Nasjonalt Register for Leddproteser

Nasjonalt Hoftebruddregister

Nasjonalt Korsbåndregister

Nasjonalt Barnehofteregister

NASJONAL KOMPETANSETJENESTE
for leddproteser og hoftebrudd

REPORT

June 2020

Norwegian National Advisory Unit on Arthroplasty and Hip Fractures

Norwegian Arthroplasty Register
Norwegian Cruciate Ligament Register
Norwegian Hip Fracture Register
Norwegian Paediatric Hip Register

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ISBN: 978-82-91847-25-2
ISSN: 1893-8906 (Printed version)
1893-8914 (Online)

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

This annual report presents results and descriptive statistics up to and including 2019 from our four registers. The current COVID-19 pandemic has not affected the results, except that much of the report was produced from home. We are naturally interested to find out how patients with joint diseases and injuries have been affected by the pandemic. We hope to shed light on this next year. We welcome ideas for studies exploring the pandemic and register data.

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

This annual report is sent electronically to all orthopaedic surgeons in Norway. Paper copies can be obtained by contacting the Norwegian Arthroplasty Register (NAR). The National Advisory Unit website http://nrlweb.ihelse.net/ contains all our annual reports and references to our scientific papers and presentations. Most of the papers are also available electronically from this website. We publish most of our findings from implants and surgical methods in scientific journals. Here, we can account for materials and methods and discuss strengths and weaknesses and the significance of our findings. Please see the reference lists at the end of this report. New this year is the presentation of durability and documentation of hip and knee prostheses used in 2019. This information will be published on our website. The data are used to calculate the proportion of patients who received a well-documented prosthesis in each hospital.

We present percentages of three- and ten-year durability of the most commonly used hip and knee prostheses in Norway. This information is also available on the website of the National Service Centre https://www.kvalitetsregistre.no/.

The NAR and the Norwegian Hip Fracture Register are collaborating on two national quality improvement projects. The goal is for all women >75 receiving total hip arthroplasty (THA) and all patients over 70 receiving arthroplasty for a hip fracture to have a cemented femoral component. Eighteen hospitals are participating in the project and we have seen a positive trend since project start in autumn 2018.

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

A completeness of reporting analysis is published for each of the registers. These analyses have now been updated for 2017 and 2018 in cooperation with the National Service Centre and the Norwegian Patient Register (NPR). Hospitals with low reporting need to review their reporting procedures. Some hospitals have low reporting of revisions.

The Cruciate Ligament Register has developed electronic recording of the surgeon's form in the medical registration system (MRS), and this is now being used in more than 50% of hospitals. A bar code scanner is used to read information on implants. The Paediatric Hip Register already uses electronic recording of surgeons' data on patients. A corresponding system has now been developed for shoulder arthroplasty and will be used in 2020. The electronic form is now ready for testing by the Hip Fracture Register. Electronic recording of patient-reported outcome measures (PROMs) for hip and knee arthroplasty is now operative in 27 hospitals and we have a consultant responsible for teaching staff at the various hospitals how to use the system. We would ask hospitals to prepare for collection of PROM data from patients. Our goal is for all patients to complete the PROM form before surgery and one, six and ten years after surgery.

Please remember that the Norwegian Data Protection Authority requires statements of consent to be signed by patients before operations are reported to the registers, and the statements must be stored in a secure archiving system. We are currently conducting a data privacy impact assessment (DPIA), which we hope will lead to the right to waive the requirement for written consent for the Hip Fracture Register.

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

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

Bergen, June 2020

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Norwegian Arthroplasty Register

Total Hip Replacement

HIP ARTHROPLASTY REGISTER: ANNUAL REPORT

Many thanks to all of you who send data to our register. For primary hip arthroplasty, the reporting rate for 2017-18 was as much as 97.5%, while for revisions it was 93.1%. This is exceptionally good reporting!

In 2019, there were 9879 primary operations, 101 reoperations and 1384 revisions. The total number of hip arthroplasties recorded from 1987 to 2019 is 244 555. We are pleased to note that the revision rate continues to decline; it was 12.2% in 2019 compared to 14-15% about ten years ago. This indicates that Norwegian arthroplasty surgeons are doing a good job!

A considerable number of forms are incompletely filled out on certain points. In particular, information on bone loss and bone transplants in revisions is missing. One of the great advantages of the NRL over other registries is the amount of detail, which makes it important to have good reporting of details. We ask surgeons to be as accurate as possible when filling out the forms. The lack of information may be because the form is not entirely clear on these points. Electronic recording is gradually being developed and we hope that this will make it simple and intuitive to record all the details, thus increasing the level of accuracy. No changes were made to the form for hip surgery in 2019.

SURGICAL TRENDS:
The trends described in recent years have continued. The posterior approach dominates (71%), use of the anterior approach is stable (direct anterior 8% and anterolateral 14%), while we see a further decline in the direct lateral approach (4%). The posterior approach is also increasingly being used in revisions. Heads smaller than 32mm are not greatly used, and there is a slight increase in the use of 36mm heads. Dual mobility is increasing gradually and was used in 459 primary operations and 374 revisions in 2019. Just over 25% of hip replacements are fully cemented. We recommend cementing in the oldest patients, especially women, to reduce the risk of periprosthetic fractures. Since the start of the Register's quality improvement project on this topic, there has been a moderate but gratifying increase in the use of cemented stems in women over 75 years.

PROSTHETIC SURVIVAL:
As in previous years, a large number of results have been published on the SKDE website (kvalitetsregistre.no/registers/nasjonalt-register-leddproteser). These are results for e.g. the most common prosthesis combinations, hospital results, coverage rates for hospitals and how well hospitals meet the quality indicators. Also published is the extent to which hospitals use well-documented prostheses, where the core requirement for a well-documented component is 95% survival after at least ten years.

The ten-year survival rate for total prostheses inserted in the period 2008-2019 averages 94.8%, which is a good result. The results vary somewhat between hospitals, and this variation can be seen in Figure A.28. However, the range is clearly smaller than previously, as illustrated in A.21 and A.22. The funnel plot (A.29) shows that only one hospital is outside the 99.8% percentile, which is related to the continued use of a poor prosthesis a few years after the other hospitals had ceased using it.

94.5% of patients receive well-documented stems and 95.2% well-documented cups. Contact persons have been informed that the NRL needs to know about ongoing clinical studies on prostheses that are not well documented. These will not be included in the information on hospital-based use of well-documented implants in the future.

The survival curves for hip arthroplasty with different fixations, different time periods and gender must be interpreted with some caution. Cox regression analyses were used to calculate risk ratio (RR). The model assumptions were not met (the curves crossed). We have still chosen to present the results here, but will study the significance of this more closely before next year's report.

CAUSES OF REOPERATION:
Reoperations for *loosening* of one or both components are decreasing. This also applies to reoperations for *wear* and *osteolysis*. Better polyethylene is probably the reason for much of this improvement. *Dislocation* and *periprosthetic fractures* are increasing as causes of reoperation, which may well be related to the shift to the posterior approach and the use of uncemented stems in older patients, respectively. Reoperations for *infection* have increased considerably throughout the history of the Register (Dale H et al., 2009), and in 2019 infection was the second most common cause of revision after cup loosening. This has also been the case for the past five years. Table 3a shows that revisions of *implant fractures* have also been increasing since about the year 2011. In 2019, 46 such revisions were recorded. These are mainly *stem fractures* and *liner fractures* (conventional polyethylene), see Table 3b. Among stem fractures, polished tapered stems seem to be in the majority, but there are also uncemented tapered stems and other types of cemented stems. We will study this more closely. Fractures of older conventional polyethylene liners are probably in most cases the result of heavy wear. In a recent study (Hallan G et al. 2020) we found that about 1 in 1000 ceramic heads (n=43) were revised for fracture, and that Alumina ceramics, 28mm heads, short length of head/neck, ceramic-ceramic articulation and male gender were associated with higher risk of this rare complication. One reason for the increase in the number of revisions of implant fractures recorded is probably a change in the reporting form in 2011. Separate check boxes for the fracture of each prosthetic component were then introduced. Previously, the box for *Other* was checked and the details specified in free text.

PROM:
Of the 55 hospitals with hip surgery, 27 are at various stages of establishing electronic recording of PROMs at the time of writing. Some of the other hospitals have already established an in-house PROM registration, and solutions are underway to import this data directly into the Register. Our consultant Mikael Solberg is interested in contact with the super users of all hospitals to enable the recording of PROMs to commence. Some patients may not wish to have their PROMs recorded. In such cases, it is important to inform patients that they may refuse the PROMs but still have their surgery recorded in the Register through the surgery form. We must ensure that the recording of PROMs does not lead to a decrease in the recording of operations. In Covid-19 times, recording of PROMs, like so many other things, may well have been put on hold. We hope there will be a renewed focus on this now that things are gradually getting back to normal. One-year PROMs should be sent to the patient directly via helsenorge.no if the Register has not received this information within 14 months postoperatively. This functionality is not yet operational, but we expect it to be very soon.

RECOMMENDATIONS:
The Register has updated its recommendations on the follow-up of patients with metal-on-metal arthroplasty, and also drawn up recommendations for the management of patients with fracture of ceramic prosthetic components and for the follow-up of arthroplasty with worse

than expected outcomes. The recommendations may be found on our website http://nrlweb.ihelse.net/Anbefalinger.htm

PUBLICATIONS IN 2019:

Kreipke R et al. compared the results of dual mobility cups and conventional cups in primary THA for osteoarthritis in NARA data and found an equal risk of revision with an average of three years of follow-up. The dual mobility cups resulted in fewer dislocations, but more infections.

Gromov K et al. conducted a Nordic survey in which orthopaedic surgeons specified the standard procedures on their ward for postoperative restrictions following primary THA. They found that results varied between the countries. In Denmark, 50% of wards had no restrictions, while in Norway the figure was 19%. Two-thirds of wards had changed to a less restrictive protocol in the past five years.

MacInnes SJ et al. explored possible genetic causes of aseptic loosening. The study included 2624 hip arthroplasty patients from Norway and 890 from the UK. Five independent genetic signals were found. This study received the *2018 Otto Aufranc Award*.

Pedersen AB et al. studied the risk of thromboembolism, major bleeding and mortality based on the duration of thrombotic prophylaxis and timing of the first dose, using Norwegian and Danish data (n=55 540) linked to prescription registers and patient registers. There were no significant differences in risk of DVT (approximately 1%) or bleeding. However, it was found that those with short-term prophylaxis (<6 days) started postoperatively had a 0.3% increased risk of mortality compared to the standard length (6-14 days) of postoperative prophylaxis. The significance of this finding needs further study.

Halvorsen V et al. studied the results of primary THA in young patients (<22 years, n=881, NARA). The results are poorer than those of average patients, with a 10-year prosthetic survival rate of 86%. Cups were most frequently revised.

Pijls BG et al. described MoM results from 11 registers in NORE (Network of Orthopaedic Registries of Europe). The data consisted of 54 434 MoM resurfacing arthroplasties and 58 498 conventional arthroplasties with large MoM articulations. At five years, the risk of revision of the MoM prostheses was 6% for resurfacing and 7% for stemmed MoM, while it was 3% for regular non-MoM prostheses. After 10 years, the corresponding figures were 12%, 16% and 5%.

Mäkelä KT et al. described the benefits of collaboration between registers as illustrated by the Nordic Arthroplasty Register Association (NARA). In particular, they emphasized that collaboration means that the registers work in more similar ways, that results can more easily be compared and that data can be collected across national boundaries.

Varnum C et al. described how register results have affected orthopaedic practice, and how registers could be used in the future, e.g. in the monitoring of implant results and as a source of data for intelligent tools for individual clinical decision making.

Jobory A et al. compared the use of dual mobility (DM) cups and conventional cups in hip fracture patients (NARA), and found that patients with DM cups had a roughly 25% lower risk of revision, and that this reduction in risk was due to a lower likelihood of dislocation of DM cups. The mortality risk was 50% higher for the DM group, which is probably the result of selection of sicker patients to this group.

Bartz-Johannessen C et al., in a collaboration between the NARA group and colleagues in Sheffield, examined the accuracy of survival estimates in national registers and international register collaborations, and found that a national register needed to have between 40 and 2060 joint replacements, depending on the combination of prosthetic components, before the prosthetic survival estimate was more accurate than the NARA estimate, where data from different countries to some extent lowers the level of accuracy due to national peculiarities.

Langvatn H et al. validated register data on operating room type. The ventilation systems of hospitals (n=40) were studied and compared to the data recorded at the patient level. No hospitals used true "greenhouse" ventilation in their operating rooms, 57% of patients were operated in rooms with laminar airflow, and the remainder in rooms with conventional turbulent ventilation. There was a misreporting rate of 12%.

Dale H et al. studied risk of revision with different types of fixation in patients of different genders and ages. The study only included recent operations (2005-2017) and showed good results. Uncemented hip replacement had a 40% higher risk overall, mostly due to the increased chance of revision due to periprosthetic fracture and dislocation. In women, the increased risk was significant in patients as young as 55 years.

Weldingh E et al. used data from the NRL, the Musculoskeletal Pain in Ullensaker Study (MUST) and the Norwegian OA twin study (Nor-Twin) to calculate maternal and paternal contributions to the heredity of osteoarthritis. They found that osteoarthritis seems to be inherited from the mother to a greater extent than from the father. Furthermore, the probability of inheriting osteoarthritis was greatest for daughters.

Please also consult the list of publications in this report and on our website http://nrlweb.ihelse.net/

Bergen, June 2020

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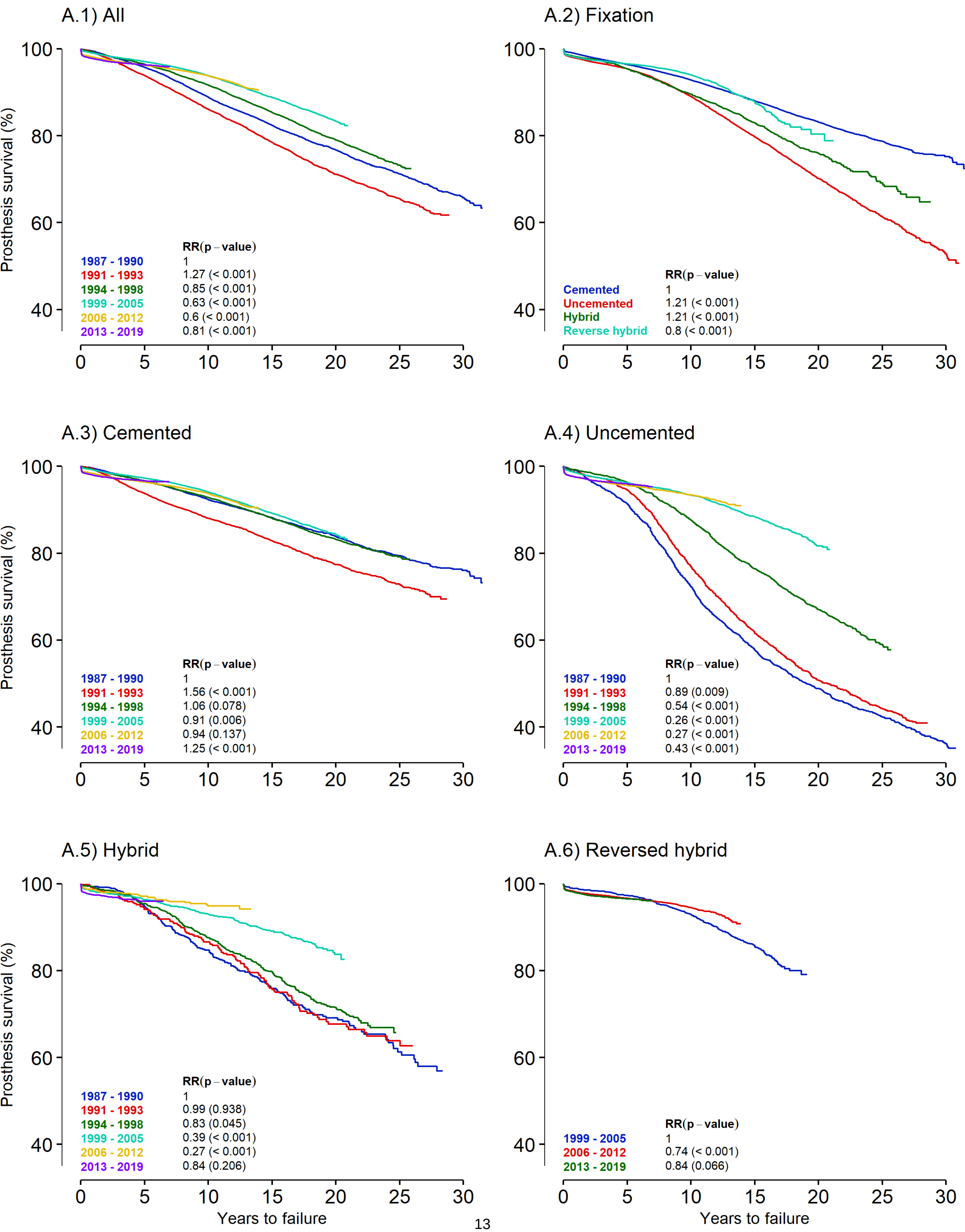
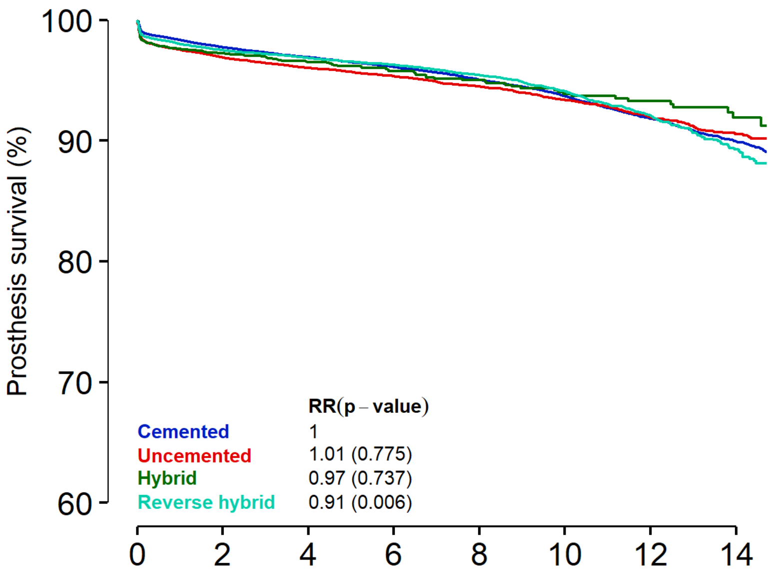
Survival of total hip prosthesis
1987-2019



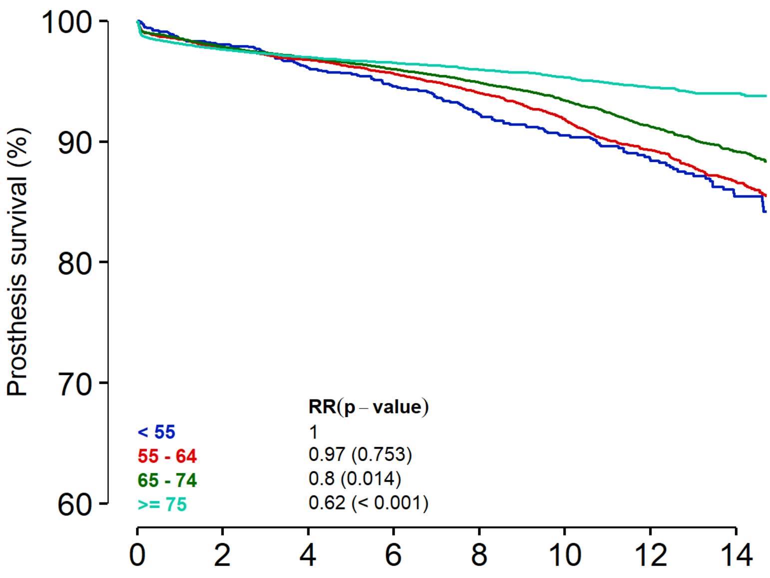
Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses are at risk.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all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

Survival of total hip prosthesis
2004-2019

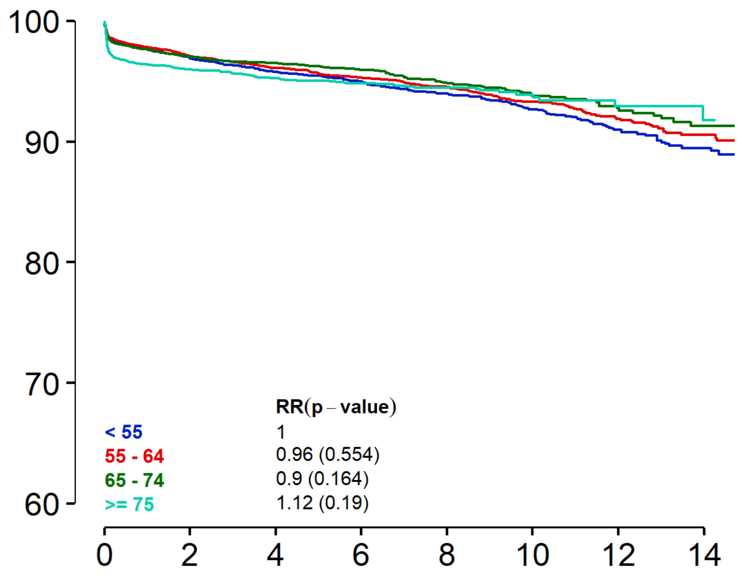
A.7) Fixation



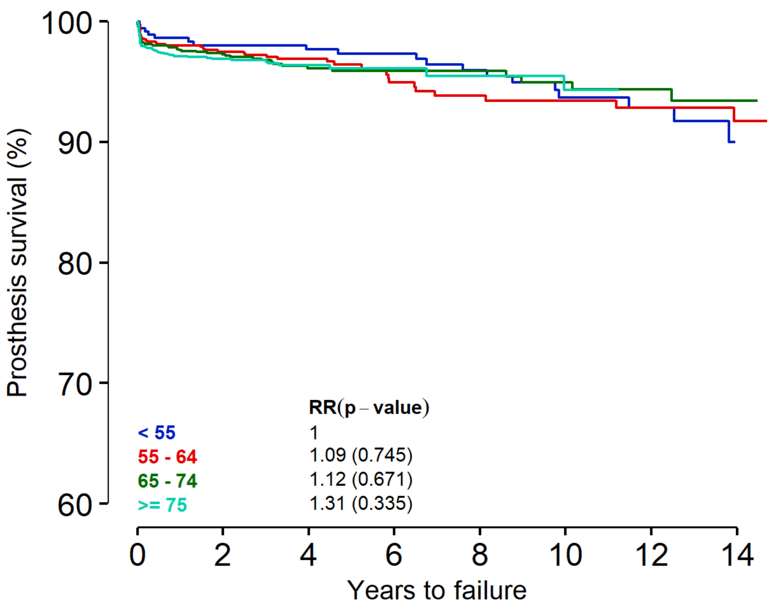
A.8) Cemented



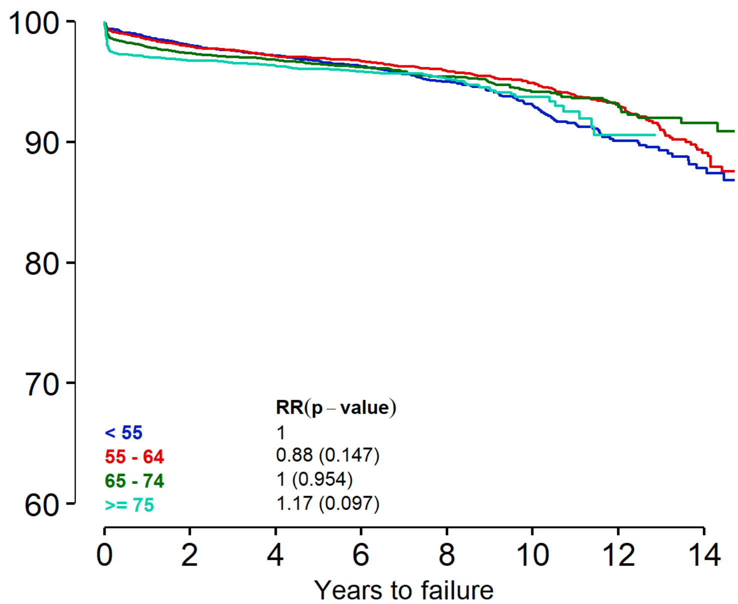
A.9) Uncemented



A.10) Hybrid

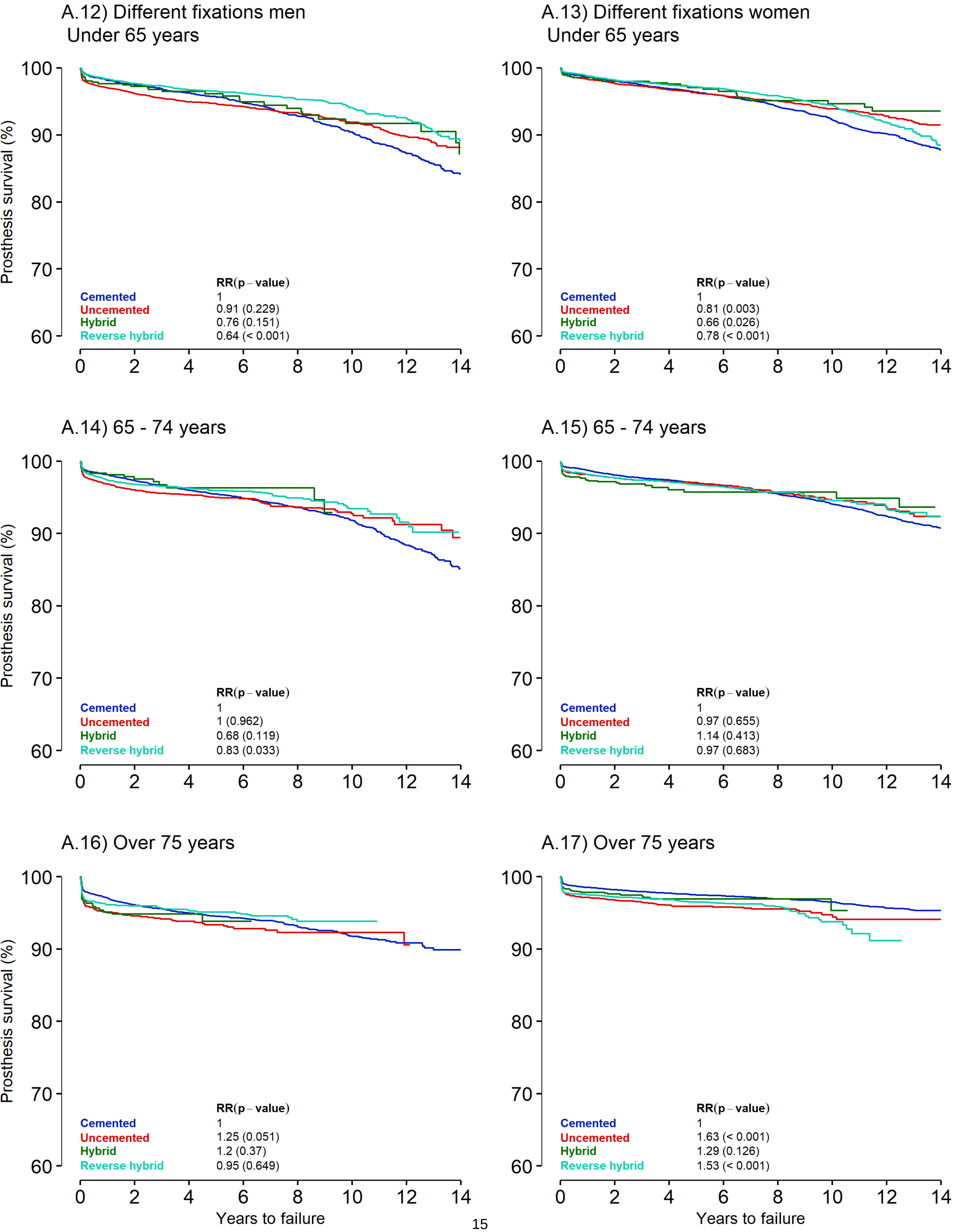


A.11) Reversed hybrid



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

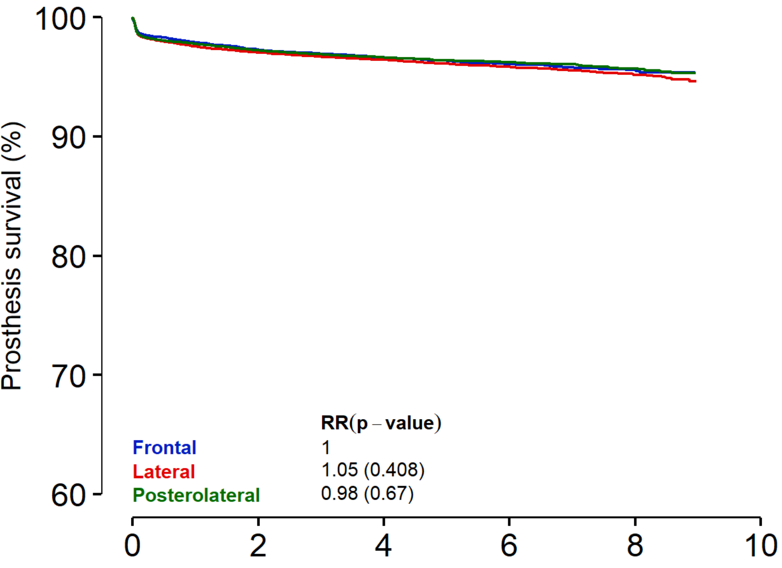
Survival of total hip prosthesis
2004-2019



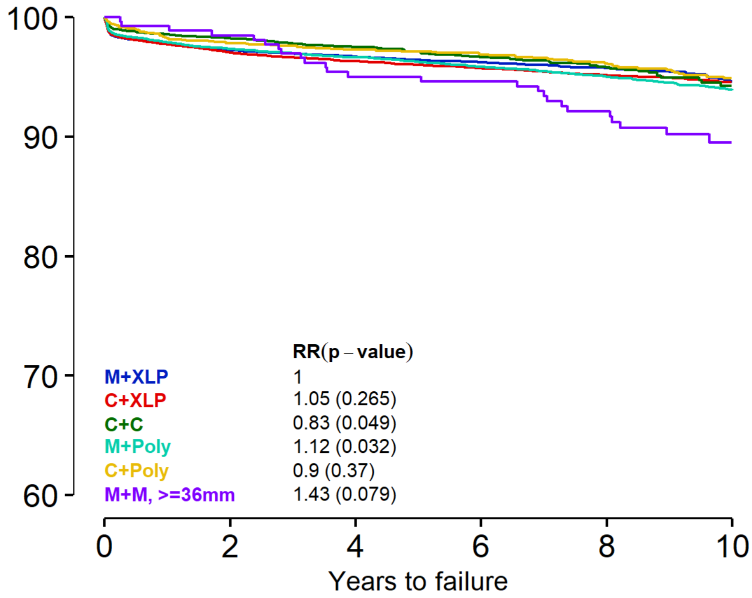
Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for diagnosis.
Survival estimate is given as long as more than 50 prostheses are at risk.
There is some uncertainty tied to the risk estimates from the Cox-analysis as the assumption of proportional hazard does not hold for all models.

Survival of total hip prosthesis
2009-2019

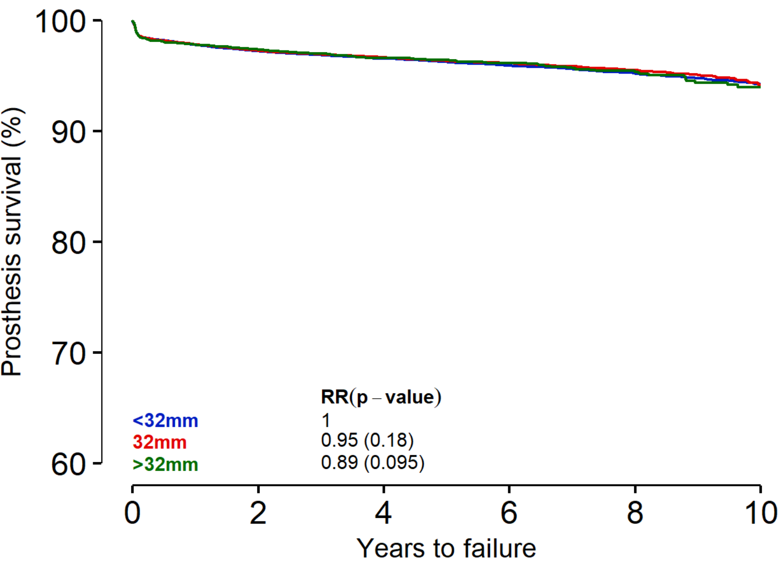
A.18) Access (from 2011)



A.19) Articulation (without dual mobility)



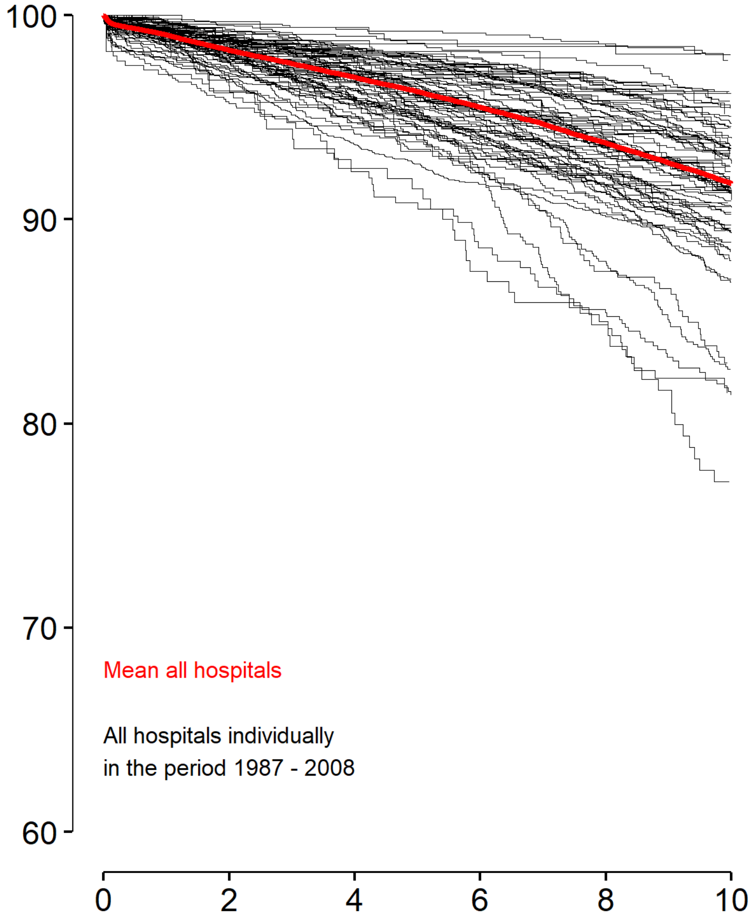
A.20) Head size (without dual mobility or metall on metall)



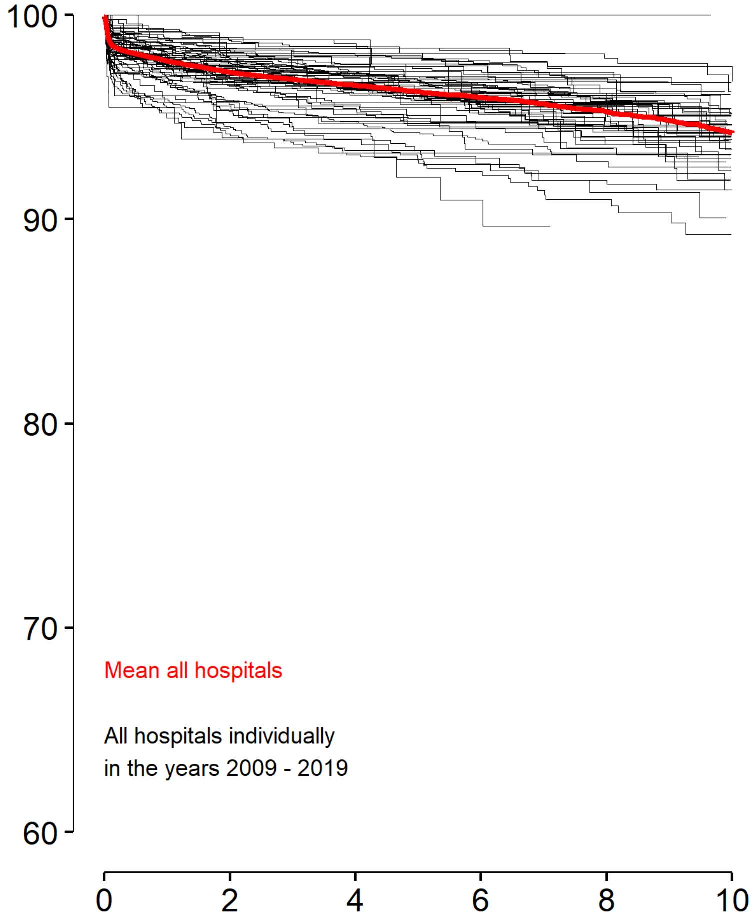
Kaplan-Meier survival curves. Risk ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses are at risk.
There is some uncertainty tied to the risk estimates from the Cox-analysis as the assumption of proportional hazard does not hold for all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

Survival curves for all hospitals individually

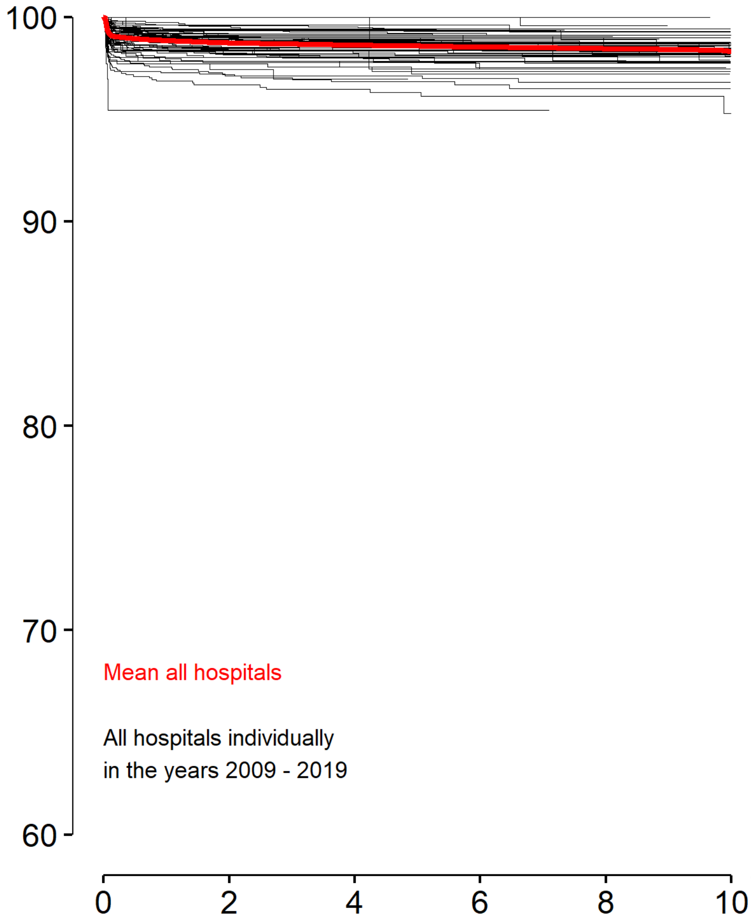
A.21) All hospitals in the years 1987 - 2008



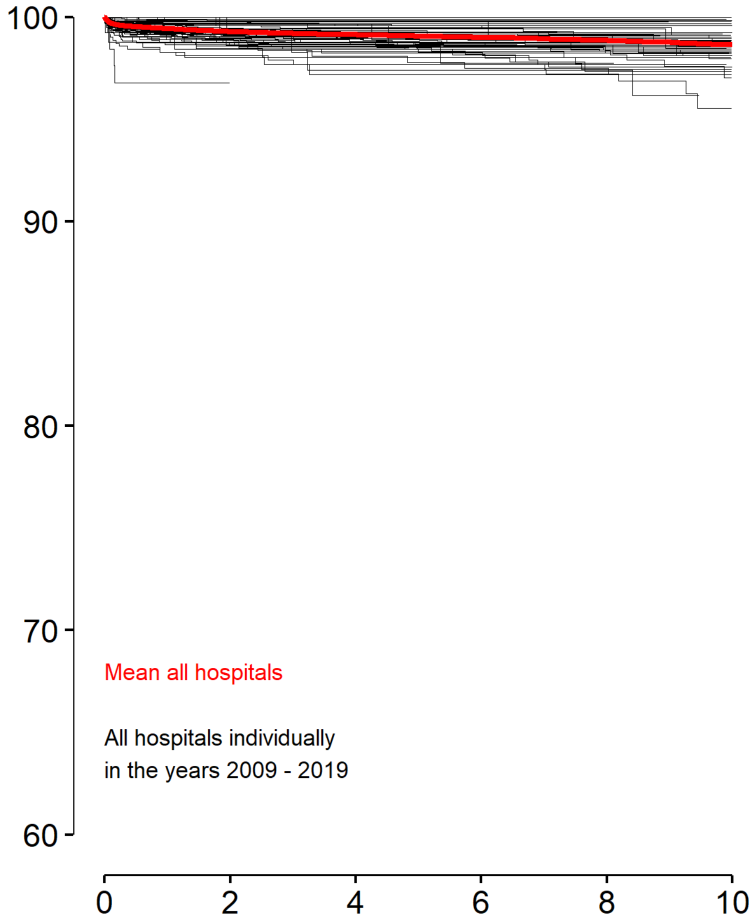
A.22) All hospitals in the years 2009 - 2019



A.23) Endpoint revision due to infection, 2009 - 2019



A.24) Endpoint revision due to dislocation, 2009 - 2019



One stage bilateral hip prosthesis operations

År	1987-2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Sum:
Antall pasienter	222	15	18	26	23	22	28	32	47	72	64	569

