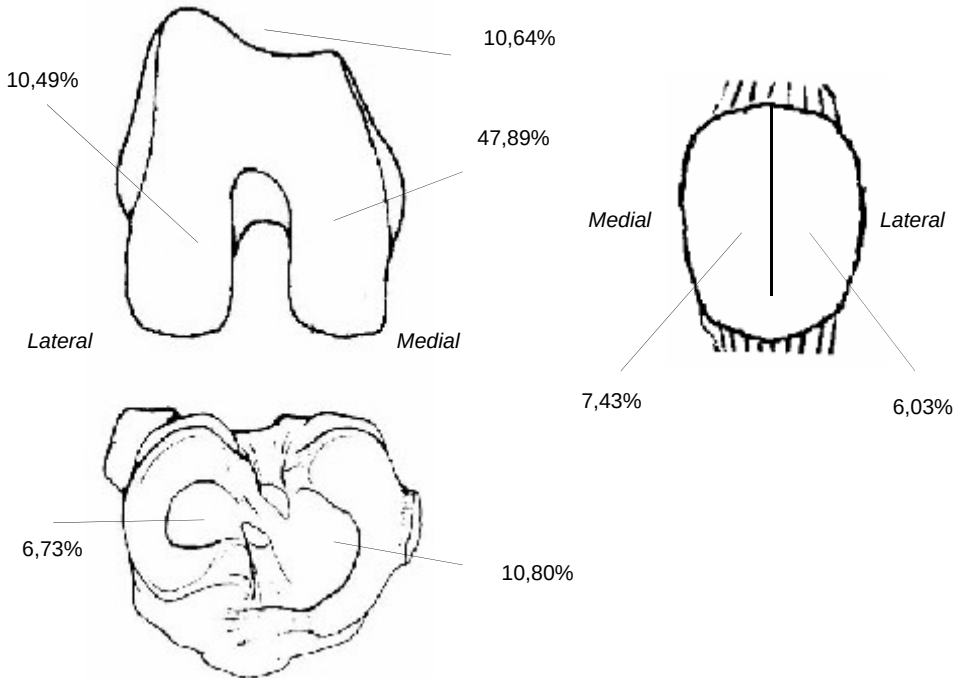


Figure 9: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 25: Outpatient surgery

	Yes		No		Missing		Total
2022	1 526	(82,2%)	330	(17,8%)	1	(0,1%)	**1 857**
2021	1 263	(82,6%)	264	(17,3%)	1	(0,1%)	**1 529**
2020	1 384	(82,7%)	280	(16,7%)	10	(0,6%)	**1 674**
2019	1 452	(73,6%)	513	(26,0%)	7	(0,4%)	**1 972**
2018	1 403	(73,8%)	493	(25,9%)	6	(0,3%)	**1 902**
2004-17	13 332	(57,0%)	9 934	(42,5%)	118	(0,5%)	**23 384**
Total	**20 360**	**(63,0%)**	**11 814**	**(36,6%)**	**143**	**(0,4%)**	**32 318**

Intraoperative complications

Table 26: Intraoperative complications

	Yes		No		Missing		Total
2022	50	(2,7%)	1 787	(96,2%)	20	(1,1%)	**1 857**
2021	32	(2,1%)	1 473	(96,3%)	24	(1,6%)	**1 529**
2020	34	(2,0%)	1 618	(96,7%)	22	(1,3%)	**1 674**
2019	37	(1,9%)	1 904	(96,6%)	30	(1,5%)	**1 972**
2018	43	(2,3%)	1 818	(95,6%)	41	(2,2%)	**1 902**
2004-17	718	(3,1%)	22 154	(94,7%)	511	(2,2%)	**23 384**
Total	**914**	**(2,8%)**	**30 754**	**(95,2%)**	**648**	**(2,0%)**	**32 318**

Systemic antibiotic prophylaxis

Table 27: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2022	1 842	(99,2%)	15	(0,8%)			**1 857**
2021	1 519	(99,3%)	7	(0,5%)	3	(0,2%)	**1 529**
2020	1 665	(99,5%)	8	(0,5%)	1	(0,1%)	**1 674**
2019	1 966	(99,7%)	5	(0,3%)	1	(0,1%)	**1 972**
2018	1 891	(99,4%)	7	(0,4%)	4	(0,2%)	**1 902**
2004-17	23 225	(99,3%)	104	(0,4%)	55	(0,2%)	**23 384**
Total	**32 108**	**(99,4%)**	**146**	**(0,5%)**	**64**	**(0,2%)**	**32 318**

Table 28: Drug

	2004-17	2018	2019	2020	2021	2022
Benzylpenicillin (Penicillin G)	0,02%					
Cefaleksin (Keflex, Cefalexin)	0,01%					0,05%
Cefalotin (Keflin)	91,73%	68,16%	19,53%	11,83%	11,59%	13,08%
Cefazolin (Cephazolin)	0,34%	28,93%	69,99%	83,00%	86,37%	84,20%
Cefotaksim (Claforan)	0,01%					
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1,20%		0,46%			
Ciprofloksasin (Ciproxin)	0,01%					
Dikloksacillin (Diclocil, Dicillin)	2,42%	0,05%	0,05%	0,12%		0,27%
Doksysyklin (Vibramycin, Dumoxin, Doxylin)	0,00%					
Erytromycin (Ery-max, Abboticin)	0,01%					
Gentamicin (Garamycin, Gensumycin)	0,03%					
Klindamycin (Dalacin, Clindamycin)	2,36%	2,22%	1,98%	2,64%	1,38%	1,74%
Kloksacillin (Ekvacillin)	1,57%		7,48%	2,28%	0,46%	0,27%
Linkomycin (Lincocin)	0,00%		0,05%			
Oxacillin (Unspecified)	0,03%					
Piperacillin\Tazobactam (Tazocin)		0,05%				
Tobramycin (Nebcina, Nebcin, Tobi)	0,01%					
Missing	0,25%	0,58%	0,46%	0,12%	0,20%	0,38%

Thrombosis prophylaxis

Table 29: Thrombosis prophylaxis

	Yes		No		Missing		Total
2022	921	(49,6%)	931	(50,1%)	5	(0,3%)	**1 857**
2021	753	(49,2%)	771	(50,4%)	5	(0,3%)	**1 529**
2020	933	(55,7%)	738	(44,1%)	3	(0,2%)	**1 674**
2019	1 295	(65,7%)	672	(34,1%)	5	(0,3%)	**1 972**
2018	1 448	(76,1%)	452	(23,8%)	2	(0,1%)	**1 902**
2005-17	18 370	(81,3%)	3 983	(17,6%)	262	(1,2%)	**22 615**
Total	**23 720**	**(75,2%)**	**7 547**	**(23,9%)**	**282**	**(0,9%)**	**31 549**

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
2022	741	(80,5%)	180	(19,5%)	**921**
2021	634	(84,2%)	119	(15,8%)	**753**
2020	734	(78,7%)	199	(21,3%)	**933**
2019	1 214	(93,7%)	81	(6,3%)	**1 295**
2018	1 422	(98,2%)	26	(1,8%)	**1 448**
2005-17	18 242	(99,3%)	128	(0,7%)	**18 370**
Total	**22 987**	**(96,9%)**	**733**	**(3,1%)**	**23 720**

Table 31: Drug

	2004-17	2018	2019	2020	2021	2022
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)	0,01%		0,23%	0,43%	0,93%	0,54%
Apixaban (Eliquis)		0,14%	0,23%	0,21%	0,53%	0,43%
Dabigatranetixalat (Re-Novate, Pradaxa)	0,01%	0,07%				0,11%
Dalteparin (Fragmin)	60,64%	57,80%	54,75%	49,95%	50,73%	50,16%
Dekstran (Macrodex, Dextran)	0,10%					
Enoksaparin (Klexane)	36,00%	39,64%	37,68%	27,65%	31,21%	27,25%
Heparin (Heparin)	0,01%					
Rivaroksaban (Xarelto)	0,05%	0,07%	0,15%	0,11%		1,30%
Ticagrelor (Brilique)		0,07%				0,22%
Warfarin (Marevan)	0,04%			0,11%	0,13%	
Ximelagatran (Exanta, Malagatran)	0,16%					
Unknown	0,01%					
No drugs	1,99%					
Missing	0,28%	0,41%	0,69%	0,21%	0,66%	0,43%
Two drugs	0,70%	1,80%	6,25%	21,33%	15,80%	19,54%

Physiotherapy *

Table 32: Physiotherapy

	Yes		No		Uncertain		Total
2022	1 024	(81,9%)	195	(15,6%)	31	(2,5%)	**1 250**
2021	819	(83,4%)	132	(13,4%)	31	(3,2%)	**982**
2020	72	(82,8%)	11	(12,6%)	4	(4,6%)	**87**
2019	8	(80,0%)	2	(20,0%)	0	(0,0%)	**10**
Total	**1 923**	**(82,6%)**	**340**	**(14,6%)**	**66**	**(2,8%)**	**2 329**

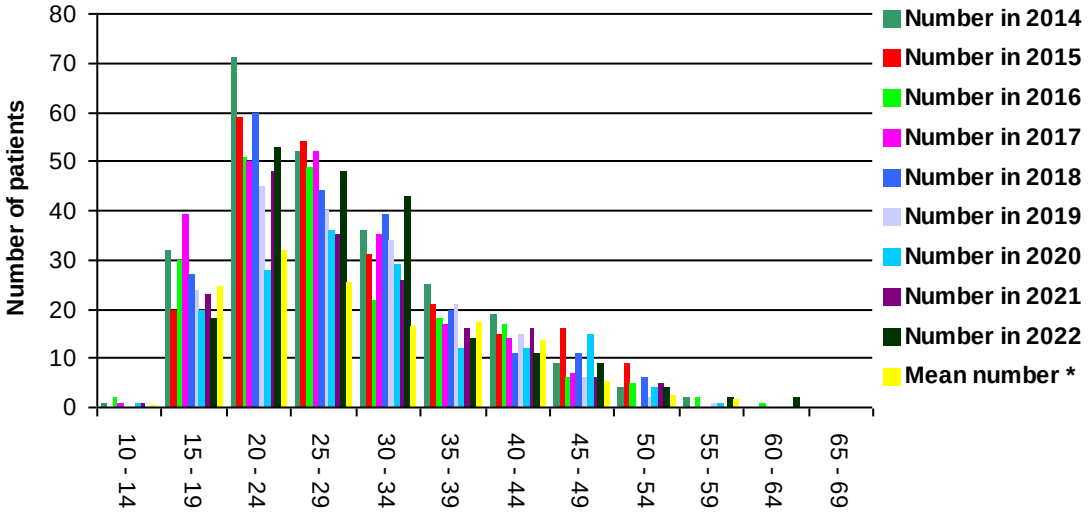
Table 33: Reason for physiotherapy not carried out

	Acute injury		Undesirable		Economy		Other		Missing		Total
2022	171	(87,7%)	3	(1,5%)	0	(0,0%)	16	(8,2%)	5	(2,6%)	**195**
2021	114	(86,4%)	4	(3,0%)	0	(0,0%)	13	(9,8%)	1	(0,8%)	**132**
2020	7	(63,6%)	2	(18,2%)	0	(0,0%)	1	(9,1%)	1	(9,1%)	**11**
2019	0	(,0%)	0	(0,0%)	0	(0,0%)	0	(0,0%)	2	(100,0%)	**2**
Total	**292**	**(85,9%)**	**9**	**(2,6%)**	**0**	**(0,0%)**	**30**	**(8,8%)**	**9**	**(2,6%)**	**340**