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 2019

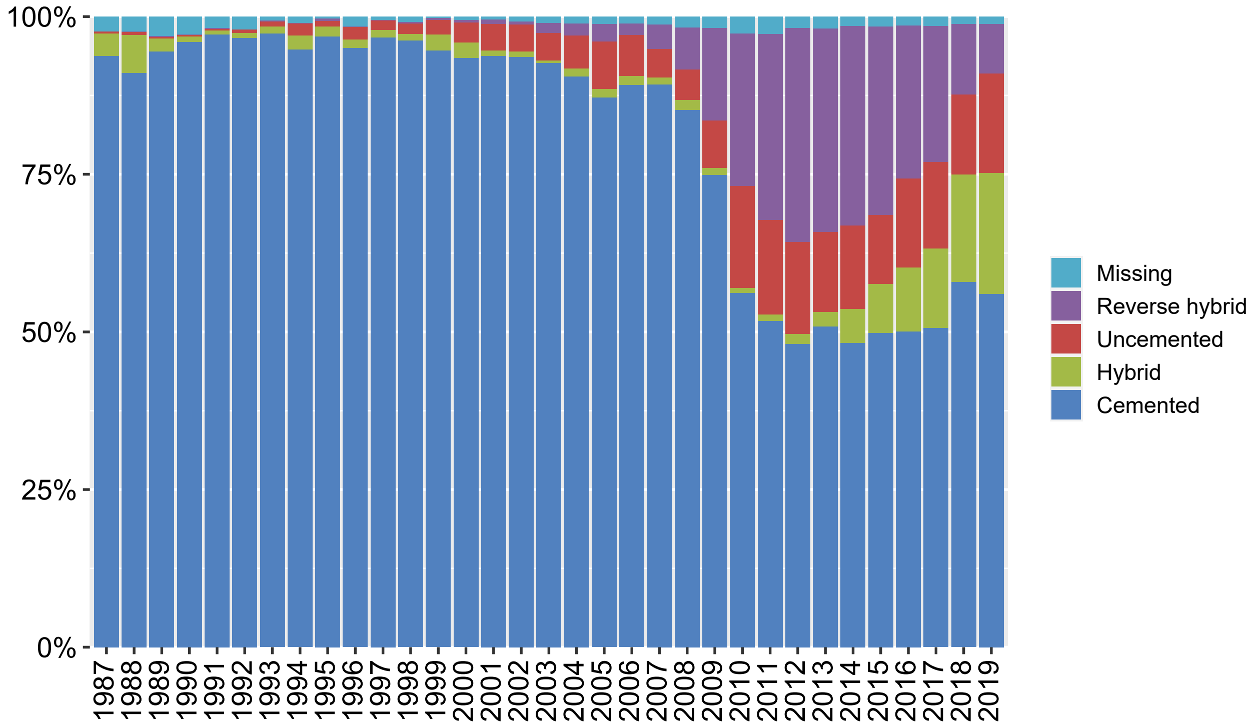


FIGURE A.26: Number of primary THA operations, 2019

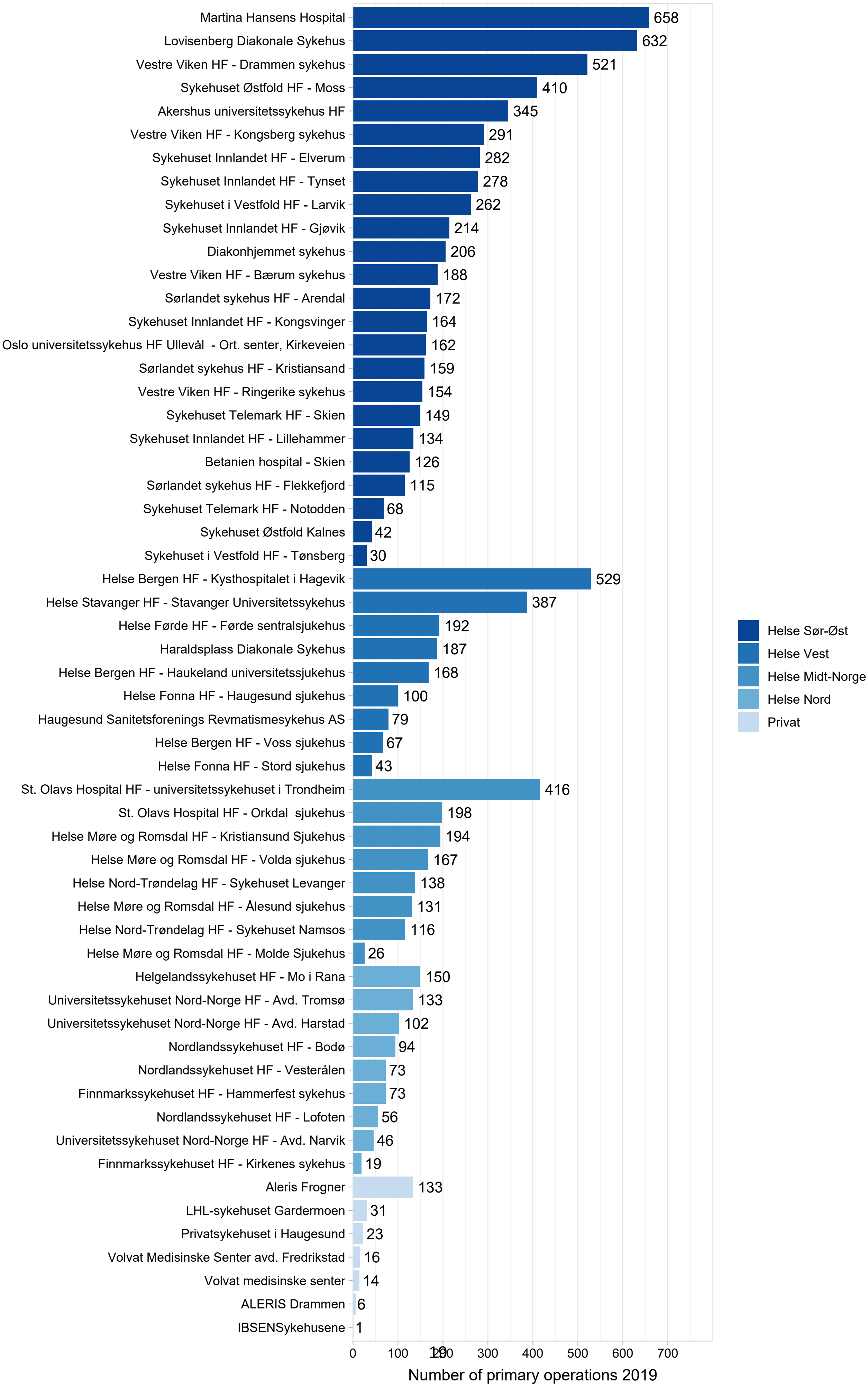
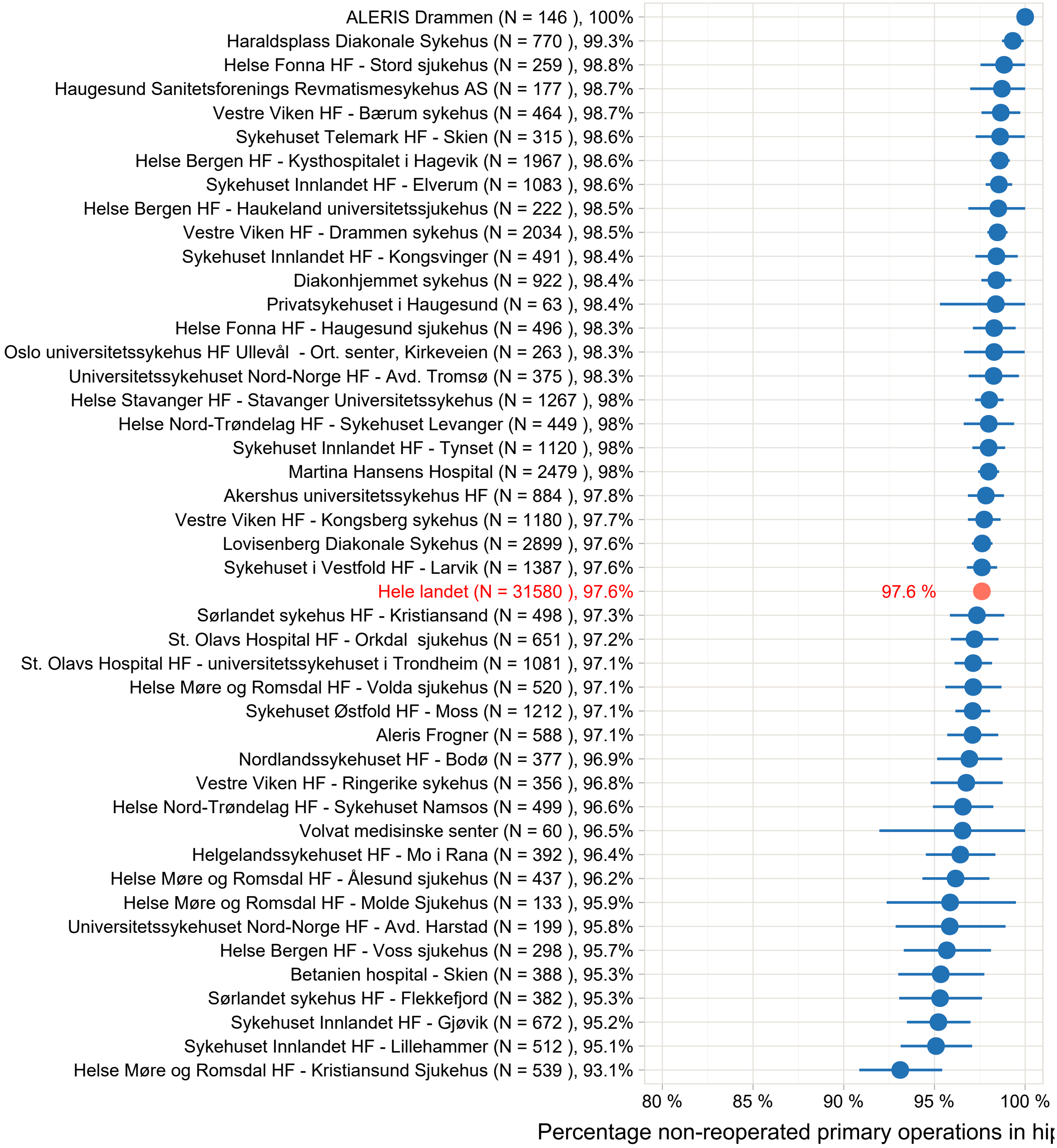
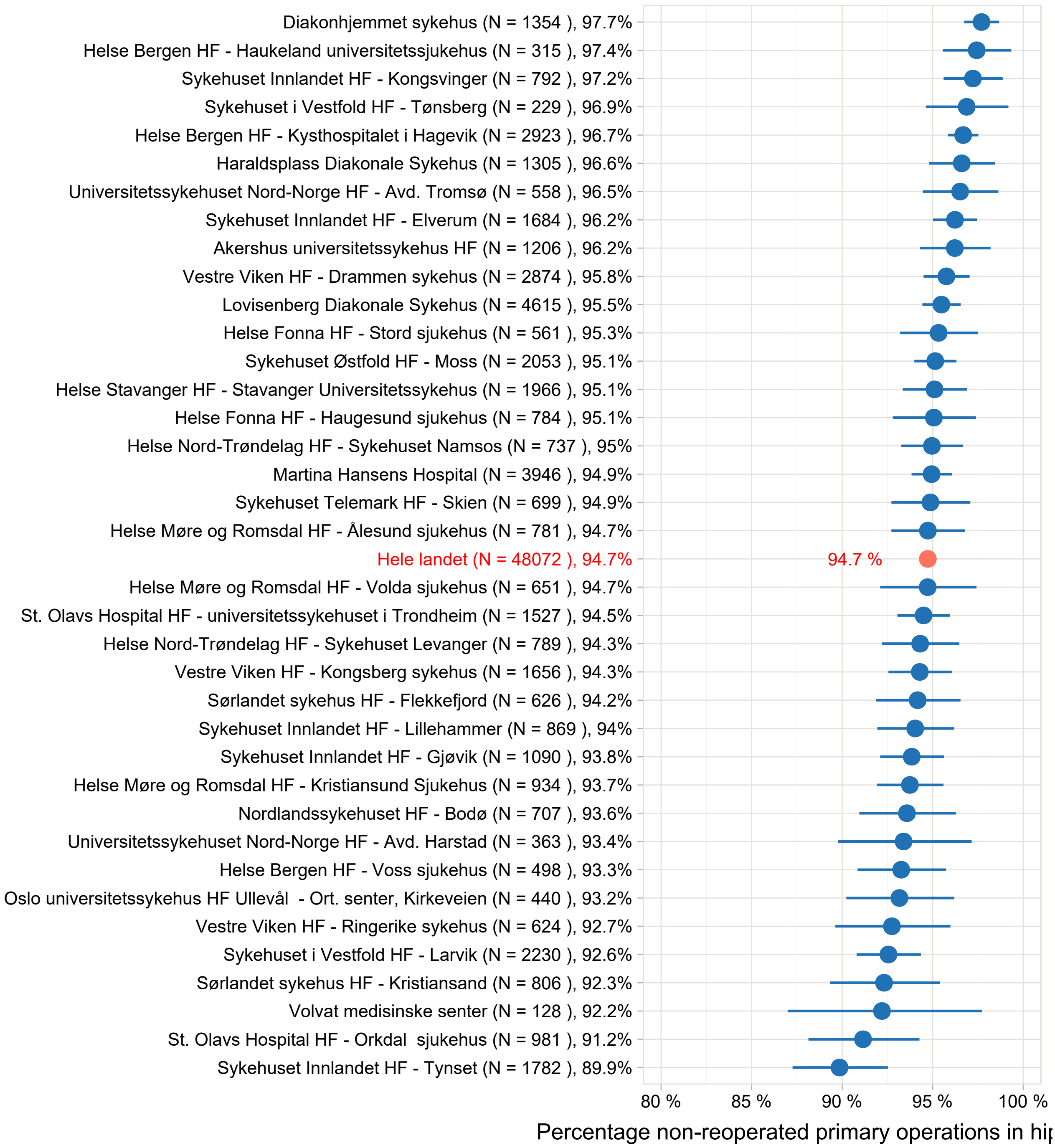


FIGURE A.27: Percentage non-revised standard patients two years after operations in 2013-2019



Kaplan-Meier estimates of percentage non-revised standard patients after two years with 95prosent confidence interval. Endpoint is all revisions. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2 and with idiopathic cox arthrosis 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 2013 to 2019. Only hospitals with operations in 2019 and with more than 50 operations from 2013 to 2019 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 2013 to 2018 are included.
See section «How to interpret the hospital-based results:».

FIGURE A.28: Percentage non-revised standard patients ten years after operations in 2008-2019



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 idiopathic cox arthrosis 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 2008 to 2019. Only hospitals with operations in 2019 and with more than 50 operations from 2008 to 2019 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 2008 to 2018 are included.
See section «How to interpret the hospital-based results:».

How to interpret the hospital-based results:

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

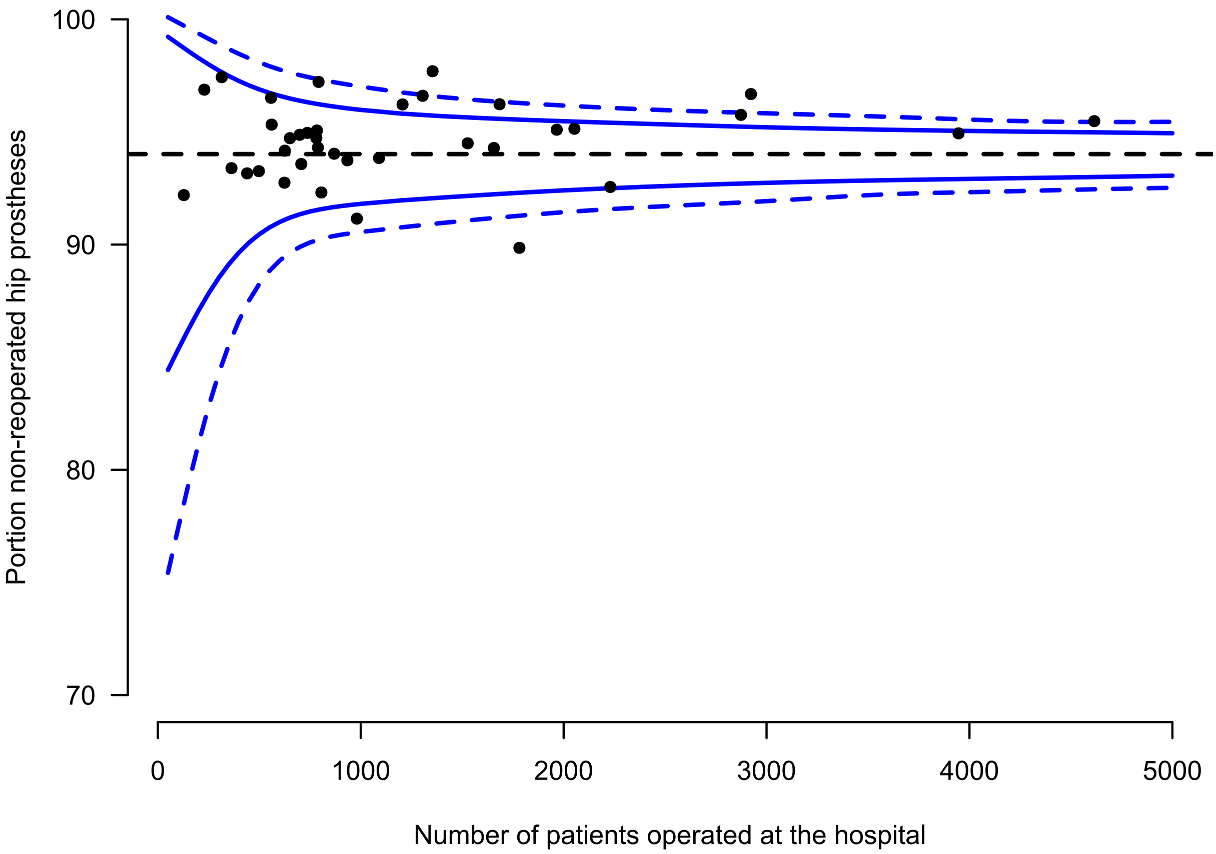
1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analyses.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications,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

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

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

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

FIGURE A.29: Funnel plot, percentage non-revised standard patients ten years after operations in 2008-2019



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2008 to 2019 at Norwegian hospitals. Some hospitals are excluded. This can be due to low completeness of reporting of revisions (<80 % from 2008 to 2018), 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 2019. 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 "Portion non-reoperated" on the x and y axis respectively, the hospital belonging to the point can be found in figure A.28.

One hospital falls below the 99,8 percentile in 2019. The hospital continued to use a prosthesis with bad results for a few years longer than the other hospitals, resulting in such a low survival rate.

FIGURE A.30: Durability of hip replacements 2008-2019.

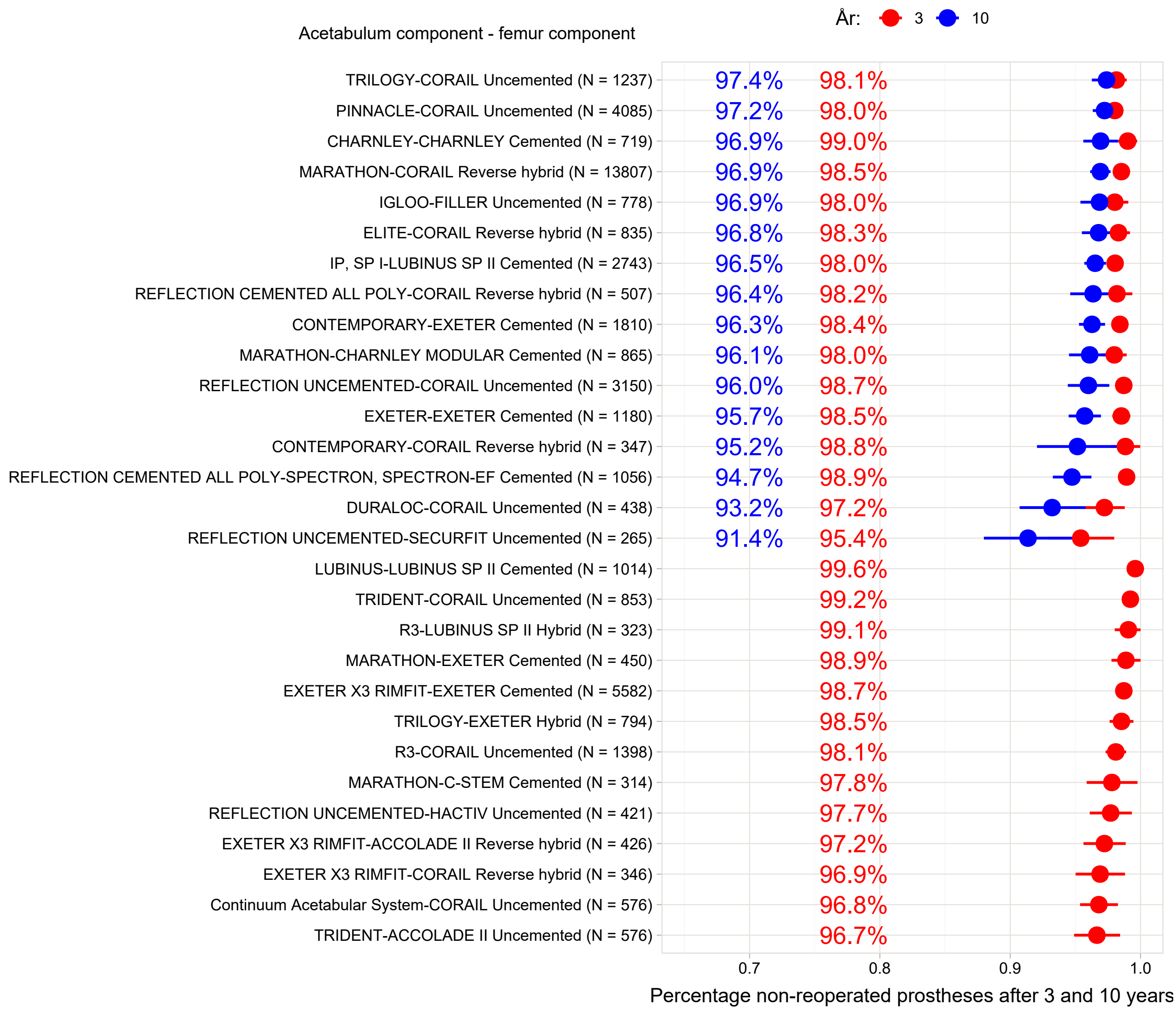


Figure A.30 shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of hip prostheses. We have only included combinations used in 500 or more operations in 2008-2019. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2008 to 2019 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. 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 combinations Reflection All Poly/Spectron EF (cemented) and Titan/Titan (cemented) are no longer in use. This is based on results in studies published by the Register (Espehaug B 2009, Hallan G 2007, Hallan G 2010, Hallan G 2012 and Kadar T 2011), see our list of publications in the annual report `http://nrlweb.ihelse.net/)`. 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:

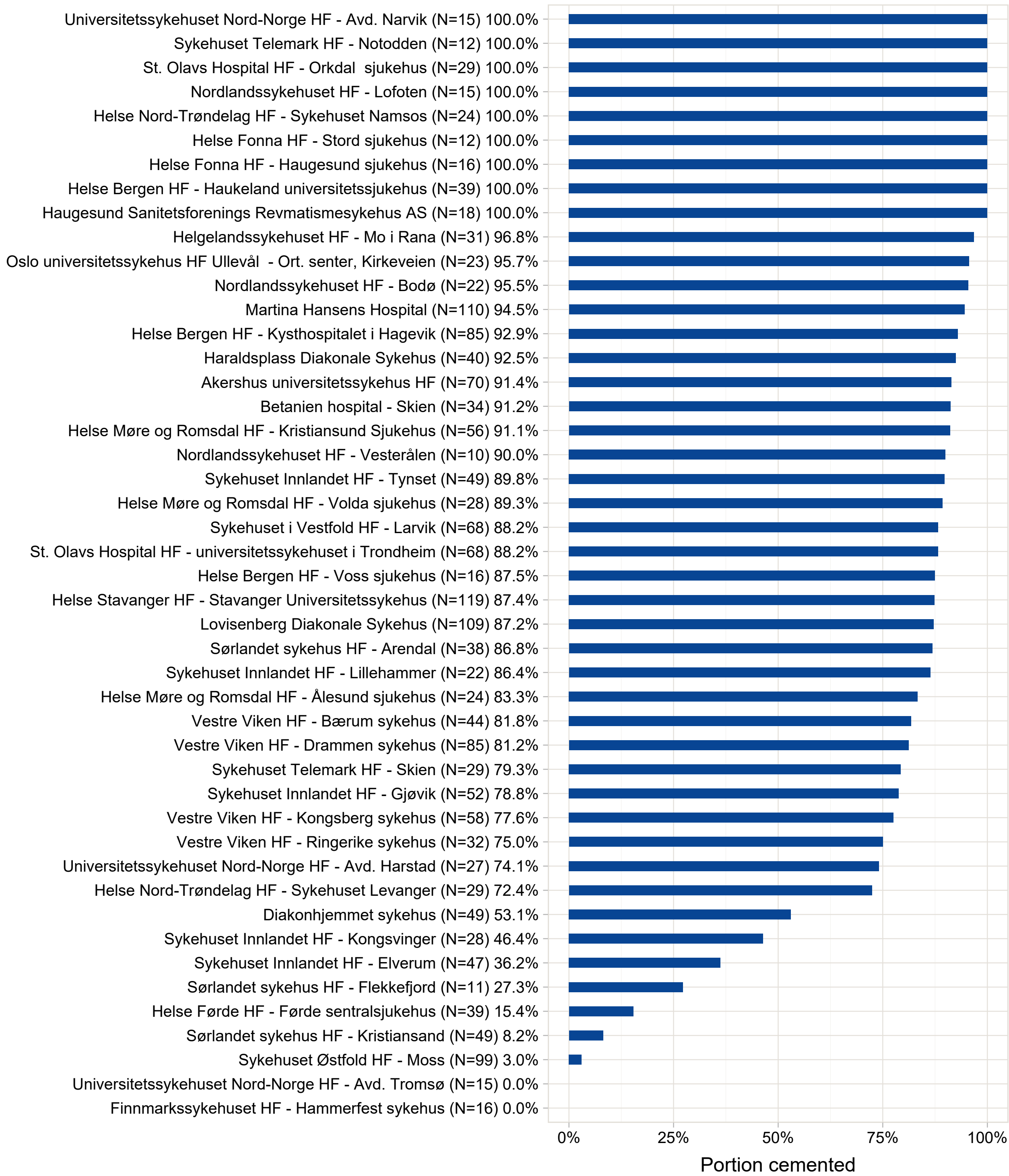
When prostheses are ranked by percentage of revisions, results must be interpreted with caution, as there may be many reasons for different revision percentages. We mainly publish prosthesis results in scientific journals and presentations where we account for materials and methods and discuss strengths and weaknesses and the significance of the findings (see the reference list in `http://nrlweb.ihelse.net/Rapporter/Rapport2019.pdf`).

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 is not recorded in the registers.
3. A prosthesis may be used at few hospitals and in small numbers, which may mean that the revision percentage reflects the skill of the surgeon or the threshold for revision rather than the qualities of the prosthesis.
4. If a prosthesis is used in a large number of patients (>3000) and in several hospitals (>5), we consider the results more reliable.
5. 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.
6. 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: Portion of women over 75 years with cemented stem in 2019.

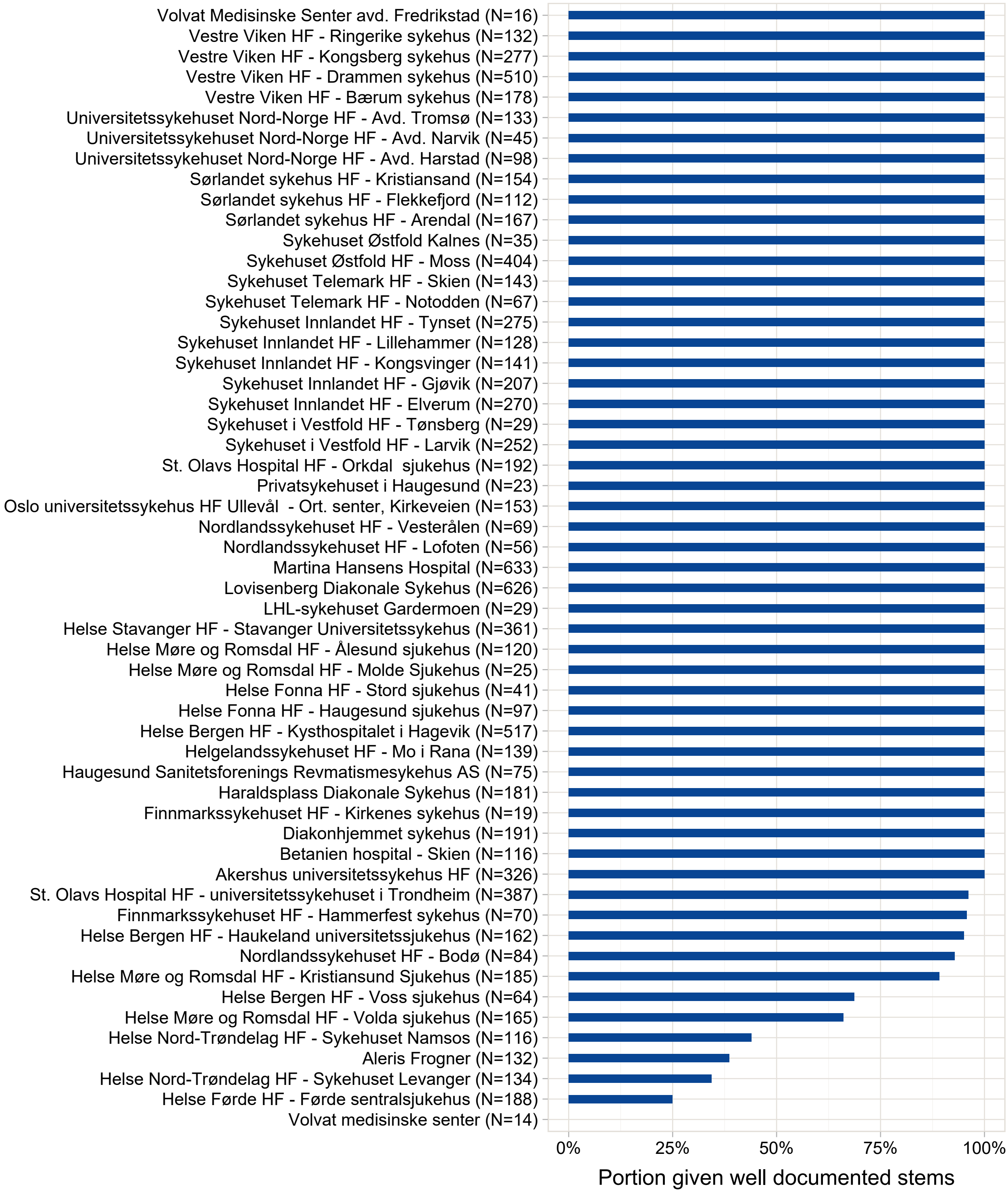


The figure shows that some hospitals use cemented femoral prostheses in all women over 75 years, others differentiate and some choose uncemented femoral prostheses for all these patients. The Register recommends using a cemented prosthesis for this patient group.

FIGURE A.32: Portion of patients with strong cup materials (cross-linked polyethylene/ceramic) in 2019.

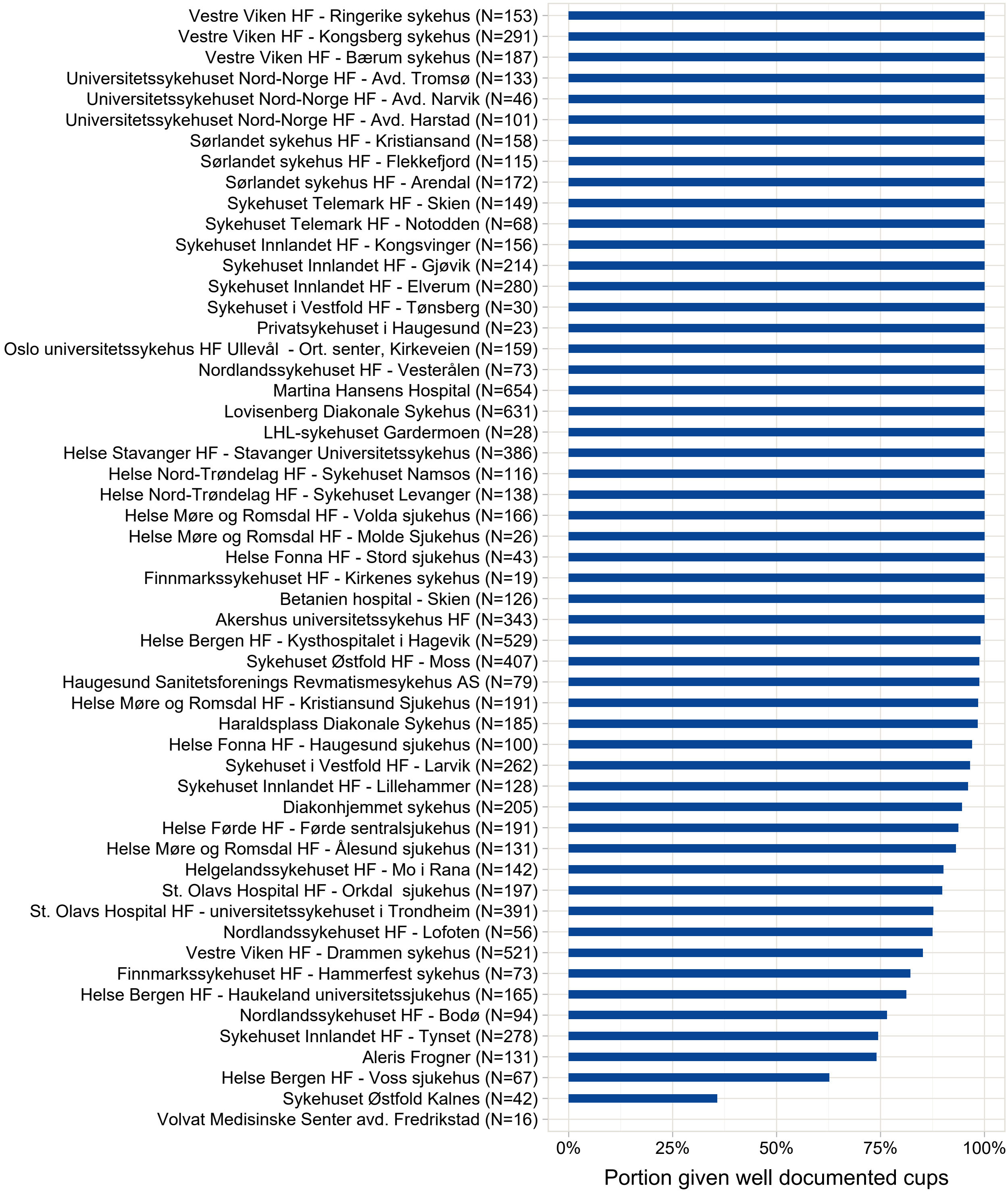
Figure A.32 shows that most patients at all hospitals receive hip prostheses with wear-resistant joint surfaces (crosslinked polyethylene or ceramic acetabular components). The use of ordinary polyethylene is justified in certain patients who do not need a prosthesis lasting longer than 10-15 years.

FIGURE A.33: Portion of patients recieving well documented hipstem in 2019.



The overwhelming majority of all inserted hipstems are well documented. A few hospitals fall short of satisfying the requirements. For some hospitals, this is due to ongoing clinical trials on new implants. Others have elected to use implants where the long-term results have yet to be documented.

FIGURE A.34: Portion of patients recieving well documented hipcups in 2019.



Most inserted hipcups are well documented. Many hospitals fall short of satisfying the requirements. This is mostly due to hospitals electing to use newer cups where the long-term results have yet to be documented. Some hospitals fall short of the requirements due to ongoing clinical trials on new implants.

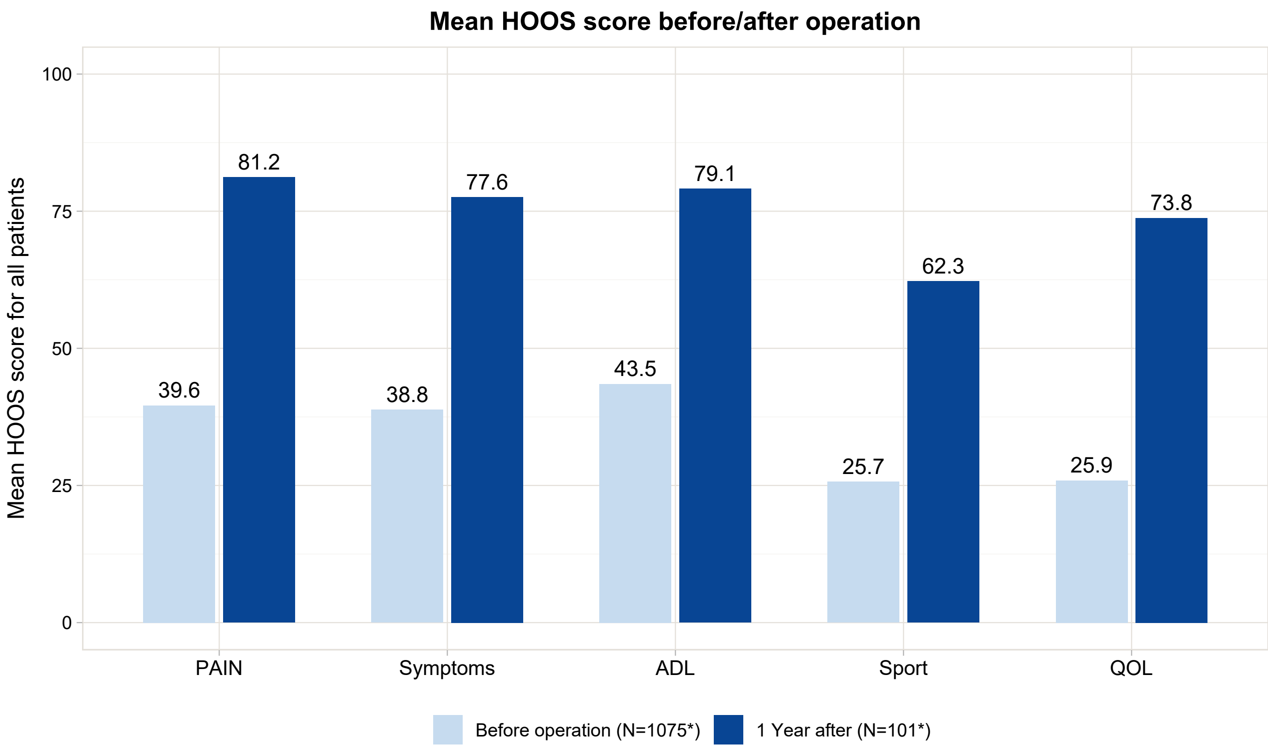
PROM, Hip Arthroplasty Register

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

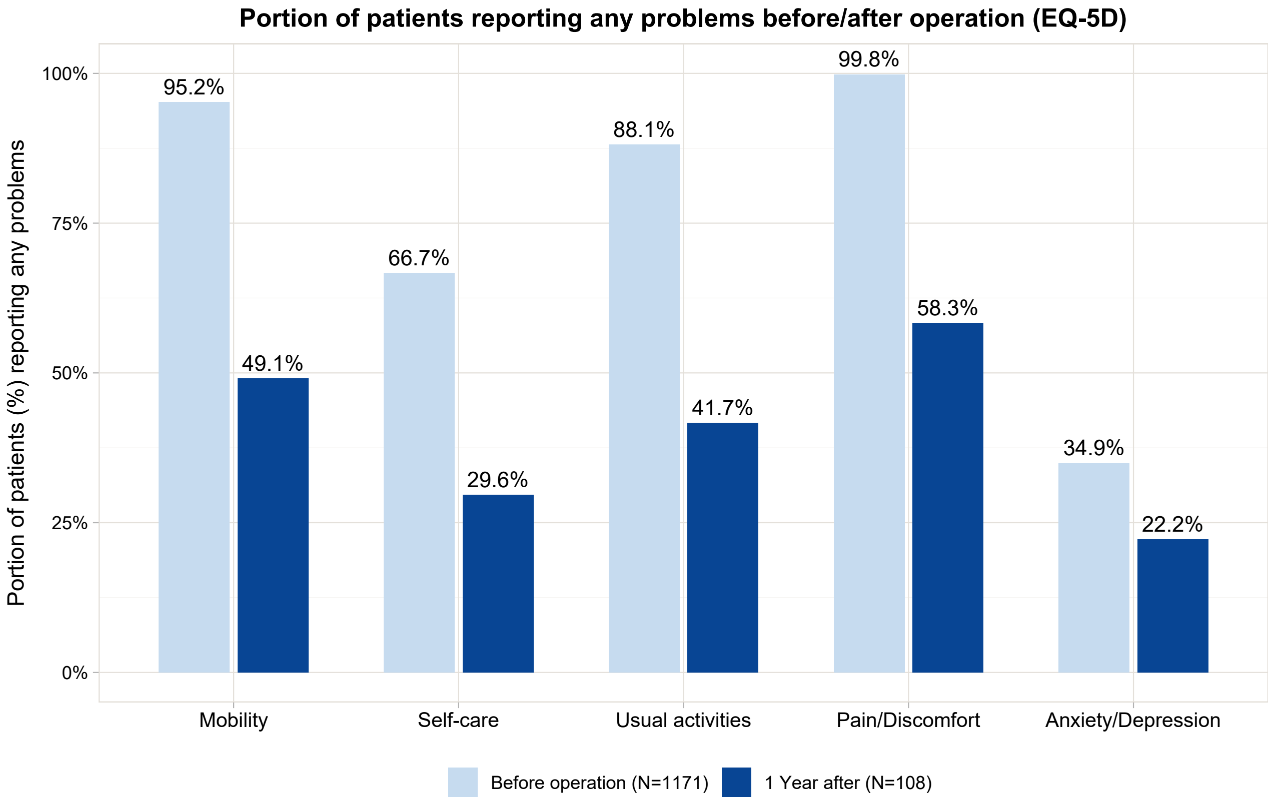
Thus far, we have collected data from 1199 patients. 1171 of the forms were filled out before the operation, while 108 were filled one year after the operation. 43 patients have filled out a form both before and one year after the operation. Currently 22 hospitals report to the register. All hospitals will receive an overview of their own results. Please contact our consultant Mikal Solberg (mikal.solberg@helse-bergen.no) with questions regarding electronic reporting of PROM.

Patient demografic	Before operation	1 Year after
number of forms (n)	1171	108
Men (%)	38.9	40.7
Median age (min-maks)	67 (14-94)	72 (16-92)
Body-Mass Index (BMI)	28.5 (12.8)	27.8 (5.3)
Uses alchohol n (%)	841 (71.8)	56 (51.9)
Smokes n (%)	133 (11.4)	14 (13)
High school education or higher n (%)	579 (49.4)	45 (41.7)
Lives alone n (%)	314 (26.8)	35 (32.4)
UCLA activity* mean (SD)	4.7 (2)	5.3 (2.1)
Health** (VAS) mean (SD)	55.5 (20.2)	67.1 (19.5)
Pain*** mean (SD)	65.2 (17.9)	22.1 (29.8)

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



*Only 1075 forms have adequate completeness of the questions tied to HOOS before the operation, and 101 forms 1 year after.