* Electronic registration started in 2019

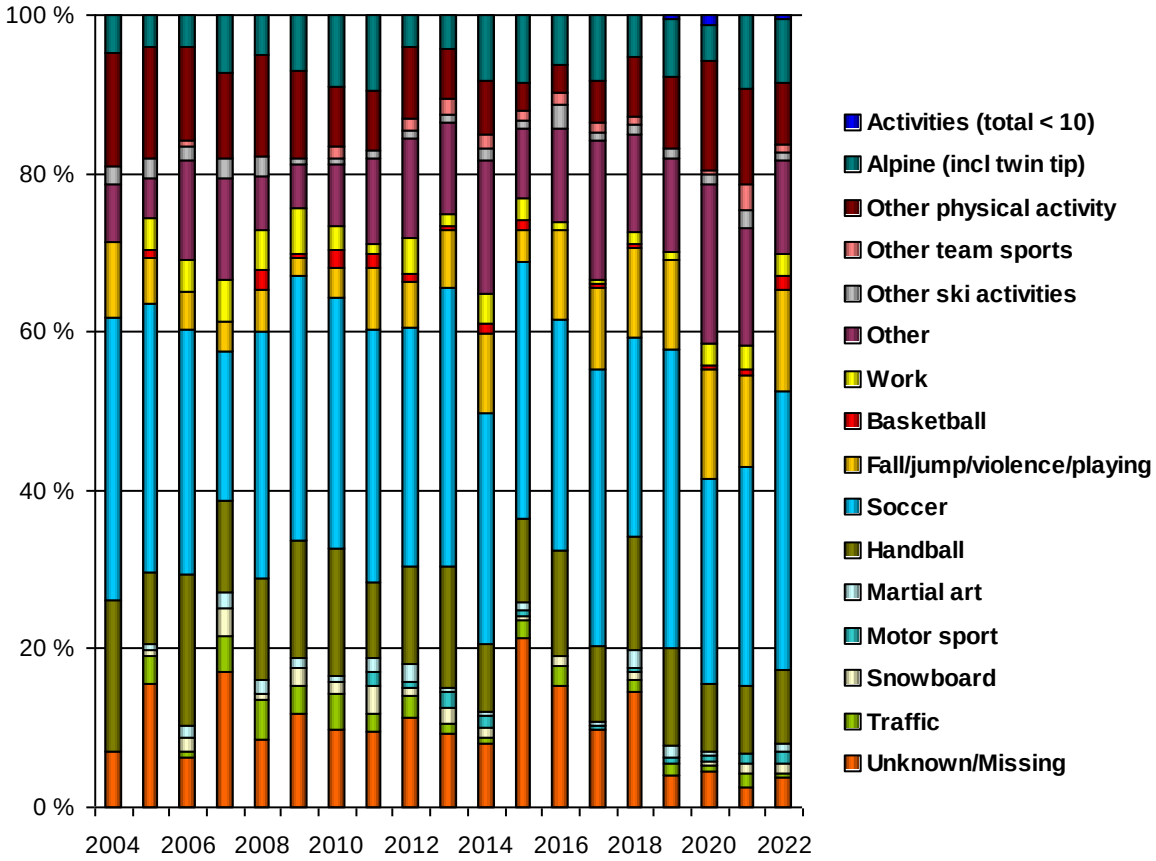
Revision reconstruction

Figure 10: Age by revision reconstruction



* Mean number of revision reconstructions for 2004 - 2013

Figure 11: Activity that led to injury



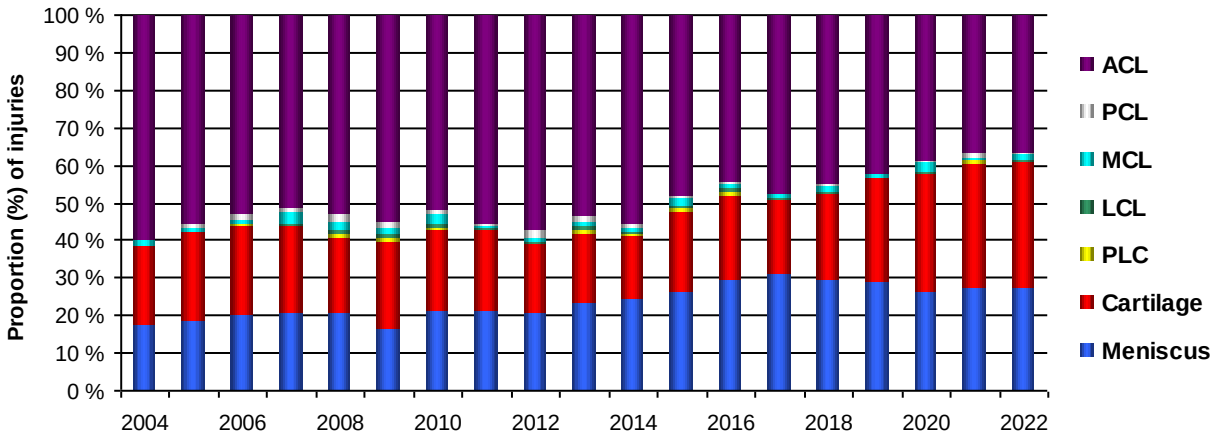
Actual injury

Table 34: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2022	185	4	7	2		98	140
2021	160	7	3	1	3	91	121
2020	151	3	9	2	1	67	104
2019	181	1	5			89	125
2018	208	3	8	1	1	95	136
2004-17	2 024	43	56	22	23	794	906
Total	**2 909**	**61**	**88**	**28**	**28**	**1 234**	**1 532**

* More than one type of injury can be given for each form

Figure 12: Actual injury



Additional injuries

Table 35: ACL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
1 017	x						
703	x					x	
654	x					x	x
408	x						x
19	x		x				
14	x		x			x	x
9	x		x			x	
9	x		x				x
6	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 36: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
17		x					
8		x					x
5	x	x					x
5	x	x					
4	x	x	x				x
3	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 37: Reason for revision reconstruction

	Cause 1	Cause 2	Cause 3	Cause 4	Cause 5	Cause 6	Cause 7	Cause 8	Other	Total
2022		17	1	81	109	2	16	35		261
2021		8	2	76	87	6	10	20		209
2020	1	6	1	54	84	2	5	12		165
2019	2	5	2	74	93	10	7	6		199
2018	3	9	3	95	95	5	6	3		219
2004-17	33	85	22	897	796	33			35	1 901
Total	**39**	**130**	**31**	**1 277**	**1 264**	**58**	**44**	**76**	**35**	**2 954**

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 38: BPTB

	ACL	PCL	MCL	LCL	PLC	Total
2022	75	0	0	0	0	**75**
2021	76	0	0	0	0	**76**
2020	71	0	0	0	0	**71**
2019	82	0	0	0	0	**82**
2018	96	0	0	0	0	**96**
2004-17	949	2	0	0	0	**951**
Total	**1 349**	**2**	**0**	**0**	**0**	**1 351**

Table 39: HAMSTRING

	ACL	PCL	MCL	LCL	PLC	Total
2022	50	0	2	0	0	**50**
2021	37	1	1	0	0	**38**
2020	41	1	4	0	0	**42**
2019	47	0	1	0	0	**47**
2018	41	0	2	0	0	**41**
2004-17	777	9	17	4	3	**793**
Total	**993**	**11**	**27**	**4**	**0**	**1 035**

Table 40: ALLOGRAFT

	ACL	PCL	MCL	LCL	PLC	Total
2022	16	4	4	0	0	**20**
2021	15	5	2	1	3	**24**
2020	7	2	0	0	0	**9**
2019	4	1	1	0	0	**5**
2018	6	0	0	0	0	**6**
2004-17	71	25	12	10	14	**120**
Total	**119**	**37**	**19**	**11**	**17**	**203**

Tabell 41: Quadriceps Graft (QTC + QTB)

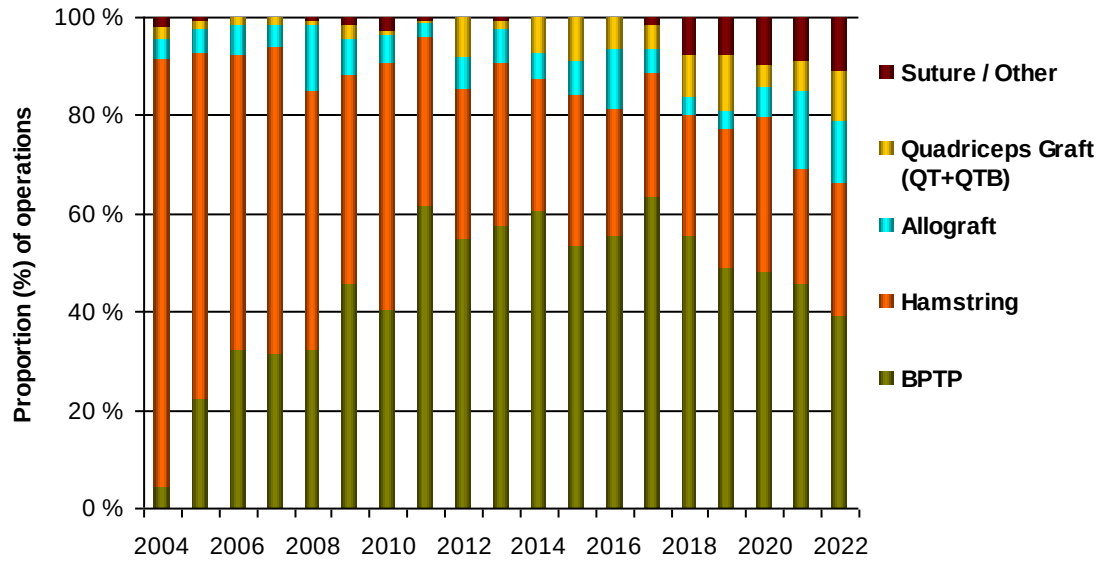
	ACL	PCL	MCL	LCL	PLC	Total
2022	145	0	0	0	0	**145**
2021	108	0	1	0	0	**109**
2020	92	1	0	0	0	**93**
2019	142	2	0	0	0	**144**
2018	113	2	0	0	0	**115**
2004-17	305	9	0	0	1	**315**
Total	**905**	**14**	**1**	**0**	**1**	**921**

Table 42: Suture / Other

	ACL	PCL	MCL	LCL	PLC	Total
2022	19	0	1	1	0	**21**
2021	14	1	0	0	0	**15**
2020	12	0	1	1	0	**14**
2019	12	0	1	0	0	**13**
2018	13	1	1	0	0	**15**
2004-17	8	4	3	0	1	**16**
Total	**78**	**6**	**7**	**2**	**1**	**94**

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 43: Femur ACL (The 5 most common for the last 5 years)

Product	2004-17	2018	2019	2020	2021	2022	Total
SoftSilk	476	43	47	40	40	42	**688**
Endobutton CL Ultra	408	38	34	33	22	25	**560**
Endobutton CL BTB	92	14	13	13	10	2	**144**
Peek Interference Scre	28	10	13	7	17	15	**90**
ACL TightRope	8	1	5	6	14	26	**60**

Table 44: Femur PCL (The 5 most common for the last 5 years)

Product	2004-17	2018	2019	2020	2021	2022	Total
Endobutton CL Ultra	13			1	3		**17**
SoftSilk	8		1		4	3	**16**
RCI Screw	12					1	**13**
Peek Interference Scre	1					1	**2**
Ultrabutton					1	1	**2**

Table 45: Tibia ACL (The 5 most common for the last 5 years)

Product	2004-17	2018	2019	2020	2021	2022	Total
SoftSilk	440	44	60	54	47	42	**687**
RCI Screw	339	21	18	23	21	21	**443**
Biosure HA Interferenc	209	25	11	11	1	4	**261**
Peek Interference Scre	31	11	15	9	13	20	**99**
Biosure PK	36	6	11	9	13	18	**93**

Table 46: Tibia PCL (The 5 most common for the last 5 years)

Product	2004-17	2018	2019	2020	2021	2022	Total
RCI Screw	25		1	1	2	1	**30**
Biosure HA Interferenc	2			1			**3**
Biosure PK					2		**2**
Peek Interference Scre						1	**1**
SUTURE WASHER ST					1		**1**

Table 47: Femur and tibia ACL (The 5 most common for the last 5 years)

Femur	Tibia	2004-17	2018	2019	2020	2021	2022	Total
SoftSilk	SoftSilk	395	30	43	30	28	23	**549**
Endobutton CL Ultra	Biosure HA Interference screw	151	21	8	9	1	2	**192**
Endobutton CL Ultra	RCI Screw	128	14	14	17	10	8	**191**
Peek Interference Screw	Peek Interference Screw	26	10	10	7	17	15	**85**
Endobutton CL BTB	SoftSilk	18	7	7	13	8	1	**54**

Meniscal lesion

Table 48: Actual treatment of meniscal lesion

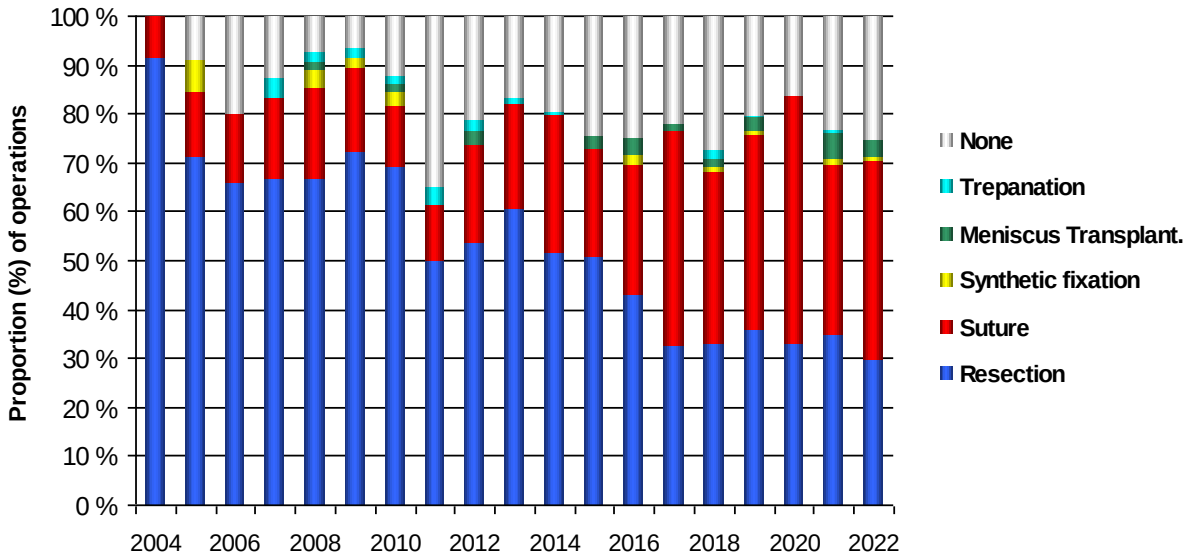
		Resection				Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
		OLD	Total	Partial	Suture					
2022	Lateral			18	26				18	**62**
2022	Medial		1	29	40	1	6		23	**100**
2021	Lateral			17	22			1	9	**49**
2021	Medial			30	24	2	7		22	**85**
2020	Lateral			14	25				8	**47**
2020	Medial		1	23	34				11	**69**
2019	Lateral			17	27		1	1	11	**57**
2019	Medial		1	32	28	1	3		17	**82**
2018	Lateral			23	31			2	13	**69**
2018	Medial		1	31	29	1	3	1	33	**99**
2004-17	Lateral	85	2	136	96	5	3	7	95	**429**
2004-17	Medial	149	6	211	159	6	12	5	119	**667**
Total		**234**	**12**	**581**	**541**	**16**	**35**	**17**	**379**	**1 815**

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 34: 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 49: Synthetic

Product	2004-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Contour Meniscus arrow	3													**3**
FAST-FIX									1	1		2		**4**
Meniscus arrow	1													**1**
Truespan Meniscal Repair System													1	**1**
Unknown	1						3							**4**
Total	**5**						**3**		**1**	**1**		**2**	**1**	**13**

Table 50: Suture

Product	2004-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
BioComposite SwiveLock C w/Fiber Tape								3	1	4	1		1	**10**
Endobutton (BOX OF 1) Str										3	2	4	5	**14**
FAST-FIX	28	5	14	16	19	16	15	41	33	38	38	28	51	**342**
Meniscus arrow	1													**1**
Orthocord w/Double-Armed Meniscal Needles										1		6	4	**11**
PDS II (polydioxanone) sutur								1	1					**2**
Rapidloc	4													**4**
Suture Buttons										2			1	**3**
Suture Washer Ster.									1	1	1	1	2	**6**
Tightrope ABS Button													3	**3**
Truespan Meniscal Repair System										1		2	2	**5**
Ultratape Suture Blue												1		**1**
Unknown	1	4	1	5	6	9	13	1	2	2				**44**
Total	**34**	**9**	**15**	**21**	**25**	**25**	**28**	**46**	**38**	**52**	**42**	**42**	**69**	**446**

Cartilage lesion all localizations

Table 51: ICRS Grade

Definition 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
2022	27,7%	53,8%	17,2%	1,3%	
2021	35,0%	48,1%	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%
2004-17	24,5%	48,1%	21,1%	4,8%	1,5%

Table 52: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2022	4,6%		92,4%		2,9%
2021	6,2%	0,8%	91,4%		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%
2004-17	8,8%	2,1%	73,0%	1,1%	15,0%

Cartilage injuries registered in revision reconstructions

Figure 15: All Cartilage injuries (total)

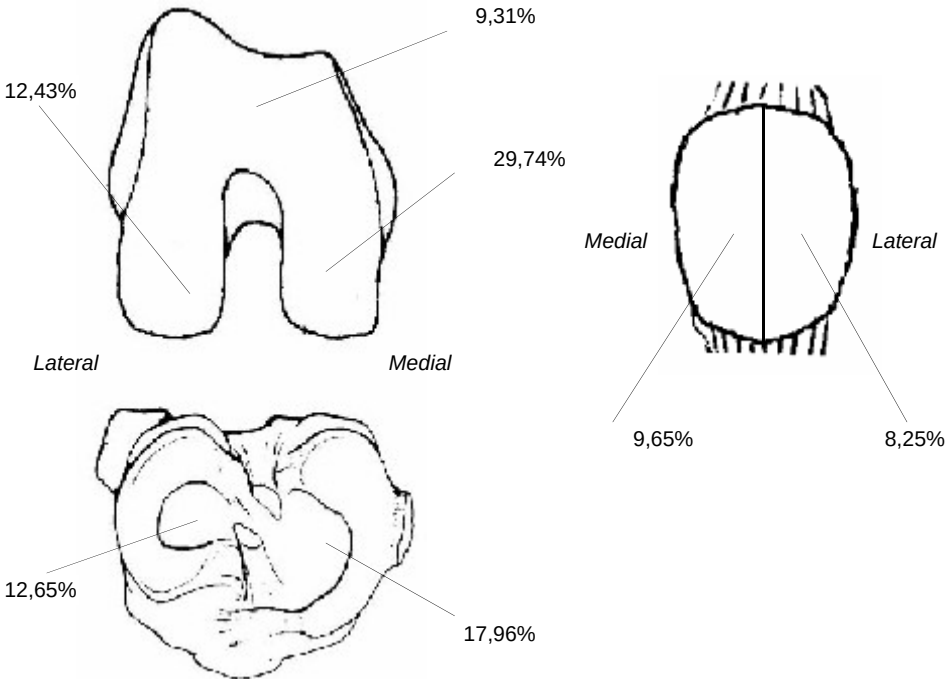


Figure 16: All Cartilage injuries with area greater than 2 cm² (total)

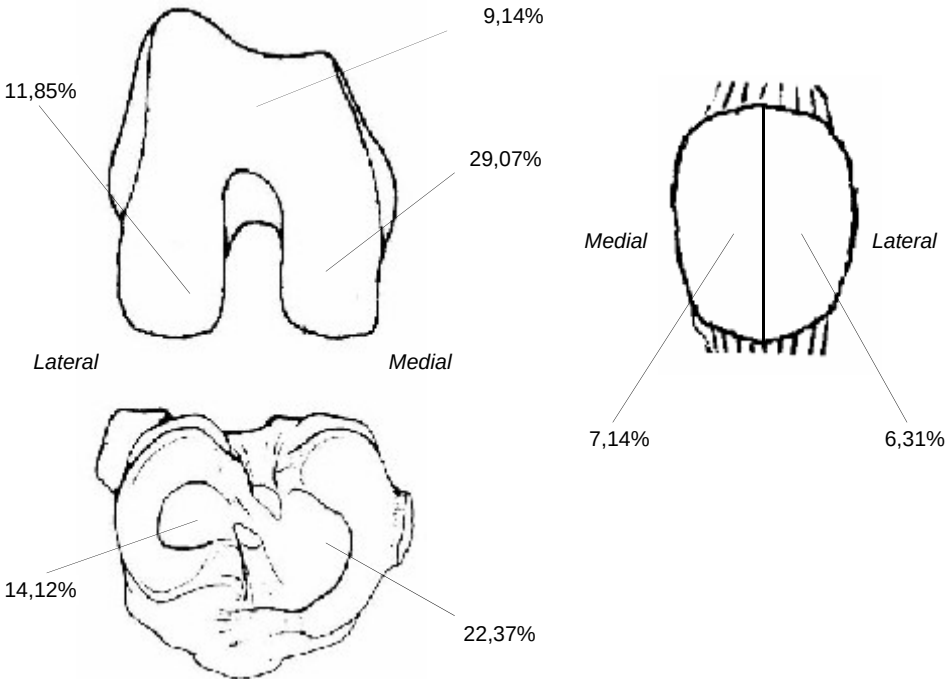
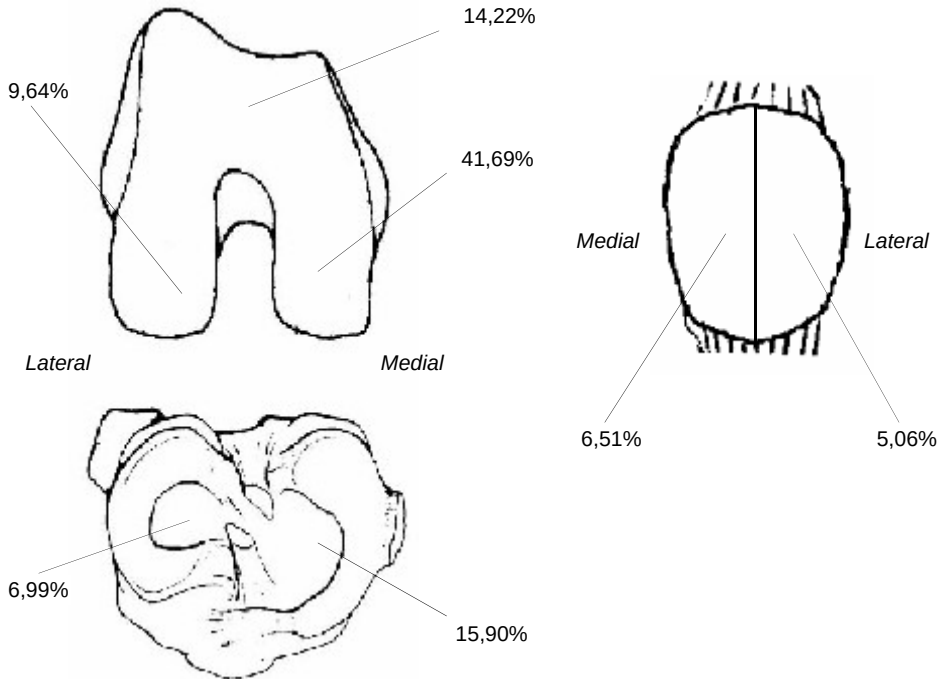


Figure 17: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 53: Outpatient surgery

	Yes		No		Missing		Total
2022	118	(57,8%)	85	(41,7%)	1	(0,5%)	**204**
2021	102	(58,0%)	74	(42,0%)			**176**
2020	99	(62,7%)	59	(37,3%)			**158**
2019	93	(49,5%)	93	(49,5%)	2	(1,1%)	**188**
2018	118	(54,1%)	98	(45,0%)	2	(0,9%)	**218**
2004-17	1 001	(43,7%)	1 270	(55,4%)	22	(1,0%)	**2 293**
Total	**1 531**	**(47,3%)**	**1 679**	**(51,9%)**	**27**	**(0,8%)**	**3 237**

Intraoperative complications

Table 54 : Intraoperative complications

	Yes		No		Missing		Total
2022	3	(1,5%)	200	(98,0%)	1	(0,5%)	**204**
2021	8	(4,5%)	165	(93,8%)	3	(1,7%)	**176**
2020	4	(2,5%)	154	(97,5%)			**158**
2019	7	(3,7%)	179	(95,2%)	2	(1,1%)	**188**
2018	3	(1,4%)	206	(94,5%)	9	(4,1%)	**218**
2004-17	83	(3,6%)	2 136	(93,2%)	74	(3,2%)	**2 293**
Total	**108**	**(3,3%)**	**3 040**	**(93,9%)**	**89**	**(2,7%)**	**3 237**

Systemic antibiotic prophylaxis

Table 55: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2022	201	(98,5%)	3	(1,5%)			**204**
2021	172	(97,7%)	3	(1,7%)	1	(0,6%)	**176**
2020	158	(100,0%)					**158**
2019	185	(98,4%)	2	(1,1%)	1	(0,5%)	**188**
2018	215	(98,6%)	3	(1,4%)			**218**
2004-17	2 253	(98,3%)	30	(1,3%)	10	(0,4%)	**2 293**
Total	**3 184**	**(98,4%)**	**41**	**(1,3%)**	**12**	**(0,4%)**	**3 237**

Table 56: Drug

	2004-17	2018	2019	2020	2021	2022
Benzylpenicillin (Penicillin G)	0,04%					
Cefalotin (Keflin)	92,72%	68,37%	14,05%	6,96%	8,14%	6,47%
Cefazolin (Cephazolin)	0,31%	29,30%	77,30%	88,61%	87,79%	92,54%
Ceftriakson (Rocefalin)	0,04%					
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	0,40%					
Ciprofloksasin (Ciproxin)	0,04%					
Dikloksacillin (Diclocil, Dicillin)	1,29%					
Gentamicin (Garamycin, Gensumycin)	0,04%					
Imipenem (Tienam)		0,47%				
Klindamycin (Dalacin, Clindamycin)	2,66%	1,86%	3,24%	3,16%	3,49%	0,50%
Kloksacillin (Ekvacillin)	1,82%		5,41%	0,63%		
Oxacillin (Unspecified)	0,04%					
Vankomycin (Vancomycin, Vancocin)	0,04%					
Missing	0,53%			0,63%	0,58%	0,50%

Thrombosis prophylaxis

Table 57: Thrombosis prophylaxis

	Yes		No		Missing		Total
2022	84	(41,2%)	119	(58,3%)	1	(0,5%)	**204**
2021	80	(45,5%)	96	(54,5%)			**176**
2020	92	(58,2%)	66	(41,8%)			**158**
2019	117	(62,2%)	70	(37,2%)	1	(0,5%)	**188**
2018	152	(69,7%)	65	(29,8%)	1	(0,5%)	**218**
2005-17	1 779	(79,2%)	443	(19,7%)	26	(1,2%)	**2 248**
Total	**2 304**	**(72,2%)**	**859**	**(26,9%)**	**29**	**(0,9%)**	**3 192**

There are 2 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.
There are 53 forms with two drugs and 2251 forms with one drug.

Table 58: Drug

	2004-17	2018	2019	2020	2021	2022
Apixaban (Eliquis)	0,06%			1,09%		
Dalteparin (Fragmin)	64,36%	63,16%	64,10%	43,48%	53,75%	45,24%
Dekstran (Macrodex, Dextran)	0,11%					
Enoksaparin (Klexane)	33,61%	35,53%	33,33%	32,61%	35,00%	39,29%
Rivaroksaban (Xarelto)	0,06%					
Ticagrelor (Brilique)				1,09%		
Warfarin (Marevan)	0,06%					
Ximelagatran (Exanta, Malagatran)	0,17%					
No drugs	0,79%					
Missing	0,34%	0,66%	0,85%			
Two drugs	0,11%	0,66%	1,71%	21,74%	11,25%	15,48%

PROM (Patient Reported Outcome Measures)

Table 59: Number of issued and answered patient questionnaires

	2 years *			5 years *			10 years *			Total		
	Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)	
2022	2 190	1 429	(65,3%)	1 846	942	(51,0%)	1 733	830	(47,9%)	**5 769**	**3 201**	(55,5%)
2021	1 402	760	(54,2%)	1 826	888	(48,6%)	1 794	931	(51,9%)	**5 022**	**2 579**	(51,4%)
2020	1 754	1 039	(59,2%)	1 747	933	(53,4%)	1 708	938	(54,9%)	**5 209**	**2 910**	(55,9%)
2019	1 807	965	(53,4%)	1 698	913	(53,8%)	1 797	1 016	(56,5%)	**5 302**	**2 894**	(54,6%)
2018	1 860	1 002	(53,9%)	1 722	894	(51,9%)	1 646	810	(49,2%)	**5 228**	**2 706**	(51,8%)
2017	1 766	1 022	(57,9%)	1 745	940	(53,9%)	1 602	909	(56,7%)	**5 113**	**2 871**	(56,2%)
2016	1 720	1 053	(61,2%)	1 818	1 054	(58,0%)	1 426	824	(57,8%)	**4 964**	**2 931**	(59,0%)
2015	1 749	1 054	(60,3%)	1 717	962	(56,0%)	1 515	933	(61,6%)	**4 981**	**2 949**	(59,2%)
2014	1 750	1 051	(60,1%)	1 823	1 105	(60,6%)	899	434	(48,3%)	**4 472**	**2 590**	(57,9%)
2013	1 852	1 179	(63,7%)	1 688	1 015	(60,1%)				**3 540**	**2 194**	(62,0%)
2012	1 917	1 145	(59,7%)	1 801	778	(43,2%)				**3 718**	**1 923**	(51,7%)
2011	1 674	1 130	(67,5%)	1 303	849	(65,2%)				**2 977**	**1 979**	(66,5%)
2010	1 866	1 173	(62,9%)	1 694	1 069	(63,1%)				**3 560**	**2 242**	(63,0%)
2009	1 633	1 118	(68,5%)	762	429	(56,3%)				**2 395**	**1 547**	(64,6%)
2008	1 545	886	(57,3%)							**1 545**	**886**	(57,3%)
2007	1 458	788	(54,0%)							**1 458**	**788**	(54,0%)
2006	954	451	(47,3%)							**954**	**451**	(47,3%)
Total	28 897	17 245	(59,7%)	23 190	12 771	(55,1%)	14 120	7 625	(54,0%)	**66 207**	**37 641**	(56,9%)

* The register sends questionnaires to patients 2, 5 and 10 years post-operatively

Completeness analysis for the Cruciate Ligament Register, 2019-2020

A completeness analysis for the Cruciate 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 Cruciate Ligament Register.