Health trust	Reporting hospitals	Number of pre-operative forms
Helse Sør-Øst	8/24	521
Helse Vest	6/9	439
Helse Midt-Norge	4/8	143
Helse Nord	3/9	45
Privat	1/8	23

TOTAL HIP ARTHROPLASTY

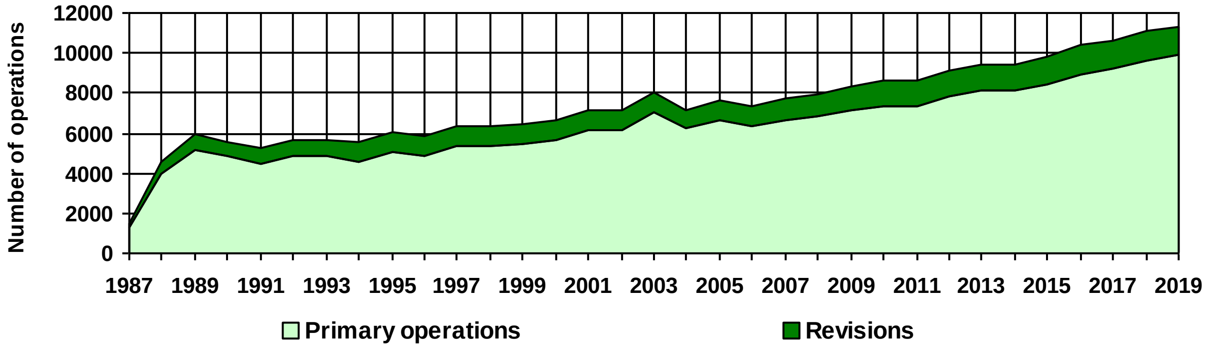
Table 1: Annual numbers of operations (Hemi prosthesis operations for hip fracture are not included here. These are found in tables of The Norwegian Hip Fracture Register)

Year	Primary operations *		Reoperations **		Revisions		Total
2019	9 879	(86,9%)	101	(0,9%)	1 384	(12,2%)	11 364
2018	9 599	(86,1%)	118	(1,1%)	1 438	(12,9%)	11 155
2017	9 174	(85,9%)	107	(1,0%)	1 394	(13,1%)	10 675
2016	8 953	(85,7%)	78	(0,7%)	1 419	(13,6%)	10 450
2015	8 450	(85,7%)	18	(0,2%)	1 392	(14,1%)	9 860
2014	8 138	(86,3%)	28	(0,3%)	1 266	(13,4%)	9 432
2013	8 104	(85,9%)	21	(0,2%)	1 306	(13,8%)	9 431
2012	7 843	(85,6%)	28	(0,3%)	1 287	(14,1%)	9 158
2011	7 357	(85,1%)	18	(0,2%)	1 269	(14,7%)	8 644
2010	7 328	(85,3%)	2	(0,0%)	1 256	(14,6%)	8 586
2009	7 113	(85,5%)			1 209	(14,5%)	8 322
2008	6 847	(85,9%)			1 122	(14,1%)	7 969
2007	6 659	(86,4%)	1	(0,0%)	1 051	(13,6%)	7 711
2006	6 319	(86,3%)	1	(0,0%)	1 006	(13,7%)	7 326
2001-05	32 199	(86,9%)	1	(0,0%)	4 865	(13,1%)	37 065
1996-00	26 637	(84,2%)	1	(0,0%)	4 981	(15,8%)	31 619
1987-95	39 193	(85,6%)	1	(0,0%)	6 594	(14,4%)	45 788
Total	**209 792**	**(85,8%)**	**524**	**(0,2%)**	**34 239**	**(14,0%)**	**244 555**

* In addition, there were reports 150 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.).

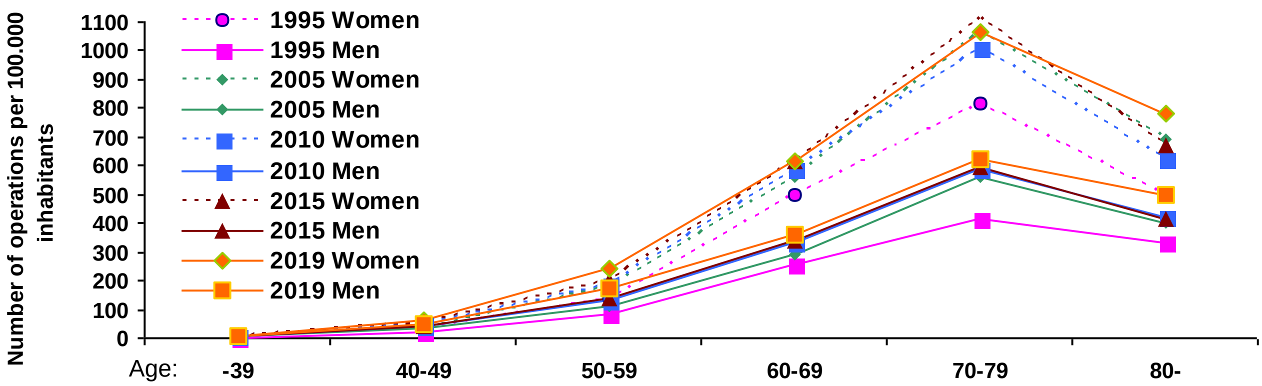
Figure 1: Annual numbers of operations



54,8 % of all operations were performed on the right side. 66,5 % performed in women.

Mean age at primary surgery was 68,9 years, 69,7 years for women and 67 years for men.

Figure 2: Incidence of primary hip prostheses



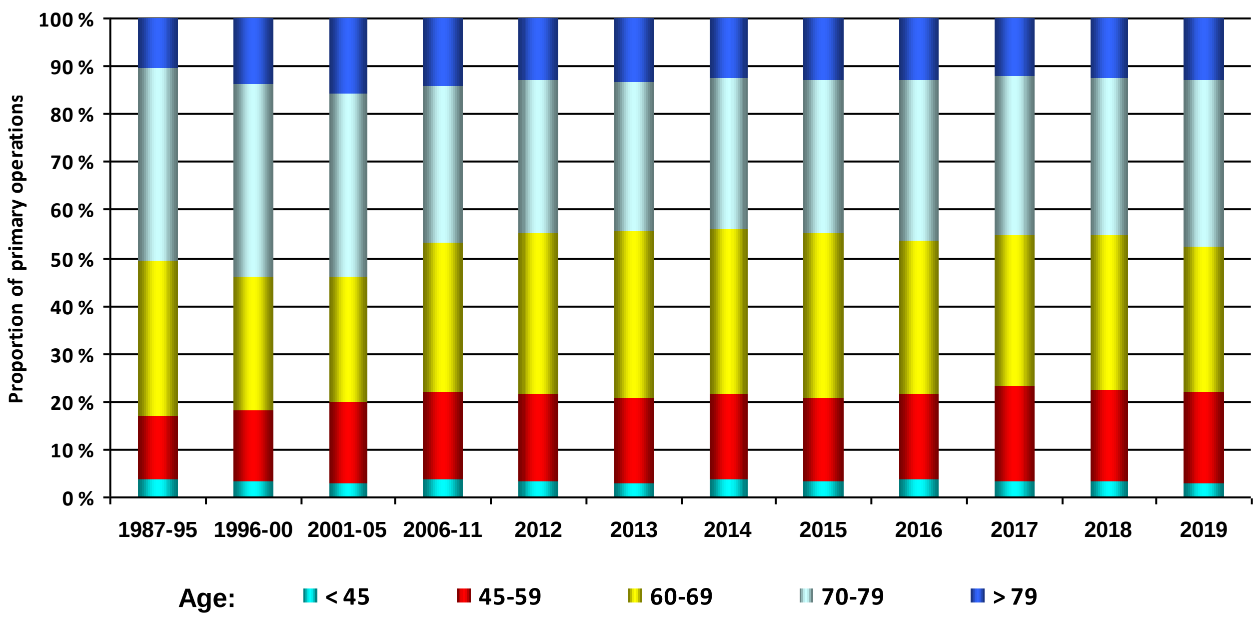
Reasons for primary operations

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
2019	7 804	87	303	651	17	94	20	609	293	30	288	28
2018	7 621	99	297	653	24	113	21	571	266	23	282	10
2017	7 301	108	299	679	19	105	26	404	270	34	282	13
2016	7 109	138	355	685	11	107	19	342	229	33	247	9
2015	6 796	108	332	587	11	106	21	321	181	26	200	19
2014	6 414	115	354	648	18	86	28	287	250	22	175	19
2013	6 416	125	351	611	10	115	31	288	172	29	191	30
2012	6 220	157	365	615	12	92	43	204	186	16	202	14
2011	5 787	132	372	573	24	96	26	187	138	21	187	30
2010	5 734	130	354	594	36	88	20	160	152	16	191	50
2009	5 515	131	390	560	26	127	24	150	174	11	165	32
2008	5 359	144	443	498	25	99	21	148	145	19	144	6
2007	5 166	146	475	457	21	80	22	159	174	21	110	15
2006	4 819	147	486	445	17	83	24	131	172	19	126	13
2001-05	24 253	821	2 770	2 233	132	405	130	398	464	66	462	83
1996-00	18 854	883	3 085	1 851	147	356	128	194	269	61	529	290
1987-95	26 713	1 469	5 140	3 148	562	518	175	105	156	136	741	331
Total	**157 881**	**4 940**	**16 171**	**15 488**	**1 112**	**2 670**	**779**	**4 658**	**3 691**	**583**	**4 522**	**992**

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

Figure 3: Age by year of operation



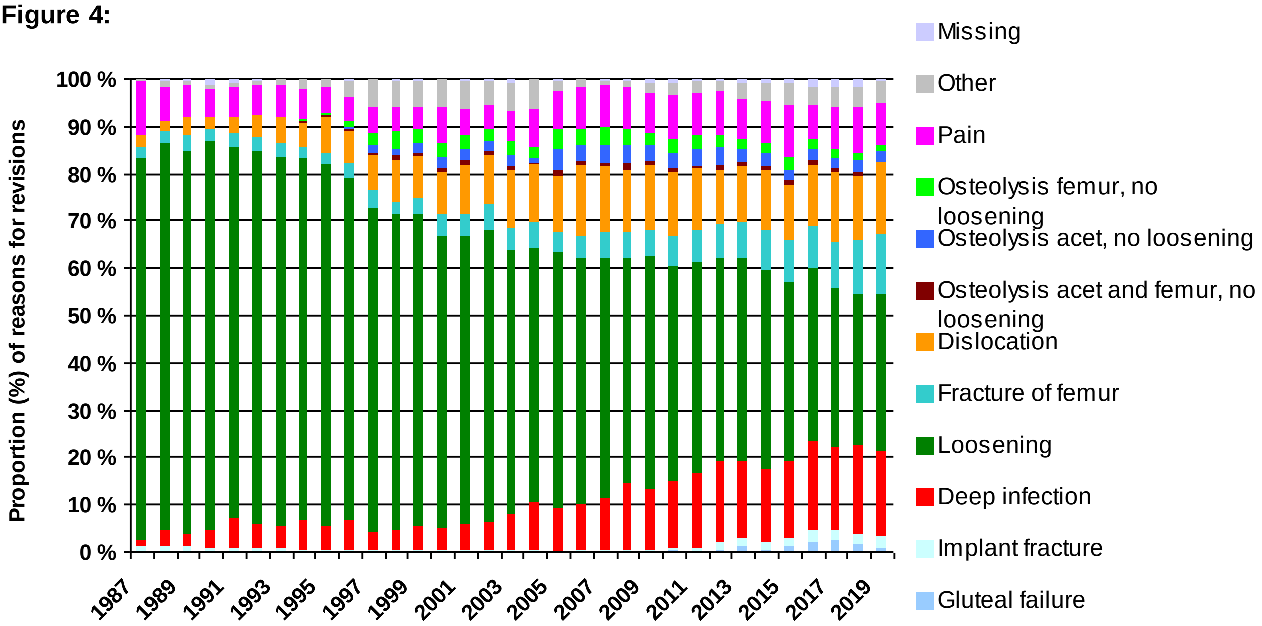
Reasons for revisions

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	Previous Girdlestone	Implant fracture	Gluteal failure	Other	Missing information
2019	389	240	279	333	234	167	43	22	36	10	46	19	84	11
2018	397	250	273	377	231	190	55	32	43	6	41	38	92	30
2017	415	238	286	346	188	175	41	43	37	10	35	51	77	35
2016	456	268	259	374	181	145	51	40	30	11	45	45	77	30
2015	434	292	228	315	163	212	46	56	49	9	32	28	84	17
2014	425	281	217	267	144	147	50	36	48	18	24	10	67	11
2013	450	323	213	292	140	146	53	43	55	13	30	24	60	18
2012	445	318	203	310	127	168	70	42	49	18	31	5	37	8
2011	443	323	220	274	118	146	63	52	66	22	13	3	49	5
2010	444	319	229	239	101	154	55	50	55	45	8	7	44	12
2009	443	316	215	203	85	131	52	41	80	29	4	3	35	10
2008	399	305	192	211	83	131	54	53	63	47	6	0	19	5
2007	409	282	187	149	77	120	53	48	66	28	3	1	15	3
2006	399	295	198	126	64	119	45	46	48	22	8	0	18	2
2001-05	1 990	1 725	738	497	316	436	170	195	348	164	21	0	315	29
1996-00	2 220	2 481	573	335	249	377	112	196	284	187	29	0	363	20
1987-95	3 426	3 967	405	432	273	603	5	6	44	144	74	0	112	43
Total	**13 584**	**12 223**	**4 915**	**5 080**	**2 774**	**3 567**	**1 018**	**1 001**	**1 401**	**783**	**450**	**234**	**1 548**	**289**

Revision causes are not mutually exclusive. More than one reason of revision is possible

Figure 4:



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

Reasons for revisions

Table 3b: Implant Fracture

Year of revision	Femural stem	Femoral head	Acetabular cup	Liner	Other	Tota
2019	24	4	3	15	0	46
2018	12	4	4	19	2	41
2017	9	7	3	16	0	35
2016	8	9	7	17	4	45
2015	8	5	4	11	4	32
2014	3	2	4	13	2	24
2013	9	6	3	10	2	30
2012	6	6	3	13	3	31
2011	2	5	1	4	1	13
2010	1	4	3	0	0	8
2009	0	3	1	0	0	4
2008	0	3	3	0	0	6
2007	0	3	0	0	0	3
2006	1	3	4	0	0	8
2001-05	11	4	6	0	0	21
1996-00	20	1	8	0	0	29
1987-95	58	0	16	0	0	74
Total	**172**	**69**	**73**	**118**	**18**	**450**

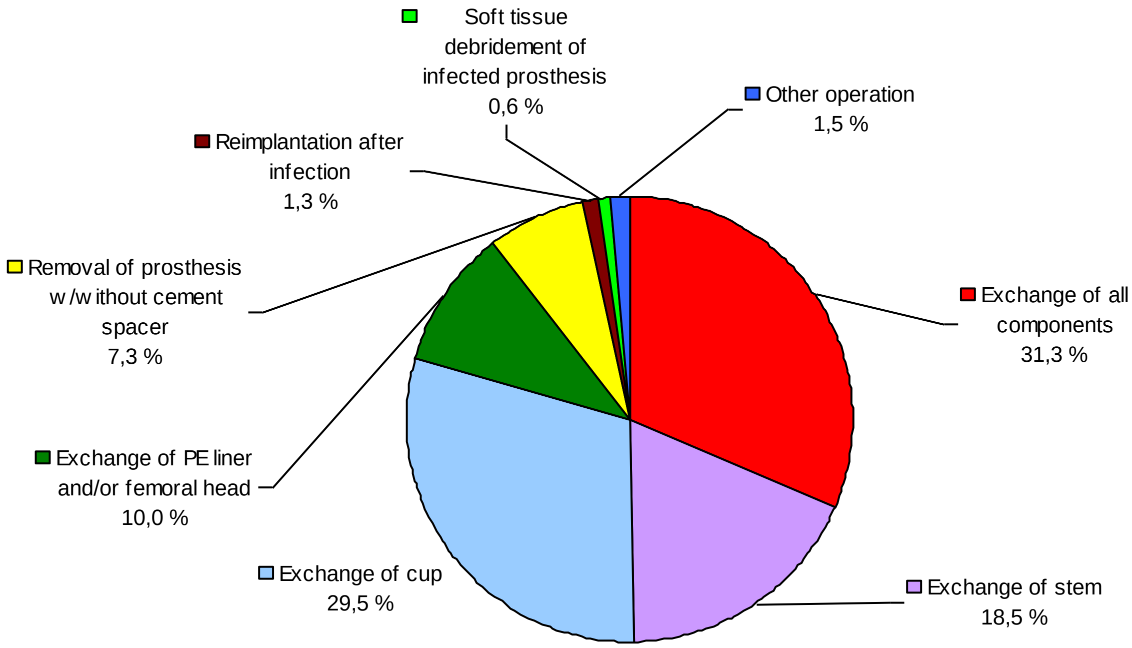
Revision causes are not mutually exclusive. More than one reason of revision is possible

Type of revision

Table 4:

Year	Exchange of femoral stem and head	Exchange of stem, PE liner, head	Exchange of acetabular cup	Exchange of femoral head	Exchange of femoral head and acetabular cup	Exchange of all components	Exchange of PE liner only	Exchange of PE liner and femoral head	Removal of prosthesis or cement spacer	Removal of prosthesis and insertion of cement spacer	Insertion of new prosthesis (after Girdlestone)	Soft tissue debridement of infected prosthesis	Muscle resonance and transposition	Osteosynthesis for fracture	Other operation	Missing information	Total
2019	162	45	231	98	227	243	9	123	18	129	1	23	7	82	80	7	**1 485**
2018	183	39	181	118	258	267	14	116	31	136	1	26	27	67	86	6	**1 556**
2017	168	39	218	124	259	256	7	112	29	105		26	34	46	71	7	**1 501**
2016	144	25	163	135	302	298	3	93	17	138	4	26	22	35	86	6	**1 497**
2015	177	29	203	118	261	291	11	97	44	96	5	20		1	53	4	**1 410**
2014	157	30	200	100	246	272	8	80	38	92	1	25		1	38	6	**1 294**
2013	176	20	168	114	260	309	4	75	30	102	5	17			41	6	**1 327**
2012	169	18	187	113	229	323	6	67	39	106	2	25			21	10	**1 315**
2006-11	944	94	927	516	1 623	1 807	34	343	449	35	56	14			59	34	**6 935**
2001-05	817	98	753	150	815	1 470	41	245	326	1	101	1			6	42	**4 866**
1996-00	1 072	65	517	73	719	1 874	27	199	243	0	177	1			4	11	**4 982**
1987-95	1 652	8	1 012	20	143	3 300	8	22	278	0	88	1			20	43	**6 595**
Total	**5 821**	**510**	**4 760**	**1 679**	**5 342**	**10 710**	**172**	**1 572**	**1 542**	**940**	**441**	**205**	**90**	**232**	**565**	**182**	**34 763**

Figure 5:



Bone transplantation in revisions

Table 5: Acetabular cup

Year	Yes		No		Bone impaction[1]		Missing		Total
2019	60	(4 %)	927	(62,4 %)	69	(4,6 %)	429	(28,9 %)	**1 485**
2018	50	(3,2 %)	962	(61,8 %)	76	(4,9 %)	468	(30,1 %)	**1 556**
2017	65	(4,3 %)	961	(64 %)	82	(5,5 %)	393	(26,2 %)	**1 501**
2016	72	(4,8 %)	942	(62,9 %)	96	(6,4 %)	387	(25,9 %)	**1 497**
2015	102	(7,2 %)	971	(68,9 %)	92	(6,5 %)	245	(17,4 %)	**1 410**
2014	112	(8,7 %)	856	(66,2 %)	94	(7,3 %)	232	(17,9 %)	**1 294**
2013	89	(6,7 %)	854	(64,4 %)	131	(9,9 %)	253	(19,1 %)	**1 327**
2012	105	(8 %)	832	(63,3 %)	143	(10,9 %)	235	(17,9 %)	**1 315**
2011	112	(8,7 %)	807	(62,7 %)	181	(14,1 %)	187	(14,5 %)	**1 287**
2010	131	(10,4 %)	786	(62,5 %)	189	(15 %)	152	(12,1 %)	**1 258**
2009	111	(9,2 %)	715	(59,1 %)	245	(20,3 %)	138	(11,4 %)	**1 209**
2008	110	(9,8 %)	668	(59,5 %)	211	(18,8 %)	133	(11,9 %)	**1 122**
2007	132	(12,5 %)	594	(56,5 %)	193	(18,3 %)	133	(12,6 %)	**1 052**
2006	115	(11,4 %)	554	(55 %)	201	(20 %)	137	(13,6 %)	**1 007**
2001-05	877	(18 %)	2 947	(60,6 %)	757	(15,6 %)	285	(5,9 %)	**4 866**
1996-00	1 104	(22,2 %)	3 110	(62,4 %)	653	(13,1 %)	115	(2,3 %)	**4 982**
1987-95	1 893	(28,7 %)	4 564	(69,2 %)	4	(0,1 %)	134	(2 %)	**6 595**
Total	**5 240**	**(15,1 %)**	**22 050**	**(63,4 %)**	**3 417**	**(9,8 %)**	**4 056**	**(11,7 %)**	**34 763**

Table 6: Femoral stem

Year	Yes		No		Bone impaction[1]		Missing		Total
2019	32	(2,2 %)	926	(62,4 %)	5	(0,3 %)	522	(35,2 %)	**1 485**
2018	26	(1,7 %)	954	(61,3 %)	4	(0,3 %)	572	(36,8 %)	**1 556**
2017	44	(2,9 %)	956	(63,7 %)	7	(0,5 %)	494	(32,9 %)	**1 501**
2016	43	(2,9 %)	964	(64,4 %)	3	(0,2 %)	487	(32,5 %)	**1 497**
2015	70	(5 %)	982	(69,6 %)	11	(0,8 %)	347	(24,6 %)	**1 410**
2014	63	(4,9 %)	880	(68 %)	3	(0,2 %)	348	(26,9 %)	**1 294**
2013	84	(6,3 %)	886	(66,8 %)	8	(0,6 %)	349	(26,3 %)	**1 327**
2012	81	(6,2 %)	838	(63,7 %)	21	(1,6 %)	375	(28,5 %)	**1 315**
2011	116	(9 %)	818	(63,6 %)	29	(2,3 %)	324	(25,2 %)	**1 287**
2010	119	(9,5 %)	797	(63,4 %)	44	(3,5 %)	298	(23,7 %)	**1 258**
2009	129	(10,7 %)	752	(62,2 %)	45	(3,7 %)	283	(23,4 %)	**1 209**
2008	144	(12,8 %)	677	(60,3 %)	69	(6,1 %)	232	(20,7 %)	**1 122**
2007	125	(11,9 %)	601	(57,1 %)	70	(6,7 %)	256	(24,3 %)	**1 052**
2006	145	(14,4 %)	598	(59,4 %)	81	(8 %)	183	(18,2 %)	**1 007**
2001-05	774	(15,9 %)	3 174	(65,2 %)	551	(11,3 %)	367	(7,5 %)	**4 866**
1996-00	1 092	(21,9 %)	2 903	(58,3 %)	872	(17,5 %)	115	(2,3 %)	**4 982**
1987-95	1 469	(22,3 %)	4 987	(75,6 %)	5	(0,1 %)	134	(2 %)	**6 595**
Total	**4 556**	**(13,1 %)**	**22 693**	**(65,3 %)**	**1 828**	**(5,3 %)**	**5 686**	**(16,4 %)**	**34 763**

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
2019	231	192	108	53	61	19	821	**1 485**
2018	310	173	93	48	49	20	863	**1 556**
2017	311	165	99	62	55	9	800	**1 501**
2016	267	219	103	82	54	29	743	**1 497**
2015	241	180	108	51	59	20	751	**1 410**
2014	197	171	93	70	41	31	691	**1 294**
2013	253	186	85	78	61	25	639	**1 327**
2012	209	238	111	88	73	18	578	**1 315**
2011	227	183	116	87	66	20	588	**1 287**
2010	236	176	103	77	62	20	584	**1 258**
2009	210	165	92	78	76	27	561	**1 209**
2008	196	181	83	96	67	27	472	**1 122**
2007	185	142	88	73	55	30	479	**1 052**
2005-06	450	273	165	139	118	47	872	**2 064**

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
2019	250	132	57	10	7	1 029	**1 485**
2018	295	123	59	15	10	1 054	**1 556**
2017	275	139	51	13	8	1 015	**1 501**
2016	253	153	70	24	4	993	**1 497**
2015	200	134	87	17	10	962	**1 410**
2014	162	149	67	13	3	900	**1 294**
2013	234	154	67	24	4	844	**1 327**
2012	205	190	70	18	6	826	**1 315**
2011	177	165	77	21	7	840	**1 287**
2010	196	150	70	18	8	816	**1 258**
2009	155	141	68	20	9	816	**1 209**
2008	156	177	81	11	10	687	**1 122**
2007	144	129	60	18	10	691	**1 052**
2005-06	377	303	130	45	15	1 194	**2 064**

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
2019	745	(7,5 %)	1 389	(14,1 %)	403	(4,1 %)	7 044	(71,3 %)	23	(0,2 %)	275	(2,8 %)	**9 879**
2018	765	(8 %)	1 249	(13 %)	464	(4,8 %)	6 797	(70,8 %)	43	(0,4 %)	281	(2,9 %)	**9 599**
2017	713	(7,8 %)	1 170	(12,8 %)	753	(8,2 %)	6 175	(67,3 %)	4	(0 %)	359	(3,9 %)	**9 174**
2016	718	(8 %)	1 164	(13 %)	1 437	(16,1 %)	5 170	(57,7 %)	5	(0,1 %)	459	(5,1 %)	**8 953**
2015	521	(6,2 %)	1 147	(13,6 %)	2 235	(26,4 %)	4 087	(48,4 %)	3	(0 %)	457	(5,4 %)	**8 450**
2014	337	(4,1 %)	1 059	(13 %)	3 175	(39 %)	3 021	(37,1 %)	16	(0,2 %)	530	(6,5 %)	**8 138**
2013	344	(4,2 %)	1 081	(13,3 %)	3 628	(44,8 %)	2 473	(30,5 %)	24	(0,3 %)	554	(6,8 %)	**8 104**
2012	438	(5,6 %)	1 023	(13 %)	3 916	(49,9 %)	2 192	(27,9 %)	12	(0,2 %)	262	(3,3 %)	**7 843**
2011	429	(5,8 %)	748	(10,2 %)	3 894	(52,9 %)	2 081	(28,3 %)	30	(0,4 %)	175	(2,4 %)	**7 357**
2010	625	(8,5 %)	470	(6,4 %)	3 917	(53,5 %)	2 153	(29,4 %)	48	(0,7 %)	115	(1,6 %)	**7 328**
2009	326	(4,6 %)	340	(4,8 %)	4 356	(61,2 %)	1 963	(27,6 %)	11	(0,2 %)	117	(1,6 %)	**7 113**
2008	68	(1 %)	387	(5,7 %)	4 359	(63,7 %)	1 927	(28,1 %)	8	(0,1 %)	98	(1,4 %)	**6 847**
2007	14	(0,2 %)	404	(6,1 %)	4 416	(66,3 %)	1 711	(25,7 %)	10	(0,2 %)	104	(1,6 %)	**6 659**
2006	2	(0 %)	452	(7,2 %)	4 270	(67,6 %)	1 482	(23,5 %)	3	(0 %)	110	(1,7 %)	**6 319**
2001-05	47	(0,1 %)	2 403	(7,5 %)	2 114	(68,7 %)	7 379	(22,9 %)	38	(0,1 %)	218	(0,7 %)	**32 199**
1996-00	42	(0,2 %)	2 026	(7,6 %)	8 066	(67,8 %)	6 401	(24 %)	13	(0 %)	89	(0,3 %)	**26 637**
1987-95	115	(0,3 %)	2 352	(6 %)	6 198	(66,8 %)	0 237	(26,1 %)	35	(0,1 %)	256	(0,7 %)	**39 193**
Total	**6 249**	**(3 %)**	**18 864**	**(9 %)**	**07 601**	**(51,3 %)**	**72 293**	**(34,5 %)**	**326**	**(0,2 %)**	**4 459**	**(2,1 %)**	**209 792**

Figure 6: In primary operations *

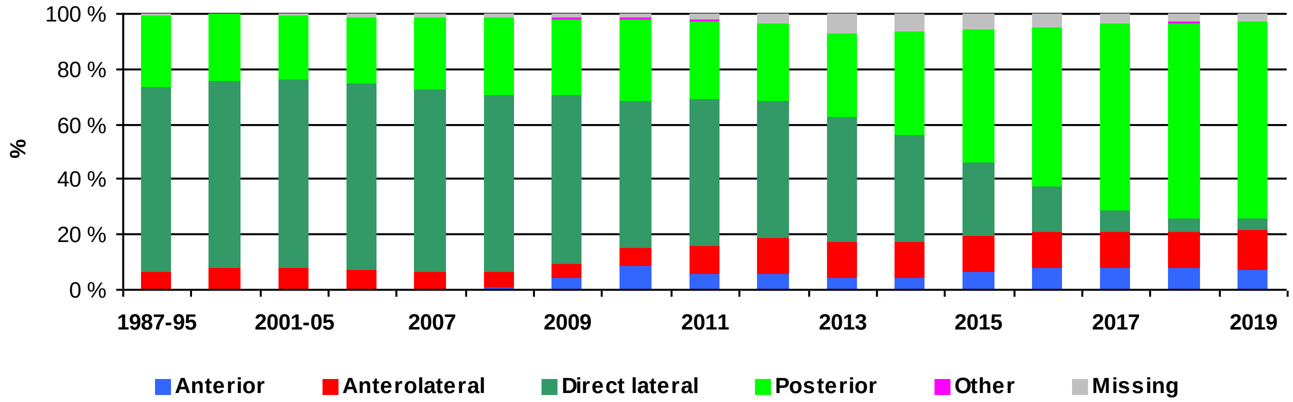


Table 10: Mini invasive surgery in primary surgery

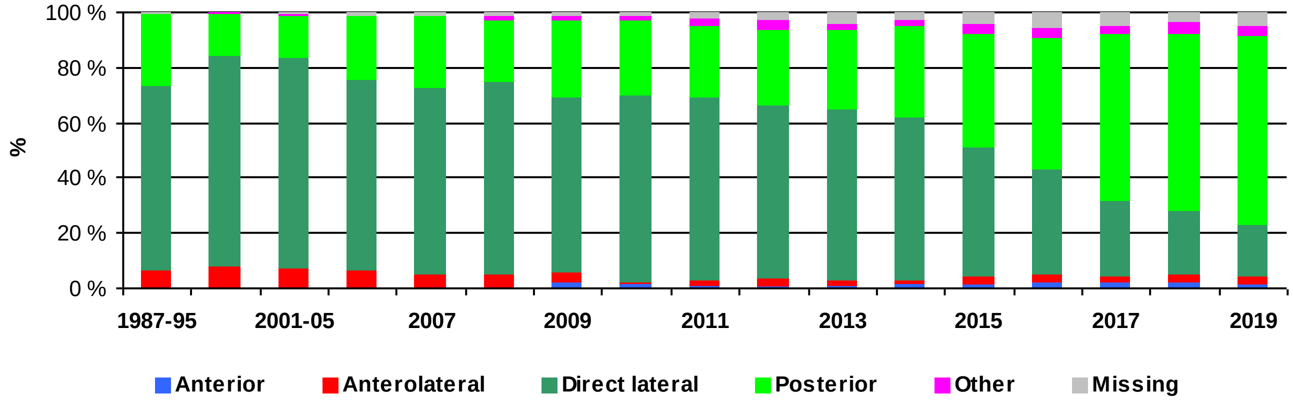
Year	Yes		No		Missing		Total
2019	2 071	(21,0%)	7 485	(75,8%)	323	(3,3%)	**9 879**
2018	2 089	(21,8%)	7 104	(74,0%)	406	(4,2%)	**9 599**
2017	1 943	(21,2%)	6 880	(75,0%)	351	(3,8%)	**9 174**
2016	1 818	(20,3%)	6 897	(77,0%)	238	(2,7%)	**8 953**
2015	1 594	(18,9%)	6 542	(77,4%)	314	(3,7%)	**8 450**
2014	1 337	(16,4%)	6 528	(80,2%)	273	(3,4%)	**8 138**
2013	1 409	(17,4%)	6 322	(78,0%)	373	(4,6%)	**8 104**
2012	1 328	(16,9%)	5 859	(74,7%)	656	(8,4%)	**7 843**
2011	1 000	(13,6%)	6 002	(81,6%)	355	(4,8%)	**7 357**
2010	934	(12,7%)	6 169	(84,2%)	225	(3,1%)	**7 328**
2009	398	(5,6%)	6 669	(93,8%)	46	(0,6%)	**7 113**
2008	65	(0,9%)	6 754	(98,6%)	28	(0,4%)	**6 847**
2007	4	(0,1%)	6 566	(98,6%)	89	(1,3%)	**6 659**
2005-06	202	(1,6%)	11 820	(91,5%)	894	(6,9%)	**12 916**

* 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 11: In revisions *

Year	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing information		Total
2019	26	(1,8 %)	35	(2,4 %)	275	(18,5 %)	987	(66,5 %)	58	(3,9 %)	104	(7 %)	**1 485**
2018	34	(2,2 %)	47	(3 %)	341	(21,9 %)	973	(62,5 %)	63	(4 %)	98	(6,3 %)	**1 556**
2017	29	(1,9 %)	35	(2,3 %)	408	(27,2 %)	899	(59,9 %)	41	(2,7 %)	89	(5,9 %)	**1 501**
2016	27	(1,8 %)	45	(3 %)	570	(38,1 %)	713	(47,6 %)	54	(3,6 %)	88	(5,9 %)	**1 497**
2015	24	(1,7 %)	35	(2,5 %)	662	(47 %)	573	(40,6 %)	50	(3,5 %)	66	(4,7 %)	**1 410**
2014	16	(1,2 %)	25	(1,9 %)	762	(58,9 %)	427	(33 %)	23	(1,8 %)	41	(3,2 %)	**1 294**
2013	7	(0,5 %)	31	(2,3 %)	822	(61,9 %)	380	(28,6 %)	34	(2,6 %)	53	(4 %)	**1 327**
2012	11	(0,8 %)	35	(2,7 %)	828	(63 %)	353	(26,8 %)	46	(3,5 %)	42	(3,2 %)	**1 315**
2011	9	(0,7 %)	26	(2 %)	851	(66,1 %)	335	(26 %)	30	(2,3 %)	36	(2,8 %)	**1 287**
2010	14	(1,1 %)	17	(1,4 %)	843	(67 %)	347	(27,6 %)	19	(1,5 %)	18	(1,4 %)	**1 258**
2009	24	(2 %)	42	(3,5 %)	770	(63,7 %)	341	(28,2 %)	12	(1 %)	20	(1,7 %)	**1 209**
2008	3	(0,3 %)	52	(4,6 %)	787	(70,1 %)	251	(22,4 %)	10	(0,9 %)	19	(1,7 %)	**1 122**
2007	1	(0,1 %)	55	(5,2 %)	706	(67,1 %)	273	(26 %)	2	(0,2 %)	15	(1,4 %)	**1 052**
2006	1	(0,1 %)	61	(6,1 %)	699	(69,4 %)	231	(22,9 %)	2	(0,2 %)	13	(1,3 %)	**1 007**
2001-05	13	(0,3 %)	331	(6,8 %)	3 653	(75,1 %)	714	(14,7 %)	42	(0,9 %)	113	(2,3 %)	**4 866**
1996-00	10	(0,2 %)	374	(7,5 %)	3 787	(76 %)	749	(15 %)	29	(0,6 %)	33	(0,7 %)	**4 982**
1987-95	18	(0,3 %)	390	(5,9 %)	4 433	(67,2 %)	1 704	(25,8 %)	17	(0,3 %)	33	(0,5 %)	**6 595**
Total	**267**	**(0,8 %)**	**1 636**	**(4,7 %)**	**21 197**	**(61 %)**	**10 250**	**(29,5 %)**	**532**	**(1,5 %)**	**881**	**(2,5 %)**	**34 763**

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 12:

	Primary operations						Revisions						
Year	**No**		**Yes**		**Missing**		**No**		**Yes**		**Missing**		**Total**
2019	9 411	(95,3 %)	20	(0,2 %)	448	(4,5 %)	1 297	(87,3 %)	62	(4,2 %)	126	(8,5 %)	**11 364**
2018	9 016	(93,9 %)	27	(0,3 %)	556	(5,8 %)	1 334	(85,7 %)	92	(5,9 %)	130	(8,4 %)	**11 155**
2017	8 574	(93,5 %)	20	(0,2 %)	580	(6,3 %)	1 304	(86,9 %)	69	(4,6 %)	128	(8,5 %)	**10 675**
2016	8 457	(94,5 %)	25	(0,3 %)	471	(5,3 %)	1 306	(87,2 %)	91	(6,1 %)	100	(6,7 %)	**10 450**
2015	7 608	(90 %)	29	(0,3 %)	813	(9,6 %)	1 203	(85,3 %)	96	(6,8 %)	111	(7,9 %)	**9 860**
2014	7 400	(90,9 %)	21	(0,3 %)	717	(8,8 %)	1 112	(85,9 %)	66	(5,1 %)	116	(9 %)	**9 432**
2013	7 231	(89,2 %)	58	(0,7 %)	815	(10,1 %)	1 163	(87,6 %)	65	(4,9 %)	99	(7,5 %)	**9 431**
2012	7 040	(89,8 %)	37	(0,5 %)	766	(9,8 %)	1 078	(82 %)	111	(8,4 %)	126	(9,6 %)	**9 158**
2011	6 622	(90 %)	29	(0,4 %)	706	(9,6 %)	1 064	(82,7 %)	123	(9,6 %)	100	(7,8 %)	**8 644**
2010	6 688	(91,3 %)	38	(0,5 %)	602	(8,2 %)	1 061	(84,3 %)	106	(8,4 %)	91	(7,2 %)	**8 586**
2009	6 583	(92,5 %)	59	(0,8 %)	471	(6,6 %)	1 013	(83,8 %)	121	(10 %)	75	(6,2 %)	**8 322**
2008	6 247	(91,2 %)	59	(0,9 %)	541	(7,9 %)	954	(85 %)	106	(9,4 %)	62	(5,5 %)	**7 969**
2007	6 104	(91,7 %)	75	(1,1 %)	480	(7,2 %)	867	(82,4 %)	112	(10,6 %)	73	(6,9 %)	**7 711**
2006	5 718	(90,5 %)	87	(1,4 %)	514	(8,1 %)	836	(83 %)	104	(10,3 %)	67	(6,7 %)	**7 326**
2001-05	30 519	(94,8 %)	806	(2,5 %)	874	(2,7 %)	4 135	(85 %)	522	(10,7 %)	209	(4,3 %)	**37 065**
1996-00	25 225	(94,7 %)	1 192	(4,5 %)	220	(0,8 %)	4 320	(86,7 %)	582	(11,7 %)	80	(1,6 %)	**31 619**
1987-95	32 226	(82,2 %)	6 565	(16,8 %)	402	(1 %)	5 265	(79,8 %)	1 260	(19,1 %)	70	(1,1 %)	**45 788**
Total	**190 669**	**(90,9 %)**	**9 147**	**(4,4 %)**	**9 976**	**(4,8 %)**	**29 312**	**(84,3 %)**	**3 688**	**(10,6 %)**	**1 763**	**(5,1 %)**	**244 555**

Antibiotic prophylaxis

Table 13:

	Primary operations						Revisions						
Year	**No**		**Yes**		**Missing**		**No**		**Yes**		**Missing**		**Total**
2019	3	(0 %)	9 841	(99,6 %)	35	(0,4 %)	102	(6,9 %)	1 354	(91,2 %)	29	(2 %)	**11 364**
2018	3	(0 %)	9 557	(99,6 %)	39	(0,4 %)	102	(6,6 %)	1 411	(90,7 %)	43	(2,8 %)	**11 155**
2017	4	(0 %)	9 116	(99,4 %)	54	(0,6 %)	96	(6,4 %)	1 371	(91,3 %)	34	(2,3 %)	**10 675**
2016	3	(0 %)	8 898	(99,4 %)	52	(0,6 %)	83	(5,5 %)	1 386	(92,6 %)	28	(1,9 %)	**10 450**
2015	0	(0 %)	8 411	(99,5 %)	39	(0,5 %)	9	(0,6 %)	1 380	(97,9 %)	21	(1,5 %)	**9 860**
2014	2	(0 %)	8 098	(99,5 %)	38	(0,5 %)	9	(0,7 %)	1 277	(98,7 %)	8	(0,6 %)	**9 432**
2013	2	(0 %)	8 065	(99,5 %)	37	(0,5 %)	8	(0,6 %)	1 301	(98 %)	18	(1,4 %)	**9 431**
2012	1	(0 %)	7 808	(99,6 %)	34	(0,4 %)	11	(0,8 %)	1 291	(98,2 %)	13	(1 %)	**9 158**
2011	6	(0,1 %)	7 329	(99,6 %)	22	(0,3 %)	43	(3,3 %)	1 236	(96 %)	8	(0,6 %)	**8 644**
2010	6	(0,1 %)	7 296	(99,6 %)	26	(0,4 %)	45	(3,6 %)	1 203	(95,6 %)	10	(0,8 %)	**8 586**
2009	32	(0,4 %)	7 080	(99,5 %)	1	(0 %)	37	(3,1 %)	1 170	(96,8 %)	2	(0,2 %)	**8 322**
2008	39	(0,6 %)	6 803	(99,4 %)	5	(0,1 %)	38	(3,4 %)	1 077	(96 %)	7	(0,6 %)	**7 969**
2007	27	(0,4 %)	6 625	(99,5 %)	7	(0,1 %)	30	(2,9 %)	1 015	(96,5 %)	7	(0,7 %)	**7 711**
2006	37	(0,6 %)	6 282	(99,4 %)	0	(0 %)	28	(2,8 %)	979	(97,2 %)	0	(0 %)	**7 326**
2001-05	45	(0,1 %)	32 149	(99,8 %)	5	(0 %)	45	(0,9 %)	4 805	(98,7 %)	16	(0,3 %)	**37 065**
1996-00	37	(0,1 %)	26 597	(99,8 %)	3	(0 %)	31	(0,6 %)	4 945	(99,3 %)	6	(0,1 %)	**31 619**
1987-95	1 801	(4,6 %)	37 345	(95,3 %)	47	(0,1 %)	179	(2,7 %)	6 393	(96,9 %)	23	(0,3 %)	**45 788**
Total	**2 048**	**(1 %)**	**207 300**	**(98,8 %)**	**444**	**(0,2 %)**	**896**	**(2,6 %)**	**33 594**	**(96,6 %)**	**273**	**(0,8 %)**	**244 555**

Fixation in primary operations

Figure 8a: All patients

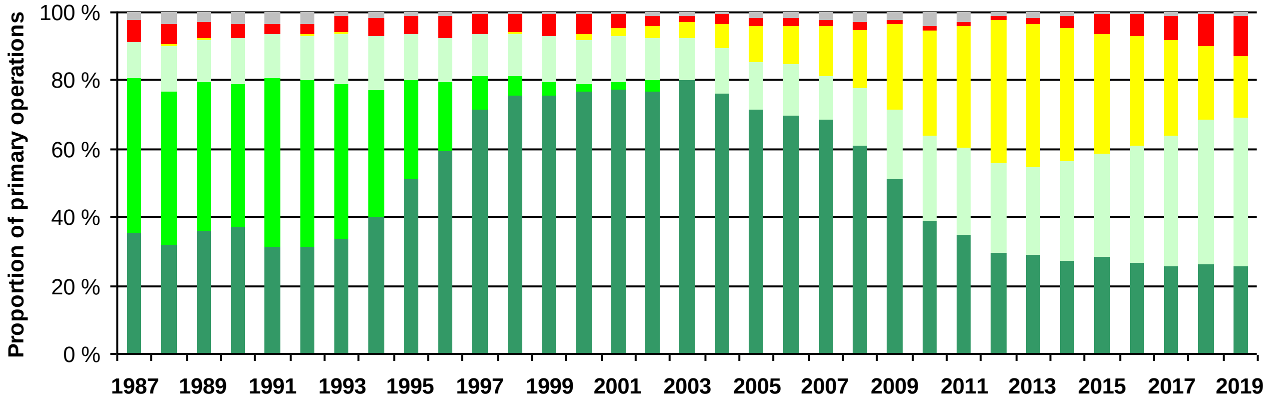
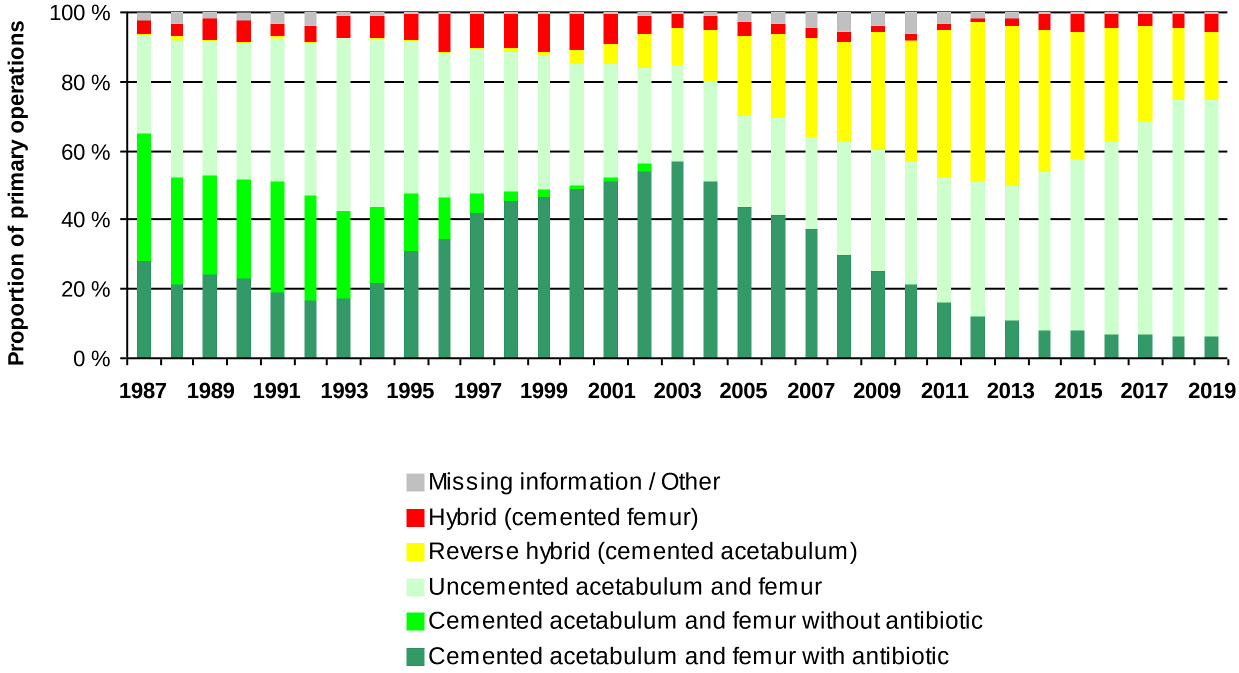


Figure 8b: Patients under 65 years old



Fixation in primary operations (cont.)