NCSP codes for combining data from NPR hospital stays and the Cruciate 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

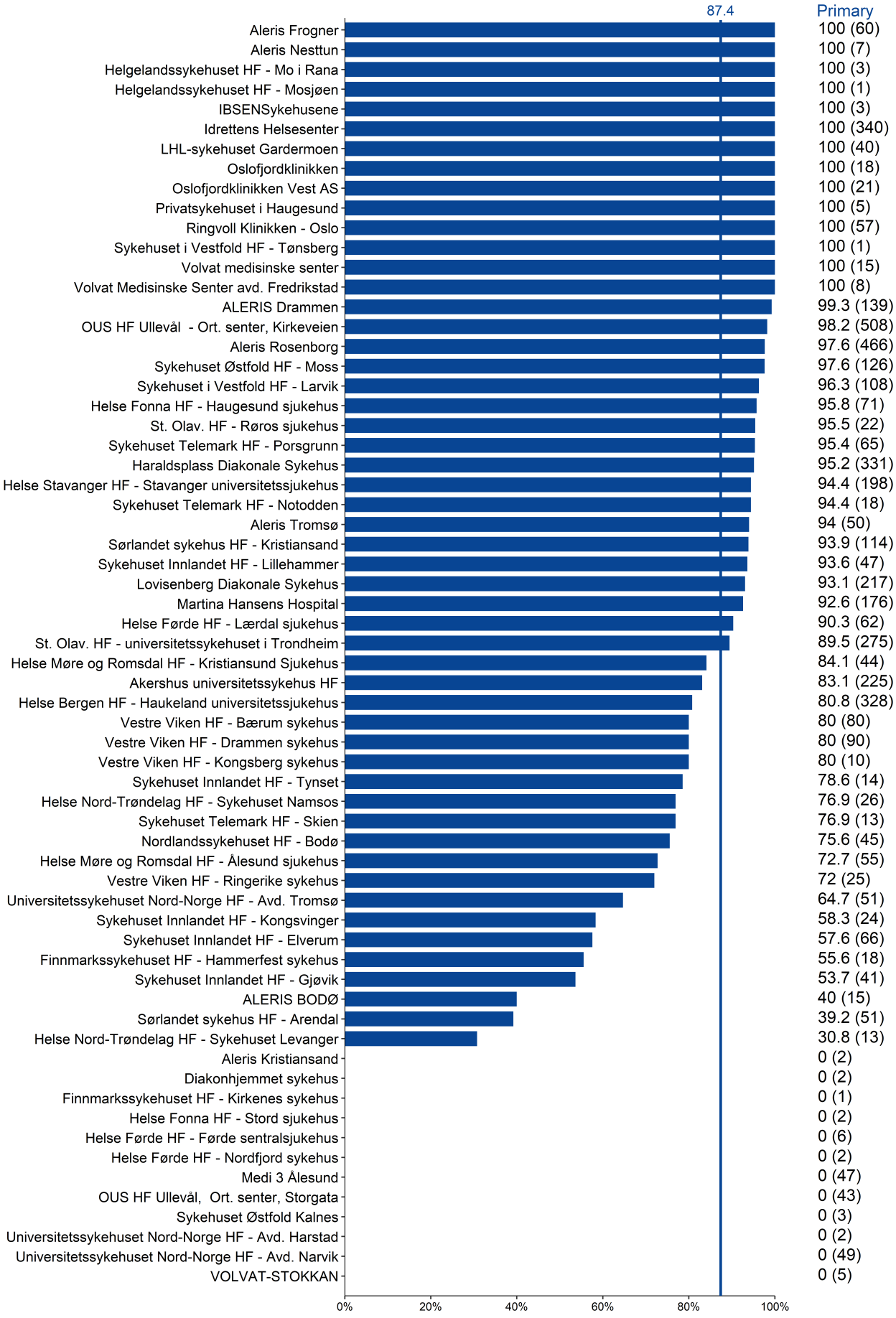
Formulae for completeness rates:

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

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

In 2019-2020, 4970 cruciate ligament operations were reported to one or both of the registers. 87.4% of these were reported to the Cruciate Ligament Register, while 74.3% were reported to the NPR. The coverage for the Cruciate Ligament Register shows considerable variation between hospitals. In the case of hospitals with a low coverage rate for the Cruciate Ligament Register, either the forms were not submitted or other interventions than cruciate ligament surgery were incorrectly coded.

Completeness of reporting for cruciate ligament operations , 2019-2020



The vertical line shows the national average. The numbers in brackets gives the number of operations registred at both NAR and NPR

CONTENTS

Norwegian Pediatric Hip Register

ANNUAL REPORT NORWEGIAN PAEDIATRIC HIP REGISTER

The Pediatric Hip Registry now receives all forms electronically through MRS (Medical Registration System). Patient-Reported Outcome Measures (PROMs) are sent directly to patients who respond to the forms by logging in through Bank-ID. For adult hip cases, the electronic PROM collection started in September 2022.

In total, 11 hospitals reported patients to the registry in 2022. We observe that this number is lower than in previous years, and it appears that more of the treatment for these hip conditions is being centralized at larger university hospitals. This is as expected, given that these are rare conditions, some of which involve significant surgeries, and in some cases, patients as young as 6 months old.

We are pleased to present the data from the quality improvement study conducted at 5 hospitals across the country. The study aimed to assess the time it takes for patients with Perthes disease and slipped capital femoral epiphysis (SCFE) from they experience their first symptoms to they receive the correct diagnosis and start treatment. For Perthes patients, it takes around 14 weeks from the onset of symptoms until they seek primary healthcare. In the case of SCFE, this time is approximately 9 weeks. The time it takes for Perthes patients to receive their diagnosis is about 17 weeks, while for SCFE, it's approximately 19 weeks. It appears that hospitals have effective routines in place for assessing referrals and promptly scheduling consultations, with referral assessment times being 3 and 1 day for Perthes and SCFE, respectively, and consultation times being 4 and 1 day for the two conditions. The challenge lies in how we can effectively reach the general population and primary healthcare providers with information, primarily to encourage patients to seek medical attention when experiencing symptoms.

For SCFE, we are now observing that most patients are being operated on with implants that allow for further growth in the proximal femoral growth plate. However, there will always be cases where patients are operated on with implants that do not permit growth, particularly in situations where open reduction is performed for severe slippage and rapid physeal fusion is desired to achieve stability. Interestingly, regarding patients reported with SCFE, there is a predominance of girls, accounting for 52%. This diagnosis typically has a higher occurrence in boys, making it an interest to explore the reasons behind this increased proportion of girls in the reported cases.

For hip dysplasia, we are observing that nearly 60% of those reported to the registry receive the diagnosis after 3 months, categorizing them as late-detected cases. Only around 43% of those reported have been screened with ultrasound (US) at birth due to known risk factors or clinical findings during newborn examinations. Even though the number of patients is not high, it remains crucial to work on reducing this percentage as much as possible, as this patient group often requires more extensive and prolonged treatment to achieve good hip function. The registry considers it a responsibility to utilize our data in further efforts to develop interdisciplinary treatment recommendations for screening, treatment, and follow-up of children with hip joint dysplasia.

Bergen, June 2023

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Chief Physician
Responsible Adult hip

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Biostatistician/researcher

Figure F.1: Number of treated patients registered in Norwegian Pediatric Hip Register

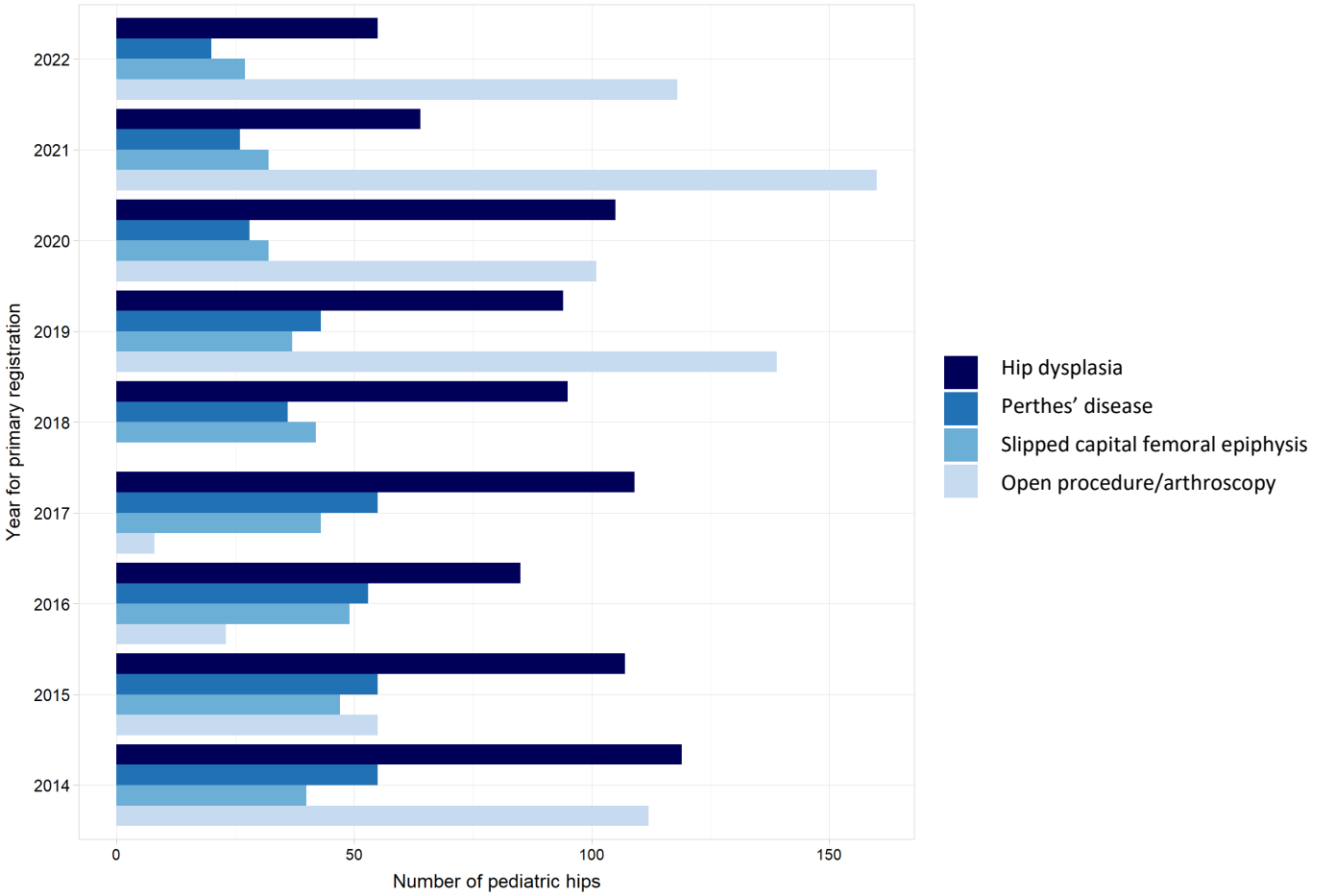


Figure F.2: Number of treated patients by diagnosis at each hospital

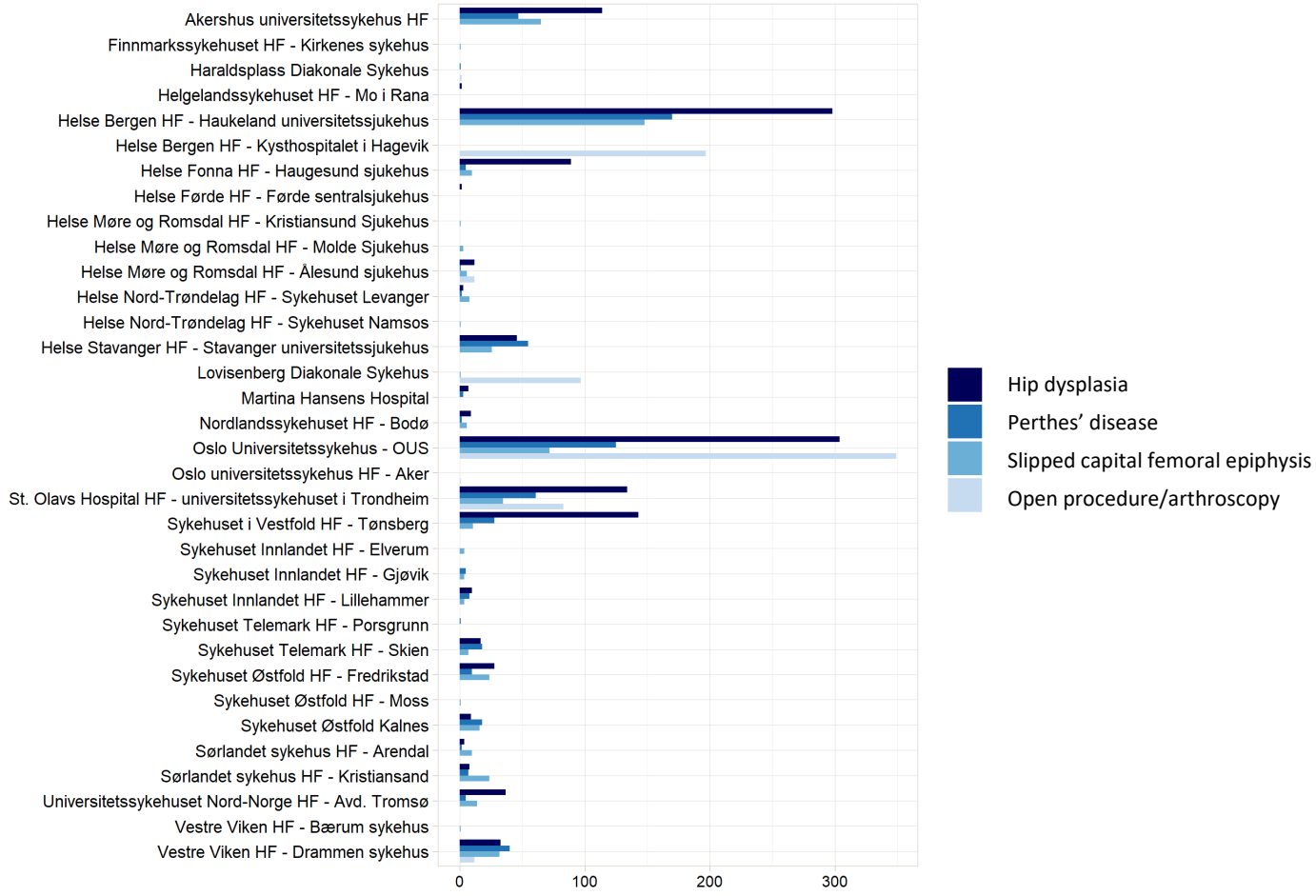


Figure F.3: Time trend for symptom duration before Perthes' disease

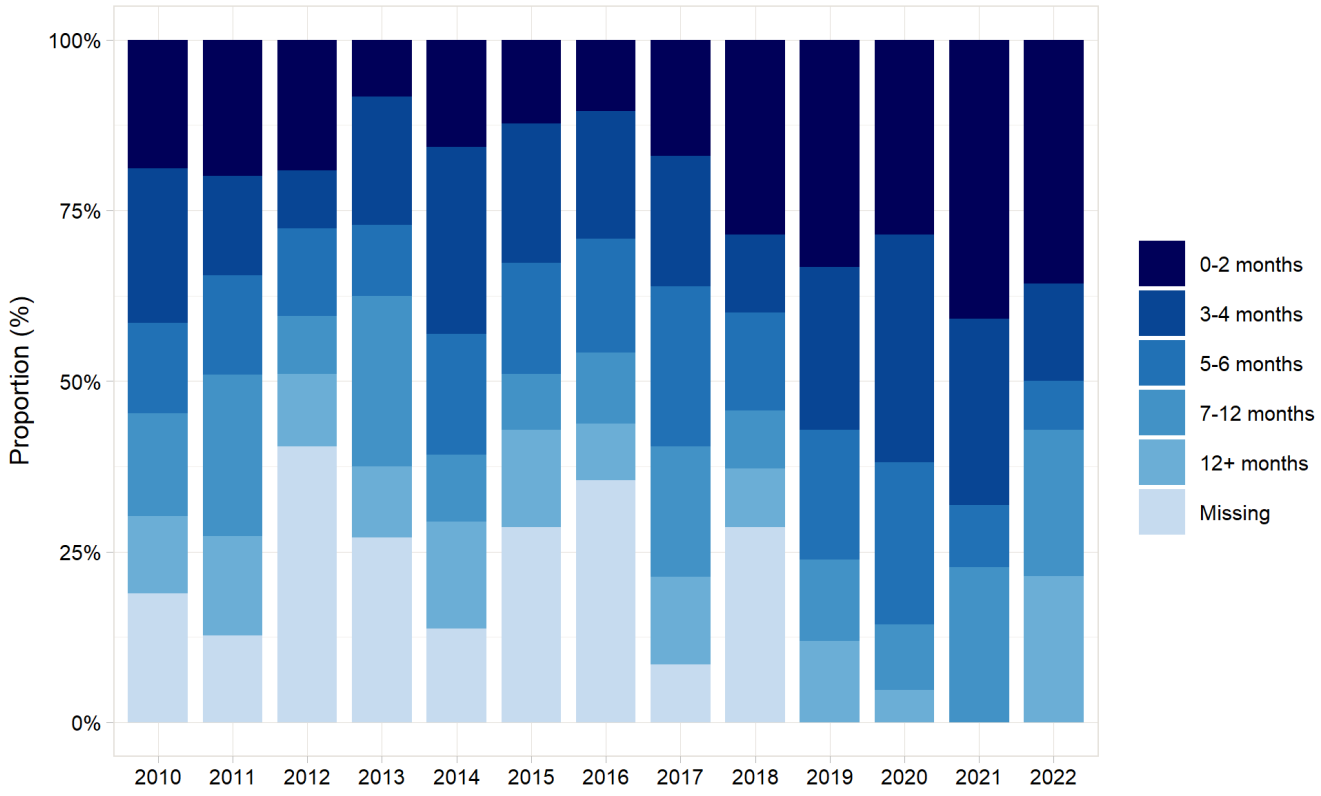
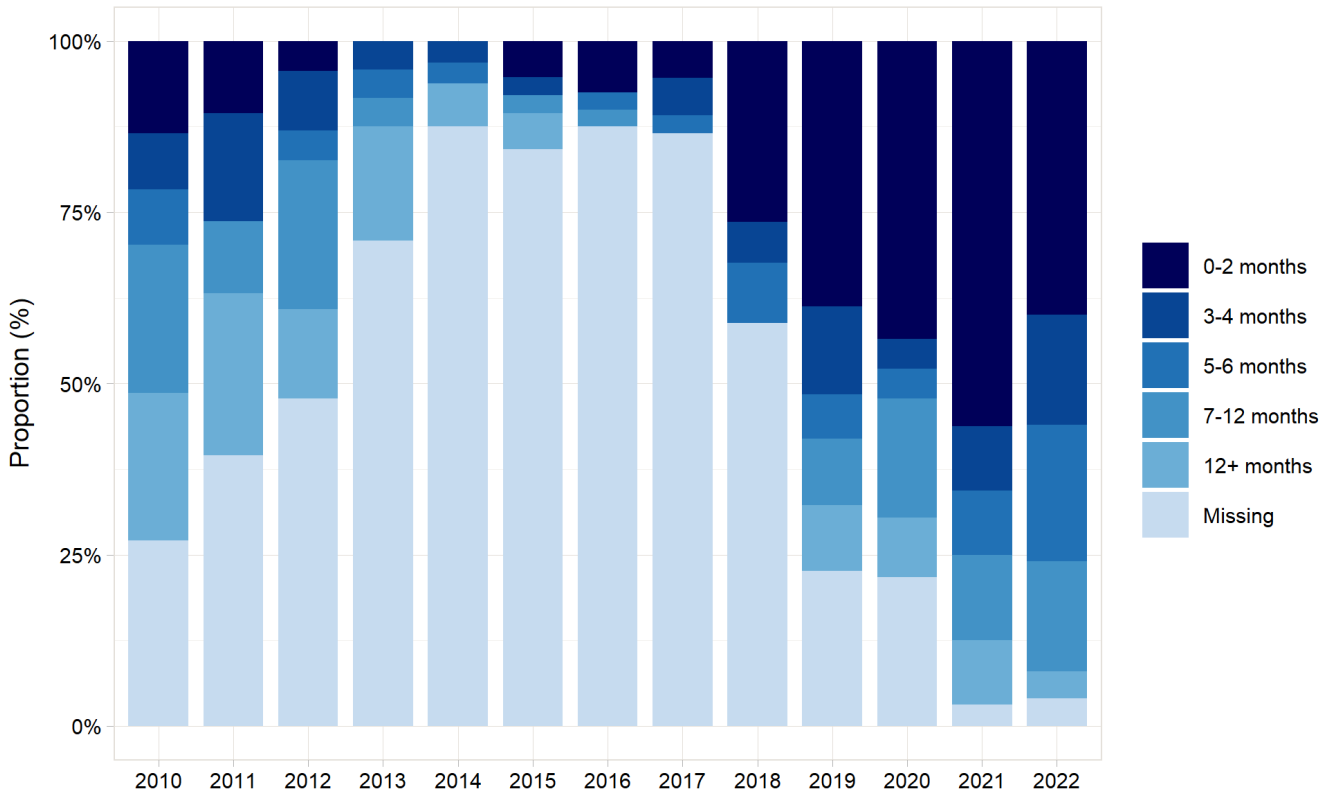


Figure F.4: Time trend for symptom duration before SCFE diagnosis



Annual report 2023

The entire country

The National Pediatric Hip Registry collects data from all hospitals treating children with hip diseases such as hip dysplasia (HD), Perthes' disease, and Slipped capital femoral epiphysis (SCFE). Additionally, open and arthroscopic hip joint surgeries in young adults are also registered. We will present the key findings from the data collected from all hospitals in the registry. Patient-reported outcome measure (PROM) data for pediatric hips will be presented for the first time.

PEDIATRIC HIPS

Hip dysplasia

Nationally, we observe that the number of hip dysplasias reported to the registry in 2022 is somewhat reduced compared to previous years. There have been no changes in the inclusion criteria,and we have no reason to believe that fewer children with hip dysplasia are being born. Hospitals must have been attentive to registering all children with hip dysplasia, including those who do not undergo surgery.

Table 1: Number of reported children with hip dysplasia

Year	Number of cases
2022	53
2021	60
2020	98
2019	90
2018	93
2017	107
2016	84
2015	101
2014	116
2013	93
2012	136
2011	94
2010	125
Total	1250

Table 2: The number of children diagnosed with hip dysplasia before and after 3 months

Year	<3 months	>3 months	Missing	Total
2022	22	31	0	53
2021	30	30	0	60
2020	40	58	0	98
2019	35	52	3	90
2018	38	50	5	93
2017	47	56	4	107
2016	25	54	5	84
2015	37	57	7	101
2014	54	60	2	116
2013	31	61	1	93
2012	58	74	4	136
2011	36	57	1	94
2010	42	82	1	125

For hip dysplasia, late-detected dysplasia is nationally defined as a diagnosis made after 3 months of age. All children are screened at the newborn examination, either clinically or additionally with ultrasound if they have risk factors for hip disease. The national goal is to keep the proportion of late-detected hip dysplasia as low as possible, aiming to be below 0.1 % of all newborns. Of course, the aim is for as many as possible to receive the diagnosis as early as possible, highlighting the importance of thorough newborn screening.

Table 3: Number of children screened for hip dysplasia with ultrasound

Year	No screening	Ultrasound screening	Missing	Total
2022	27	23	3	53
2021	29	28	3	60
2020	40	48	10	98
2019	31	27	32	90
2018	10	6	77	93
2017	12	11	84	107

Table 4: Previous treatment of hip dysplasia

Year	None	Pillow / Abd. ort.	Other	Missing	Total
2022	31	14	5	3	53
2021	26	26	4	4	60
2020	48	41	2	7	98
2019	51	33	4	2	90
2018	44	39	7	3	93
2017	43	45	15	4	107
2016	33	37	9	5	84
2015	39	24	14	24	101
2014	37	39	13	27	116
2013	30	16	6	41	93
2012	6	6	0	124	136
2011	1	1	0	92	94
2010	3	3	0	119	125
Total	392	324	79	455	1250

Table 5: Hip status at the time of diagnosis for hip dysplasia

Year	Normally located	Subluxated	Dislocated	Missing	Total
2022	25	17	11	0	53
2021	29	23	8	0	60
2020	69	22	6	1	98
2019	59	15	14	2	90
2018	73	11	5	4	93
2017	69	17	19	2	107
2016	43	13	21	7	84
2015	51	25	17	8	101
2014	67	15	32	2	116
2013	49	17	18	9	93
2012	66	21	35	14	136
2011	55	14	21	4	94
2010	65	24	28	8	125
Total	720	234	235	61	1250

Table 6: Pelvic osteotomy performed for dysplasia

Year	Salter	Dega	Other	Total
2022	4	2	0	6
2021	1	1	0	2
2020	2	2	0	4
2019	4	3	0	7
2018	1	9	0	10
2017	3	13	1	17
2016	2	8	2	12
2015	5	7	3	15
2014	7	2	0	9
2013	6	0	1	7
2012	2	0	0	2
2011	1	1	3	5
2010	1	1	0	2
Total	39	49	10	98

Table 7: Age and gender at the time of dysplasia

Gender	N	Mean age	Standard deviation
Boy	165	1.1	4.0
Girl	1085	0.6	1.4

Perthes' disease

Perthes' disease affects children aged 3-9 years. Without a known cause, they experience degeneration of the hip joint, leading to pain and limping. There is no effective treatment to halt or reverse the degeneration, but it is considered crucial to reduce load through activity restrictions. Activities that impact the hip, such as running and jumping, are especially limited to reduce stress on the hip joint. Most children become stiffer in the hip joint, especially during the degenerative phase, and it's essential for them to start targeted physiotherapy with an emphasis on stretching exercises. The stretching primarily aims to maintain mobility. Caterall's classification is used to assess the extent of degeneration. It indicates the percentage of the femoral head affected, with Grade 1 being less than 25 %, Grade 2 less than 50 %, Grade 3 less than 75 %, and Grade 4 affecting the entire femoral head. The degree of degeneration is crucial to classify, as treatment choices depend on it.

Table 8: Number reported per year with Perthes' disease

Year	Number
2022	14
2021	22
2020	21
2019	42
2018	35
2017	47
2016	48
2015	49
2014	51
2013	48
2012	47
2011	55
2010	53
Total	532

Table 9: Duration of symptoms before diagnosis for Perthes'

Year	<= 2 months	>2 months	Missing	Total
2022	5	9	0	14
2021	9	13	0	22
2020	6	15	0	21
2019	14	28	0	42
2018	10	15	10	35
2017	8	35	4	47
2016	7	28	13	48
2015	8	29	12	49
2014	10	36	5	51
2013	4	31	13	48
2012	13	19	15	47
2011	12	38	5	55
2010	13	34	6	53

Table 10: Caterall classification at diagnosis for Perthes'

Year	Caterall I/II	Caterall III/IV	Missing	Total
2022	1	13	0	14
2021	12	10	0	22
2020	5	16	0	21
2019	12	29	1	42
2018	9	24	2	35
2017	13	27	7	47
2016	8	24	16	48
2015	11	27	11	49
2014	10	32	9	51
2013	12	30	6	48
2012	15	27	5	47
2011	16	35	4	55
2010	20	32	1	53

Table 11: Number of children under and over 6 years of age who undergo surgery, divided by Caterall classification

Year	<6yr Cat I/II	<6yr Cat III/IV	<6yr Cat Missing	>6yr Cat I/II	>6yr Cat III/IV	>6yr Cat Missing
2022	0/1	1/4			8/9	
2021	0/7	0/7		1/5	2/3	
2020	0/3	0/8		0/2	7/8	
2019	0/5	0/10	0/1	1/7	16/19	
2018	0/4	1/10		0/5	6/14	0/2
2017	0/2	0/14	0/2	0/11	4/13	2/5
2016	0/2	0/7	1/3	0/6	8/17	7/13
2015	0/5	1/14		0/6	6/13	2/11
2014	0/2	1/16	1/2	0/8	6/16	3/7
2013	0/5	1/15	0/2	0/7	9/15	3/4
2012	0/8	0/13	0/1	0/7	3/14	0/4
2011	0/8	0/15		0/8	9/20	0/4
2010	0/13	3/16	0/1	0/7	6/16	

Table 12: Age and gender at the time of Perthes' disease

Gender	N	Mean age	Standard deviation
Boy	421	6.0	2.4
Girl	111	6.6	4.3

Based on a large Norwegian study conducted between 1996-2000 on children with Perthes' disease, it has been concluded that children under 6 years of age, regardless of the degree of degeneration, achieve the best results with conservative treatment. For children over 6 years of age, those with over 50 % degeneration will have a better outcome if they undergo proximal varus femoral osteotomy. This is done to improve coverage of the affected femoral head. These principles also form the basis of the national treatment guidelines adopted by the Norwegian Pediatric Orthopedic Society.