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

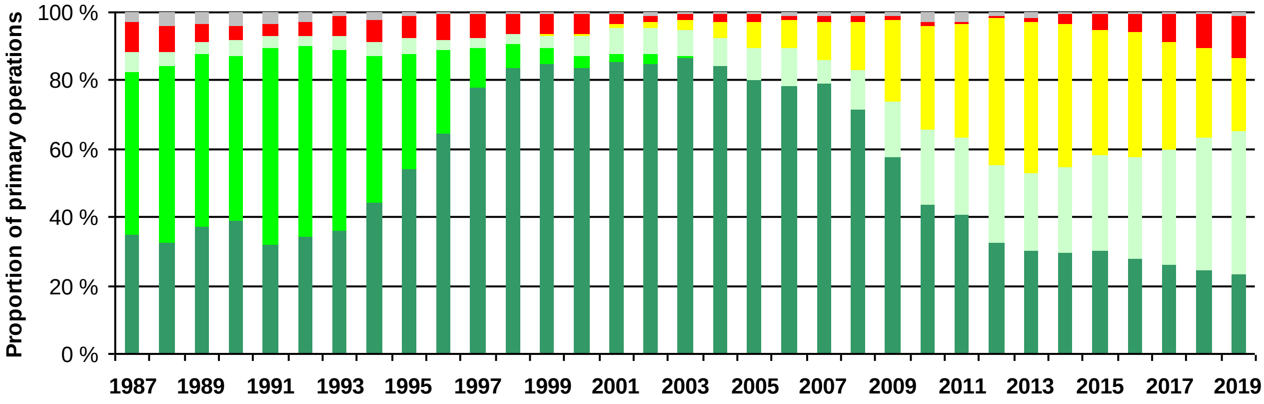
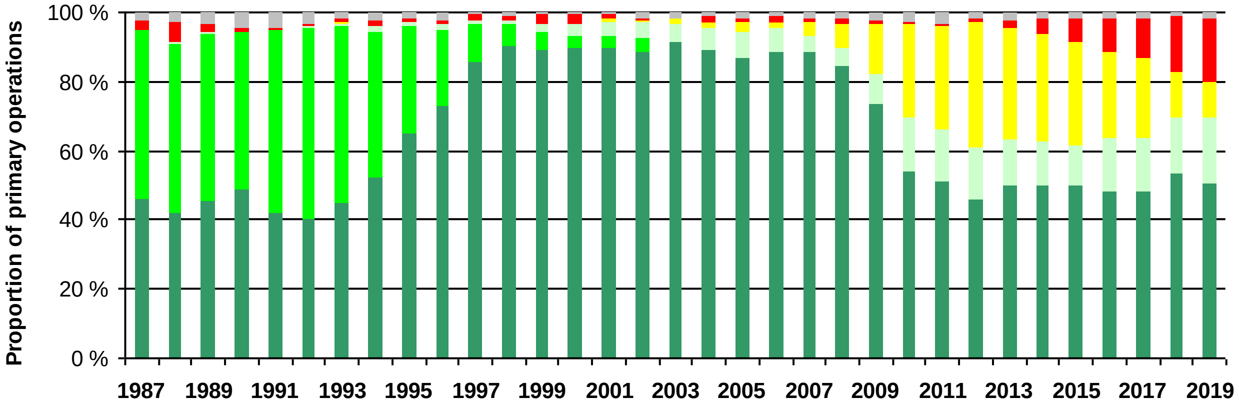


Figure 8d: Patients over 75 years old



Missing information / Other
Hybrid (cemented femur)
Reverse hybrid (cemented acetabulum)
Uncemented acetabulum and femur
Cemented acetabulum and femur without antibiotic
Cemented acetabulum and femur with antibiotic

Fixation in revisions

Figure 9: Acetabular cup - All patients

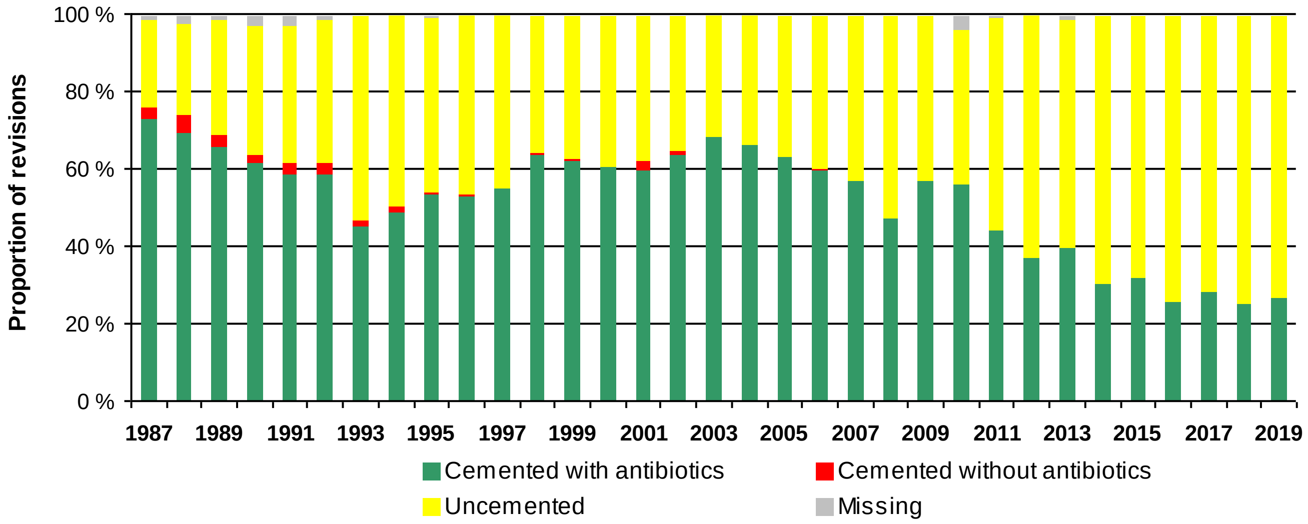
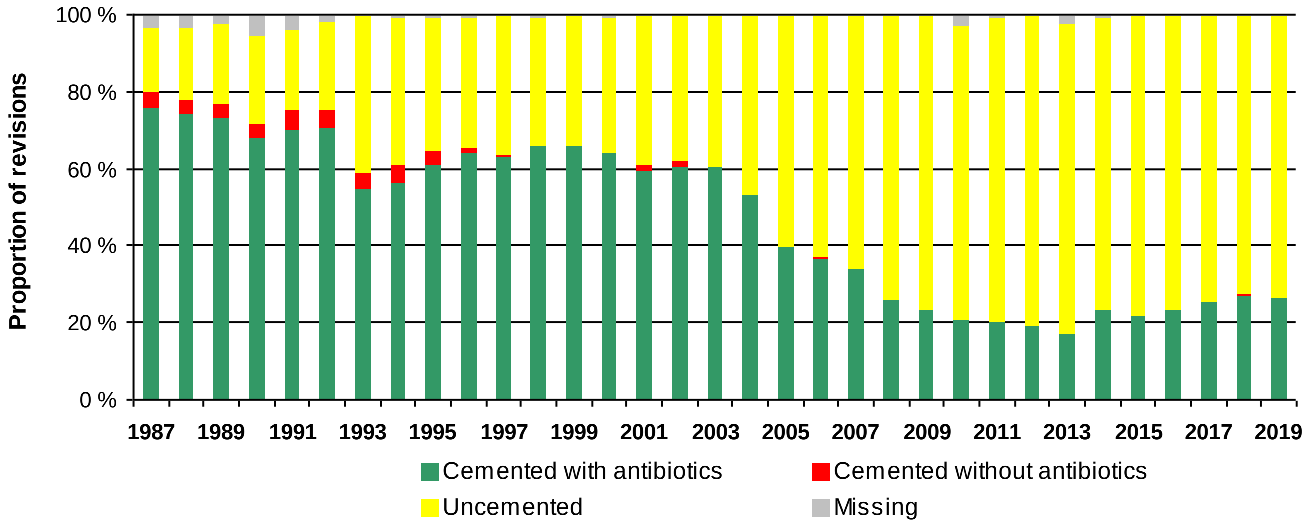


Figure 10: Femoral stem - All patients



Type of fixation and bone transplantation in revisions

Table 14: Acetabular cup

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2019	11%	5%	68%	16%	247	6%	7%	65%	22%	669
2018	12%	5%	61%	22%	237	7%	5%	65%	23%	694
2017	16%	7%	56%	20%	257	5%	7%	73%	15%	654
2016	16%	7%	57%	20%	235	6%	8%	70%	17%	698
2015	21%	9%	63%	7%	301	5%	12%	69%	15%	638
2014	26%	10%	56%	8%	260	4%	14%	67%	14%	593
2013	31%	7%	50%	12%	347	4%	11%	71%	13%	515
2012	36%	8%	46%	11%	317	5%	14%	71%	10%	544
2006-11	43%	8%	43%	6%	2 490	7%	22%	64%	8%	2 128
2001-05	33%	19%	47%	2%	2 109	5%	38%	53%	4%	1 133
1996-00	27%	21%	52%	0%	1 954	9%	49%	41%	1%	1 337
1987-95	0%	26%	72%	1%	2 774	0%	63%	35%	2%	1 775
Total	**24%**	**16%**	**55%**	**5%**	**11 528**	**5%**	**28%**	**58%**	**9%**	**11 378**

Table 15: Femoral stem

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2019	1%	1%	79%	19%	140	0%	4%	71%	24%	388
2018	1%	0%	73%	26%	148	0%	4%	71%	24%	406
2017	3%	3%	76%	18%	130	0%	7%	74%	19%	393
2016	0%	1%	77%	22%	126	1%	7%	75%	17%	412
2015	2%	4%	82%	12%	118	2%	9%	76%	14%	427
2014	3%	3%	63%	32%	114	0%	13%	74%	14%	376
2013	6%	4%	63%	27%	96	0%	14%	72%	14%	461
2012	13%	4%	59%	24%	101	1%	15%	71%	13%	430
2006-11	31%	6%	51%	11%	750	3%	27%	62%	9%	2 083
2001-05	33%	10%	56%	1%	1 376	7%	43%	48%	3%	1 111
1996-00	33%	17%	50%	1%	2 069	16%	56%	27%	1%	1 094
1987-95	0%	14%	84%	2%	3 600	0%	66%	33%	1%	1 405
Total	**16%**	**12%**	**67%**	**5%**	**8 768**	**4%**	**32%**	**55%**	**9%**	**8 986**

Registration of "Bone impaction" started in 1996

Cements used in the acetabulum and femur

Table 16: In primary- and revision surgeries

Cements	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
Boneloc	1 353	0	0	0	0	0	0	0	0	**1 353**
Cemex System Genta FAST	947	218	215	116	83	0	0	0	1	**1 580**
Cemex system genta ID green	0	0	0	0	0	18	197	204	138	**557**
Cemex w/gentamicin	404	10	43	128	150	234	0	0	1	**970**
CMW I	5 110	0	0	0	0	0	0	0	0	**5 110**
CMW I w/gentamicin	3 345	0	0	0	0	1	0	0	0	**3 346**
CMW II	16	0	0	0	0	0	0	0	0	**16**
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	0	0	4	7	13	11	25	32	91	**183**
Copal w/gentamicin+clindamycin	13	0	3	3	9	3	13	23	41	**108**
Optipac Refobacin Bonecement R	4 168	1 938	1 918	2 110	2 465	2 207	1 633	1 180	84	**17 703**
Optipac Refobacin Bonecement R-3	0	0	0	0	0	0	0	0	116	**116**
Optipac Refobacin Revision	3	12	14	8	21	17	13	1	0	**89**
Palacos	6 991	2	0	0	1	0	0	0	0	**6 994**
Palacos E-Flow (low viscosity)	99	0	0	0	0	0	0	0	0	**99**
Palacos R + G	18 764	2 215	2 605	2 464	2 506	2 336	1 663	1 541	998	**35 092**
Palacos R+G pro	0	0	1	2	1	58	790	2 073	3 679	**6 604**
Palacos w/gentamicin	62 809	0	2	0	1	0	0	1	0	**62 813**
Palamed G (gentamicin)	13	0	0	0	0	0	0	0	0	**13**
Refobacin Bone Cement R	7 624	1 131	988	694	384	632	913	59	1	**12 426**
Refobacin Revision	188	87	38	38	36	24	70	24	5	**510**
Refobacin Revision-3	0	0	0	0	0	0	0	35	35	**70**
Refobacin-Palacos	2 387	0	0	0	0	0	0	0	0	**2 387**
Simplex	7 148	0	0	0	0	0	0	0	0	**7 148**
Simplex unknown	826	0	0	1	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	5 451	514	503	511	527	534	488	503	492	**9 523**
SmartSet GHV	164	0	0	0	0	0	0	0	0	**164**
SmartSet GHV Genta. Smartmix	185	0	2	2	25	157	178	99	109	**757**
SmartSet HV	15	0	0	0	0	0	0	0	0	**15**
Vancogenx	0	3	2	2	2	1	5	4	10	**29**
Annet (n<10)	18	0	1	1	1	0	0	0	0	**21**
Missing information	208	7	11	6	9	18	35	48	52	**394**

Cemented primary prostheses

Table 17: (The 45 most common combinations of cup and stem)

Cup	Stem	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
CHARNLEY	CHARNLEY	40 162	112	65	39						**40 378**
EXETER	EXETER	12 835	80	25							**12 940**
REFLECTION CEM. ALL POLY	SPECTRON-EF	9 615	85	33	1						**9 734**
EXETER X3 RIMFIT	EXETER	658	982	1 173	1 158	1 354	1 309	977	1 043	959	**9 613**
TITAN	TITAN	6 955									**6 955**
IP	LUBINUS SP II	4 097	466	415	281	307	262	217	202	219	**6 466**
CONTEMPORARY	EXETER	4 376	188	104	56	15	3	1		3	**4 746**
SPECTRON	ITH	2 405									**2 405**
MARATHON	CHARNLEY MODULAR	796	203	196	225	135	45	25		2	**1 627**
KRONOS	TITAN	1 483									**1 483**
LUBINUS	LUBINUS SP II	13		125	168	252	212	214	200	215	**1 399**
MARATHON	EXETER	58	70	83	91	120	186	194	244	232	**1 278**
ELITE	TITAN	1 224									**1 224**
ELITE	CHARNLEY	935									**935**
REFLECTION CEM. ALL POLY	ITH	926									**926**
REFLECTION CEM. ALL POLY	BIO-FIT	898									**898**
WEBER ALLO PRO	MS-30	813									**813**
ELITE	EXETER	777	1								**778**
ZCA	CPT	756									**756**
MARATHON	C-STEM	34				41	127	117	174	208	**701**
CHARNLEY	CHARNLEY MODULAR	658	1		1						**660**
IP	LUBINUS	587									**587**
ELITE	ELITE	579									**579**
CHARNLEY	EXETER	571									**571**
TITAN	FJORD	523									**523**
ELITE	CHARNLEY MODULAR	417	48	30	21						**516**
AVANTAGE	EXETER	87	41	47	61	37	37	32	64	65	**471**
MARATHON	LUBINUS SP II	20	11	21	44	65	110	40	41	104	**456**
SPECTRON	SP I	432									**432**
MODULAR HIP SYSTEM	BIO-FIT	430									**430**
SPECTRON	TITAN	411									**411**
CHARNLEY	C-STEM	378									**378**
CHARNLEY	ELITE	375									**375**
MARATHON	MS-30					14	18	71	114	152	**369**
OPERA	SPECTRON-EF	356									**356**
ELITE	MS-30	331									**331**
PEARL	TITAN	285									**285**
EXCEED ABT RINGLOC-X	CPT							104	113	61	**278**
MODULAR HIP SYSTEM	ITH	277									**277**
EXCEED ABT RINGLOC-X	MS-30							65	97	90	**252**
SPECTRON	BIO-FIT	226									**226**
IP	SP I	214									**214**
LMT	LMT	191									**191**
ELITE	CPT	183									**183**
ZCA	CPS-PLUS	168									**168**
Other	Other	2 750	42	65	106	64	80	287	206	200	**3 800**

Uncemented primary prostheses

Table 18: (The 45 most common combinations of cup and stem)

Cup	Stem	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
PINNACLE	CORAIL	740	455	360	320	384	490	1 239	1 674	1 708	**7 370**
REFLECTION UNCEMENTED	CORAIL	1 753	674	745	822	542	169	218	427	182	**5 532**
IGLOO	FILLER	2 437	249	210	173	124	165	108	121	125	**3 712**
TRILOGY	CORAIL	1 482	182	218	272	248	331	270	199	321	**3 523**
TROPIC	CORAIL	2 659									**2 659**
R3	CORAIL	1	1			120	493	568	519	447	**2 149**
Trident MDM	CORAIL	48	17	26	73	113	272	240	303	653	**1 745**
ATOLL	CORAIL	1 280									**1 280**
DURALOC	CORAIL	929	72	62							**1 063**
Continuum Acetabular System	CORAIL				190	302	332	88	41	48	**1 001**
Trident MDM	ACCOLADE II			42	75	174	127	116	174	228	**936**
REFLECTION UNCEMENTED	HACTIV	1		9	3	117	185	187	180	95	**777**
BICON-PLUS	ZWEYMÜLLER	586									**586**
REFLECTION UNCEMENTED	SECURFIT	393	91	32							**516**
TRILOGY	SCP/UNIQUE	508		1							**509**
R3	POLARSTEM	89	56	82	51	50	74	50	14	15	**481**
R3	FILLER				31	89	90	114	96	43	**463**
TRILOGY	HACTIV	429	12	7						8	**456**
GEMINI	PROFILE	407									**407**
BICON-PLUS	HACTIV	386									**386**
Trident MDM	POLARSTEM				43	58	21	60	59	119	**360**
DURALOC	PROFILE	332									**332**
REFLECTION UNCEMENTED	OMNIFIT	294	6								**300**
DURALOC	SCP/UNIQUE	267									**267**
TRILOGY	FILLER	203	38	18		2					**261**
ENDLER	ZWEYMÜLLER	247									**247**
REFLECTION UNCEMENTED	SCP/UNIQUE	178	1	14	25	13	10	2			**243**
EUROPEAN CUP SYSTEM	TAPERLOC	240									**240**
PLASMACUP	BICONTACT	232									**232**
LMT	TAPERLOC	224									**224**
Trident MDM	ABG II	28	29	52	81	22					**212**
AVANTAGE	CORAIL	84	16	4	2	2	30	10	13	25	**186**
TRABECULAR METAL	CORAIL	4	11	7	19	21	36	26	26	33	**183**
TI-FIT	BIO-FIT	175									**175**
REFLECTION UNCEMENTED	SL-PLUS MIA	169									**169**
SECURFIT	OMNIFIT	166									**166**
ABG I	ABG I	165									**165**
HARRIS/GALANTE	HARRIS/GALANTE	158									**158**
ABG II	ABG II	155									**155**
COXA	FEMORA	155									**155**
PARHOFER	PARHOFER	152									**152**
BICON-PLUS	CORAIL	148			1	1					**150**
REFLECTION UNCEMENTED	PROFEMUR GLADIATOR	44	60	37	1						**142**
Trident MDM	HACTIV				3	18	65	44	6		**136**
TRILOGY	OMNIFIT	134									**134**
Other	Other	2 877	71	152	172	179	181	178	263	322	**4 395**

Hybrid primary prostheses

Table 19: Hybrid primary prostheses. (The 20 most common)

Cup (uncemented)	Stem (cemented)	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
TRILOGY	EXETER	409	44	88	201	232	236	249	170	54	**1 683**
TROPIC	TITAN	869									**869**
Trident MDM	EXETER	89		1	10	22	30	12	174	423	**761**
MORSCHER	MS-30	667									**667**
R3	LUBINUS SP II					41	141	134	138	94	**548**
REFLECTION UNCEMENTED	C-STEM				1	24	61	102	124	134	**446**
TRILOGY	CHARNLEY	382									**382**
ENDLER	TITAN	336									**336**
REFLECTION UNCEMENTED	LUBINUS SP II	5	2	32	62	78	1		21	9	**210**
AVANTAGE	EXETER	29	20	7	10	15	32	26	25	16	**180**
DURALOC	CHARNLEY	153									**153**
REFLECTION UNCEMENTED	BIO-FIT	142									**142**
TRILOGY	CPT	89						40	2	1	**132**
REFLECTION UNCEMENTED	SPECTRON-EF	120	1	1					1		**123**
PINNACLE	C-STEM						3	2	23	83	**111**
Trident MDM	LUBINUS SP II			1		3	7	20	13	64	**108**
ATOLL	TITAN	105									**105**
IP	SP I	101									**101**
PINNACLE	CPT			1				20	41	31	**93**
HG II	ANATOMIC CC	80									**80**
Other	Other	1 193	16	16	24	41	36	81	151	255	**1 813**

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

Cup (cemented)	Stem (uncemened)	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
MARATHON	CORAIL	3 283	2 738	2 936	2 766	2 606	2 391	2 203	1 815	1 479	**22 217**
ELITE	CORAIL	2 261	205	86	71	3	2				**2 628**
REFLECTION CEM. ALL POLY	CORAIL	1 150	25	21	22	30	29	31	7	2	**1 317**
TITAN	CORAIL	929	1								**930**
CONTEMPORARY	CORAIL	672	6	2	1						**681**
EXETER X3 RIMFIT	ACCOLADE II			59	49	119	157	121	115	57	**677**
KRONOS	CORAIL	633									**633**
EXETER X3 RIMFIT	CORAIL	60	42	70	88	46	129	54	24	20	**533**
REFLECTION CEM. ALL POLY	HACTIV	363	91	20	1						**475**
REFLECTION CEM. ALL POLY	FILLER	164	23	26	19	1		2			**235**
IP	CORAIL	181	4	11	3	2	5	1	3	4	**214**
EXETER	CORAIL	171	2								**173**
EXETER	ABG II	172									**172**
AVANTAGE	CORAIL	49	11	15	20	13	14	14	20	11	**167**
REFLECTION CEM. ALL POLY	TAPERLOC	155									**155**
EXETER X3 RIMFIT	ABG II	79	60	8							**147**
EXETER X3 RIMFIT	FILLER	1		23	37	35	25	7		2	**130**
CHARNLEY	CORAIL	116		1							**117**
ELITE	SCP/UNIQUE	93	2	2	1	1					**99**
EXETER X3 RIMFIT	EXETER	1	10	6	9	6	12	15		34	**93**
Other	Other	1 009	83	80	77	97	126	111	63	148	**1 794**

Acetabular cups in primary operations

Table 21: (The 45 most common)

Cup	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
CHARNLEY	42 989	114	66	40						**43 209**
MARATHON	4 391	3 090	3 319	3 193	3 045	2 999	2 762	2 487	2 290	**27 576**
REFLECTION CEM. ALL POLY	13 679	234	108	53	36	33	34	8	17	**14 202**
EXETER	13 408	84	26	1						**13 519**
EXETER X3 RIMFIT	816	1 103	1 370	1 363	1 571	1 635	1 178	1 185	1 076	**11 297**
REFLECTION UNCEMENTED	3 723	848	933	968	798	435	520	831	452	**9 508**
TITAN	8 815	1								**8 816**
PINNACLE	871	468	388	331	398	519	1 285	1 810	1 921	**7 991**
TRILOGY	4 298	292	351	509	517	582	576	374	456	**7 955**
ELITE	7 375	261	118	95	5	2				**7 856**
IP	5 314	482	440	286	315	267	220	211	228	**7 763**
CONTEMPORARY	5 137	195	111	58	15	3	1		3	**5 523**
Trident MDM	232	53	161	347	441	548	546	783	1 614	**4 725**
IGLOO	2 664	249	211	175	124	169	110	121	125	**3 948**
TROPIC	3 823									**3 823**
R3	97	57	82	84	308	829	885	808	664	**3 814**
SPECTRON	3 652									**3 652**
KRONOS	2 193									**2 193**
DURALOC	1 849	72	62							**1 983**
AVANTAGE	550	119	103	119	98	158	189	182	219	**1 737**
ATOLL	1 491									**1 491**
LUBINUS	31	1	125	169	253	213	215	205	226	**1 438**
BICON-PLUS	1 211			1	1					**1 213**
Continuum Acetabular System				194	320	348	98	50	60	**1 070**
ZCA	1 063									**1 063**
EXCEED ABT RINGLOC-X	64	8	20	39	66	37	206	274	179	**893**
MODULAR HIP SYSTEM	878									**878**
MORSCHER	843									**843**
WEBER ALLO PRO	830									**830**
POLARCUP	56	58	79	66	64	49	91	99	179	**741**
ENDLER	662									**662**
BIRMINGHAM HIP RESURFACING	498	21	2							**521**
GEMINI	510									**510**
OPERA	457									**457**
EUROPEAN CUP SYSTEM	332									**332**
TI-FIT	312									**312**
TRABECULAR METAL	12	14	17	33	35	54	41	44	54	**304**
PEARL	287									**287**
PLASMACUP	283									**283**
LMT (Uncemented)	275									**275**
HARRIS/GALANTE	252									**252**
PE-PLUS	247									**247**
MÜLLER TYPE	242									**242**
ABG II	236									**236**
COXA	220									**220**
Other	2 227	6		6	31	67	204	121	105	**2 767**

Acetabular cups in revisions

Table 22: (The 45 most common)

Cup	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
CHARNLEY	2 856	5	3				1			**2 865**
TROPIC	1 885									**1 885**
AVANTAGE	1 011	114	99	85	86	76	90	97	91	**1 749**
TRILOGY	1 227	50	51	56	65	59	46	42	24	**1 620**
ELITE	1 563	19	12	6						**1 600**
TRABECULAR METAL	207	118	161	214	160	203	158	152	153	**1 526**
PINNACLE	484	97	82	117	97	111	115	132	107	**1 342**
POLARCUP	102	84	119	113	132	118	129	111	122	**1 030**
MARATHON	336	164	138	66	94	66	59	46	42	**1 011**
EXETER	940	3						1		**944**
REFLECTION CEM. ALL POLY	895	7	4	3	4	2				**915**
Trident MDM	74	38	41	44	94	88	111	170	228	**888**
REFLECTION UNCEMENTED	227	78	94	83	74	35	40	27	23	**681**
IGLOO	432	24	18	15	15	25	18	17	19	**583**
TITAN	527									**527**
ATOLL	396									**396**
R3		7	6	6	20	61	79	67	31	**277**
IP	241	10	4	3	5	3	4	1	1	**272**
Continuum Acetabular System				13	51	66	37	37	37	**241**
CONTEMPORARY	227	9	3							**239**
KRONOS	225									**225**
CHRISTIANSEN	196									**196**
SPECTRON	189									**189**
EXETER X3 RIMFIT	25	24	30	25	29	29	9	5	11	**187**
DURALOC	110	10	5	11	9	2	6	5	6	**164**
OPERA	101									**101**
HARRIS/GALANTE	99									**99**
ZCA	96									**96**
MODULAR HIP SYSTEM	95									**95**
CAPTIV	71					7				**78**
EUROPEAN CUP SYSTEM	73									**73**
BICON-PLUS	49	2	3		2	1	5	4	5	**71**
LMT (Uncemented)	67									**67**
ENDLER	66									**66**
HG II	53									**53**
MORSCHER	51									**51**
GEMINI	47									**47**
SECURFIT	45									**45**
OCTOPUS	40									**40**
REGENEREX RINGLOC	31	7	2							**40**
TI-FIT	36									**36**
PARHOFER	35									**35**
PCA	33	1								**34**
S-ROM	27									**27**
COXA	25									**25**
Other	341	2	3	5	4	7	18	19	19	**418**

Femoral stems in primary operations

Table 23: (The 45 most common)

Stem	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
CORAIL	19 714	4 495	4 637	4 712	4 459	4 759	5 030	5 168	5 009	**57 983**
CHARNLEY	42 321	116	67	43						**42 547**
EXETER	20 295	1 461	1 570	1 651	1 850	1 894	1 553	1 838	1 897	**34 009**
TITAN	12 188									**12 188**
SPECTRON-EF	10 512	92	37	10	3	1	2	6	6	**10 669**
LUBINUS SP II	4 445	514	622	589	780	786	670	682	886	**9 974**
FILLER	2 963	321	374	328	262	287	245	235	183	**5 198**
ITH	3 723									**3 723**
CHARNLEY MODULAR	1 930	258	237	261	154	46	28		2	**2 916**
MS-30	1 877				17	21	144	226	314	**2 599**
HACTIV	1 277	108	38	9	150	281	242	200	134	**2 439**
CPT	1 113		1	2	1	2	440	262	175	**1 996**
BIO-FIT	1 993									**1 993**
C-STEM	540		1	2	76	203	250	355	566	**1 993**
ACCOLADE II			110	137	314	341	266	305	314	**1 787**
SCP/UNIQUE	1 286	15	33	36	28	35	11		1	**1 445**
ZWEYMÜLLER	1 102									**1 102**
ELITE	1 026	3	1							**1 030**
POLARSTEM	124	83	108	103	110	97	111	112	157	**1 005**
OMNIFIT	884	6								**890**
PROFILE	890									**890**
ABG II	572	94	78	81	23					**848**
TAPERLOC	787									**787**
SP I	780									**780**
FJORD	652									**652**
LUBINUS	624									**624**
SECURFIT	432	94	32							**558**
CPS-PLUS	496									**496**
BICONTACT	443									**443**
LMT (Cemented)	417									**417**
KAR/Corail Revision	150	20	32	21	29	42	38	24	37	**393**
ABG I	304									**304**
PROFEMUR GLADIATOR	57	71	38	4				33	20	**223**
TI-FIT	221									**221**
MÜLLER TYPE	213									**213**
FEMORA	182									**182**
BI-METRIC	145	5	2	3	7	16	1			**179**
SL-PLUS MIA	177									**177**
HARRIS/GALANTE	169									**169**
PARHOFER	159									**159**
FURLONG EVOLUTION				4	19	19	36	32	32	**142**
KAREY	136									**136**
FURLONG				41	16	19	23	18	15	**132**
MÜLLER TYPE V	132									**132**
ECHELON	121									**121**
Other	1 158	25	35	61	110	56	24	53	66	**1 588**

Femoral stems in revisions

Table 24: (The 45 most common)

Stem	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
KAR/Corail Revision	2 253	138	147	120	138	103	98	89	105	**3 191**
CHARNLEY	2 978	1	1	2	1			1		**2 984**
EXETER	1 701	72	62	63	77	78	68	84	84	**2 289**
CORAIL	1 340	62	65	40	51	66	57	50	44	**1 775**
RESTORATION	219	57	67	63	70	55	36	73	51	**691**
CPT	474	7	2	5	7	6	23	17	8	**549**
TITAN	538									**538**
FJORD	476									**476**
FILLER	318	15	17	16	10	19	19	16	18	**448**
TTHR	169	71	52	37	20	24	24	16	19	**432**
SPECTRON-EF	355	4	8	3	3	2	1		2	**378**
ELITE	351		1							**352**
REEF	320	5	2							**327**
LUBINUS SP II	166	9	8	30	16	9	17	30	27	**312**
REVITAN	7	7	27	20	36	31	38	33	34	**233**
MP RECONSTRUCTION	69	24	26	18	17	12	14	14	10	**204**
ARCOS	1	3	12	17	27	32	42	41	26	**201**
ANATOMIC BR	192									**192**
ITH	192									**192**
BIO-FIT	167									**167**
HACTIV	102	4	4		13	9	9	8	6	**155**
REACTIV	51	3	6	19	13	27	14	9	12	**154**
BI-METRIC	102	16	16	1		2	2			**139**
Securus			7	15	11	19	20	21	39	**132**
TAPERLOC	115									**115**
ZWEYMÜLLER	83									**83**
Profemur	47	11	14	5						**77**
C-STEM	13			1	3	12	11	14	17	**71**
ECHELON	68									**68**
PRIUS				2	11	17	8	22	8	**68**
SP I	66									**66**
RECLAIM		1	13	9	12	12	6	9		**62**
SCAN HIP	59									**59**
LUBINUS	51									**51**
MS-30	34					2	4	4	4	**48**
HARRIS/GALANTE	44									**44**
CHARNLEY MODULAR	25	3	3	3	3	5	1			**43**
FEMORA	43									**43**
PARHOFER	43									**43**
PROFEMUR GLADIATOR	7	20	9	3						**39**
AURA	38									**38**
MRP-TITAN							6	18	10	**34**
LANDOS (Reconstruction)	33									**33**
MÜLLER TYPE	32									**32**
OMNIFIT	32									**32**
Other	316	4	3	2	12	6	10	2	7	**362**

The 7 most common primary prostheses in last 5 years

Table 25a: Acetabular cup

2015	2016	2017	2018	2019
MARATHON (3 045)	MARATHON (2 999)	MARATHON (2 762)	MARATHON (2 487)	MARATHON (2 290)
EXETER X3 RIMFIT (1 571)	EXETER X3 RIMFIT (1 635)	PINNACLE (1 285)	PINNACLE (1 810)	PINNACLE (1 921)
REFLECTION * (798)	R3 (829)	EXETER X3 RIMFIT (1 178)	EXETER X3 RIMFIT (1 185)	Trident MDM (1 614)
TRILOGY (517)	TRILOGY (582)	R3 (885)	REFLECTION * (831)	EXETER X3 RIMFIT (1 076)
Trident MDM (441)	Trident MDM (548)	TRILOGY (576)	R3 (808)	R3 (664)
PINNACLE (398)	PINNACLE (519)	Trident MDM (546)	Trident MDM (783)	TRILOGY (456)
Continuum Acetabular System (320)	REFLECTION * (435)	REFLECTION * (520)	TRILOGY (374)	REFLECTION * (452)

Table 25b: Femoral stem

2015	2016	2017	2018	2019
CORAIL (4 459)	CORAIL (4 759)	CORAIL (5 030)	CORAIL (5 168)	CORAIL (5 009)
EXETER (1 850)	EXETER (1 894)	EXETER (1 553)	EXETER (1 838)	EXETER (1 897)
LUBINUS SP II (780)	LUBINUS SP II (786)	LUBINUS SP II (670)	LUBINUS SP II (682)	LUBINUS SP II (886)
ACCOLADE II (314)	ACCOLADE II (341)	CPT (440)	C-STEM (355)	C-STEM (566)
FILLER (262)	FILLER (287)	ACCOLADE II (266)	ACCOLADE II (305)	ACCOLADE II (314)
CHARNLEY ** (154)	HACTIV (281)	C-STEM (250)	CPT (262)	MS-30 (314)
HACTIV (150)	C-STEM (203)	FILLER (245)	FILLER (235)	FILLER (183)

Table 25c: Combinations of cup and stem

2015	2016	2017	2018	2019
MARATHON + CORAIL (2 616)	MARATHON + CORAIL (2 411)	MARATHON + CORAIL (2 215)	MARATHON + CORAIL (1 841)	PINNACLE + CORAIL (1 714)
EXETER X3 RIMFIT + EXETER (1 361)	EXETER X3 RIMFIT + EXETER (1 321)	PINNACLE + CORAIL (1 240)	PINNACLE + CORAIL (1 676)	MARATHON + CORAIL (1 501)
REFLECTION * + CORAIL (543)	R3 + CORAIL (493)	EXETER X3 RIMFIT + EXETER (992)	EXETER X3 RIMFIT + EXETER (1 044)	EXETER X3 RIMFIT + EXETER (993)
PINNACLE + CORAIL (386)	PINNACLE + CORAIL (491)	R3 + CORAIL (568)	R3 + CORAIL (519)	Trident MDM + CORAIL (655)
IP + LUBINUS SP II (307)	Continuum Acetabular System + CORAIL (334)	TRILOGY + CORAIL (270)	REFLECTION * + CORAIL (427)	Trident MDM + EXETER (457)
Continuum Acetabular System + CORAIL (303)	TRILOGY + CORAIL (331)	TRILOGY + EXETER (259)	Trident MDM + CORAIL (303)	R3 + CORAIL (447)
LUBINUS + LUBINUS SP II (252)	Trident MDM + CORAIL (272)	Trident MDM + CORAIL (242)	MARATHON + EXETER (244)	TRILOGY + CORAIL (321)

* UNCEMENTED

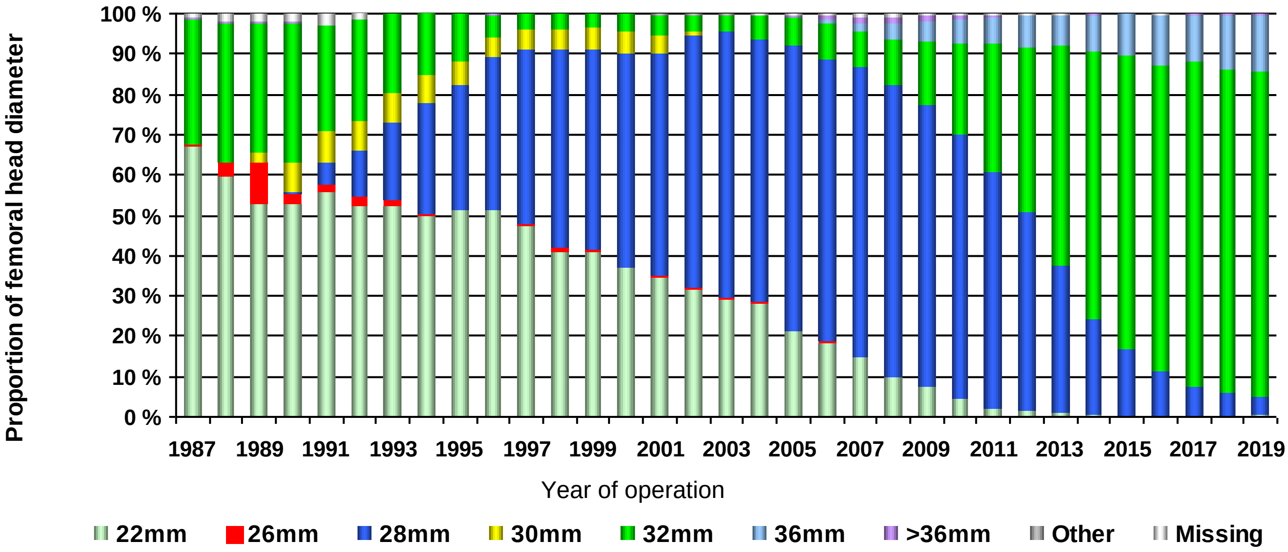
**' MODULAR

Femoral head diameter (No dual mobility has been taken).