Slipped Capital Femoral Epiphysis (SCFE)

SCFE is a condition that always requires surgery. Using data from the Norwegian Patient Register (NPR), it has been previously observed that the incidence is between 25-40 cases per year in Norway. The low number of new cases per year means that smaller hospitals may not have patients to report to the registry every year.

Table 13: Number reported per year with SCFE

Year	Number
2022	25
2021	32
2020	23
2019	31
2018	34
2017	37
2016	40
2015	38
2014	32
2013	48
2012	23
2011	38
2010	37
Total	438

Table 14: Duration of symptoms before diagnosis for SCFE

Year	<=2 months	>2 months	Missing	Total
2022	10	15	0	25
2021	18	14	0	32
2020	10	13	0	23
2019	14	16	1	31
2018	12	18	4	34
2017	7	29	1	37
2016	9	29	2	40
2015	11	27	0	38
2014	2	30	0	32
2013	4	39	5	48
2012	3	17	3	23
2011	9	27	2	38
2010	8	28	1	37

For SCFE it is essential to diagnose the condition as early as possible. However, many individuals have often experienced symptoms for a while before undergoing X-rays and receiving a diagnosis. Previous research indicates that the duration of symptoms is often linked to the severity of the slippage, with those experiencing longer durations typically having more severe forms of slippage, which in turn leads to a poorer long-term prognosis. Therefore, a national goal is for as many individuals as possible to receive a diagnosis within 2 months.

Table 15: Degree of slippage at the time of diagnosis for SCFE

Year	< 30 degrees	30-50 degrees	> 50 degrees	Missing	Total
2022	16	6	2	1	25
2021	11	8	13	0	32
2020	8	8	5	2	23
2019	15	11	4	1	31
2018	16	6	3	9	34
2017	16	8	9	4	37
2016	16	10	9	5	40
2015	17	11	6	4	38
2014	14	7	9	2	32
2013	30	12	5	1	48
2012	9	6	5	3	23
2011	14	10	8	6	38
2010	21	7	8	1	37
Total	203	110	86	39	438

Table 16: Choice of implants for SCFE

Year	Screw osteosynthesis	Pin osteosynthesis	Other	Missing	Total
2022	24	0	0	1	25
2021	30	1	0	1	32
2020	21	0	1	1	23
2019	27	4	0	0	31
2018	31	2	0	1	34
2017	33	3	0	1	37
2016	33	5	1	1	40
2015	26	10	0	2	38
2014	27	3	1	1	32
2013	34	10	2	2	48
2012	15	8	0	0	23
2011	26	11	0	1	38
2010	25	12	0	0	37
Total	352	69	5	12	438

Table 17: Primary implants that allow for continued growth in SCFE

Year	Allow for continued growth	No	Missing	Total
2022	17	3	1	21
2021	22	1	0	23
2020	13	4	5	22
2019	13	8	7	28
Total	65	16	13	94

In national treatment recommendations for SCFE, there is a recommendation for the use of implants that allow for continued growth. Upon reviewing the data, we have observed that most large hospitals follow this recommendation. However, we have identified that some hospitals still use implants that halt growth. It is important to note that this percentage should never reach 100 %, as some of the severe slippages are operated on with an open procedure to restore anatomy, and in those cases, implants that do not allow for further growth are used to ensure the quickest possible fusion of the growth plate.

In Table 17, which displays the number of patients operated on with implants allowing for continued growth, only patients who underwent in situ fixation are included.

Table 18: Reoperations after SCFE

Year	Number of reoperations
2022	3
2020	10
2019	6
2018	4
2017	6
2016	9
2015	8
2014	9
2013	3
2012	7
2011	8
2010	12
Antall	85

Table 19: Reasons for reoperation following the primary procedure for SCFE

Year	Re-osteosynthesis	Soft tissue revision	Removal of screw	Other	Missing	Total
2022	1	0	1	0	1	3
2020	1	0	7	1	1	10
2019	1	0	3	2	0	6
2018	1	0	1	2	0	4
2017	1	0	2	2	1	6
2016	0	0	8	0	1	9
2015	0	0	5	3	0	8
2014	2	0	4	2	1	9
2013	0	0	2	1	0	3
2012	1	0	6	0	0	7
2011	0	0	5	2	1	8
2010	1	0	8	3	0	12
Total	9	0	52	18	6	85

All reoperations should be reported to the registry. The most common reoperations have their own checkbox, but the more unusual ones are classified as 'other.' If you want information about reoperations reported on your own patients, you can contact the registry directly to obtain this information.

Table 20: Age and gender at the time of SCFE

Gender	N	Mean age	Standard deviation
Boy	210	13	1.8
Girl	228	12	3.1

Patient-Reported Outcome Measures (PROM) for pediatric hip

When registering PROM data for pediatric hip conditions, we use two different forms. The results are categorized by diagnosis, and for the hip-specific questionnaire, the maximum score is 72 points, with 0 being the lowest score. Nationally, we observe that patients generally score quite high, but children with hip dysplasia perform the best, while those with Perthes' score the lowest. This is not unexpected since hip dysplasia usually has fewer symptoms in children. Much of the treatment is also aimed at preventing the development of early osteoarthritis. The children for whom we currently have PROM data are only 10 years old and have not had time to develop degenerative changes. The results must be closely monitored and compared with data collected when they reach 18 years of age to determine if they continue to have good outcomes.

It is also expected that Perthes' scores the lowest. Ongoing disease is most common in the age range of 4-9 years and is associated with a lot of pain and stiffness, especially during the phase when the femoral head collapses. As the femoral head rebuilds, the pain usually decreases somewhat, and activity becomes easier. These patients will also only have a 10-year follow-up form, and for many, we hope to see an improvement in results by the age of 18. Children with poorer femoral head reconstruction may still experience some problems at the age of 18, and some may already be considered for hip replacement.

For PROMIS 25-Ped, we have chosen to provide each subscale score converted into T-scores. This makes it comparable to the average population. As a group, patients perform slightly better than the national average on function and peer relationships, and they have scores below 50 on pain, depression, pain impact, and fatigue. The translation of T-scores should be interpreted as them experiencing less of these parameters than the average population. Pain intensity scores are low, but even here, the Perthes' group scores higher than the other two, indicating that this patient group is more affected and may require greater adjustments in relation to pain issues.

Table 21: PROM

PROMs	The entire country	The entire country
Pediatric hip - 6 questions	Number of responses	Mean score (SD)
HD	103	66.8 (9.2)
SCFE	91	63.8 (11.8)
Perthes	65	60.2 (12.6)
	Number of responses	Mean Tscore
PROMIS Physical function - 4 questions		
HD	103	54.4
SCFE	90	52.1
Perthes	64	50.6
PROMIS Anxiety. - 4 questions		
HD	105	40.4
SCFE	91	40.6
Perthes	65	41.3
PROMIS Depression - 4 questions		
HD	105	43.4
SCFE	91	42.4
Perthes	65	45.6
PROMIS Fatigue - 4 questions		
HD	105	43.6
SCFE	89	45.4
Perthes	64	45.9
PROMIS Social function - 4 questions		
HD	104	56.4
SCFE	90	56.2
Perthes	65	53.6
PROMIS Pain interference - 4 questions		
HD	104	41.4
SCFE	89	42.9
Perthes	63	46.3
PROMIS Pain intencity - 1 questions		
HD	104	0.9
SCFE	90	1.5
Perthes	65	2

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

How completness is calculated:

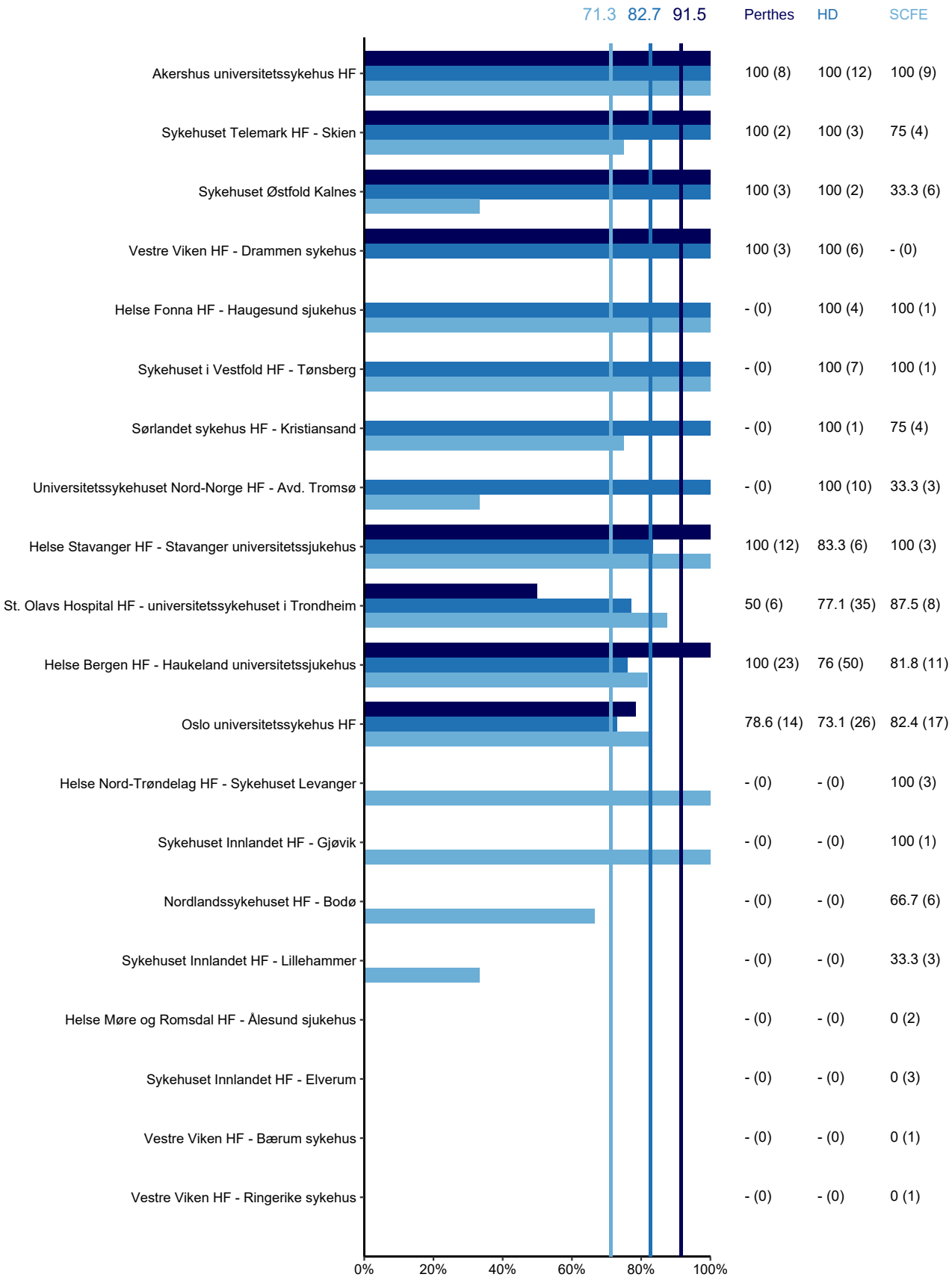
$$\text{Completeness rate NPHR} = \frac{\text{only NPHR} + \text{inclusion both registers}}{\text{only NPR} + \text{only NPHR} + \text{inclusion both registers}}$$

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

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 low. One explanation for low completeness rates in NPHR may be patients not giving consent to registration of the data.

The following page 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.

Completeness of reporting, Norwegian Pediatric Hip Register 2019-2020



Dark blue bars and first number to the right of the bars gives completensess of reporting for Perthes. 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.

OPEN AND ARTHROSCOPIC PROCEDURES IN YOUNG ADULTS

The entire country

Electronic registration of these procedures was initiated on February 1st, 2019, and since then, a total of 519 surgeries have been reported to the national registry. Among these, 342 patients have undergone hip arthroscopy, while 177 have undergone an open procedures (with the majority being periacetabular osteotomy - PAO).

This type of surgery has been performed at only a few hospitals, and especially for periacetabular osteotomies, it requires specialized expertise.

Hip arthroscopies are performed for various indications, with the most frequent being femoroacetabular impingement syndrome (a triad of symptoms, clinical and imaging findings), loose bodies, synovial disorders, or as a result of sequelae of pediatric hip diseases that do not involve impingement.

Periacetabular osteotomies are performed when an acetabular dysplasia has been identified, either due to known hip dysplasia or due to undiagnosed hip dysplasia.

Other open surgeries include femoral osteotomies for torsion and/or axis deviations and impingement surgery through surgical hip dislocation.