Table 26: In primary operations and revisions

Year	22 mm	26 mm	28 mm	30 mm	32 mm	36 mm	>36 mm	Other	Missing	Total
2019	28		457	2	8 287	1 435	12		21	**10 242**
2018	14		592		8 207	1 358	6	4	19	**10 200**
2017	7		720		7 869	1 135	9	2	21	**9 763**
2016	9		1 081	1	7 365	1 186	1	2	27	**9 672**
2015	22		1 507		6 747	948	5	2	10	**9 241**
2014	56		2 094	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		4 781		2 607	522	53	1	24	**8 146**
2010	348		5 339	3	1 826	482	82	1	48	**8 129**
2009	598	2	5 529	4	1 241	386	115	1	47	**7 923**
2008	732	2	5 493	2	880	279	136	3	64	**7 591**
2007	1 082		5 316	2	665	148	111	2	62	**7 388**
2006	1 291	6	4 908	3	638	58	60	5	33	**7 002**
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	14	**7 748**
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	1 043	390	1 045		2		11	**5 372**
1992	2 775	124	605	404	1 332		8		70	**5 318**
1991	2 708	102	274	380	1 264		12		133	**4 873**
1990	2 731	117	27	398	1 778	1	20		106	**5 178**
1989	2 875	566	5	151	1 757		23		100	**5 477**
1988	2 281	133	1	1	1 334		15		71	**3 836**
1987	778	1	1		359		6		13	**1 158**
Total	**50 661**	**1 364**	**87 714**	**4 419**	**73 959**	**10 098**	**792**	**86**	**1 081**	**230 174**

Figure 11: In primary operations and revisions



Femoral head prostheses

Table 27: In primary operations and revisions (The 50 most common)

Prosthesis	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
EXETER	21 903	868	744	653	793	744	563	568	569	**27 405**
CORAIL	2 059	2 023	2 401	2 710	2 894	3 124	3 454	3 573	4 074	**26 312**
CERAMTEC	5 238	2 690	2 586	2 449	2 218	2 211	2 109	2 177	1 435	**23 113**
LANDOS	21 648	72	7	15						**21 742**
UNIVERSAL	16 771	149	108	50	39	35	63	59	100	**17 374**
LFIT ANATOMIC	994	878	1 245	1 434	1 646	1 718	1 469	1 839	1 822	**13 045**
FJORD	11 699	62	6	2	3		2			**11 774**
SP II	4 775	561	680	647	826	835	734	772	966	**10 796**
ELITE	3 461	158	195	184	136	62	35	8	8	**4 247**
IGLOO	2 358	254	210	213	170	229	207	224	187	**4 052**
PINNACLE	434	307	340	249	161	286	358	372	719	**3 226**
SCANOS	1 563	102	28	30	211	347	288	264	173	**3 006**
PROTEK	1 984	1					381	332	285	**2 983**
PLUS ENDO	1 523	29	34	30	14	16	15	14	5	**1 680**
CPT	1 618	7	9	2	1	4	3	2		**1 646**
PROFILE	1 428	1								**1 429**
HIPBALL PREMIUM	277	188	236	166	137	116	66	54	28	**1 268**
MALLORY-HEAD	722	34	43	65	107	93	64	61	45	**1 234**
TAPERLOC	1 088									**1 088**
BIOTECHNI	977	44	29	5	2	1				**1 058**
OXINIUM	815	68	68	47	5	10	6	8	16	**1 043**
VERSYS	109	41	38	29	80	81	141	164	220	**903**
HARRIS/GALANTE	863	7	6		6	5		1	5	**893**
OMNIFIT	805	19	20	1	2	2	3	2	2	**856**
" OSTEONICS Hoder" , C-taper head	701	94	20							**815**
ZIRCONIA	763									**763**
BIOBALL	102	66	42	62	61	59	63	60	49	**564**
FURLONG			8	73	80	91	108	83	96	**539**
BICONTACT	486	1	3	6	2	2	2	2	1	**505**
BIRMINGHAM HIP RESURFACING	444	20	2					1		**467**
ABG I	389	7	3	7	6	3	3	2	3	**423**
SURGIVAL	372									**372**
STRYKER HODER	68	22	15	24	41	48	19	26	105	**368**
ZWEYMÜLLER	342									**342**
Zimmer Hoder				1			162	83	76	**322**
CERAMIC OSTEO	220									**220**
FEMORA	213									**213**
PARHOFER	183		1					1		**185**
TI-FIT	141									**141**
SMITH & NEPHEW KERAMIKKHODER	128							1	4	**133**
CHRISTIANSEN	126									**126**
PCA	106	1	1		2		1	1		**112**
BIOLOX DELTA		19	42	5	3	1	6	17	17	**110**
BIRMINGHAM HIP MODULÆR	57	1								**58**
MUTARS	14	1	1	2	10	8	6	3	4	**49**
ABG II	48									**48**
ASR MODULÆR	45									**45**
LINK Rippensystem	38									**38**
AURA II	27	2					1			**30**
HASTINGS HIP	29									**29**
Other	273	7	10	1	1	3	7	27	12	**341**

Dual Mobility articulation

Table 28 In primary operation

Prosthesis	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
AVANTAGE	550	119	104	118	98	158	189	175	205	**1 716**
POLARCUP	56	58	79	66	64	49	91	95	169	**727**
Trident MDM		10	15	12	16	22	35	50	95	**255**
CAPTIV						19				**19**
Restoration Anatomic Cup	1	1	2	1		5	4	1	4	**19**
Other (n<5)	2									**2**
Total	**609**	**188**	**200**	**197**	**178**	**253**	**319**	**321**	**473**	**2 738**

Table 29 In revisions

Prosthesis	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
AVANTAGE	1 029	128	108	95	93	92	121	108	107	**1 881**
POLARCUP	104	84	130	125	144	129	141	123	127	**1 107**
Trident MDM		10	12	23	48	33	44	90	136	**396**
Restoration Anatomic Cup	1	10	8	6	12	17	28	11	4	**97**
CAPTIV						10				**10**
GYROS	10									**10**
Other (n<5)							1	1		**2**
Total	**1 144**	**232**	**258**	**249**	**297**	**281**	**335**	**333**	**374**	**3 503**

ASA classification

Figure 12: Primary operations

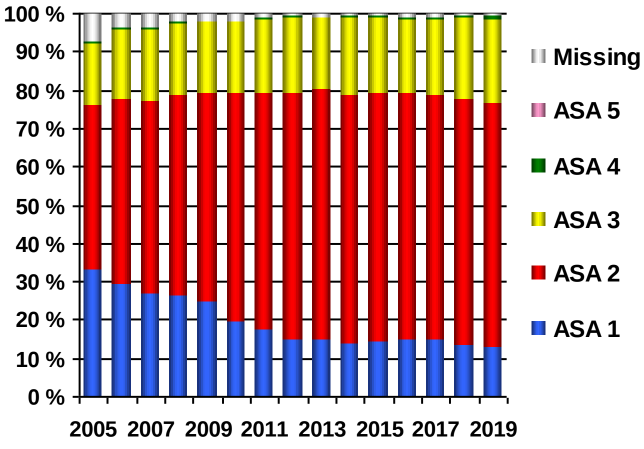
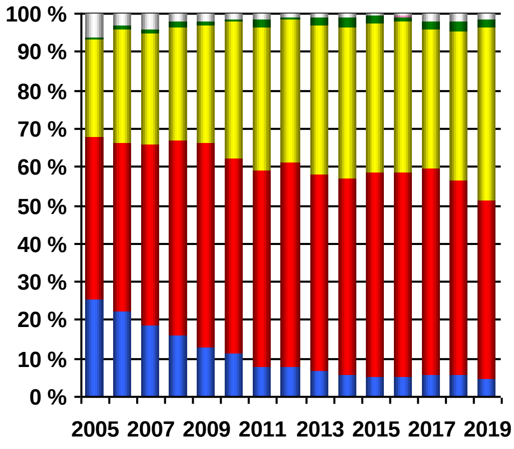


Figure 13: Revisions



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

Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 30: Primary operations *

År	1	2	3	4	Missing	Total
2019	459 (5%)	8 364 (85%)	866 (9%)	150 (2%)	40 (0%)	**9 879**
2018	581 (6%)	7 779 (81%)	1 103 (11%)	91 (1%)	45 (0%)	**9 599**
2017	627 (7%)	7 457 (81%)	984 (11%)	65 (1%)	41 (0%)	**9 174**
2016	800 (9%)	7 054 (79%)	975 (11%)	72 (1%)	52 (1%)	**8 953**
2015	1 068 (13%)	6 277 (74%)	959 (11%)	57 (1%)	89 (1%)	**8 450**
2014	1 115 (14%)	5 950 (73%)	967 (12%)	31 (0%)	75 (1%)	**8 138**
2013	1 345 (17%)	5 638 (70%)	1 049 (13%)	10 (0%)	62 (1%)	**8 104**
2012	1 579 (20%)	4 853 (62%)	1 320 (17%)	9 (0%)	82 (1%)	**7 843**
2011	2 220 (30%)	4 303 (58%)	793 (11%)	3 (0%)	38 (1%)	**7 357**
2010	2 365 (32%)	4 307 (59%)	610 (8%)	3 (0%)	43 (1%)	**7 328**
2009	2 605 (37%)	3 861 (54%)	578 (8%)	3 (0%)	66 (1%)	**7 113**
2005-08	14 998 (57%)	7 712 (29%)	2 875 (11%)	39 (0%)	798 (3%)	**26 422**

Table 31: Revisions *

År	1	2	3	4	Missing	Total
2019	192 (13%)	1 059 (71%)	144 (10%)	64 (4%)	26 (2%)	**1 485**
2018	202 (13%)	1 119 (72%)	145 (9%)	66 (4%)	24 (2%)	**1 556**
2017	206 (14%)	1 104 (74%)	139 (9%)	24 (2%)	28 (2%)	**1 501**
2016	205 (14%)	1 076 (72%)	162 (11%)	27 (2%)	27 (2%)	**1 497**
2015	222 (16%)	1 019 (72%)	133 (9%)	12 (1%)	24 (2%)	**1 410**
2014	225 (17%)	921 (71%)	118 (9%)	10 (1%)	20 (2%)	**1 294**
2013	226 (17%)	916 (69%)	153 (12%)	6 (0%)	26 (2%)	**1 327**
2012	240 (18%)	823 (63%)	216 (16%)	10 (1%)	26 (2%)	**1 315**
2011	318 (25%)	758 (59%)	184 (14%)	8 (1%)	19 (1%)	**1 287**
2010	439 (35%)	682 (54%)	125 (10%)	2 (0%)	10 (1%)	**1 258**
2009	421 (35%)	649 (54%)	126 (10%)	5 (0%)	8 (1%)	**1 209**
2005-08	2 271 (54%)	1 334 (31%)	484 (11%)	14 (0%)	135 (3%)	**4 238**

Figure 14: Primary operations

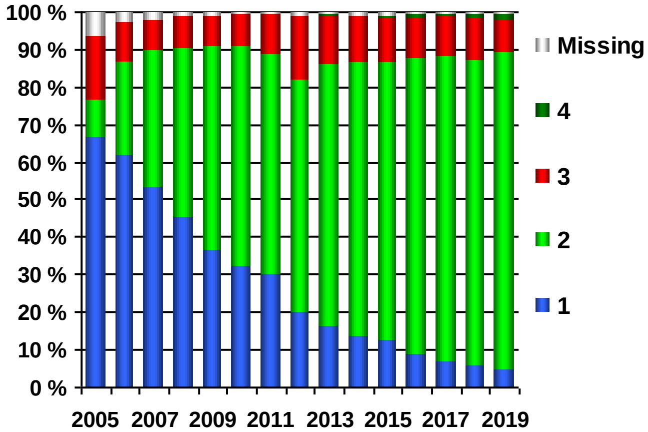
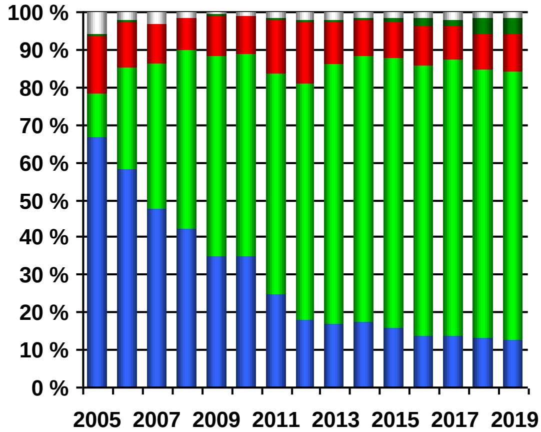


Figure 15: Revisions



*

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

Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 32: All operations

Drugs	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)				0,1 %	0,4 %	0,6 %	0,8 %	0,8 %	0,9 %	1,1 %
Apixiban (Eliquis)			0,1 %	1,2 %	1,5 %	1,5 %	1,5 %	1,6 %	1,4 %	1,4 %
Dabigatranetixalat (Re-Novate, Pradaxa)	0,5 %				0,1 %	0,1 %				
Dalteparin (Fragmin)	54,2 %	65,1 %	63,2 %	56,1 %	51,6 %	58,4 %	61,6 %	64,0 %	64,9 %	53,4 %
Dekstran (Macrodex, Dextran)		0,3 %	0,1 %	0,1 %	0,1 %					
Enoksaparin (Klexane)	39,6 %	25,5 %	24,6 %	27,9 %	31,4 %	24,1 %	22,0 %	19,6 %	17,6 %	27,1 %
Rivaroksaban (Xarelto)	0,1 %	2,9 %	2,0 %	2,3 %	2,2 %	1,5 %	1,5 %	1,1 %	1,1 %	1,0 %
Warfarin (Marevan)	0,1 %		0,1 %			0,1 %				
Ximelagatran (Exanta, Malagatran)	0,4 %									
Other	0,1 %				0,1 %					
Combination of 2 drugs	2,0 %	5,1 %	8,4 %	10,8 %	10,6 %	11,5 %	10,0 %	10,2 %	10,9 %	12,5 %
Clinical study	0,7 %									
No drugs										
Missing/Unknown	2,3 %	0,9 %	1,5 %	1,4 %	2,0 %	2,2 %	2,6 %	2,5 %	3,0 %	3,4 %
Total	**47 572**	**8 655**	**9 173**	**9 467**	**9 455**	**9 878**	**10 465**	**10 686**	**11 167**	**11 369**

Figure 16: Drugs - All operations

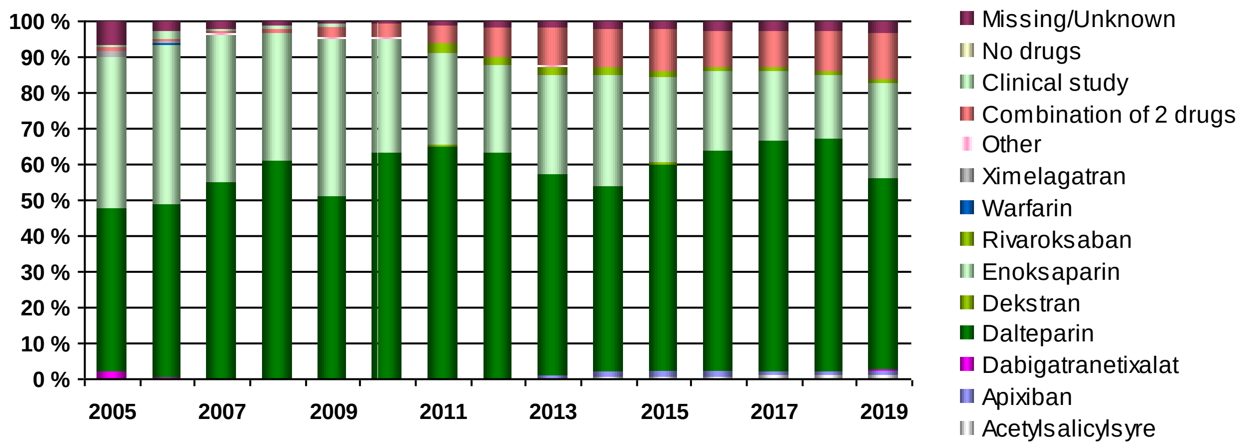


Table 33: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2019	2 574	4 428	890	116	1 399	14	0	1 948	11 369
2018	2 162	4 026	1 026	177	1 860	19	0	1 897	11 167
2017	1 457	3 924	1 003	542	1 910	25	0	1 825	10 686
2016	1 427	3 483	1 114	732	2 045	22	0	1 642	10 465
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	1 744	693	1 397	3 197	40	1	884	8 655
2010	758	2 173	636	1 078	3 154	44	2	744	8 589
2009	879	2 405	668	785	2 637	37	6	906	8 323
2008	837	2 478	787	701	2 166	124	5	871	7 969
2007	847	2 222	1 229	388	2 044	44	6	931	7 711
2006	978	2 096	1 093	276	1 738	111	0	1 034	7 326
2005	1 036	2 073	1 203	363	1 416	231	0	1 332	7 654

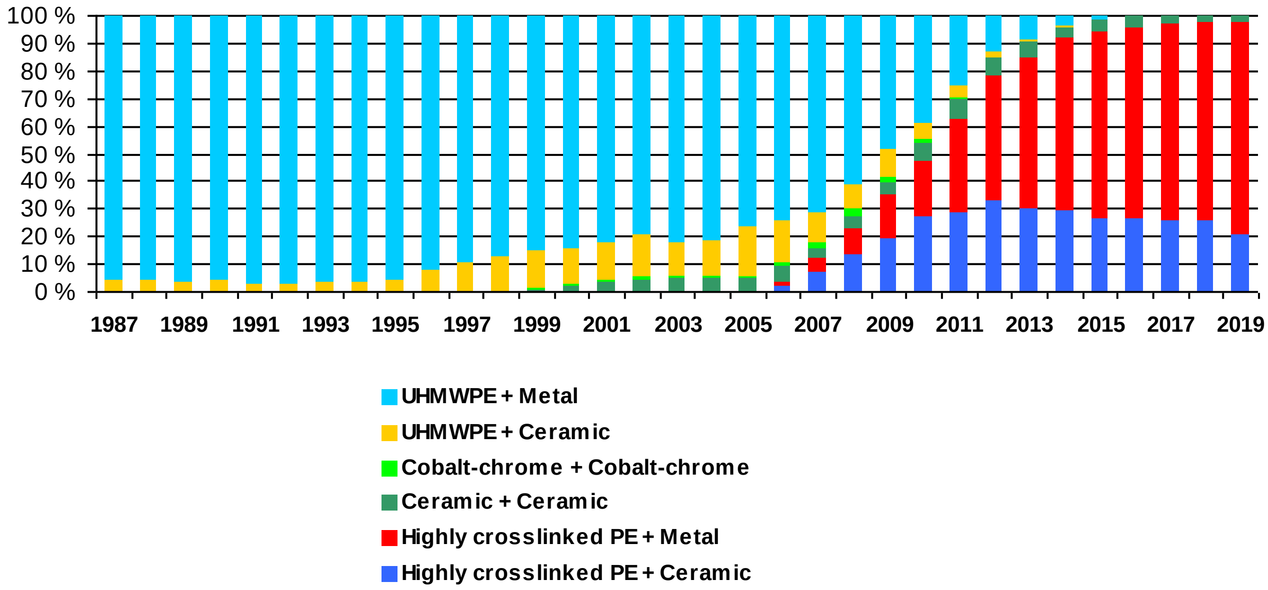
Registration of thrombosis prophylaxis started in 2005

Articulations (except dual mobility)

Table 34: In primary operations - All patients

Cup + Femoral head	1987-11	2012	2013	2014	2015	2016	2017	2018	2019	Total
UHMWPE + Steel	70 739	342	153	69	5	0	0	0	0	71 308
Highly crosslinked PE + Cobalt-chrome	4 927	2 745	3 557	4 168	4 781	5 241	5 777	6 189	6 716	44 101
UHMWPE + Cobalt-chrome	32 017	639	527	240	110	12	13	9	21	33 588
Highly crosslinked PE + Alumina	5 450	2 013	1 923	1 775	1 529	1 424	860	695	290	15 959
UHMWPE + Alumina	10 714	146	44	8	4	2	0	0	0	10 918
Highly crosslinked PE + Alumina/Zirconium[1]	1 266	483	430	557	635	904	1 423	1 686	1 663	9 047
Highly crosslinked PE + Steel	1 001	654	724	712	803	691	501	430	426	5 942
Alumina + Alumina	3 226	246	201	109	7	0	1	0	0	3 790
Alumina/Zirconium + Alumina/Zirconium[1]	523	244	225	211	342	372	218	205	181	2 521
UHMWPE + Titanium	2 038	1	4	1	0	0	0	0	0	2 044
UHMWPE + Zirconium	1 402	0	0	0	0	0	0	0	0	1 402
Cobalt-chrome + Cobalt-chrome	1 021	21	2	0	1	0	0	0	0	1 045
Highly crosslinked PE + Oxinium	615	61	51	39	3	2	2	2	11	786
UHMWPE + Alumina/Zirconium[1]	277	0	3	1	0	0	0	0	0	281
Titanium + Alumina	130	5	9	2	2	2	1	0	0	151
Highly crosslinked PE + Titanium	57	13	13	10	5	13	13	10	5	139
UHMWPE + Oxinium	76	0	0	0	0	0	0	0	0	76
Missing	3 334	29	27	18	13	19	24	30	21	3 515
Other (n<50)	163	7	6	11	18	10	10	3	9	237
Total	**138 976**	**7 649**	**7 899**	**7 931**	**8 258**	**8 692**	**8 843**	**9 259**	**9 343**	**206 850**

Figure 17: In primary operations



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

Vancouver Classification

Table 35: 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
2019	12	10	66	37	1	11	30	10	5	11	27
2018	12	7	70	25	4	10	21	14	2	6	44
2017	14	7	48	25	1	8	15	2	3	5	49
2016	17	1	24	23		7	11	6		4	70
2015			1			1					143

Completeness of reporting analysis for the Hip Arthroplasty Register, 2017-2018

A completeness of reporting analysis for the Hip 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 Hip 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

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

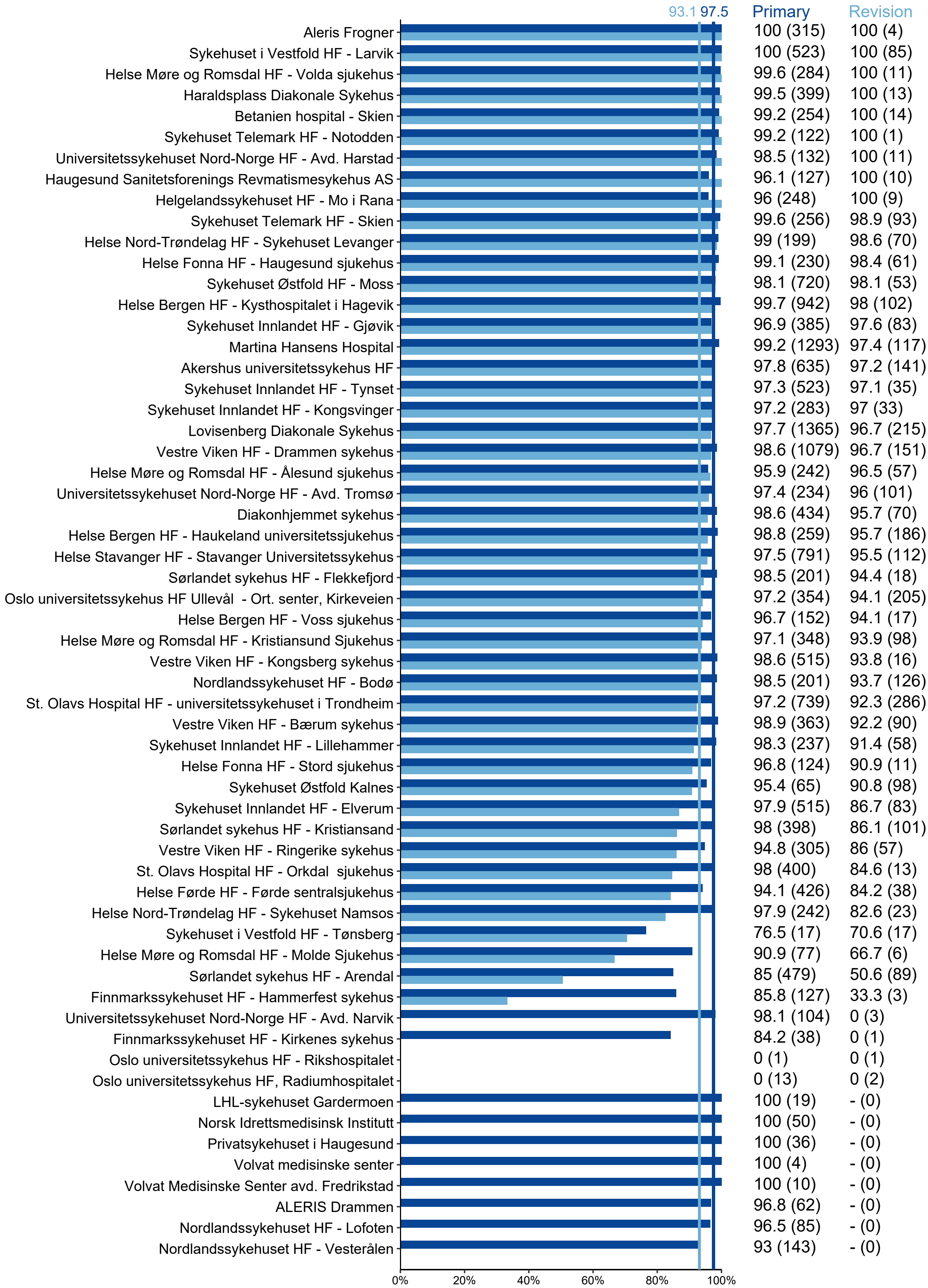
$$\text{Completeness rate NPR} = \frac{\text{Only NPR} + \text{begge registre}}{\text{Only NPR} + \text{Only NRL} + \text{both registries}}$$

Primary operations. In 2017-2018, 19124 primary hip replacements were reported to one or both of the registers. 97.5% of these were reported to the NAR while 95.5% 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 Hip 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 2017-2018, 3298 revisions were reported to one or both of the registers. 93.1% of these were reported to the NAR while 75.7% 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 Hip Arthroplasty Register, 2017-2018



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

CONTENTS

Knee prostheses

KNEE AND OTHER JOINTS REGISTER: ANNUAL REPORT

In the period 1994-2019, 104 857 knee replacements, 10 367 shoulder replacements and 10 527 replacements of other joints than the hip, knee and shoulder were recorded. There has been an increase of 3.8% in primary knee replacements since 2018. The number of unicondylar knee replacements is stable and now accounts for 13.5% of all primary knee replacements. Osteoarthritis is the dominant cause of knee arthroplasty (87%). The number of primary shoulder prostheses has decreased slightly since 2018.

Changes in the reporting form. Reoperations for periprosthetic fracture without replacement of the prosthesis should now also be reported for prostheses of the knee and other joints.

Patella components in total knee arthroplasty have increased from 104 in 2014 to 581 in 2019 and now account for almost 10% of all primary TKAs. This is probably due to an ongoing RCT and the results of a Norwegian RCT that showed a slightly better functional result in knee replacement with a patella component when a NexGen prosthesis was used (Aunan E 2016). The NRL studies on the use of a patella component showed increased risk of infection and revision for loosening when a patella component was used (Furnes O 2002, Lygre SH 2011). We also found no difference in function or pain (Lygre SH 2010). It has also been shown that the risk of patella fracture increases with the use of a patella component. Slight functional improvement associated with a patellar component must be weighed against increased complications.

We have seen an increase in posterior-stabilized TKA, which is probably due to ongoing studies. We have participated in international studies showing that the revision rate is higher with PS than with CR knee replacements (Comfort T 2014). It is unclear whether PROMs and movement are better with a PS than with a CR knee prosthesis.

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

The use of uncemented TKA has increased in recent years. This is not in line with findings from the registers. A recent NARA study shows higher rates of revision for uncemented TKA in the Nordic countries in patients under 65 (Niemeläinen M 2020). Uncemented Oxford partial unicondylar knee replacement has also increased. In a study published at the autumn meeting, we found more early revisions with uncemented than with cemented Oxford partial knee replacement, mostly due to infection (Skåden Ø 2019). A UK register study has shown good ten-year results with uncemented Oxford partial, so the Norwegian findings may be due to the learning curve.

QUALITY OF KNEE ARTHROPLASTY IN NORWAY

Survival curves show a gradual improvement since 1994 in TKA results, when the endpoint is revision surgery. We are pleased to note the improvement in results of unicondylar knee arthroplasty from 2012 to 2019. In a study based on our register data, hospitals that performed more than 100 knee arthroplasties per year had fewer revisions than hospitals performing a lower number of such operations (Badawy M 2013). Unicondylar knee replacements should be concentrated at a smaller number of hospitals (Badawy M 2014) to reduce the risk of revision.

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

DOCUMENTATION OF KNEE PROSTHESES
This year, we present the proportion of patients who received well-documented knee prostheses at different hospitals (Figure B.35). In consultation with the reference group, we have chosen the ODEP (Orthopaedic Data Evaluation Panel UK) classification 10A (without a star) as the basis for referring to a prosthesis as well-documented. This corresponds to documentation of ≥93% survival of the prosthesis after ten years. The long-term goal is to use 10A*, which is ≥95% survival. We have excluded prostheses used in studies approved by REK and revision prostheses. We see that some hospitals choose to use prostheses that cannot be classified as well-documented. We hope that these hospitals will review their practice in relation to tenders in the health trusts, and ensure that they use the prostheses stated in the tenders. They should also be aware of the attitude of the Register to tenders for joint replacement (see our website).

We present three- and ten-year durability of the most commonly used knee prostheses in Norway (more than 500 prostheses used). None of those used today have poor results, but some prosthesis combinations lack ten-year results from Norway and abroad.

KNEE ARTHROPLASTY REVISIONS
There were 618 knee arthroplasty revisions reported to the Register in 2019, which is a slight improvement on 2018. Figure B.21 shows results of all knee arthroplasty revisions, including revisions for infection. Almost 25% of knees had been re-revised after 10 years.

We find that the use of a stem is often not checked on the reporting form. When a stem is used, it must be indicated whether it was a tibial or femoral stem, and a sticker must be attached to the back of the form. For some prostheses, the same stem can be used as a femoral and tibial stem, and if this is not checked, we have no way of knowing where the stem was used.

COMPLETENESS OF REPORTING ANALYSIS
In this report, we show completeness of reporting for primary operations and revisions for 2017-2018. The national average is good for primary surgery (97.6%), and an improvement on the figure of 96.1% for 2015-2016. For revisions, the coverage rate was 93.2% compared to 90.5% in 2015-2016. We are pleased to note these improved figures. Thank you! Some hospitals have low reporting of revisions. This may result in too positive revision rates at these hospitals. In the figures showing the proportion of non-revisions after two and ten years, we have excluded hospitals with lower than 80% completeness of reporting.

For shoulder arthroplasty, the reporting rate for primary operations is 94.8% and for revisions 84.3%. We would like hospitals with low completeness of reporting for revisions to investigate this further.

Please note that hand, finger, back and toe arthroplasty must also be reported; these operations have a lower reporting rate than the other joints. The next completeness of reporting analysis will be conducted in two years, for 2019 and 2020. We encourage hospitals to review their reporting procedures if their completeness of reporting is low.

HOSPITAL RESULTS

We present some hospital results. Proportion of non-revised TKAs after two and ten years for standard patients in 2008-2019. Standard patients are 55-85 years old, ASA class 1 and 2, with primary osteoarthritis. We also present funnel plots for the proportion of standard patients operated in 2008-2019 who were not revised after ten years. The funnel plot takes into account the number of knee arthroplasties performed at the hospital. Hospitals with a risk of revision of more than three standard deviations (99.8%) above the national average must be considered to have an excessively high risk of revision and must review their procedures (Figure B.32). With the approval of the reference group, we will contact these hospitals this year to study the high revision rate more closely.

SHOULDER ATHROPLASTY

We see that the proportion of reverse shoulder arthroplasties has increased steadily in recent years, and accounted for 65% of shoulder replacements in 2019. For acute fractures, the proportion is now over 80%. The number of hemiprostheses has dropped sharply in recent years, but hemiarthroplasty is still used in acute fractures. In 2019, there were two new articles from the shoulder group of the Nordic Arthroplasty Register Association (NARA). One shows that reverse shoulder arthroplasty has a greater risk of revision due to infection than anatomic shoulder arthroplasty (Moeini 2019). This article shows that we must closely monitor the increasing use of reverse prostheses in relation to reasons for revision. The second article shows that short-term results for stemless total shoulder arthroplasty for primary osteoarthritis are similar to the results for shoulder arthroplasty using a stem (Rasmussen 2019). This type of arthroplasty has not been common in Norway.

Last year we wrote that the electronic recording procedure would be launched in 2019, but unfortunately we have met some obstacles along the way, and the form is only now ready for testing. The pilot will be conducted at Haukeland University Hospital before plans to start electronic recording in the rest of the country. With the new procedure, surgeons will need to record more variables than previously, since recording of shoulder arthroplasty has not been well adapted to the particular features of the shoulder. However, we hope that shoulder surgeons around the country will see the value of a more detailed, shoulder-adapted method of recording, and will support use of this. The recording of data will take place in the same way as for the Cruciate Ligament Register, and since there are now several hospitals conducting electronic recording of ACL surgery, we hope that the procedure for joint arthroplasty will become somewhat easier as more people become accustomed to using the solution.

ELBOW ARTHROPLASTY

The number of total elbow replacements in recent years had been decreasing until its low point in the year 2018. However, in 2019 the figure almost doubled from 2018. In 2019, five hemiprostheses were inserted, which is a similar number to previous years. A hemiprosthesis is used instead of a total prosthesis in supracondylar humerus fractures.

The humeral component was fixed with cement in all total arthroplasties except one, while the ulnar component was fixed with cement in fewer than half of the elbows. In the past five years, Nexel has been most used, providing relatively short follow-up information. The number of revisions of elbow arthroplasty has decreased somewhat. Use of the radial head prosthesis has increased steadily over the past 10 years, and a record number of these prostheses was recorded in 2019. This type is predominantly used for acute fractures.

FINGER AND HAND ARTHROPLASTY

The number of finger prostheses inserted is still low compared to previous years, and many of the operations were revisions. The wrist (radiocarpal) prosthesis is still seldom used and only two primary operations were recorded in 2019, one Motec Wrist and one Remotion. This is a decrease from recent years. In distal radioulnar joints, the use of a prosthesis has increased, with 16 inserted in 2019. The use of a carpal (CMC I) prosthesis has stabilised in recent years at about ten primary prostheses annually, following the lowest number ever (5) in 2016. In ~~2018~~2019, 11 primary prostheses were inserted.

SUMMARY OF THE MOST IMPORTANT SCIENTIFIC FINDINGS LAST YEAR

Please see the introduction to the section on hip arthroplasty for a review of studies including both hip and knee replacement.

Niemeläinen M et al. 2020 showed in a Nordic study that cemented knee arthroplasty in patients under 65 must still be considered the gold standard. Hybrid prostheses had similar results as cemented ones, but uncemented prostheses had poorer results.

Øhrn FD et al. 2020, in a study using Norwegian and Australian data, showed that medial pivot knee replacement without a patella component had poorer results than posterior cruciate retaining (CR) knee replacement with revision as the endpoint. These findings did not apply to all makes of prosthesis in the medial pivot group.

Badawy M et al. 2019, using Norwegian data, compared the results of primary condylar constrained (CCK) and rotating hinge TKA with unconstrained TKA and found that the CCK and hinged arthroplasties had more revisions than unconstrained arthroplasties. The increased risk of revision was due to a higher number of revisions due to infection.

Lewis P et al. 2020 studied results for patellofemoral arthroplasty from eight national registers. The study consistently showed a threefold greater risk of revision than total arthroplasty. The results for Norway were better than for some of the other countries. The study provides useful information to surgeons and patients regarding the choice of patellofemoral or total arthroplasty for isolated patellofemoral osteoarthritis. A Danish RCT has shown slightly better functional outcome for patellofemoral than for total prostheses in the first two years postoperatively.

Leta T et al. 2019 studied the results of three different treatment strategies for infected knee replacements. Debridement, irrigation and change of insert gave 79% survival of the prosthesis free of infection after five years. One- and two-stage revision both gave 87% survival free of infection five years after surgery.

Rasmussen J et al. 2019 compared short-term results of total arthroplasty with and without stems for primary osteoarthritis of the shoulder in the period 2011-2016 in Denmark, Finland, Norway and Sweden. The six-year survival rate for stemless prostheses was 95.3%, compared to 95.8% for stemmed prostheses.

Moeini S et al. 2019 studied the risk of revision due to infection in 17 730 primary shoulder arthroplasties from NARA. The highest risk of revision due to infection (3.1%) was found in reverse shoulder arthroplasty, compared to 1.4% for all shoulder arthroplasties.

Congratulations to Tone Wikene Nystad (Orthopaedic Surgery for Inflammatory Joint Disorders), Gunnar Petursson (Computer Navigation in Knee Arthroplasty) and Gro Dyrhovden (Computer Navigation and Causes of Revision in Knee Arthroplasty) for excellent and well-defended PhD dissertations in 2019.

Thank you all for good reporting, but please remember the small joints in the hand and the back. We would be pleased to receive suggestions for research projects.

Bergen, June 2020

Ove Furnes
Chief Physician/Professor
Knee Surgery

Randi Hole
Chief Physician
Shoulder Surgery

Yngvar Krukhaug
Chief Physician
Hand and Finger Surgery

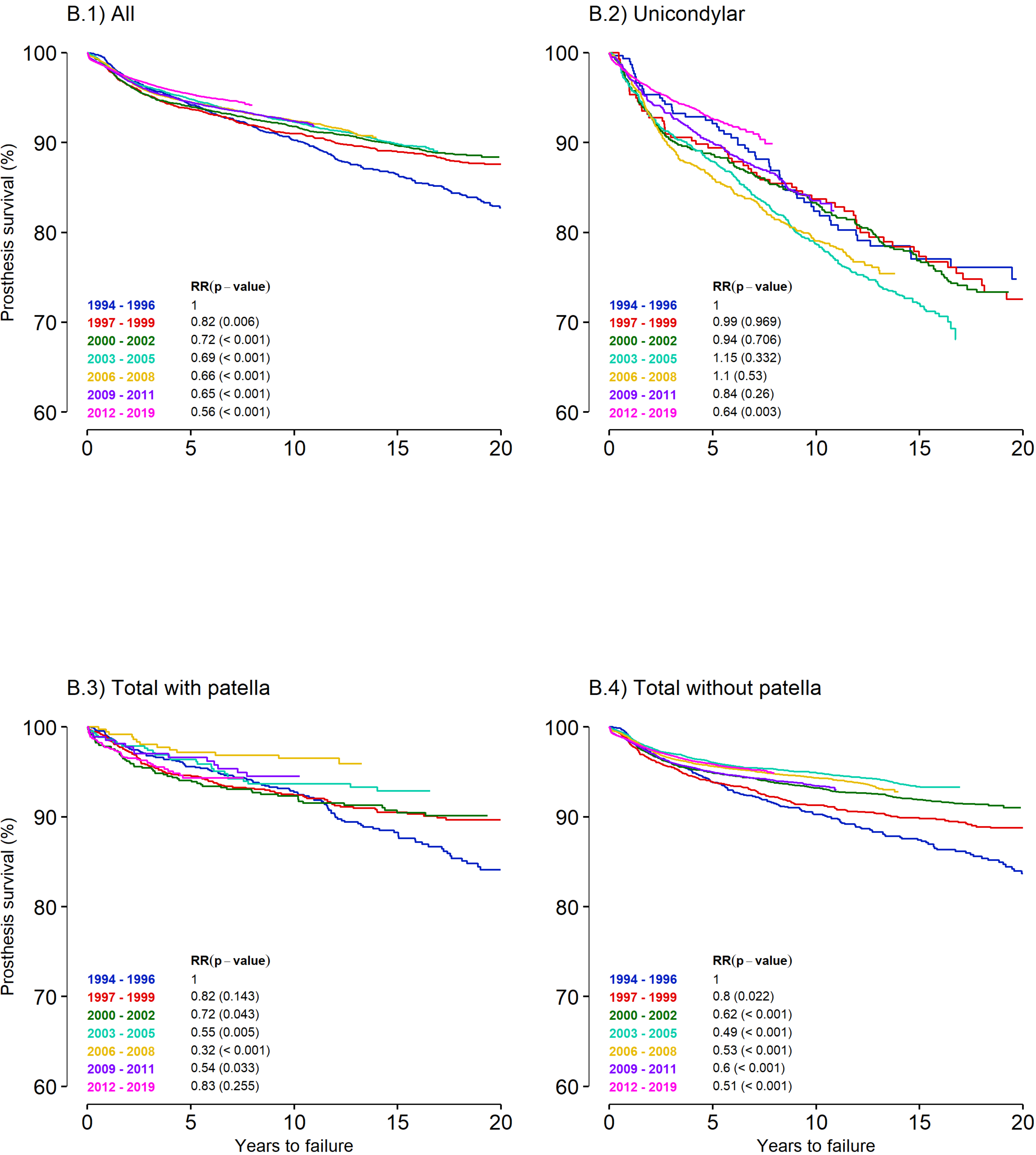
Anne Marie Fenstad
Biostatistician

Irina A Kvinnesland
IT Consultant

Gard Kroken
Biostatistician

Survival curves for knee prosthesis

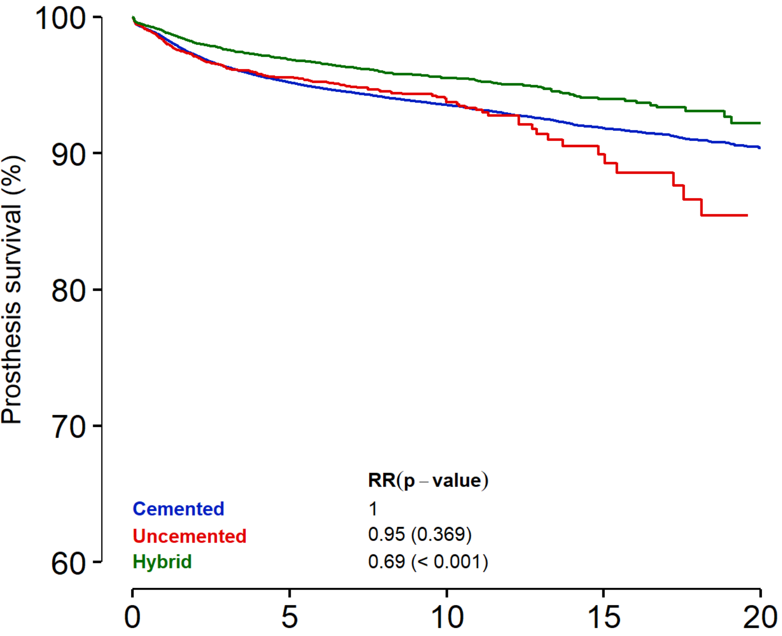
1994-2019



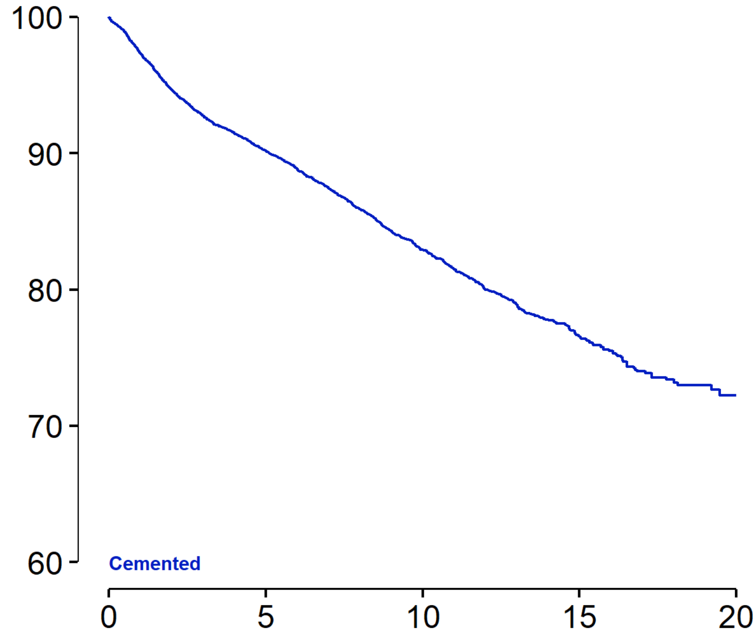
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for knee prosthesis - Fixation
1994 - 2019

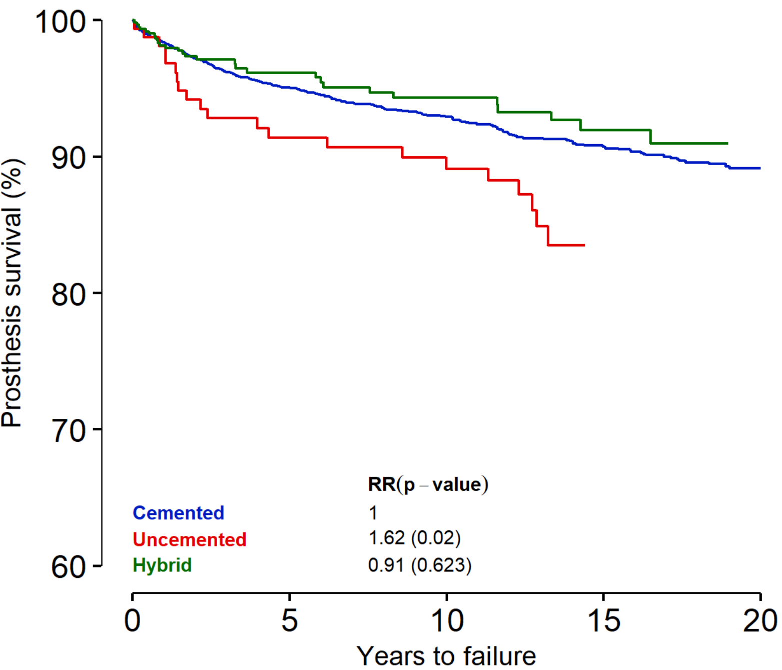
B.5) Total prosthesis



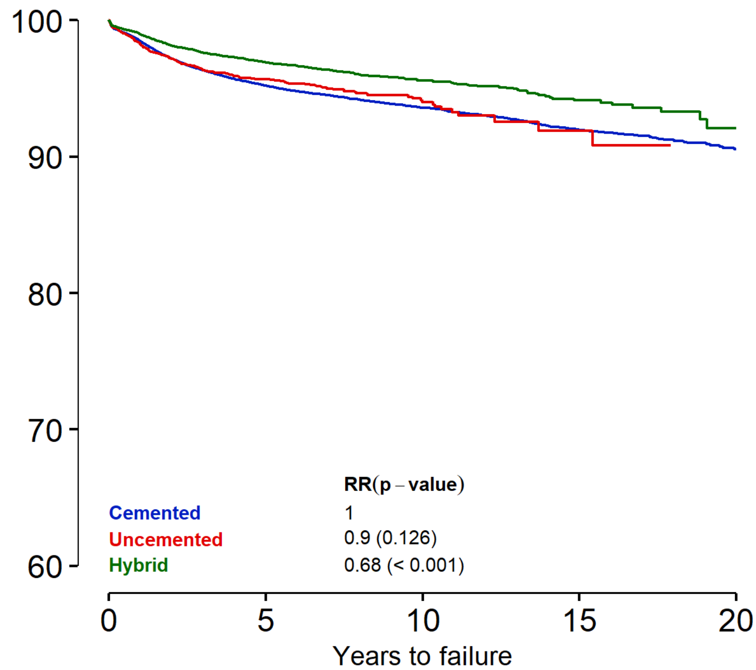
B.6) Unicondylar



B.7) Total with patella

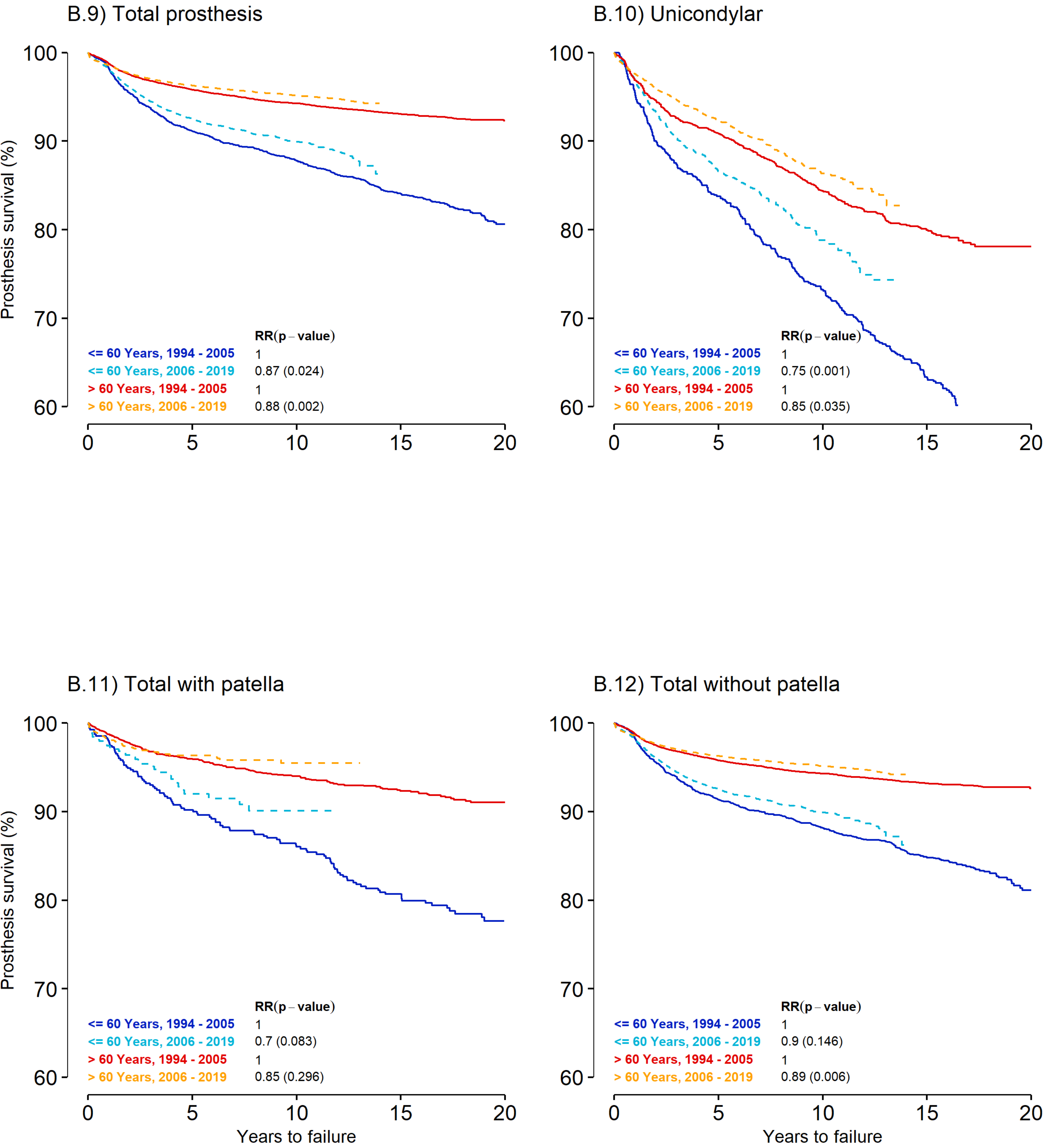


B.8) Total without patella



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

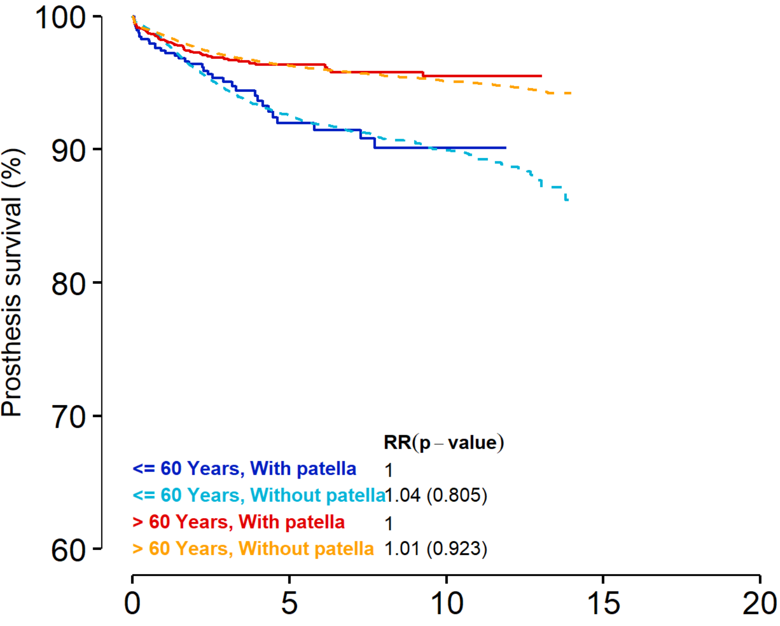
Survival curves for knee prosthesis - Age 1994 - 2019



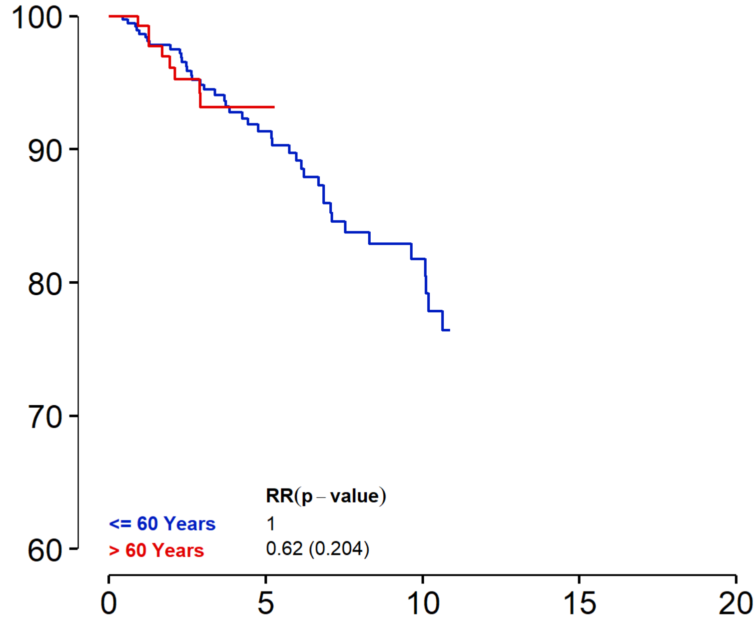
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
For figures B.9-12 two Cox-regressions have been fit; one for each age group. the years 1994-2005 is used as reference in both models.
There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

Survival curves for knee prostheses
1994 - 2019

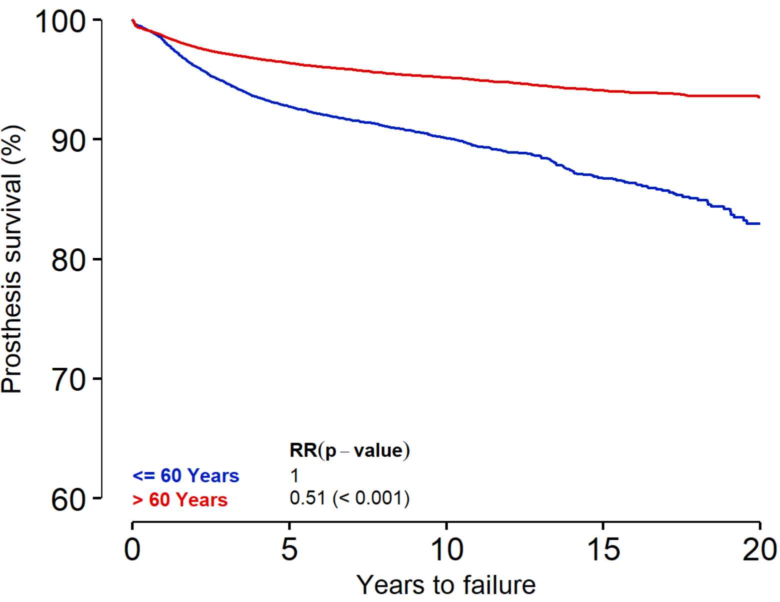
B.13) Total, 2006 - 19



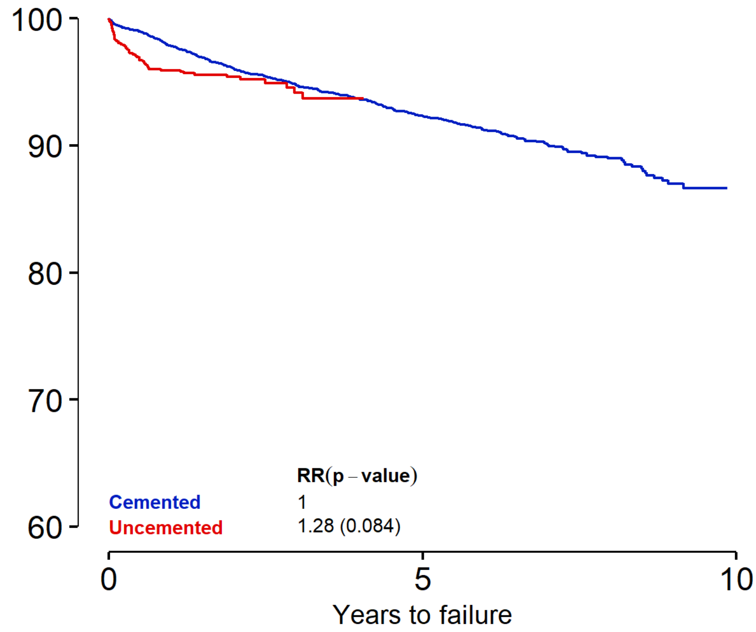
B.14) Patellofemoral



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



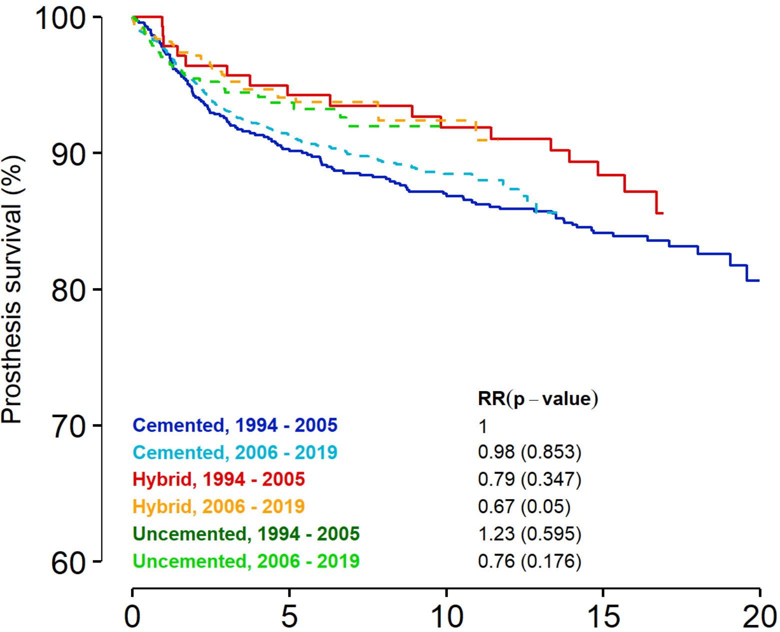
B.16) Unikcondylar prostheses cemented | uncemented



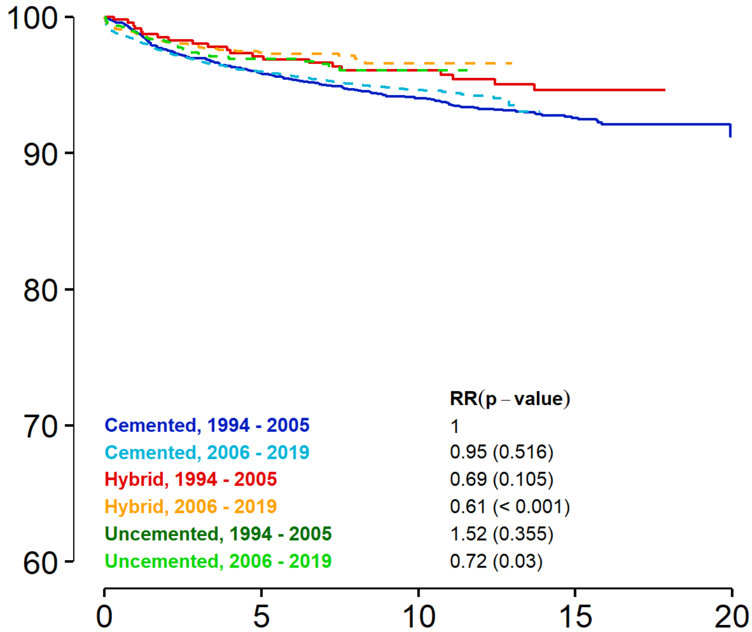
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
For figure B.13 two Cox-regressions have been fit; one for each age group. the years 1994-2005 is used as reference in both models.
There is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

Survival curves for total prostheses in knee without patella
1994 - 2019

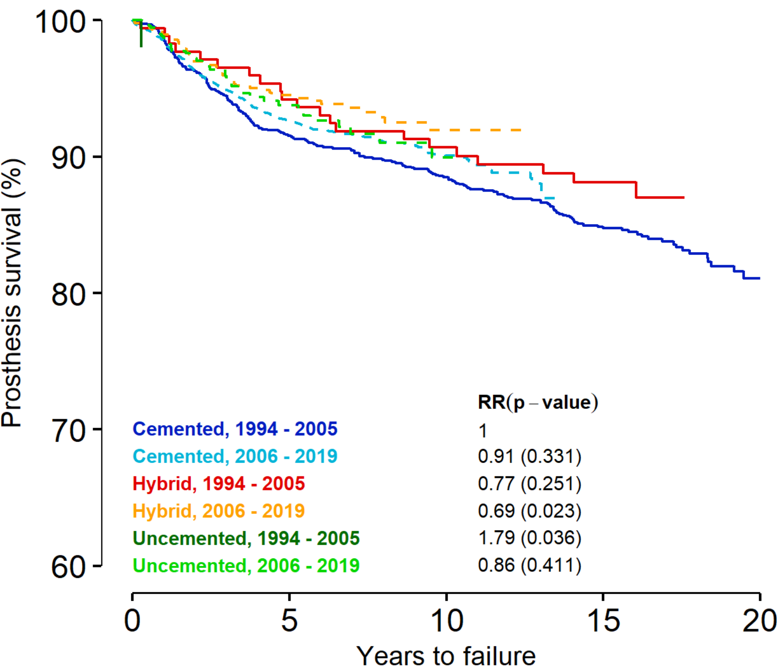
B.17) Men, under 60 years



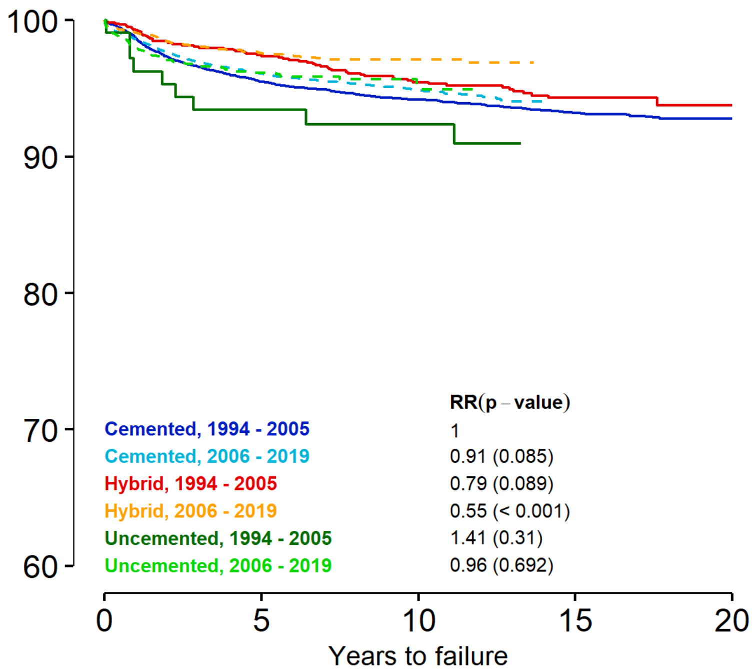
B.18) Men, over 60 years



B.19) Women, under 60 years

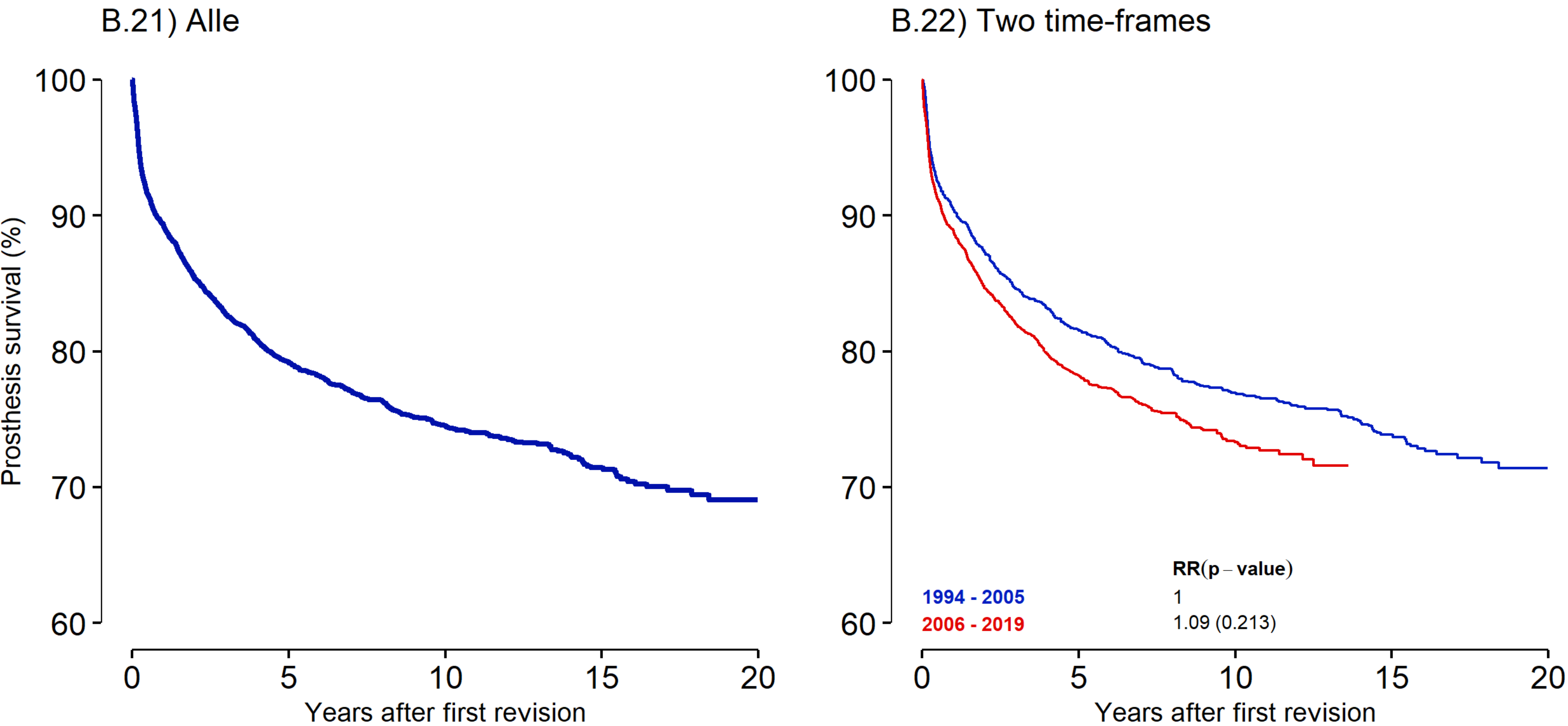


B.20) Women, over 60 years



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

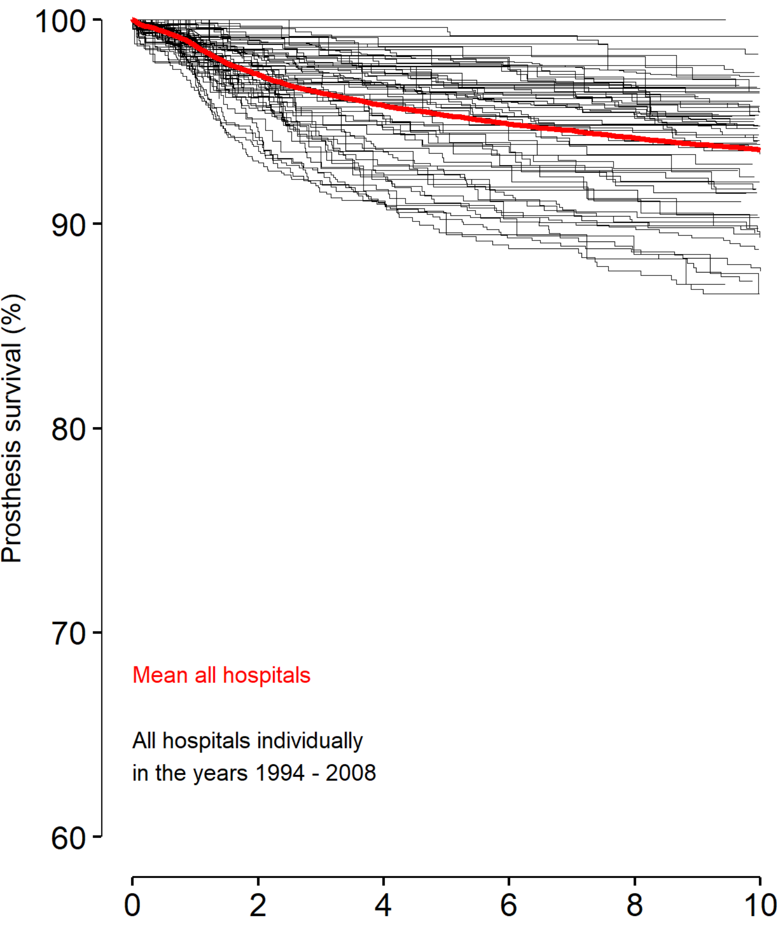
Survival curves for revisions of knee prostheses
1994 - 2019



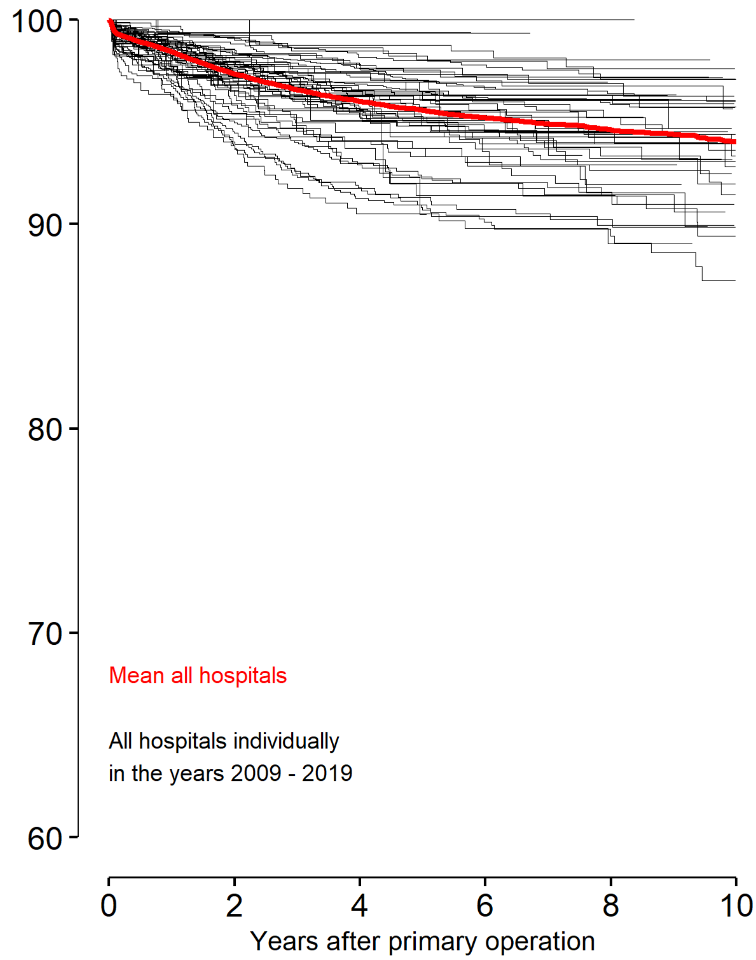
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.
There is some uncertainty tied to the risk estimates from the Cox-analysisis as the assumption of proportional hazard does not hold for all models.

Survival curves for total kneeprostheses

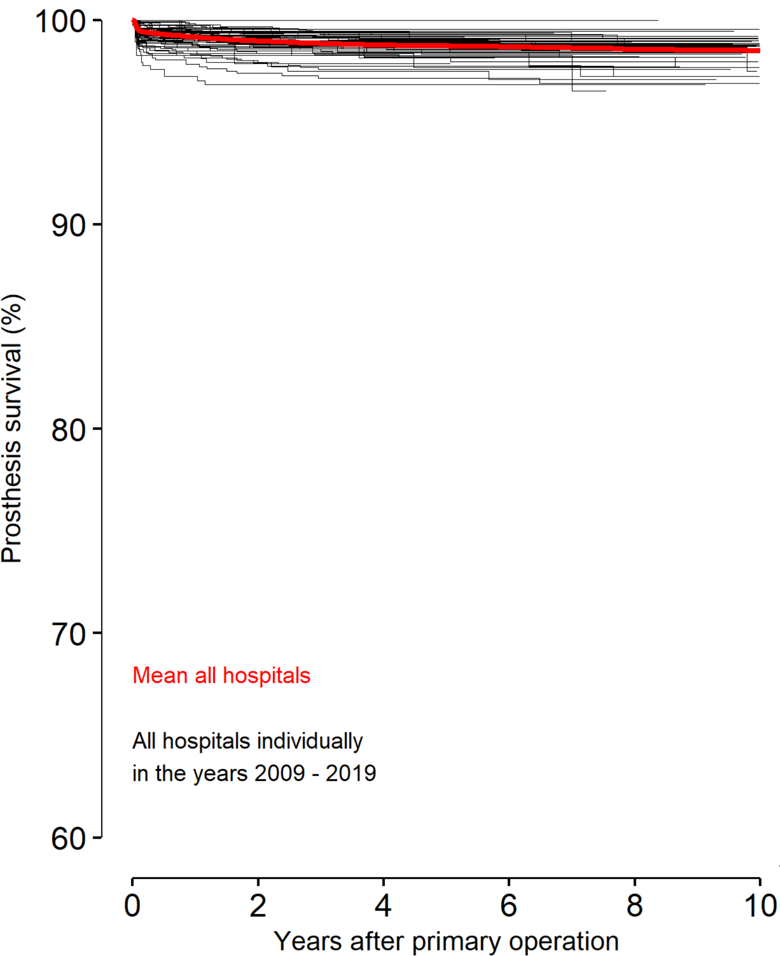
B.23) All hospitals in the years 1994 - 2008



B.24) All hospitals in the years 2009 - 2019

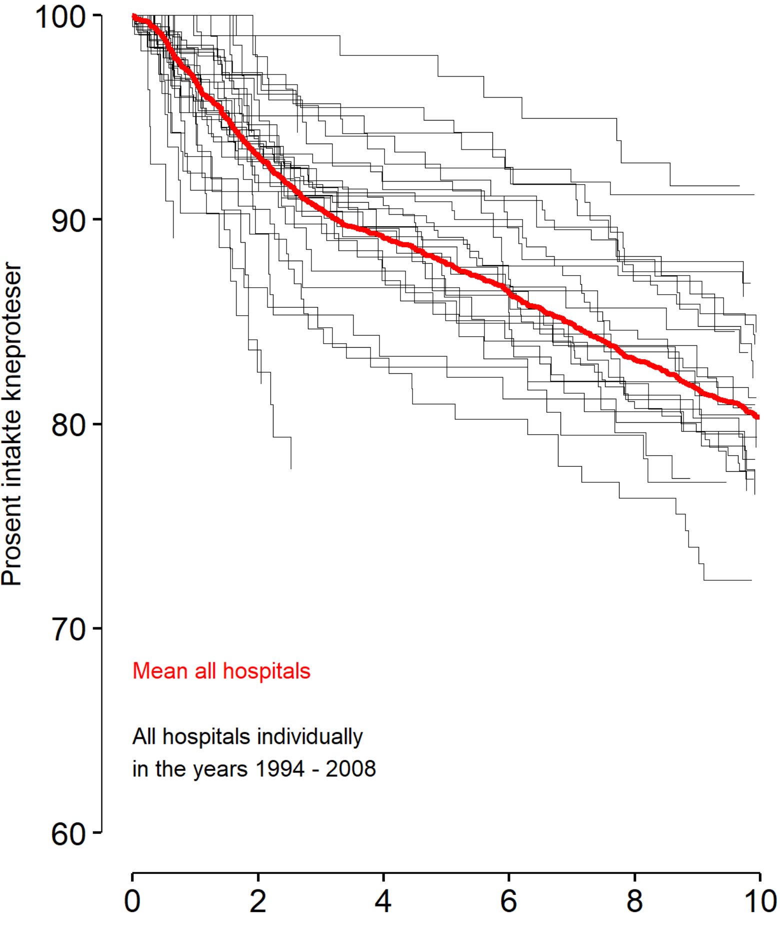


B.25) Endpoint revision for infection, 2009 - 2019

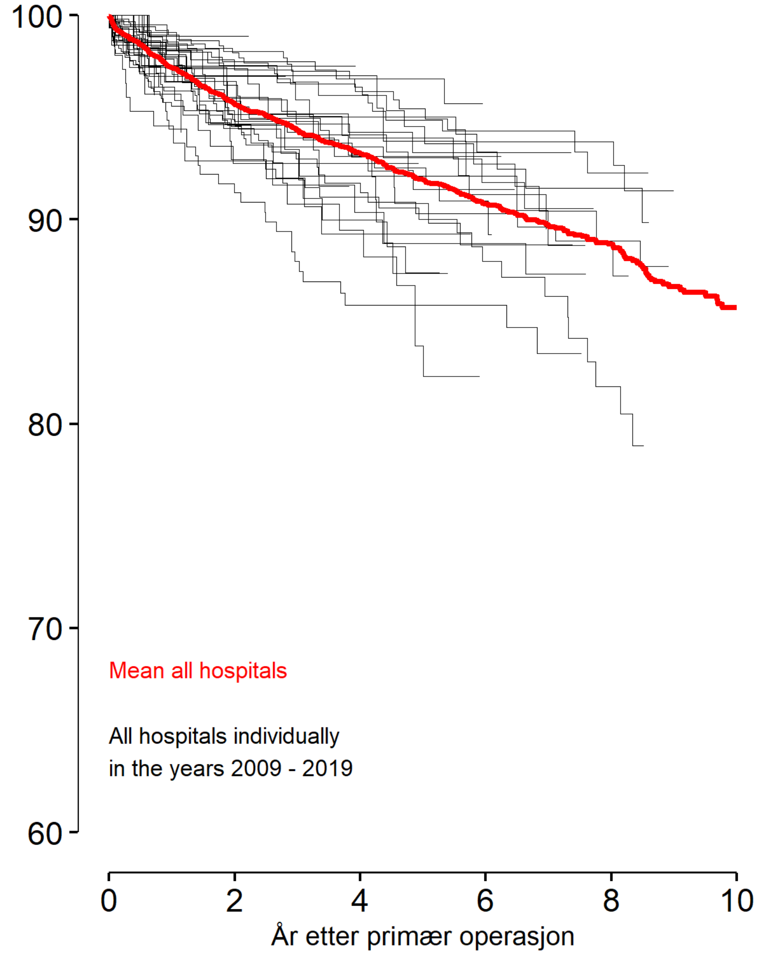


Survival curves for unicondylar kneeprostheses

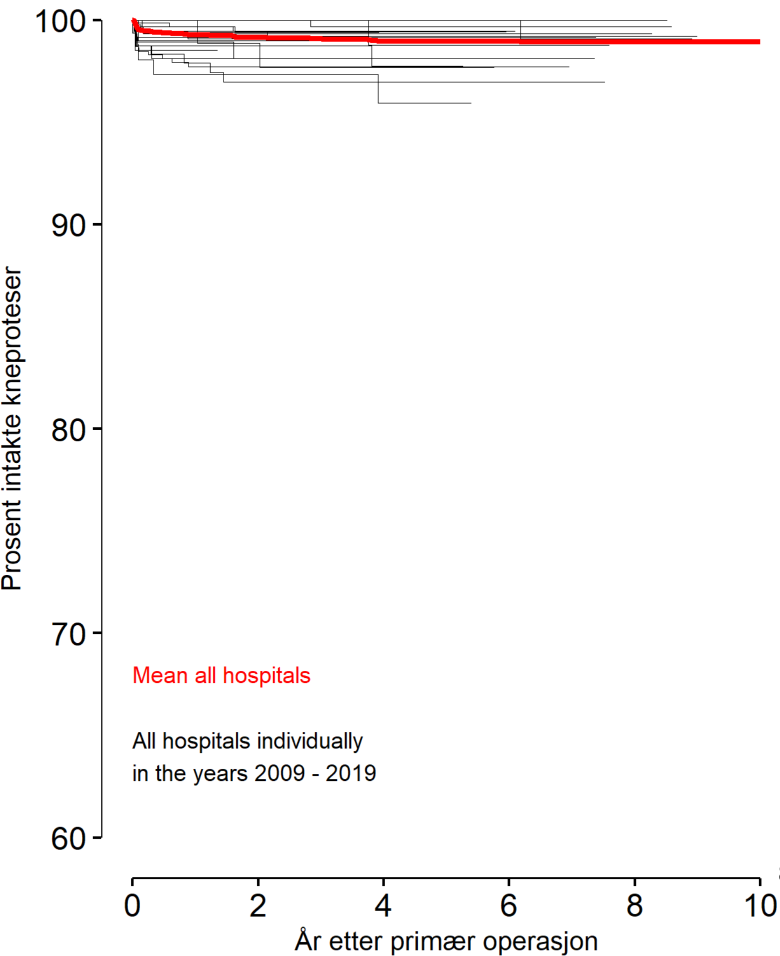
B.26) All hospitals in the years 1994 - 2008



B.27) All hospitals in the years 2009 - 2019



B.28) Endpoint revision for infection, 2009 - 2019



One stage bilateral operation in knee arthroplasty

Year	1994-2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Sum:
Number of patients	67	8	6	21	22	43	50	79	74	74	87	531

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 B.29: Number of primary operations in knee, 2019

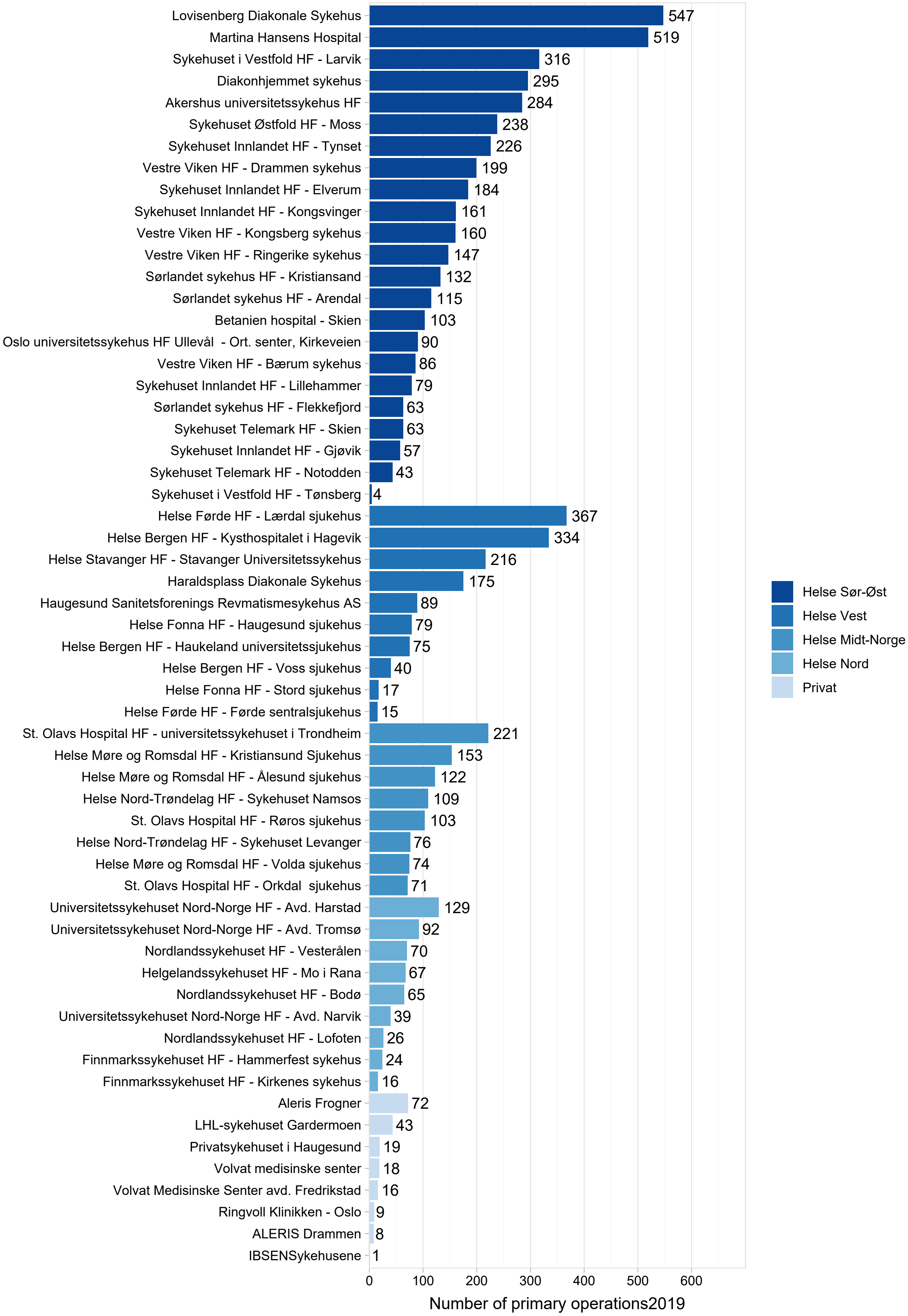
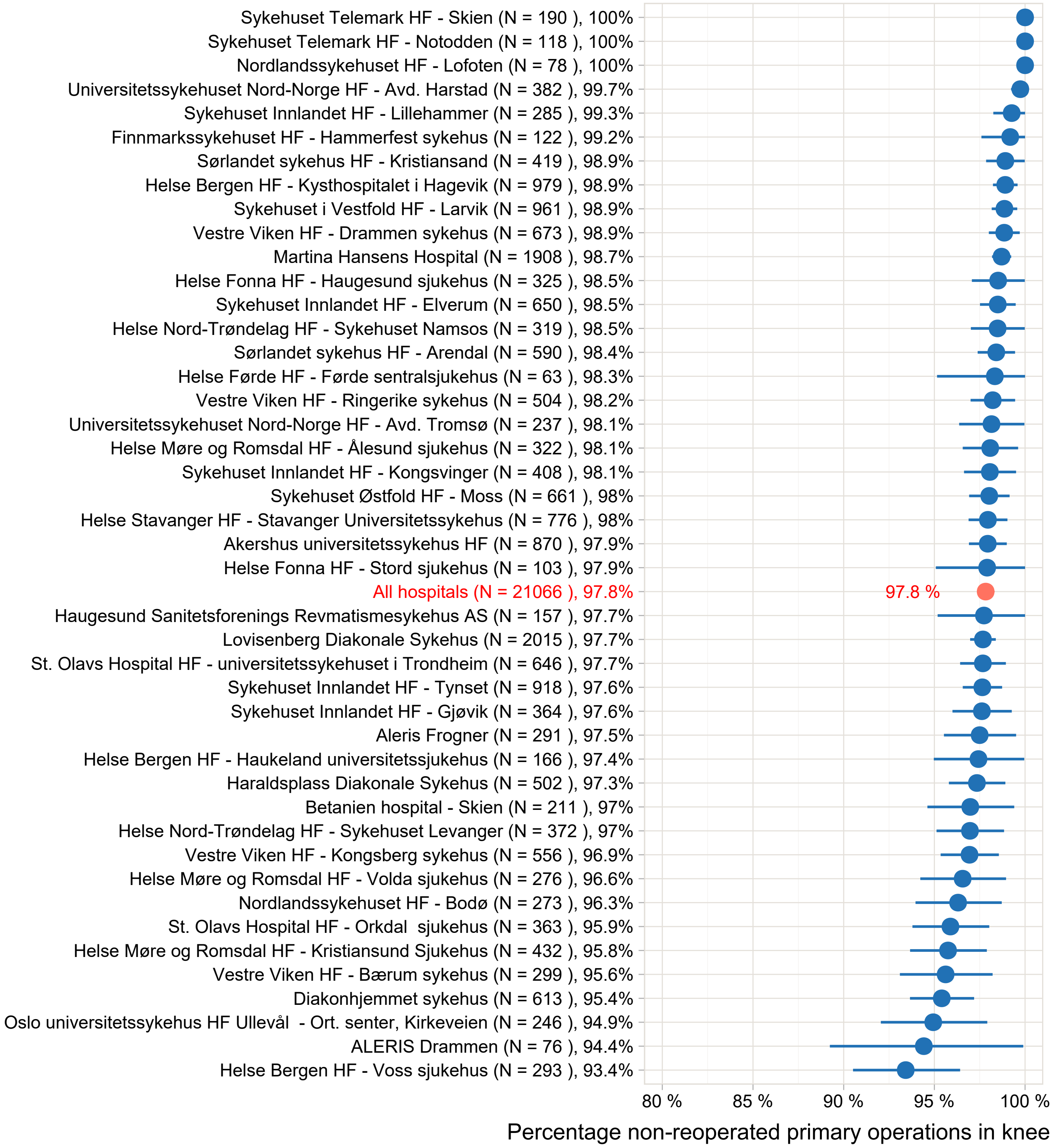
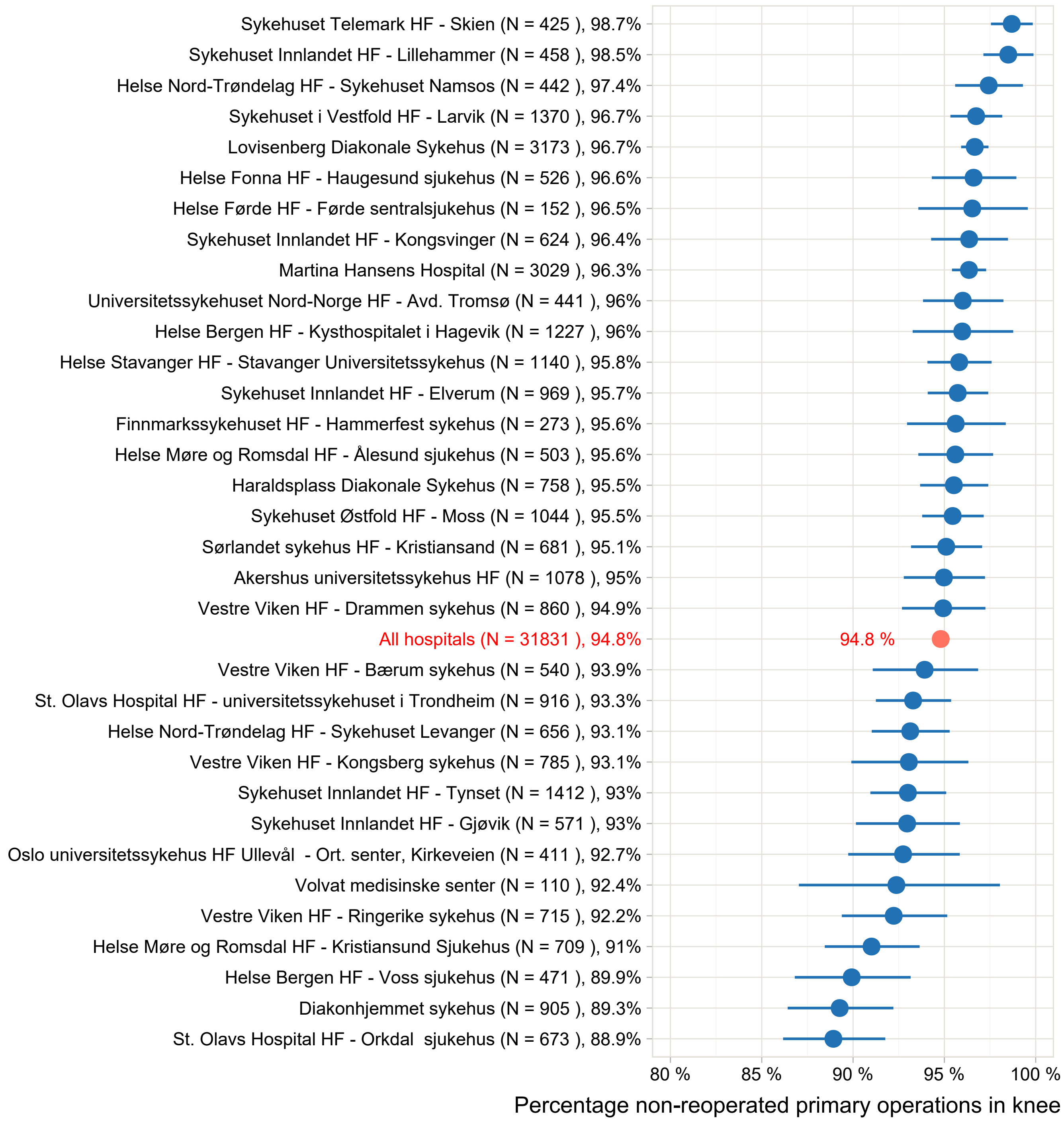


FIGURE B.30: Percentage non-revised standard patients two years after operations in 2013-2019



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 2013 to 2019. Only hospitals with operations in 2019 and with more than 50 operations from 2013 to 2019 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 2013 to 2018 are included.