Table 23: Number of open procedures and hip arthroscopies in the registry per year

Year	Hip arthroscopy	Open procedures	Total number of surgeries
2022	86	32	118
2021	116	44	160
2020	60	41	101
2019	80	59	139
2017	0	1	1

Table 24: Distribution of open hip surgeries (including PAO) and hip arthroscopies recorded in 2022 by hospitals

Hospital	Hip arthroscopy	Open procedures	Total number of surgeries
OUS	41	17	58
Kysthospitalet	27	14	41
St. Olavs hospital	18	1	19

Table 25: Demographic data for patients reported with open procedures

Open procedure n=177		
	Mean (sd)	Min-Max
Age	25.4 (8.6)	12-45
Age groups	n	%
10-20 years	64	36.2
21-30 years	58	32.8
31-40 years	45	25.4
41-50 years	10	5.6
>50 years	0	0
Gender	n	%
Men	38	21.5
women	139	78.5
Type of procedure	n	%
Intraarticular	12	6.8
Extra-articular	165	93.2
Procedure	n	%
Periacetabular osteotomy	147	83.1
Varus-valgus femoral osteotomy	34	19.2
Other	9	5.1

Table 26: Lateral Center Edge (LCE) Angle

Periacetabular osteotomy (PAO) n=147		
LCE angel categori	n	%
< 0	12	8.2
0-10	12	8.2
11-15	37	25.2
16-20	52	35.4
21-25	10	6.8
> 25	23	15.6
Missing	1	0.7
Varus-valgus femoral osteotomy n=34		
LCE angel category	n	%
< 0	2	5.9
0-10	1	2.9
11-15	6	17.6
16-20	6	17.6
21-25	2	5.9
> 25	13	38.2
Missing	4	11.8

Table 27: Demographic data for patients operated with hip arthroscopy

Hip arthroscopy n=342		
	Mean (sd)	Min-Max
Age	31.5 (10.8)	14-77
Age groups	n	%
10-20 years	48	14
21-30 years	133	38.9
31-40 years	101	29.5
41-50 years	42	12.3
>50 years	18	5.3
Gender	n	%
Men	199	58.2
Women	143	41.8
LCE angel category	n	%
<20	9	2.6
20-25	50	14.6
26-35	196	57.3
>35	77	22.5
Missing	10	2.9
Indication for surgery	n	%
Femoroacetabular impingement (FAI)	259	75.7
Labral injury of unknown etiology	51	14.9
Acetabular dysplasia (including version anomalies)	31	9.1
Femoral dysplasi/malrotation	6	1.8
Sequelae of pediatric hip joint disease	13	3.8
Extra-articular cause	7	2
Other	41	12
Procedures performed	n	%
Cam resection only	182	53.2
Cam + Pincer	38	11.1
Labrum only	44	12.9
Other/Missing	78	22.8

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Norwegian Knee Ligament Register (77 papers between 2004 and June 2023)

Papers between 2020 and June 2023 (9)

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Papers from clinical studies related to Norwegian National Advisory Unit on Arthroplasty and Hip Fractures (72 papers between 2004 and June 2023)

Papers between 2020 and June 2023 (23)

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Oral presentations/Abstracts/Postere fra 2021 to June 2023 (50)

Norwegian Arthroplasty Register (30)

Furnes O. ALBA-studien. Fagdag Ortopedisk avdeling Haukeland Universitetssykehus; 2023 09. Juni; Bergen

Furnes O. Thirty years follow-up of three commonly used femoral stems in the Norwegian Arthroplasty Register 1987–2021. International Hip Society 17.–20. May; Boston, USA

Furnes O, Khan M, Hallan G, Gjertsen JE, Badawy M, Husby OS, Høl PJ, Lygre SHL. Tourniquet use in total knee replacement. A report from the Norwegian Arthroplasty Register (NAR) with 3 years follow-up (2018–2021). 12th Annual ISAR congress;2023 13.–15. May; Montreal, Canada

Leta TH, Lygre SHL, Fenstad AM, Lie SA, Larsen ML, Pedersen AB, W-Dahl A, Rolfson O, Bülow E, Ashforth J, Steenbergen LV, Nelissen RGHH, Corfield S, Steiger RD, Lutro O, Mäkelä K, Hakulinen E, Willis J, Wyatt M, Frampton C, Grimberg A, Steinbrück A, Wu Y, Armaroli C, Molinari M, Picus R, Mullen K, Illgen R, Stoica IC, Vorovenchi AE, Dragomirescu D, Dale H, Brand C, Christen B, Shapiro J, Wilkinson JM, Armstrong R, Wooster K, Hallan G, Gjertsen JE, Chang RN, Prentice HA, Paxton EW, Furnes O. The epidemiology of antibiotic loaded bone cement and systemic antibiotic prophylactic usage in primary cemented or hybrid total knee arthroplasty among countries in Africa, Europe, North America, and Oceania: A register based descriptive international study 2010–2020. 12th Annual ISAR congress;2023 13.–15. May; Montreal, Canada

Lygre SHL, Fenstad AM, Lie SA, Hallan G, Furnes O. Long-time follow-up of cemented non-resurfaced total knee arthroplasty brands from the Norwegian Arthroplasty Register. 12th Annual ISAR congress;2023 13.–15. May; Montreal, Canada

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Khan M, Lygre SHL, Høl PJ, Furnes O. Does precoating of the NexGen Option tibial component lower the risk of loosening? 10 years follow up from the Norwegian Arthroplasty Register 2012–2021. 12th Annual ISAR congress;2023 13.–15. May; Montreal, Canada

Fenstad AM, Hallan G, Lygre SHL, Furnes O. Dokumentasjon av hofte og kneproteser. Foredrag Vestlandsk Ortopedisk Forum (VOF); 2023 26.–27. Januar; Haugesund.

Fenstad AM, Leta T, Lygre SHL, Furnes O. ALBA-studien – hvordan bruke register til både randomisering og datainnsamling. Foredrag Vestlandsk Ortopedisk Forum (VOF); 2023 26.–27. Januar; Haugesund.

Furnes O. ALBA-studien, korleis nytte register til både randomisering og datainnsamling. Årsmøte i NIPaR; 2022 10. November; Oslo

Børsheim S, Kristensen TB, Hallan G, Gjertsen JE, Furnes O, Dybvik E, Dale H. Stammegeometri, fiksasjon og risiko for revisjon for periprostetisk fraktur i hofte. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Hole R, Fenstad AM, Gjertsen JE, Hallan G, Furnes O. Risiko for revisjon og revisjonsårsaker ved Delta III og Delta Xtend skulderprotese. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Dale H, Fenstad AM, Hallan G, Overgaard S, Pedersen AB, Hailer NP, Kärrholm J, Rolfsson O, Eskelinen A, Mäkelä K, Furnes O. Økende risiko for revisjon pga infeksjon etter primær total hofteprotese i Norden 2004–2018. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Harr E, Fenstad AM, Hallan G, Furnes O, Badawy M. Simultan sekvensiell bilateral kneprotese sammenliknet med sekvensielle og unilaterale prosedyrer i Nasjonalt Register for Leddproteser. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Omenås HN, Fenstad AM, Lindalen E, Furnes O, Badawy M. Revisjonsrisiko for patellofemorale kneproteser samanlikna med total og unikondylære kneproteser. Data fra NRL 1994–2021. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Sivertsen EA, Høvik Ø, Jenssen KK, Lygre SHL, Furnes O. Proteseoverlevelse for Profix og Legion med standard og ultrakongruent insert i årene 1999–2021. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Sundet M, Dybvik E, Furnes O, Eriksen ML, Hallan G. Ankelproteser i Norge 1994–2020: Proteseoverlevelse og faktorer assosiert med revisjon. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Pawloy K, Fenstad AM, Leta T, Hallan G, Gjertsen JE, Dale H, Lie SA, Furnes O. Poster presentation: No difference in risk of revision due to infection between clindamycin and cephalosporin as antibiotic prophylaxis in cemented primary total knee replacements. A report from the Norwegian arthroplasty register 2005–2019. British Orthopaedic Association (BOA) Annual Congress; 2022 20.–23. Sep; ICC Birmingham, UK

Omenås HN, Fenstad AM, Lindalen E, Furnes O, Badawy M. Revision risk of patellofemoral arthroplasty compared to total and unicompartmental knee arthroplasty in the Norwegian arthroplasty register. ISAR congress; 2022 3.–5. Sep; Dublin

Hole RM, Fenstad AM, Gjertsen JE, Hallan G, Furnes O. Risk of revision and failure mechanisms after Delta III and Delta Xtend shoulder arthroplasties. Results from the Norwegian arthroplasty register. ISAR congress; 2022 3.–5. Sep; Dublin

Vinther D, Mailhac A, Andersen IT, Overgaard S, Fenstad AM, Lie SA, Gjertsen JE, Furnes O, Pedersen AB. Association between duration of anticoagulant thromboprophylaxis and revision rate in primary total hip arthroplasty: A Danish and Norwegian nationwide cohort study. ISAR congress; 2022 3.–5. Sep; Dublin

Skåden Ø, Furnes O, Lygre SHL, Badawy M, Gøthesen Ø. A comparison of 5 years survival of cemented and cementless Oxford partial and cemented Oxford phase III unicompartmental knee replacements. A study from the Norwegian arthroplasty register 2012–2021. ISAR congress; 2022 3.–5. Sep; Dublin

Furnes O, Leta TH, Lygre SHL, Fenstad AM, Lie SA, Larsen ML, Pedersen AB, W-Dahl A, Bohm E, Sandoval C, Dunbar M, Nelissen RG, Steiger RD, Lutro O, Mäkelä K, Wyatt M, Dale H, Wilkinson M, Hallan G, Gjertsen JE, Chan P, Prentice H, Paxton LW. The epidemiology of antibiotic loaded bone cement and systemic antibiotic use in primary total knee arthroplasty among countries in Europe, North America, and Oceania: A register based international comparative meta-analysis study. ISAR congress; 2022 3.–5. Sep; Dublin

Latifi R, Mohaddes M, Hailer N, Fenstad AM, Hallan G, Eskilinen A, Mäkelä K, Varnum C, Overgaard S. Risk of revision for different types of cup fixation in elderly patients with primary hip osteoarthritis. A study of 203,301 primary total hip arthroplasties from the Nordic arthroplasty register association (NARA). ISAR congress; 2022 3.–5. Sep; Dublin

Haarr E, Fenstad AM, Hallan G, Furnes O, Badawy M. Simultaneous bilateral total knee arthroplasty compared to staged and unilateral procedures in the Norwegian arthroplasty register (NAR) from 2012–2019. ISAR congress; 2022 3.–5. Sep; Dublin

Dale H, Fenstad AM, Hallan G, Overgaard S, Pedersen AB, Hailer NP, Kärrholm J, Rolfson O, Eskilinen A, Mäkelä KT, Furnes O. Increasing risk of revision due to infection after total hip arthroplasty: A study on 575,502 primary THAs in the Nordic arthroplasty register association`s dataset from 2004 to 2018. ISAR congress; 2022 3.–5. Sep; Dublin

Fenstad AM, Hallan G, Dybvik E, Nilsen DH, Kroken G, Gjertsen JE, Furnes O. Promoting cemented fixation of the femoral stem in elderly hip arthroplasty and hip fracture patients - a collaboration from the Norwegian arthroplasty register and the Norwegian hip fracture register. ISAR congress; 2022 3.–5. Sep; Dublin

Furnes O. Muligheter med nye studiedesign og analyser. R-RCT ALBA studien Nasjonalt register for leddproteser, Helse Bergen. Bruk av nasjonale medisinske kvalitetsregistre i forskning; 2022 26 aug; SAS Bryggen;Bergen

Omenås HN, Fenstad AM, Furnes O, Badawy M. Lateral Unicompartmental knee arthroplasty. A national arthroplasty study from 1994–2020. 23rd EFORT Congress;2022 22.–24. Jun; Lisboa, Portugal

Furnes O. Presentasjon av forskning i Nasjonalt Register for Leddproteser. Norsk karkirurgisk vårmøte; 2022 10 juni; Bergen

Norwegian Hip Fracture Register (6)

Boutera AT, Dybvik E, Hallan G, Kristensen TB, Gjertsen JE. Påvirker utskrivelsestidspunkt og utskrivelssted mortalitet, reinnleggelse og reoperasjon etter hoftebruddkirurgi? Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Bjørkevoll ES, Dybvik E, Gjertsen JE, Kristensen TB. PROM og risiko for reoperasjon etter trokantære frakutrer hos pasienter under 60 år. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Ahmad A, Egeland E, Gjertsen JE, Lie SA, Dybvik E, Fenstad AM, Matre K, Furns O. Glideskrue/ margnagle mortalitet ved trokantære/subtrokantære brudd rapportert til Nasjonalt Hoftebruddregister 2005–2020. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Børsheim S, Kristensen TB, Hallan G, Gjertsen JE, Furnes O, Dybvik E, Dale H. Stem geometry, fixation, and the risk of revision for periprosthetic fracture. A study on 147,234 hip stems in the Norwegian arthroplasty register and the Norwegian hip fracture register. ISAR congress; 2022 3.–5. Sep; Dublin

Dybvik E, Engesæter LB, Kristensen TB, Kristoffersen MH, Gjertsen JE. Occurrence of subsequent hip fractures. Results of 11,922 patients from the Norwegian hip fracture register. ISAR congress; 2022 3.–5. Sep; Dublin

Kristensen TB, Bjørkevoll E, Dybvik E, Engesæter LB, Gjersen JE. Patient-reported outcomes and 1-year risk of reoperation after trochanteric hip fractures in patiens less than 60 years. Data from 2,103 patients in the Norwegian hip fracture register. ISAR congress; 2022 3.–5. Sep; Dublin

Norwegian Knee Ligament Register (8)

Persson A. Trender og tendenser fra Nasjonalt Korsbåndsregister. Artroskopiforeningens Vintermøte: 2023 3.–5. Februar, Kvitfjell

Visnes H. Siste nytt innen korsbåndskirurgi. Vestlands Ortopedisk Forum (VOF): 2023 26.–27. Januar, Haugesund.

Birkenes T. Hva er risikoen for å få kneprotese etter påvist fokal bruskskade i kne? Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Persson A. Opererer vi for mange patellarsene graft? Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Drogset JO. Hva er risikoen for å få kneprotese etter ACL rekonstruksjon? Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Tandberg AN, Zegzdryn M, Aga C, Lygre SHL, Gifstad T, Drogset JO, Lind M, Forssblad M, Engebretsen L, Heir S. Sammenligning av kortikal fiksasjon versus skruefiksasjon for patellarsenegraft i femur. Skandinavisk registerstudie. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Martin K, Wastvedt S, Pareek A, Persson A, Visnes H, Fenstad AM, Moatshe G, Wolfson J, Lind M, Engebretsen L. Ceiling effect of the combined Norwegian and Danish knee ligament registers limits ACL outcome prediction. Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Martin K, Wastvedt S, Pareek A, Persson A, Visnes H, Fenstad AM, Moatshe G, Wolfson J, Lind M, Engebretsen L. Unsupervised machine learning of the combined Danish and Norwegian knee ligament registers for ACL revision rates.
Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Clinical studies related to Norwegian National Advisory Unit on Arthroplasty and Hip Fractures (6)

Bartels S, Kristensen TB, Gjertsen JE, Frihagen F, Rogmark C, Dolatowski FC, Figved W, Benth JS, Utvåg SE. Totalprotese gir bedre resultater etter lavenergetisk dislokert lårhalsbrudd hos pasienter mellom 55–70 år. Høstmøtet i Norsk Ortopedisk Forening;
2022 26.–28. Oktober; Oslo

Woldeyesus T, Paulsen A, Gjersten JE, Djuv A. Randomisert kontrollert studie;
Intramedullær margnagle versus protese ved ustabile trokantære hoftebrudd.
Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Enes HA, Malt MA, Willestofte A, Askeland O, Gjertsen JE. Pasientoppfølging etter hoftebrudd for pasienter med fast sykehjemsplass. Høstmøtet i Norsk Ortopedisk Forening;
2022 26.–28. Oktober; Oslo

Sætersdal C, Fevang JM, Gjertsen JE, Hallan G. Jente med kronisk luksert hofte og anisomeli behandlet med ektremitetsforlengelse og hofteprotese i to seanser.
Høstmøtet i Norsk Ortopedisk Forening; 2022 26.–28. Oktober; Oslo

Khan M, Moldestad IO, Ellison P, Høl PJ, Furnes O. Poster presentation:
Initial stability of surface VS full cemented tibial components under cyclic loading.
23rd EFORT Congress;2022 22.–24. Jun; Lisboa, Portugal

Johannessen H, Kadar T, Hallan G, Fenstad AM, Haugan K, Høl PJ, Badawy M, Stokke T, Jonsson B, Indrekvam K, Aamodt A, Furnes O. Polyethylene wear in total hip arthroplasty; comparing Oxinium and CoCr femoral heads using radiostereometry (RSA) with
10 years follow-up. 23rd EFORT Congress;2022 22.–24. Jun; Lisboa, Portugal

Surgery forms (in Norwegian)

Until now data from these forms (paper version) have been the basis for this report. Recently, more and more data are being recorded electronically (MRS), and therefore, the paper versions are no longer being updated.

All variables with explanations and definitions are available in MRS. We are also working on a separate metadata module https://falk.nhn.no

Also, read more on our website https://helse-bergen.no/nrl

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 (AlbyIE, 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 (AlbyIE, 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:

PASIENTSPØRRESKJEMA NASJONALT HOFTEBRUDDREGISTER

Dato for utfylling av skjema: |__|__| |__|__| |__|__|
(dag) (måned) (år)

Spørreskjemaet er besvart av:

- ❑ Meg selv

eller ved hjelp av….(kryss av i ruten som gjelder)

- ❑ Slektning (ektefelle, barn)
- ❑ God venn eller annen nærstående
- ❑ Annen privat person
- ❑ Hjemmesykepleier/hjemmehjelp
- ❑ Annen person, angi hvem:_____

Under hver overskrift ber vi deg krysse av den ENE boksen som best beskriver helsen din FØR du fikk hoftebruddet som du ble operert for.

GANGE

Jeg hadde ingen problemer med å gå omkring ❑
Jeg hadde litt problemer med å gå omkring ❑
Jeg hadde middels store problemer med å gå omkring ❑
Jeg hadde store problemer med å gå omkring ❑
Jeg var ute av stand til å gå omkring ❑

PERSONLIG STELL

Jeg hadde ingen problemer med å vaske meg eller kle meg ❑
Jeg hadde litt problemer med å vaske meg eller kle meg ❑
Jeg hadde middels store problemer med å vaske meg eller kle meg ❑
Jeg hadde store problemer med å vaske meg eller kle meg ❑
Jeg var ute av stand til å vaske meg eller kle meg ❑

VANLIGE GJØREMÅL *(f.eks. arbeid, studier, husarbeid, familie- eller fritidsaktiviteter)*

Jeg hadde ingen problemer med å utføre mine vanlige gjøremål ❑
Jeg hadde litt problemer med å utføre mine vanlige gjøremål ❑
Jeg hadde middels store problemer med å utføre mine vanlige gjøremål ❑
Jeg hadde store problemer med å utføre mine vanlige gjøremål ❑
Jeg var ute av stand til å utføre mine vanlige gjøremål ❑

SMERTER / UBEHAG

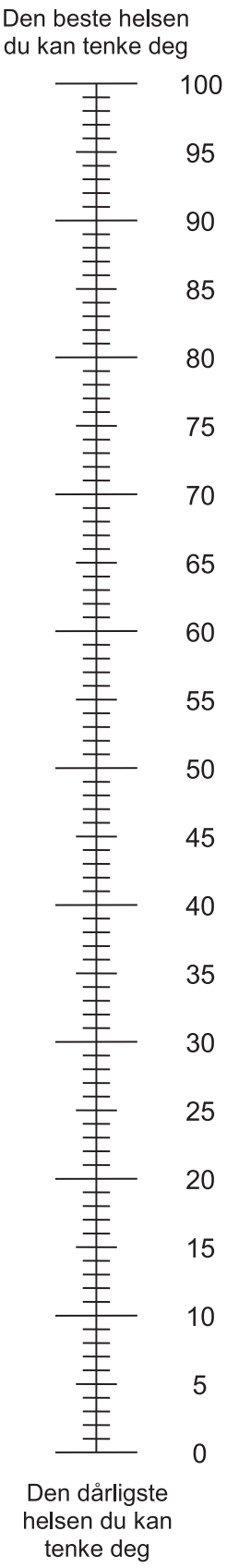
Jeg hadde verken smerter eller ubehag ❑
Jeg hadde litt smerter eller ubehag ❑
Jeg hadde middels sterke smerter eller ubehag ❑
Jeg hadde sterke smerter eller ubehag ❑
Jeg hadde svært sterke smerter eller ubehag ❑

ANGST / DEPRESJON

Jeg var verken engstelig eller deprimert ❑
Jeg var litt engstelig eller deprimert ❑
Jeg var middels engstelig eller deprimert ❑
Jeg var svært engstelig eller deprimert ❑
Jeg var ekstremt engstelig eller deprimert ❑

- Vi vil gjerne vite hvor god eller dårlig helsen din var FØR du fikk hoftebruddet som du ble operert for.
- Denne skalaen er nummerert fra 0 til 100.
- 100 betyr den beste helsen du kan tenke deg.
  0 betyr den dårligste helsen du kan tenke deg.
- Sett en X på skalaen for å angi hvordan helsen din var FØR du fikk et hoftebruddet som du ble operert for.
- Skriv deretter tallet du merket av på skalaen inn i boksen nedenfor.

HELSEN DIN FØR DU FIKK HOFTEBRUDDET SOM DU BLE OPERERT FOR = ☐



Under hver overskrift ber vi deg krysse av den ENE boksen som best beskriver helsen din I DAG.

GANGE

Jeg har ingen problemer med å gå omkring ❑
Jeg har litt problemer med å gå omkring ❑
Jeg har middels store problemer med å gå omkring ❑
Jeg har store problemer med å gå omkring ❑
Jeg er ute av stand til å gå omkring ❑

PERSONLIG STELL

Jeg har ingen problemer med å vaske meg eller kle meg ❑
Jeg har litt problemer med å vaske meg eller kle meg ❑
Jeg har middels store problemer med å vaske meg eller kle meg ❑
Jeg har store problemer med å vaske meg eller kle meg ❑
Jeg er ute av stand til å vaske meg eller kle meg ❑

VANLIGE GJØREMÅL *(f.eks. arbeid, studier, husarbeid, familie- eller fritidsaktiviteter)*

Jeg har ingen problemer med å utføre mine vanlige gjøremål ❑
Jeg har litt problemer med å utføre mine vanlige gjøremål ❑
Jeg har middels store problemer med å utføre mine vanlige gjøremål ❑
Jeg har store problemer med å utføre mine vanlige gjøremål ❑
Jeg er ute av stand til å utføre mine vanlige gjøremål ❑

SMERTER / UBEHAG

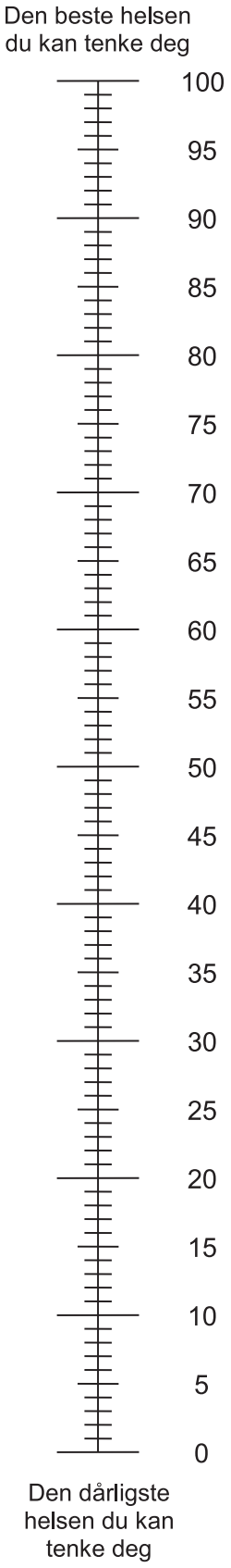
Jeg har verken smerter eller ubehag ❑
Jeg har litt smerter eller ubehag ❑
Jeg har middels sterke smerter eller ubehag ❑
Jeg har sterke smerter eller ubehag ❑
Jeg har svært sterke smerter eller ubehag ❑

ANGST / DEPRESJON

Jeg er verken engstelig eller deprimert ❑
Jeg er litt engstelig eller deprimert ❑
Jeg er middels engstelig eller deprimert ❑
Jeg er svært engstelig eller deprimert ❑
Jeg er ekstremt engstelig eller deprimert ❑

- Vi vil gjerne vite hvor god eller dårlig helsen din er I DAG.
- Denne skalaen er nummerert fra 0 til 100.
- 100 betyr den beste helsen du kan tenke deg.
  0 betyr den dårligste helsen du kan tenke deg.
- Sett en X på skalaen for å angi hvordan helsen din er I DAG.
- Skriv deretter tallet du merket av på skalaen inn i boksen nedenfor.

HELSEN DIN I DAG = ☐



HOOS
SPØRRESKJEMA FOR HOFTEPASIENTER

Denne delen av 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.

Smerter

1. 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

2. Gå på jevnt underlag

Ingen	Lette	Moderate	Store	Svært store
❑	❑	❑	❑	❑

3. Gå opp eller ned trapper

Ingen	Lette	Moderate	Store	Svært store
❑	❑	❑	❑	❑

4. Sittende eller liggende

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.

5. Reise deg opp fra sittende

Ingen	Lette	Moderate	Store	Svært store
❑	❑	❑	❑	❑

6. Stå stille

Ingen	Lette	Moderate	Store	Svært store
❑	❑	❑	❑	❑

7. Gå inn og ut av en bil

Ingen	Lette	Moderate	Store	Svært store
❑	❑	❑	❑	❑

8. Gå på ujevnt underlag

Ingen	Lette	Moderate	Store	Svært store
❑	❑	❑	❑	❑

Livskvalitet

9. Hvor ofte gjør hoften din seg bemerket?

Aldri	Hver måned	Hver uke	Hver dag	Alltid
❑	❑	❑	❑	❑

10. Har du forandret levemåte for å unngå å belaste hoften?

Ikke i det hele tatt	Noe	Moderat	Meget	Ekstremt
❑	❑	❑	❑	❑

11. I hvor stor grad kan du stole på hoften din?

Fullstendig	I stor grad	Moderat	Delvis	Ikke i det hele tatt
❑	❑	❑	❑	❑

12. Hvor store problemer har du med hoften din generelt sett?

Ingen	Lette	Moderate	Store	Svært store
❑	❑	❑	❑	❑

SMERTE

Sett ett kryss på den streken som du synes tilsvarer din gjennomsnittlige smerteopplevelse fra den opererte hoften den siste måneden:

Ingen smerte — Maksimal smerte

IııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIıııııııııI

lett — moderat — middels — sterk — uutholdelig

TILFREDSHET

Sett ett kryss på den streken som du synes tilsvarer hvor fornøyd du er med operasjonsresultatet:

Fornøyd — Misfornøyd

IııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIııııııııIıııııııııI

svært fornøyd — fornøyd — middels fornøyd — misfornøyd — svært misfornøyd

Har du besvær fra den andre hoften?

❑ Ja ❑ Nei

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)

❑ Ja ❑ Nei

Har du hatt nye operasjoner i den samme hoften som ble operert for hoftebrudd?

❑ Ja ❑ 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
☐7 Annen lagidrett
☐8 Motor- og bilsport
☐9 Annen fysisk aktivitet
☐10 Arbeid
☐11 Trafikk
☐12 Fall/hopp/vold/lek
☐98 Annet.....

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
☐ Graftsvikt
☐ Nytt traume
☐ Smerte
☐ Annet ..... +

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	Areal (cm²) >2	ICRS Grade* 1 2 3 4	Artrose Ja	Artrose 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.

Kontaktpersoner vedrørende registreringsskjema er
Professor Lars Engebretsen, Ortopedisk avdeling, Oslo Universitetssykehus
e-post: lars.engebretsen@medisin.uio.no
Lege Håvard Visnes, Haukeland universitetssjukehus
e-post: haavard.visnes@helse-bergen.no
Sekretær i Nasjonalt Korsbåndsregister, Ortopedisk avd., Helse Bergen
Kate Vadheim, tlf.: 55 97 64 54 e-post: korsband@helse-bergen.no
Internett: http://nrlweb.ihelse.net/

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: .....
Pinnefiskasjon: 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

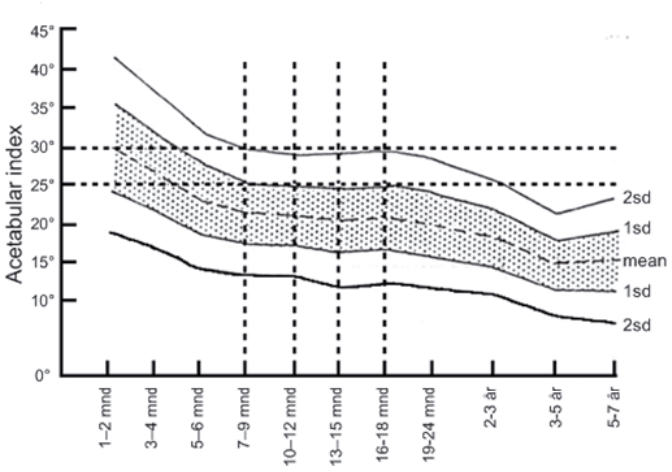
RETTLEDNING

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

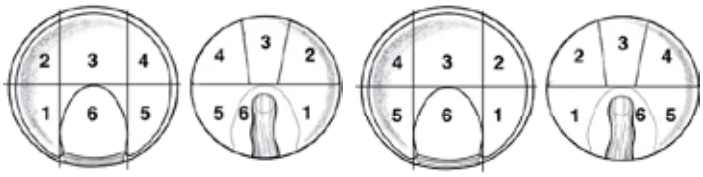
- **Registreres første gang ved diagnose/primærbehandling**
- **Registreres ved senere behandling som krever anestesi** Osteosyntese, femurosteotomier, reoperasjoner.

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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