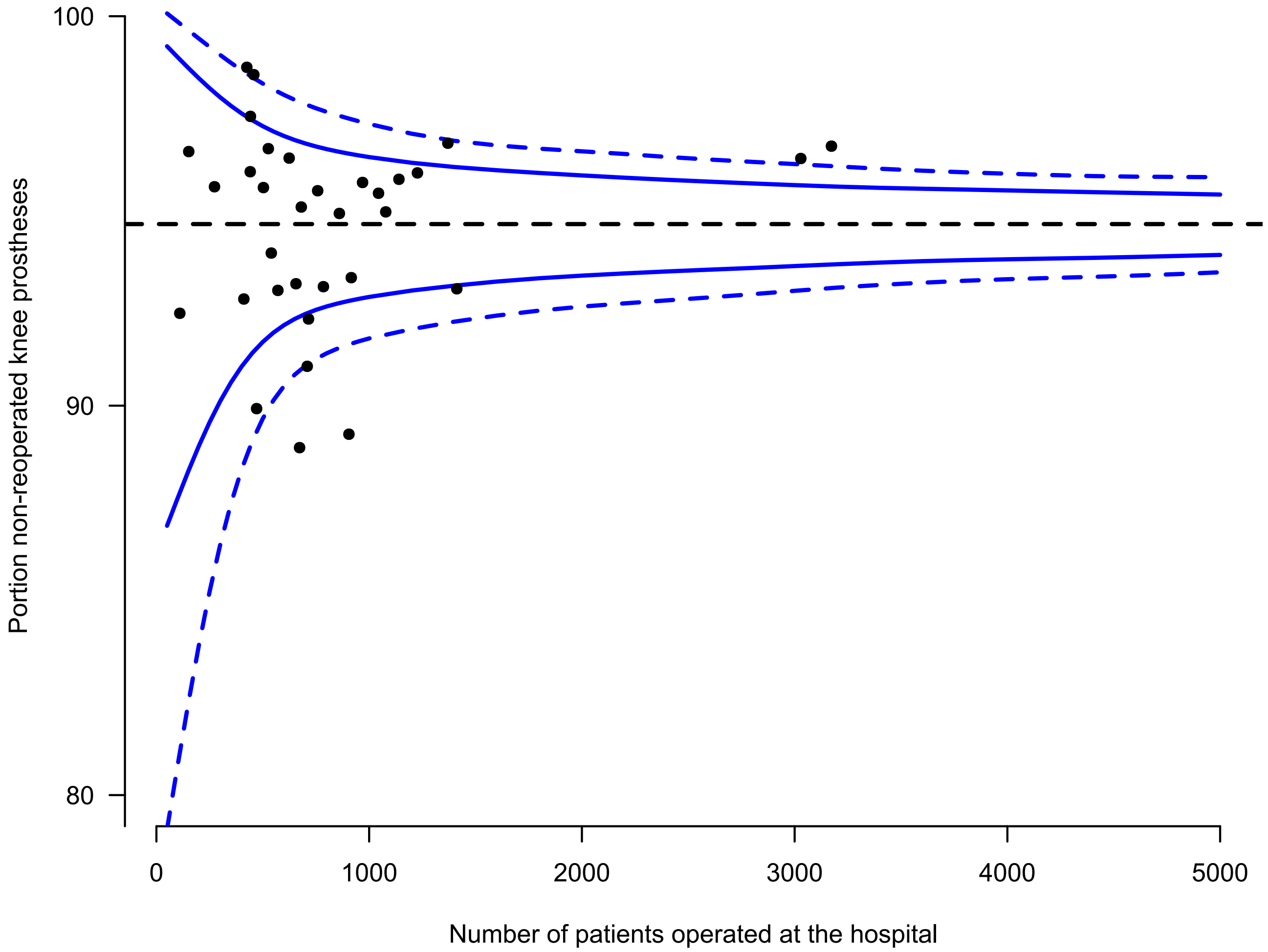
FIGURE B.31: Percentage non-revised standard patients ten years after operations in 2008-2019



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 2008 to 2019. Only hospitals with operations in 2019 and with more than 50 operations from 2008 to 2019 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 2008 to 2018 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 2008-2019



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2008 to 2019 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 2019. 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, 2008-2019.

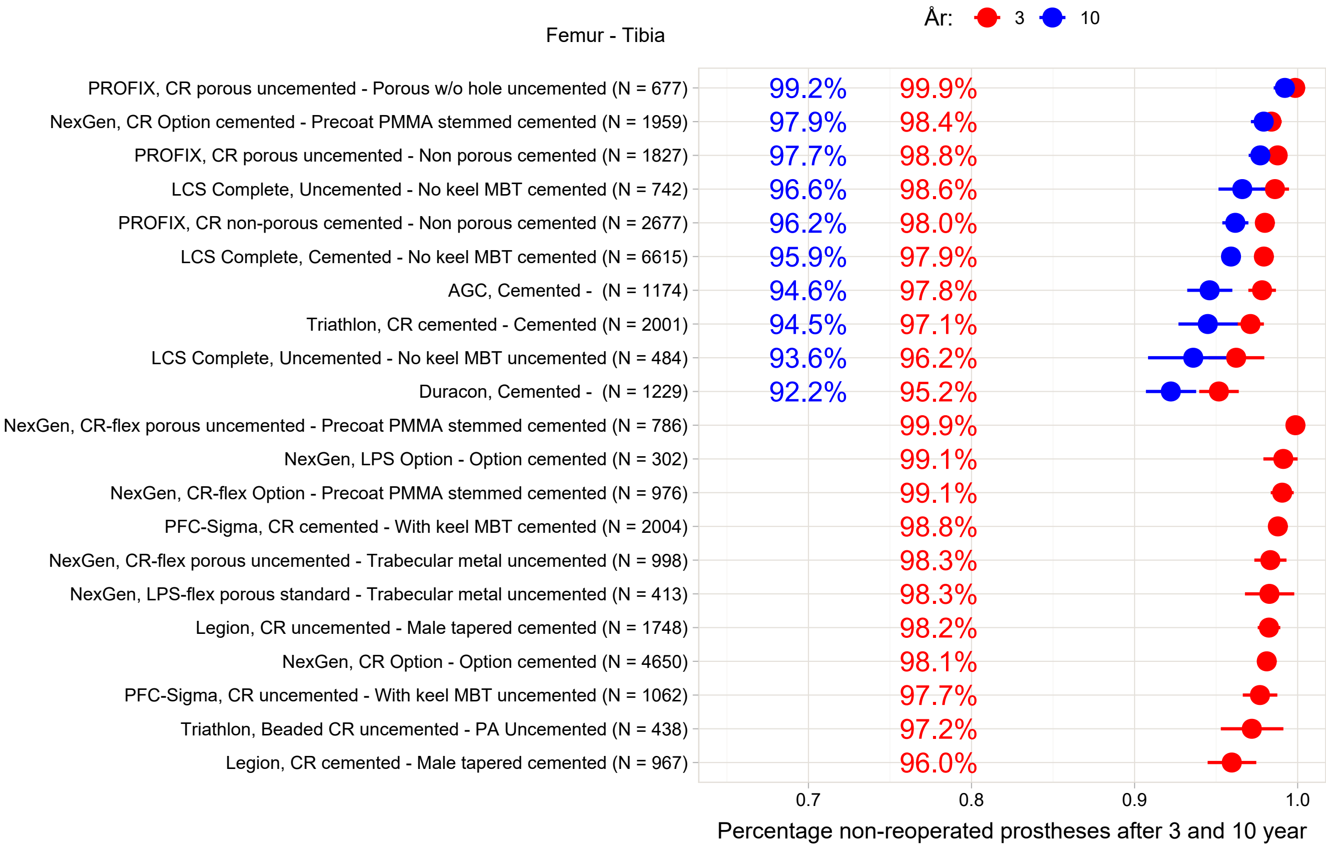


Figure B.34: Percentage non-reoperated uni prostheses in knee after 3 and 10 years, 2008-2019.

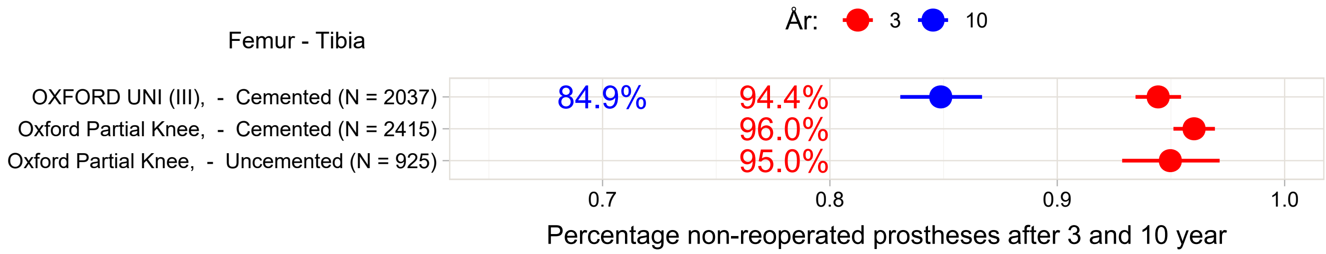
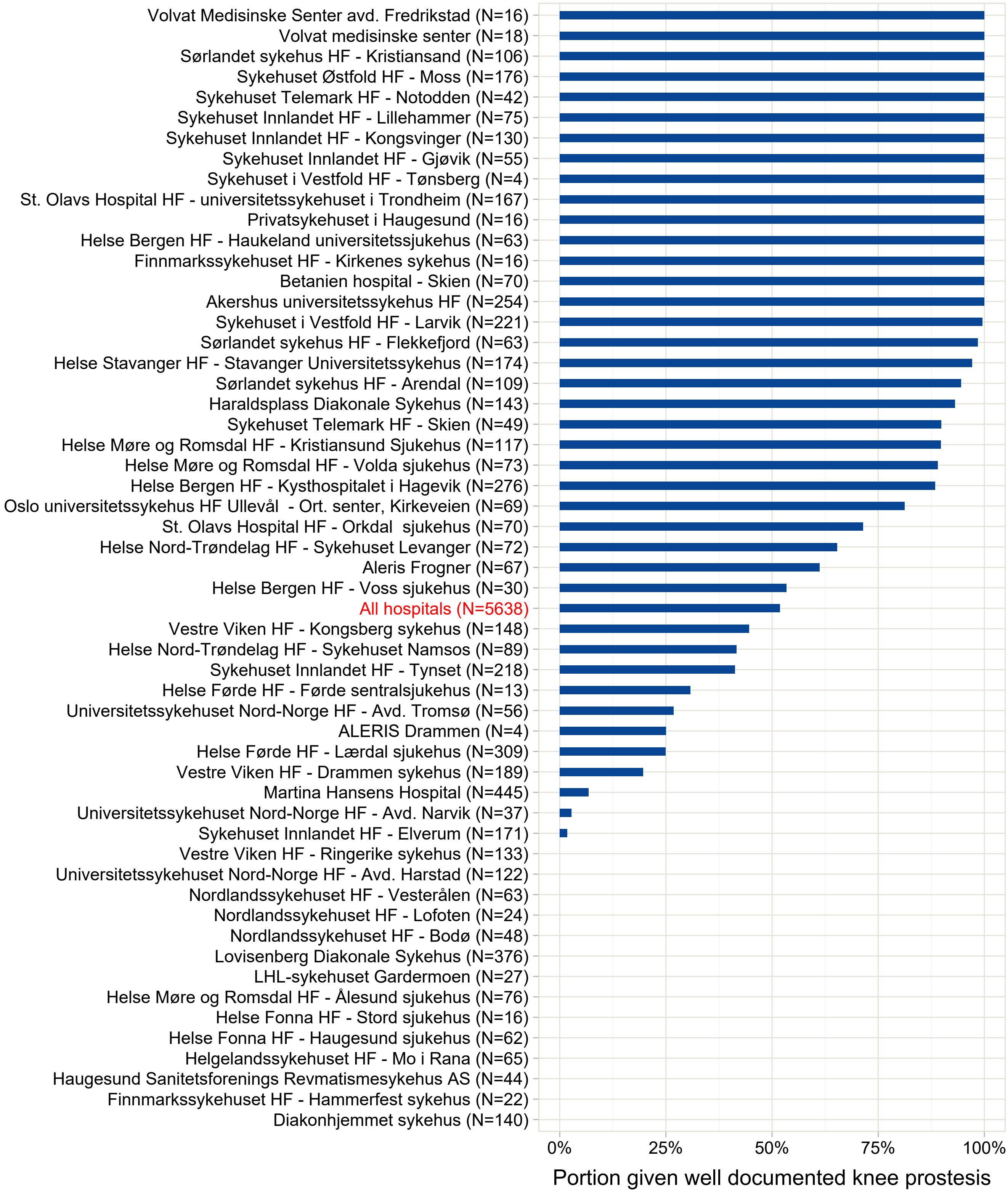


Figure B.33 and B.34 shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of knee prostheses. We have only included combinations used in 500 or more operations in 2008-2019. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2008 to 2019 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 2019.



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

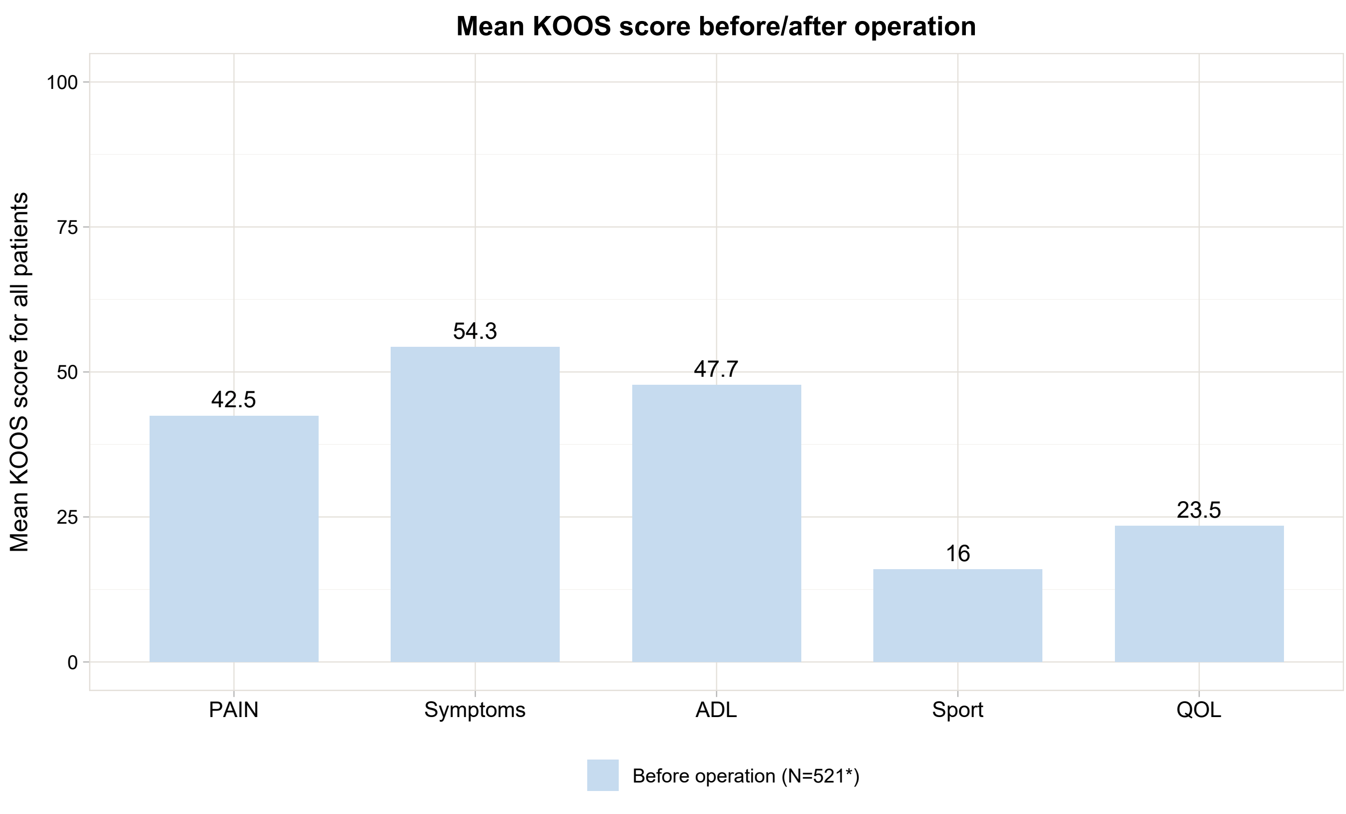
PROM, Knee Arthroplasty Register

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

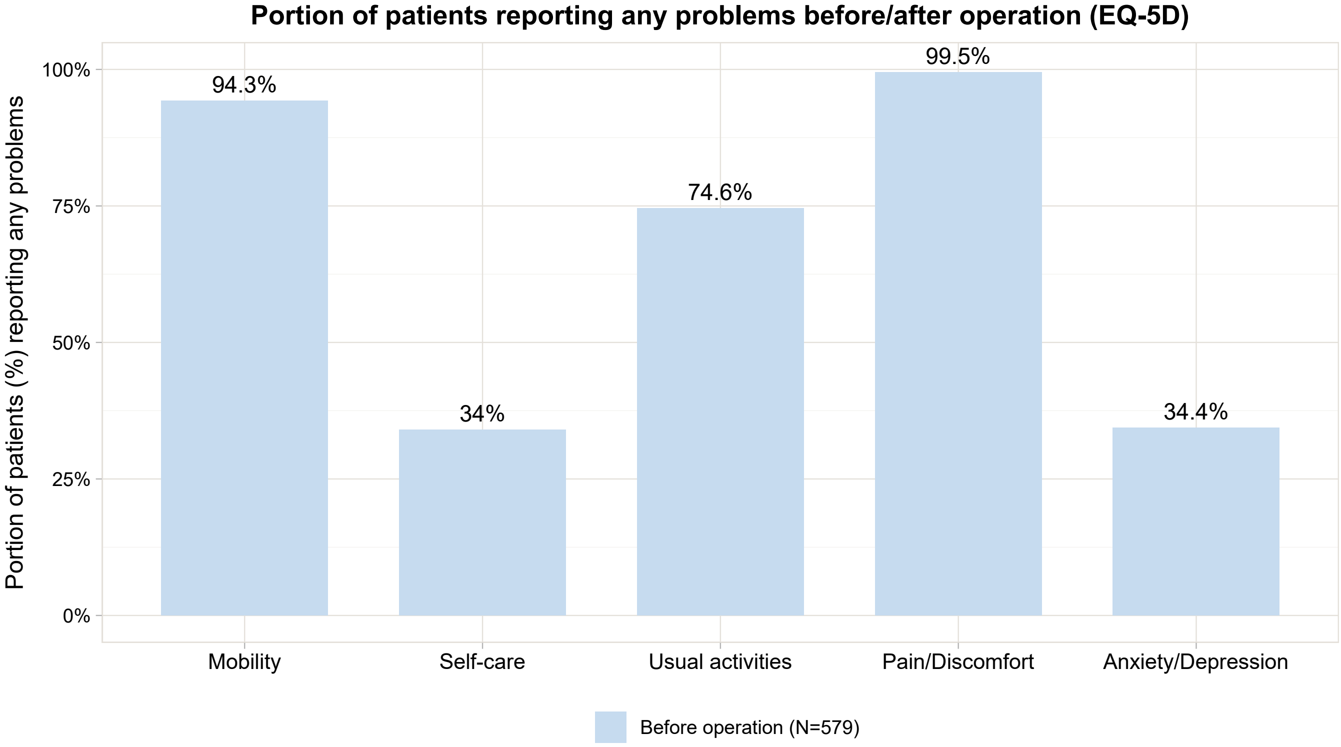
Thus far, we have collected data from 561 patients. 579 of the forms were filled out before the operation, while 2 were filled one year after the operation. 0 patients have filled out a form both before and one year after the operation. Currently 20 hospitals report to the register. All hospitals will receive an overview of their own results. Please contact our consultant Mikal Solberg (mikal.solberg@helse-bergen.no) with questions regarding electronic reporting of PROM.

Patient demografic	Before operation	1 Year after
number of forms (n)	579	2
Men (%)	48.5	0
Median age (min-maks)	67 (30-93)	63 (60-66)
Body-Mass Index (BMI)	29.9 (5.1)	31 (5.6)
Uses alchohol n (%)	403 (69.6)	2 (100)
Smokes n (%)	60 (10.4)	0 (0)
High school education or higher n (%)	274 (47.3)	1 (50)
Lives alone n (%)	121 (20.9)	0 (0)
UCLA activity* mean (SD)	4.9 (1.8)	5.5 (4.9)
Health** (VAS) mean (SD)	59.4 (18.6)	54.5 (7.8)
Pain*** mean (SD)	63.5 (17.9)	65 (7.1)

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



*Only 521 forms have adequate completeness of the questions tied to KOOS before the operation, and 2 forms 1 year after.



Health trust	Reporting hospitals	Number of pre-operative forms
Helse Sør-Øst	7/24	226
Helse Vest	6/10	225
Helse Midt-Norge	3/8	81
Helse Nord	3/9	20
Privat	1/9	27

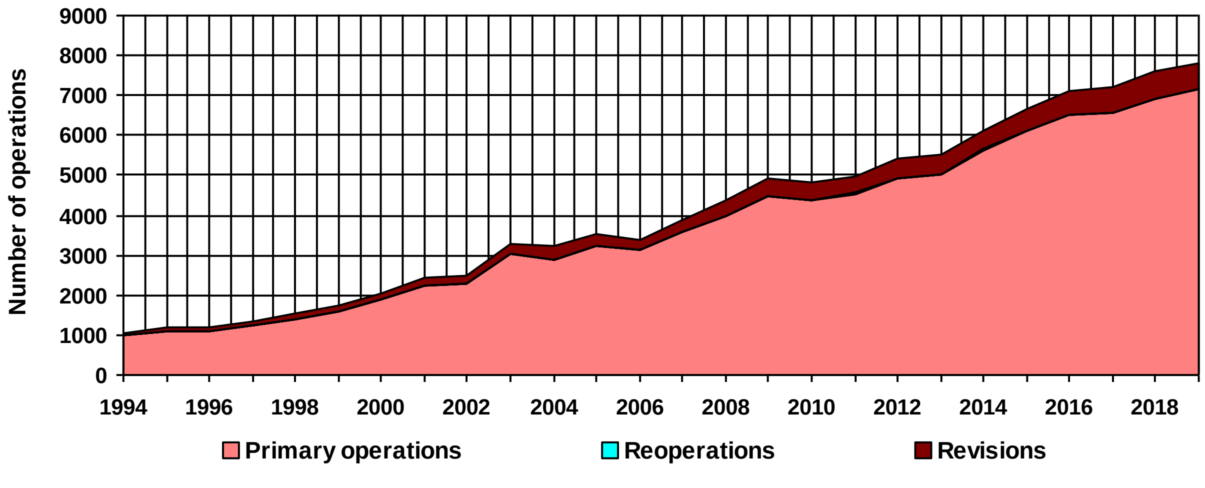
KNEE PROSTHESES

Table 1: Annual numbers of operations

Year	Primary operations		Reoperations *		Revisions		Total
2019	7 161	(91,8%)	18	(0,23%)	618	(7,9%)	**7 797**
2018	6 921	(91,2%)	14	(0,18%)	650	(8,6%)	**7 585**
2017	6 575	(91,2%)	15	(0,21%)	616	(8,5%)	**7 206**
2016	6 514	(91,5%)	16	(0,22%)	588	(8,3%)	**7 118**
2015	6 118	(91,7%)	8	(0,12%)	548	(8,2%)	**6 674**
2014	5 640	(91,9%)	7	(0,11%)	492	(8,0%)	**6 139**
2013	5 041	(91,3%)	5	(0,09%)	477	(8,6%)	**5 523**
2012	4 917	(90,9%)	7	(0,13%)	486	(9,0%)	**5 410**
2011	4 549	(91,3%)	2	(0,04%)	429	(8,6%)	**4 980**
2010	4 400	(91,5%)			411	(8,5%)	**4 811**
2009	4 473	(91,1%)			438	(8,9%)	**4 911**
2008	3 996	(91,6%)			367	(8,4%)	**4 363**
2007	3 588	(92,3%)			301	(7,7%)	**3 889**
2006	3 109	(92,1%)			267	(7,9%)	**3 376**
2005	3 255	(92,8%)			251	(7,2%)	**3 506**
2004	2 907	(90,2%)			317	(9,8%)	**3 224**
1994-03	16 833	(91,8%)			1 512	(8,2%)	**18 345**
Total	**95 997**	**(91,6%)**	**92**	**(0,09%)**	**8 768**	**(8,4%)**	**104 857**

* 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



53,2 % of all operations were performed on the right side. 62 % performed in women.

Mean age at primary surgery was 68,5 years, 69,1 years for women and 67,5 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 68,2 years in 2019, 68,4 years for women and 67,9 years for men.

Incidence

Figure 2a: Incidence of primary knee prostheses

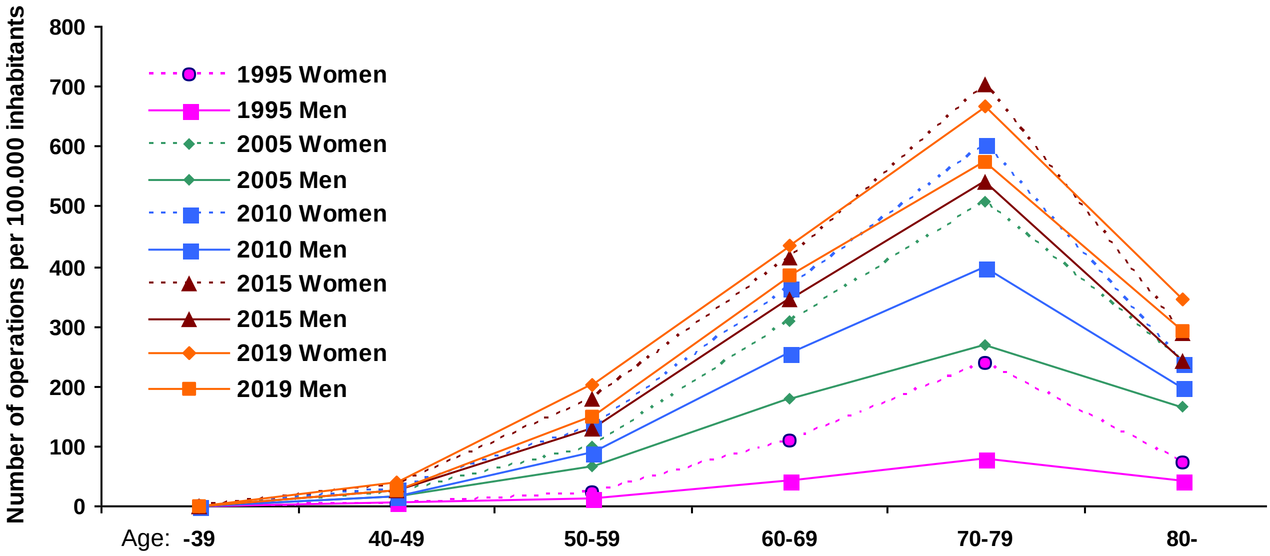


Figure 2b: Annual total incidence of primary knee prostheses for men and women

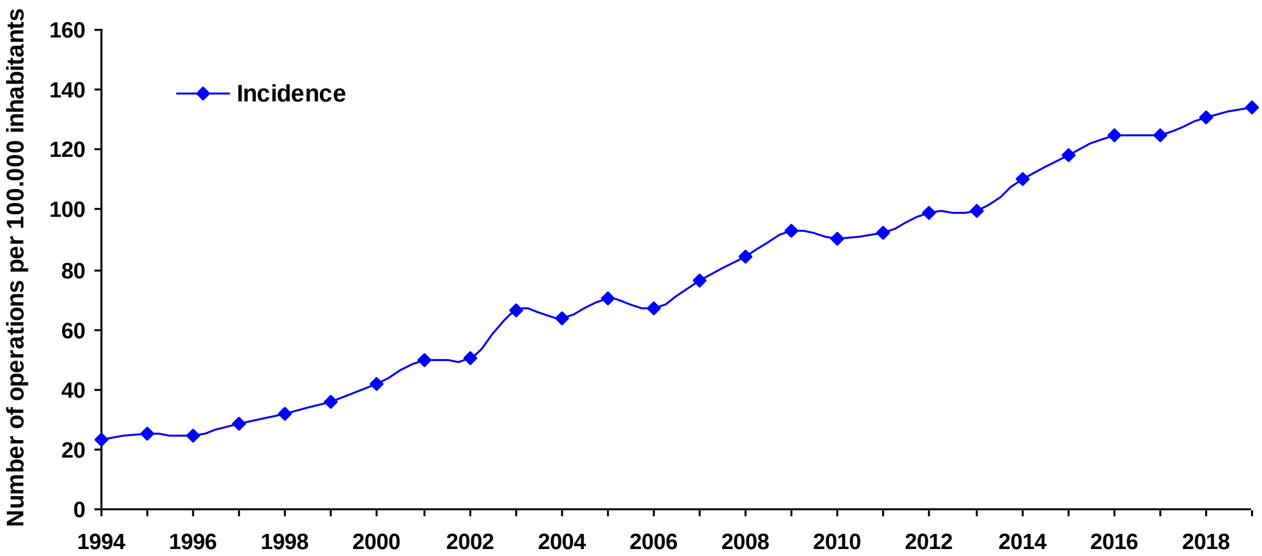


Figure 3: Age at the insertion of primary total knee prostheses

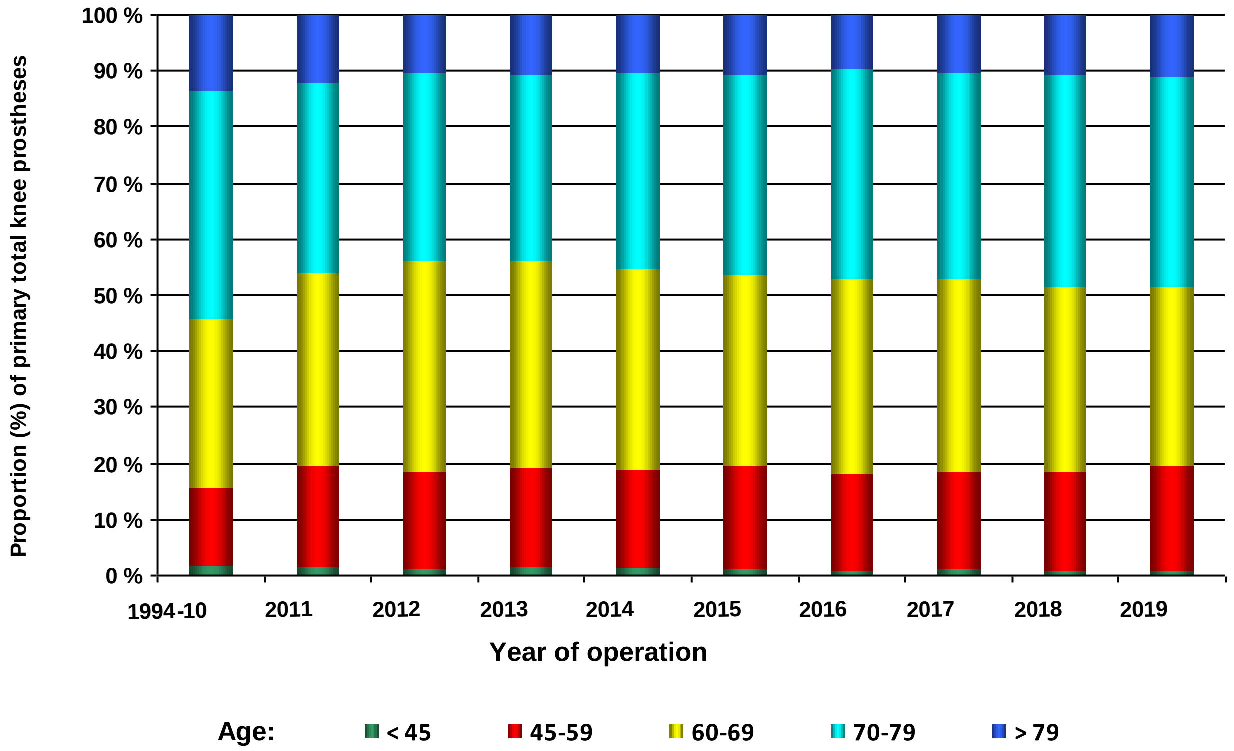


Figure 4: Age at the insertion of primary unicondylar knee prostheses

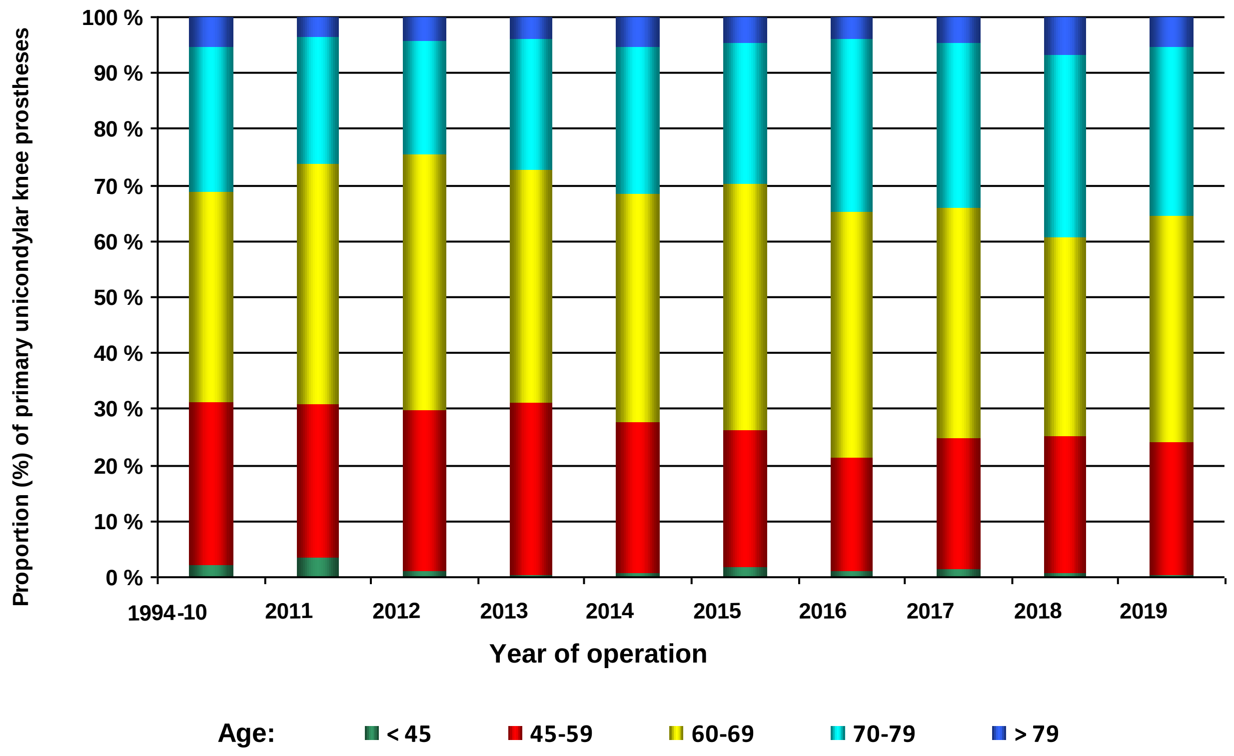


Figure 5: Age and sex at the insertion of primary total knee prostheses

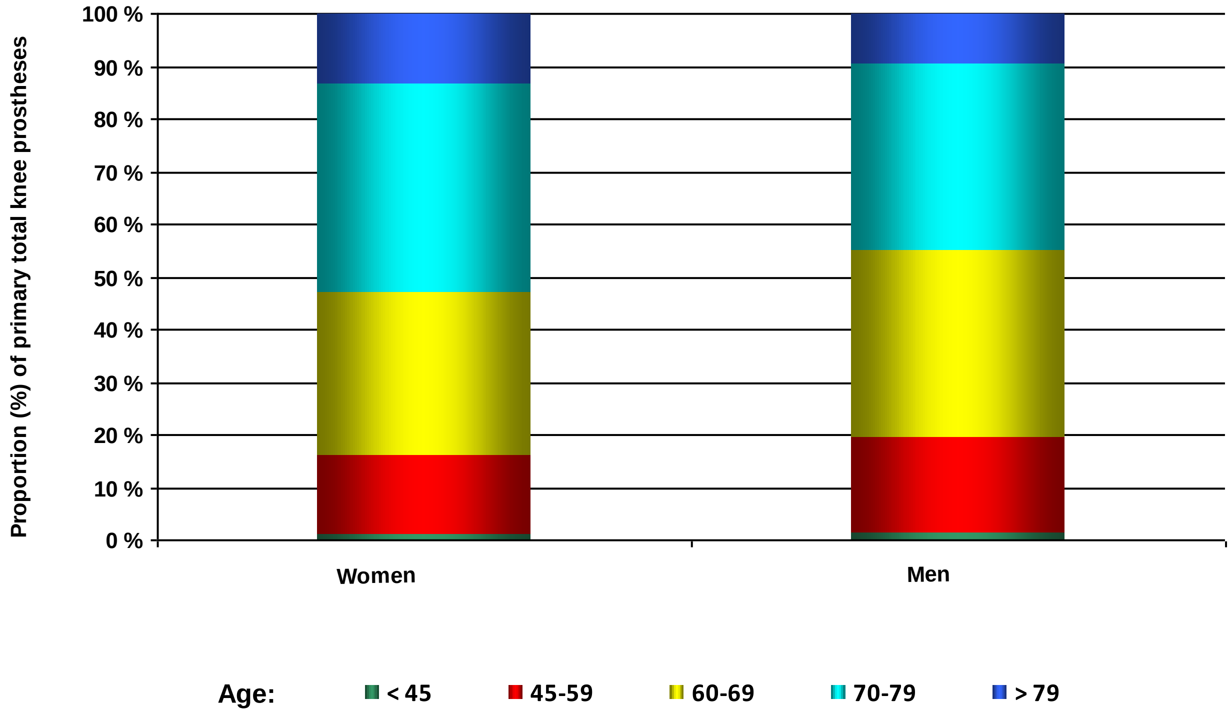
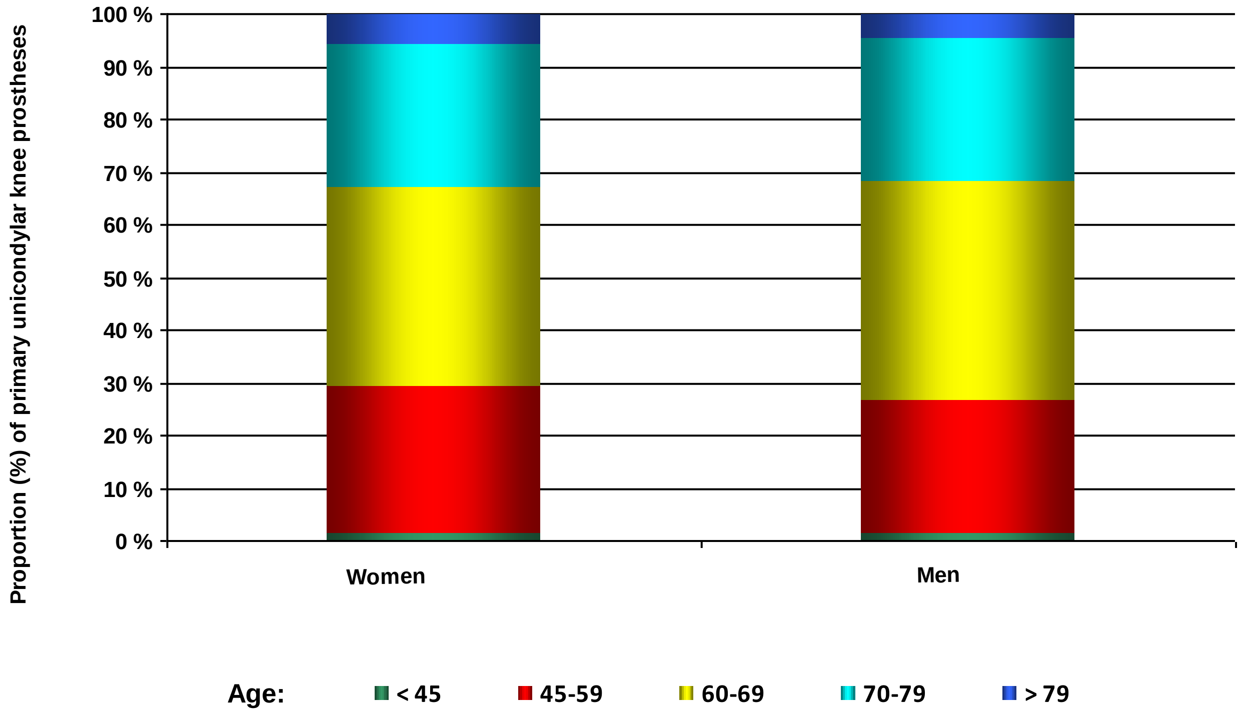


Figure 6: Age and sex at the insertion of primary unicondylar knee prostheses



Types of knee prostheses

Table 2: Primary operations

Year	Total with patella	Total without patella	Unicondylar	Patello-femoral	Bicompart-mental	Hinged * prostheses	Missing	Total
2019	581 (8,1%)	5 524 (77,1%)	971 (13,6%)	52 (0,7%)		32 (0,4%)		**7 161**
2018	504 (7,3%)	5 326 (77,0%)	1 000 (14,4%)	58 (0,8%)		31 (0,4%)		**6 921**
2017	453 (6,9%)	5 147 (78,3%)	867 (13,2%)	76 (1,2%)		32 (0,5%)		**6 575**
2016	221 (3,4%)	5 329 (81,8%)	863 (13,2%)	67 (1,0%)		32 (0,5%)		**6 514**
2015	160 (2,6%)	5 134 (83,9%)	751 (12,3%)	39 (0,6%)		33 (0,5%)	1 (0,0%)	**6 118**
2014	108 (1,9%)	4 865 (86,3%)	605 (10,7%)	41 (0,7%)		20 (0,4%)		**5 640**
2013	97 (1,9%)	4 418 (87,6%)	477 (9,5%)	38 (0,8%)		9 (0,2%)	2 (0,0%)	**5 041**
2012	98 (2,0%)	4 292 (87,3%)	474 (9,6%)	34 (0,7%)		17 (0,3%)	2 (0,0%)	**4 917**
2011	87 (1,9%)	3 975 (87,4%)	439 (9,7%)	29 (0,6%)		19 (0,4%)		**4 549**
1994-10	4 057 (9,5%)	33 372 (78,4%)	4 935 (11,6%)	119 (0,3%)	2 (0,0%)	75 (0,2%)	1 (0,0%)	42 561
Total	**6 366 (6,6%)**	**77 382 (80,6%)**	**11 382 (11,9%)**	**553 (0,6%)**	**2 (0,0%)**	**300 (0,3%)**	**6 (0,0%)**	**95 997**

* Indicated by the surgeon on the report form

Figure 7: Primary operations

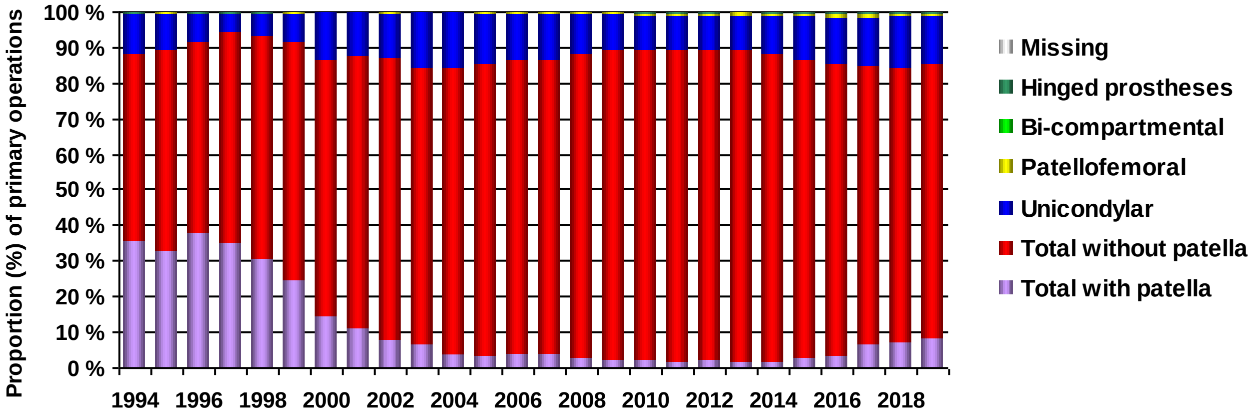


Table 3a: Classification of stability and modularity in primary total prostheses (with and without patella component)

Year	---------- MS ---------- All poly	MS MT	----------- PS ----------- All poly	PS MT	CCK	Rotating platform	Hinged * prostheses	Total
2019	103	4 393	1	602	32	972	31	**6 134**
2018	1	3 996	1	565	26	1 238	31	**5 858**
2017	0	3 675	0	539	42	1 343	32	**5 631**
2016	4	3 688	0	465	19	1 370	32	**5 578**
2015	2	3 536	0	330	22	1 403	33	**5 326**
2014	2	3 397	0	131	22	1 416	20	**4 988**
2013	2	3 177	0	55	25	1 254	9	**4 522**
2012	5	2 855	0	21	16	1 490	17	**4 404**
2011	5	2 542	0	14	9	1 490	19	**4 079**
2010	3	2 486	0	19	5	1 427	18	**3 958**
2009	3	2 542	0	7	8	1 417	5	**3 982**
2008	1	2 173	0	22	3	1 324	8	**3 531**
2007	0	1 927	0	14	2	1 162	7	**3 112**
2006	0	1 637	0	8	2	1 047	2	**2 696**
2005	0	1 623	0	6	0	1 156	3	**2 788**
2004	1	1 519	0	0	3	922	1	**2 446**
1994-03	10	11 271	0	27	12	3 561	32	**14 913**

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

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

	---------- MS ----------		----------- PS -----------					
Year	**All poly**	**MT**	**All poly**	**MT**	**CCK**	**Rotating platform**	**Hinged * prostheses**	**Total**
2019	1	133	0	117	79	82	79	**491**
2018	1	150	0	112	109	92	43	**507**
2017	0	124	0	134	66	88	65	**477**
2016	0	110	0	96	67	80	79	**432**
2015	0	129	0	100	50	75	66	**420**
2014	0	120	0	57	66	90	62	**395**
2013	1	132	0	61	75	87	32	**388**
2012	0	151	0	39	46	102	30	**368**
2011	1	142	0	19	58	98	23	**341**
2010	0	154	0	11	62	94	12	**333**
2009	0	147	0	12	44	119	21	**343**
2008	0	126	0	8	23	121	12	**290**
2007	0	103	0	6	14	99	9	**231**
2006	0	91	0	8	7	83	8	**197**
2005	0	112	0	2	3	71	4	**192**
2004	1	121	0	2	9	89	3	**225**
1994-03	1	696	0	42	39	176	31	**985**

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

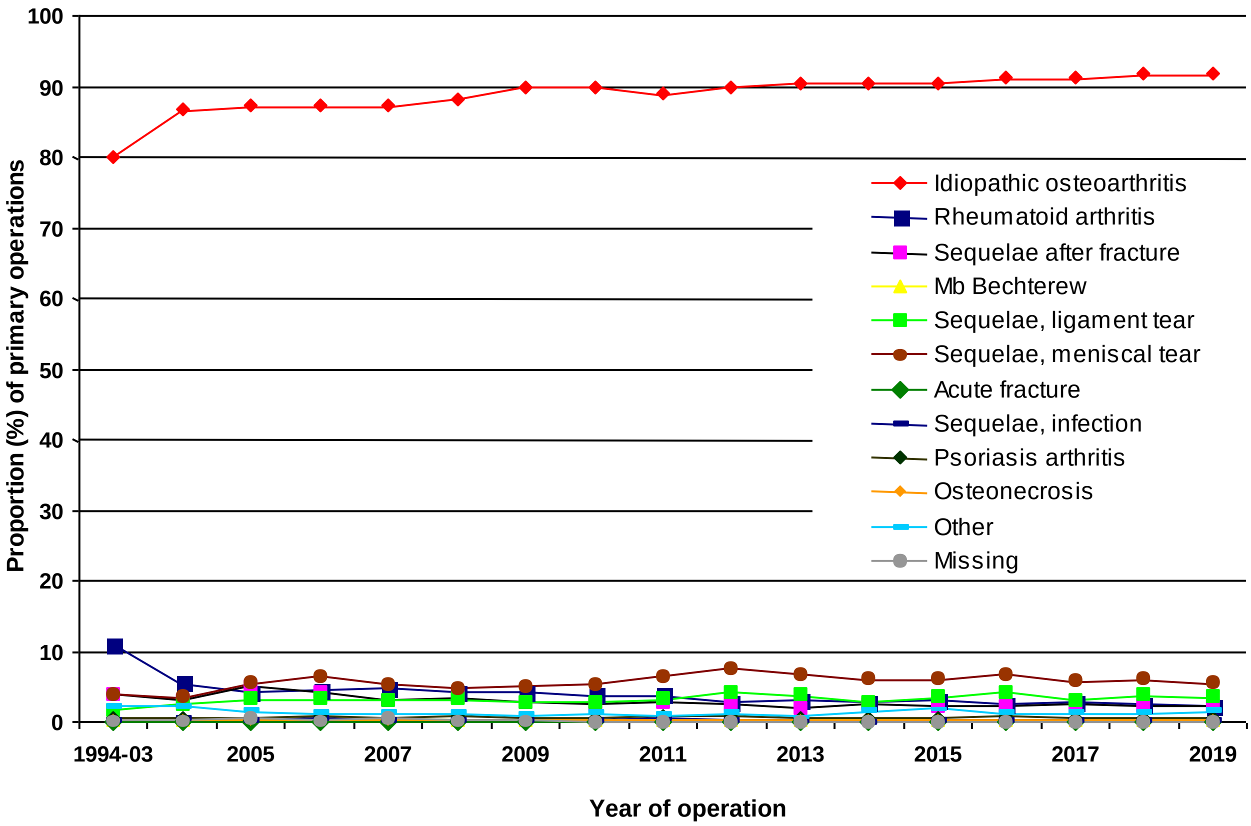
Reasons for primary operations - Total knee prostheses

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
2019	5 609	133	132	14	227	338	3	10	29	16	104	0
2018	5 351	143	132	13	228	364	4	10	28	13	90	0
2017	5 111	156	147	19	179	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	4 084	145	94	11	173	309	1	16	29	9	41	4
2012	3 944	125	106	15	182	332	2	13	33	11	60	4
2011	3 618	161	113	12	133	260	1	18	35	10	51	2
2010	3 548	155	99	13	114	216	1	9	25	7	51	3
2009	3 579	167	117	11	116	200	2	13	25	7	42	10
2008	3 105	150	125	14	116	169	2	9	30	10	50	7
2007	2 715	146	94	17	97	162	4	11	17	11	43	16
2006	2 353	123	114	14	92	178	0	12	23	11	40	5
2005	2 435	120	145	13	94	155	2	11	19	7	47	14
2004	2 130	138	76	6	59	89	0	15	14	6	53	10
1994-03	11 932	1 630	604	59	264	582	18	60	88	34	356	46
Total	**73 866**	**3 934**	**2 454**	**287**	**2 642**	**4 690**	**49**	**257**	**540**	**205**	**1 362**	**125**

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

Figure 8:



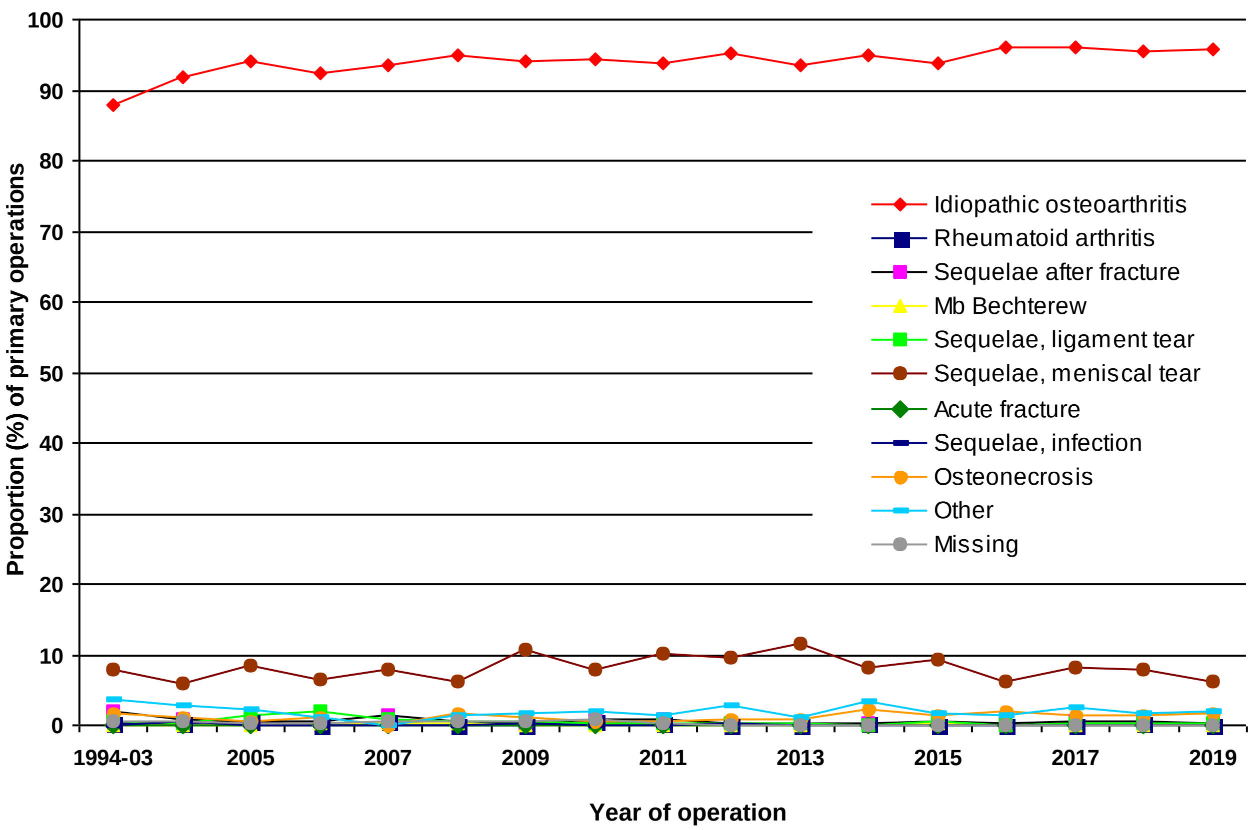
Reasons for primary operations - Unicondylar knee prostheses

Table 5:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Sequelae, infection	Osteonecrosis	Other	Missing
2019	929	1	2	0	2	60	0	17	20	0
2018	954	2	7	0	2	80	0	14	18	0
2017	832	1	4	0	3	71	0	13	22	0
2016	830	1	2	1	1	54	1	16	13	0
2015	704	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	451	0	1	0	1	46	1	4	13	0
2011	412	1	4	0	1	45	0	3	6	1
2010	391	2	3	0	1	33	0	2	8	3
2009	435	0	1	0	2	50	1	5	8	2
2008	418	0	2	1	3	27	0	7	6	2
2007	436	2	7	1	4	37	0	0	0	2
2006	369	0	2	1	8	26	0	5	5	1
2005	429	2	3	0	7	38	0	3	10	1
2004	411	1	4	0	1	27	2	5	12	3
1994-03	1 626	4	35	1	8	146	1	31	66	8
Total	**10 648**	**19**	**84**	**7**	**50**	**915**	**6**	**153**	**246**	**23**

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

Figure 9:



Use of cement - Primary total knee prostheses

Figure 10: Femur

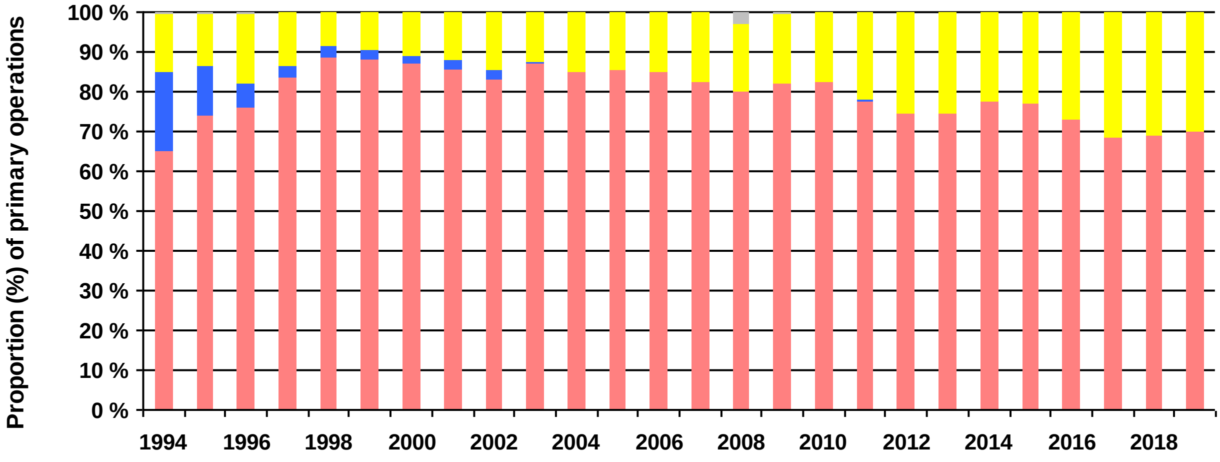


Figure 11: Tibia

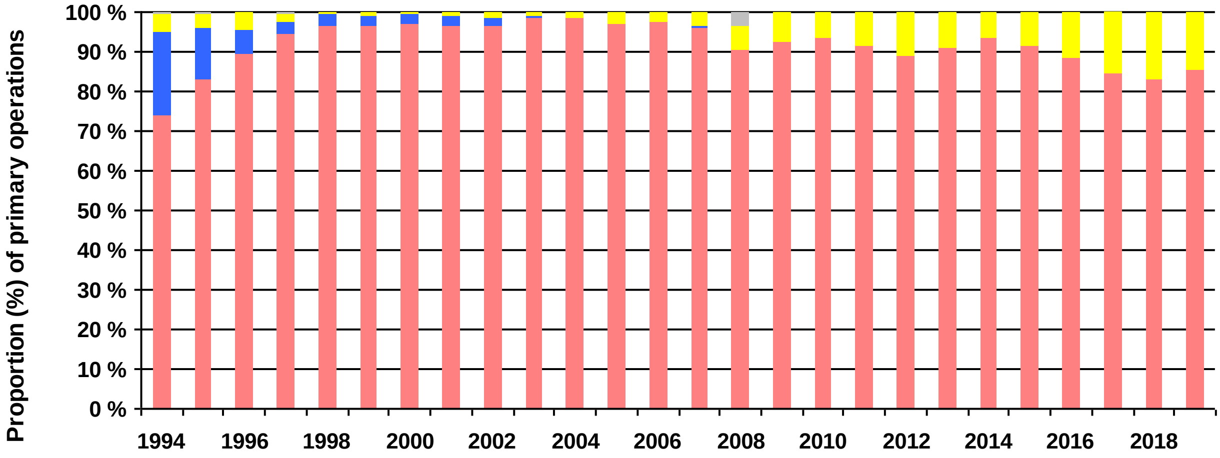
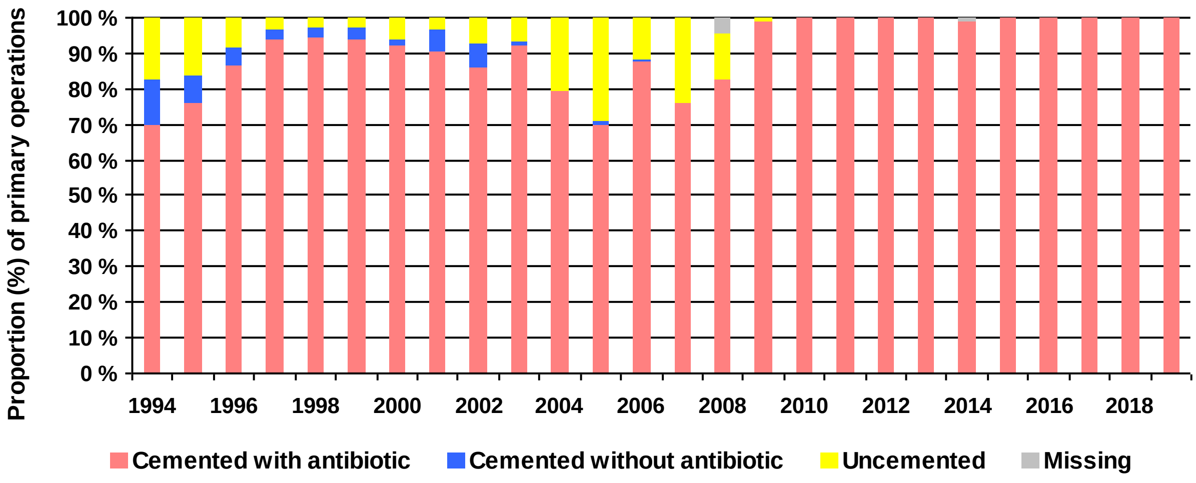


Figure 12: Patella



Use of cement in total knee prostheses

Figure 13: Primary operations

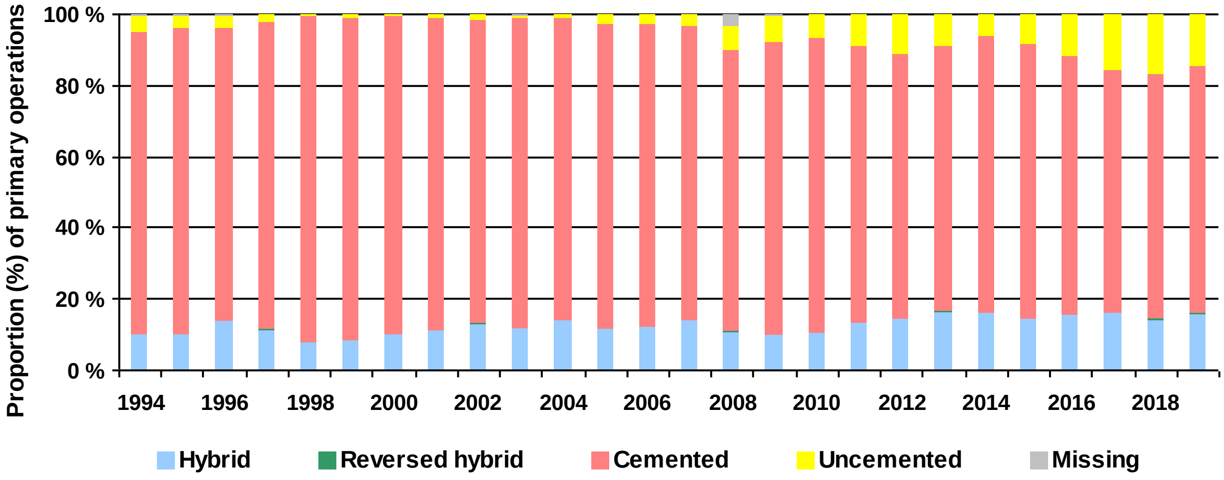
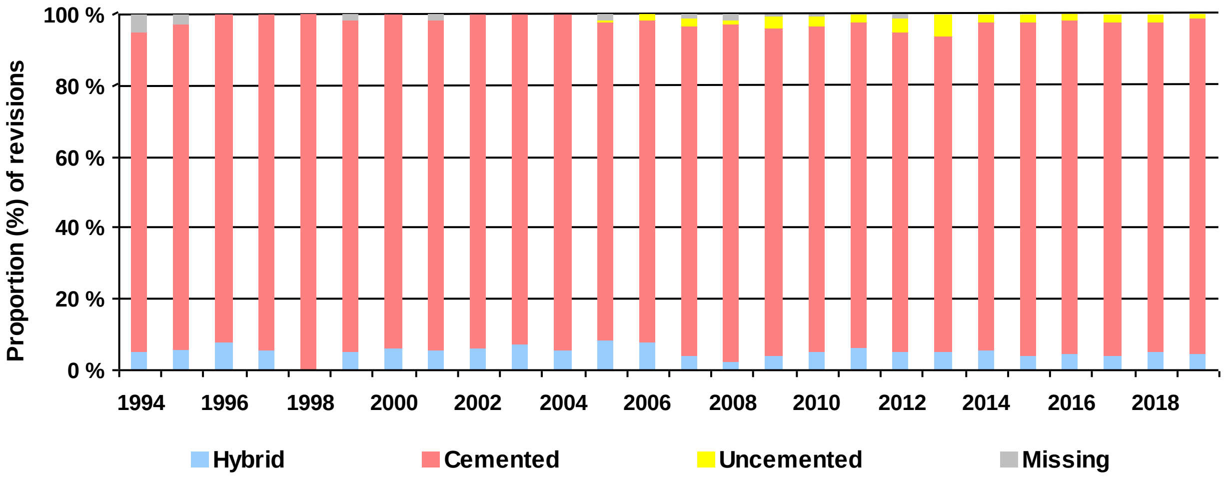
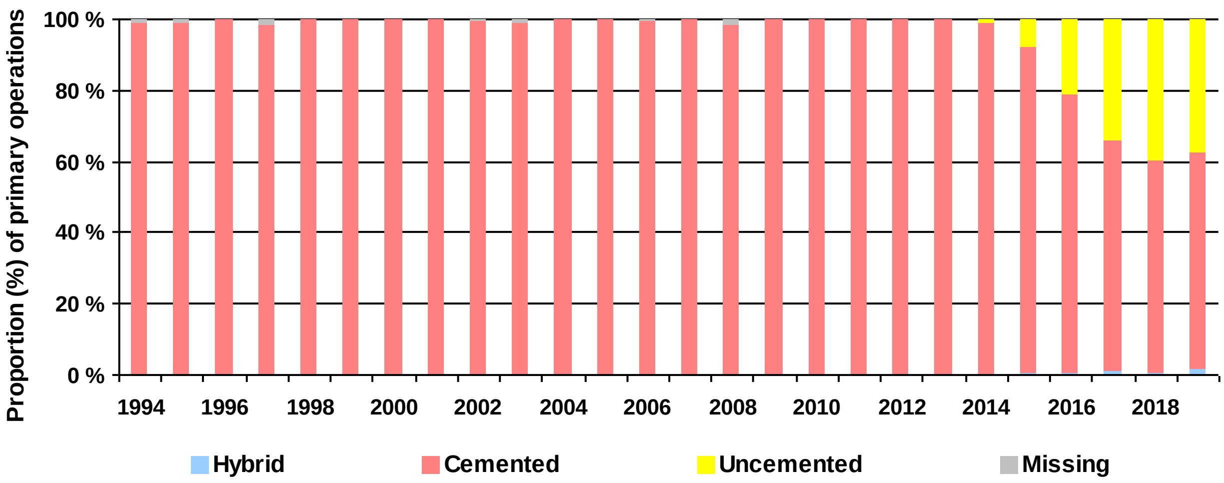


Figure 14: Revisions



Use of cement in unicondylar knee prostheses

Figure 15: Primary operations



The 7 most common primary total prostheses without patella component in 2013-2019

Table 6:

Product	Cemented *	Uncemented *	Hybrid	All poly	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
NexGen	12 855	1 824	1 971	0	0	2 124	.4 988	1 587	171	**16 662**
PFC-Sigma	3 022	1 718	271	0	5 006	0	5 008	7	4	**5 018**
LCS Complete	3 375	60	499	0	3 937	0	3 928	7	3	**3 937**
Legion	1 564	9	2 297	0	0	96	3 758	120	11	**3 873**
Triathlon	2 334	723	171	0	0	3 193	3 132	72	38	**3 231**
PROFIX	702	148	319	2	0	0	1 170	0	0	**1 170**
Vanguard TM	300	0	0	0	0	0	299	17	0	**300**

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

Table 6 A: Femur component

Product: NexGen (31)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR Option	9 269	2	9 276	0	0	**9 276**
CR-flex porous uncemented	89	2 640	2 732	0	0	**2 732**
CR-flex Option	1 466	1	1 468	0	0	**1 468**
CR-flex gender	759	0	759	0	0	**759**
LPS-flex porous standard	4	652	0	657	0	**657**
LPS Option	644	0	0	644	0	**644**
CR Porous uncemented	35	320	355	0	0	**355**
CR Precoat	243	3	246	0	0	**246**
LCCK Option	170	0	0	0	170	**170**
LPS-flex Option	149	17	0	166	0	**166**
CR-flex porous	4	135	139	0	0	**139**
LPS macro Option	8	0	0	8	0	**8**
LPS-flex	8	0	0	8	0	**8**
LPS-Flex Tivanium	7	0	0	7	0	**7**
Other	7	5	1	11	0	**12**
Unknown	13	6	0	0	0	**19**

Product: PROFIX (35)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR non-porous cemented	597	3	600	0	0	**600**
CR porous uncemented	98	459	557	0	0	**557**
Other	6	0	6	0	0	**6**
Unknown	5	1	0	0	0	**7**

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
Cemented	3 301	1	0	0	0	**3 304**
Uncemented	62	558	0	0	0	**620**
Revision	8	0	0	0	3	**8**
Unknown	5	0	0	5	0	**5**

Product: PFC-Sigma (49)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	3 027	1	3 034	0	0	**3 034**
CR uncemented	10	2 051	2 061	0	0	**2 061**
PS	7	0	0	7	0	**7**
Other	3	0	0	0	0	**3**
Unknown	6	0	0	0	0	**6**

Product: Triathlon (58)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	2 234	5	2 242	0	0	**2 242**
Beaded CR uncemented	11	884	895	0	0	**895**
PS cemented	62	0	0	62	0	**62**
TS cemented	33	0	0	0	33	**33**
Unknown	10	0	0	0	0	**10**

Product: Legion (62)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR uncemented	23	2 292	2 316	0	0	**2 316**
CR cemented	1 414	2	1 417	0	0	**1 417**
PS cemented	82	4	0	86	0	**86**
PS Oxinium cemented	25	0	0	26	0	**26**
CR Oxinium cemented	25	1	26	0	0	**26**
Femur cemented	7	0	0	7	0	**7**
Other	2	2	1	0	3	**4**
Unknown	2	0	0	0	0	**2**

Product: Vanguard TM (67)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR Anatomic interlok cemented	297	0	297	0	0	**297**
PS Anatomic interlok cemented	14	0	0	14	0	**14**
Other	3	0	2	1	0	**3**
Unknown	1	0	0	0	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
Option cemented	9 026	9	0	**9 035**
Precoat PMMA stemmed cemented	5 540	2	0	**5 543**
Trabecular metal uncemented	11	1 831	0	**1 842**
Precoat AP wedge stemmed	210	1	0	**211**
Other	0	4	0	**4**
Unknown	28	2	0	**31**

Product: PROFIX (35)

Product Category	Cemented *	Uncemented *	All poly	Total
Non porous cemented	980	3	0	**983**
Porous w/o hole uncemented	1	149	0	**150**
Porous uncemented	31	0	0	**31**
Other	2	0	2	**2**
Unknown	3	0	0	**3**

Table 6 B: Tibia

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	All poly	Total
No keel MBT* cemented	3 839	3	0	**3 843**
No keel MBT* uncemented	1	56	0	**57**
MBT* revision	28	0	0	**28**
Other	4	2	0	**6**
Unknown	5	0	0	**5**

* MBT = Mobile bearing tray

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	All poly	Total
With keel MBT* cemented	3 222	10	0	**3 233**
With keel MBT* uncemented	12	1 712	0	**1 724**
All poly	92	0	92	**92**
MBT* revision	22	10	0	**32**
No keel MBT* cemented	15	3	0	**18**
Unknown	8	2	0	**10**

* MBT = Mobile bearing tray

Product: Triathlon (58)

Product Category	Cemented *	Uncemented *	All poly	Total
Cemented	2 410	4	0	**2 414**
PA uncemented	8	624	0	**632**
Tritanium baseplate	0	99	0	**99**
Universal cemented	77	0	0	**77**
CS All poly, cemented	11	0	11	**11**
Unknown	8	1	0	**9**

Product: Legion (62)

Product Category	Cemented *	Uncemented *	All poly	Total
Male tapered cemented	3 854	8	0	**3 862**
All poly CR	9	0	9	**9**
Porous HA tibial base w/o holes uncemente	0	7	0	**7**
Other	1	0	1	**1**
Unknown	6	0	0	**6**

Product: Vanguard TM (67)

Product Category	Cemented *	Uncemented *	All poly	Total
Highly polished modular PCR	296	0	0	**296**
Interlok Monobloc PCR cemented	14	0	0	**14**
Other	4	0	0	**4**

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
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Table 6 C: Foring Tibia Insert

Product: NexGen (31)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR-Flex	0	0	.2 794	0	0	**12 794**
CR-Prolong	0	2 108	2 108	0	0	**2 108**
LPS-FlexFixed	0	0	0	1 561	0	**1 561**
LCCK	0	0	0	0	123	**123**
LPS-flex	0	16	0	16	0	**16**
CR	0	0	10	0	0	**10**
Unknown	0	0	0	0	0	**50**

Product: PROFIX (35)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Conforming PCR	0	0	1 020	0	0	**1 020**
Conforming+	0	0	141	0	0	**141**
Unknown	0	0	8	0	0	**8**

Product: LCS Complete (48)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Rotating platform RP	3 928	0	3 928	0	0	**3 928**
Other	3	0	0	0	3	**3**
Unknown	6	0	0	6	0	**6**

Product: PFC-Sigma (49)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Rotating platform RP-CV	4 996	0	4 996	0	0	**4 996**
Revision STB	6	0	0	6	0	**6**
Other	4	0	1	0	4	**5**
Unknown	0	0	0	0	0	**11**

Product: Triathlon (58)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR-X3 HXLPE	0	2 446	2 446	0	0	**2 446**
CS-X3 HXLPE	0	652	652	0	0	**652**
PS-X3 HXLPE	0	40	0	40	0	**40**
TS-X3 HXLPE	0	29	0	0	29	**29**
PS	0	0	0	28	0	**28**
CR-X3 HXLPE, EtO sterilized	0	17	17	0	0	**17**
CR	0	0	10	0	0	**10**
Unknown	0	9	0	0	0	**9**

Product: Legion (62)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR standard	0	0	2 217	0	0	**2 217**
Dished	0	0	1 526	0	0	**1 526**
PS high flex	0	82	0	82	0	**82**
PS	0	0	0	27	0	**27**
Constrained	0	0	0	0	8	**8**
CR-highflex HXLPE	0	7	7	0	0	**7**
Other	0	1	1	0	0	**1**
Unknown	0	6	0	0	0	**6**

Product: Vanguard TM (67)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Arcom CR	0	0	286	0	0	**286**
Arcom PS	0	0	0	13	0	**13**
Other	0	0	0	1	0	**1**
Unknown	0	0	0	0	0	**1**

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	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NexGen	1 573	203	606	1 436	2 201	2 313	2 047	1 794	1 853	2 126	**16 152**
LCS Complete	5 585	1 154	1 113	625	589	587	567	558	313	140	**11 231**
Profix	7 787	650	739	598	112		1				**9 887**
LCS	4 164										**4 164**
Triathlon	442	263	286	183	195	257	449	404	380	496	**3 355**
AGC Universal	2 782	148	155	27							**3 112**
Genesis I	3 100										**3 100**
PFC-Sigma	1	3	1	288	428	428	473	450	542	463	**3 077**
Duracon	2 078	396	101								**2 575**
Legion			3	10	252	350	324	342	397	446	**2 124**
AGC Anatomic	1 556	99	69								**1 724**
Tricon -C with Pro-Fit	1 079										**1 079**
Attune							44	122	424	484	**1 074**
Vanguard TM	213	199	149	146	65	65	42	2			**881**
E-motion	461										**461**
Kinemax	411										**411**
Advance	161	43	43	51	12						**310**
Persona							12	78	60	70	**220**
Journey II BCS					7	69	57	31	6	34	**204**
NexGen Rotating Hinge	24	16	10	4	19	29	25	29	25	22	**203**
Scorpio	122	2	2								**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		**37**
Interax I.S.A.	24										**24**
Legion Hinge Knee						3	5	1	3	5	**17**
RT-Plus Modular	5	1	6	4						1	**17**
Other (n<15)	57	2	5	2	2	1	2	3	2	4	**80**
Total	**31 755**	**3 179**	**3 288**	**3 374**	**3 882**	**4 112**	**4 085**	**3 856**	**4 050**	**4 292**	**65 873**

Table 7b: Uncemented femoral prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Profix	3 145	521	650	443	19			1			**4 779**
NexGen	13	18	50	174	234	382	652	814	815	726	**3 878**
Legion				126	421	401	448	420	366	419	**2 601**
LCS Complete	1 022	337	375	177	121	88	51	55	52	15	**2 293**
PFC-Sigma				165	278	300	280	283	314	442	**2 062**
Triathlon		24	43	62	33	41	57	203	257	238	**958**
LCS	652										**652**
Tricon M	288										**288**
Genesis I	192										**192**
Duracon	163										**163**
Interax I.S.A.	81										**81**
Kotz	29										**29**
Other (n<15)	19	2	1		1					3	**26**
Total	**5 604**	**902**	**1 119**	**1 147**	**1 107**	**1 212**	**1 488**	**1 776**	**1 804**	**1 843**	**18 002**

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Total prostheses

Table 8a: Cemented femoral prostheses in revisions *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NexGen LCCK Option	48	25	46	84	73	79	80	79	86	58	**658**
Profix	448	36	33	36	4						**557**
LCS Complete	242	39	35	24	16	11	16	23	24	17	**447**
NexGen	129	16	12	22	29	40	26	38	42	36	**390**
NexGen Rotating Hinge	48	12	17	18	47	53	53	39	26	63	**376**
Legion				1	18	33	30	46	53	62	**243**
Genesis I	207										**207**
LCS	172										**172**
Triathlon TS	8	14	13	26	13	12	6	20	28	31	**171**
PFC-Sigma				9	15	20	27	15	25	30	**141**
Triathlon	3	3	16	8	11	11	11	11	12	8	**94**
Scorpio TS	55	14	7								**76**
LCS Complete VVS	18	11	10	3	12	5	5	1	4		**69**
Vanguard TM	41	21	3	2							**67**
Duracon	56	4	4								**64**
AGC Dual	62										**62**
AGC Universal	56	2	3	1							**62**
Profix constrained	38	2	2	1	2						**45**
S-ROM Rotat. Hinge	5	7	1		3	1	3	7	6	1	**34**
Legion constrained	16		1	4	3	2	3	1	2	1	**33**
Legion Hinge Knee					1	7	8	9	5	3	**33**
Dual Articular 2000	30										**30**
RT-Plus Modular	3	1	8	9	1						**22**
Tricon -C with Pro-Fit	20										**20**
AGC Anatomic	18		1								**19**
Scorpio	16	2									**18**
E-motion	16										**16**
Kinemax	16										**16**
Other (n<15)	71	8	6	2	2		4	10	4	7	**114**
Total	**1 842**	**217**	**218**	**250**	**250**	**274**	**272**	**299**	**317**	**317**	**4 256**

Table 8b: Uncemented femoral prostheses in revisions *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Profix	59	9	5	6							**79**
LCS Complete	29	8	8	8	2		2	1	2	2	**62**
PFC-Sigma				3	6	4	3	4	7	6	**33**
Legion				1	5	6	5	4	5	1	**27**
NexGen	1	1	2	1	1	2	1	7	4	4	**24**
LCS Complete VVS	3	2	4	7	1						**17**
Andre (n<15)	29		2	1	1	1	4	1	3	1	**43**
Total	**121**	**20**	**21**	**27**	**16**	**13**	**15**	**17**	**21**	**14**	**285**

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Table 9a: Cemented tibial prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NexGen	1 576	204	615	1 544	2 364	2 513	2 363	2 205	2 223	2 504	**18 111**
Profix	10 469	1 053	1 213	908	113		1				**13 757**
LCS Complete	5 962	1 293	1 247	744	712	674	618	615	364	155	**12 384**
Legion			3	136	671	751	772	763	759	859	**4 714**
AGC Universal	4 035	235	213	26							**4 509**
LCS	4 351										**4 351**
Triathlon	440	267	301	228	229	294	458	408	398	514	**3 537**
PFC-Sigma	1	3	1	321	477	473	505	460	559	601	**3 401**
Genesis I	3 284										**3 284**
Duracon	2 207	396	101								**2 704**
Tricon II	1 346										**1 346**
Attune							44	122	424	483	**1 073**
Vanguard TM	214	199	147	145	65	65	42	2			**879**
E-motion	468										**468**
Kinemax	411										**411**
LCS Universal	372										**372**
AGC Anatomic	305	13	11	1							**330**
Advance	161	43	43	51	12						**310**
Persona							12	78	61	72	**223**
Journey II BCS					7	70	57	31	6	35	**206**
NexGen Rotating Hinge	23	16	10	4	19	29	25	29	26	22	**203**
Scorpio	122	2	2								**126**
Interax I.S.A.	106										**106**
Evolution Medial-Pivot						10	19	26	42	1	**98**
Search	40										**40**
GMK Sphere							18	16	3		**37**
AGC Dual	28										**28**
RT-Plus Modular	5	1	6	4						1	**17**
Legion Hinge Knee						3	5	1	3	5	**17**
Other (n<15)	66		6	3	3		2	2	1	3	**86**
Total	**35 992**	**3 725**	**3 919**	**4 115**	**4 672**	**4 882**	**4 941**	**4 758**	**4 869**	**5 255**	**77 128**

Table 9b: Uncemented tibial prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NexGen	10	17	41	68	69	182	340	402	447	350	**1 926**
PFC-Sigma				132	230	257	247	273	300	305	**1 744**
LCS Complete	596	198	241	58			1		2		**1 096**
Profix	459	118	176	134	18						**905**
Triathlon		20	28	17		4	50	199	239	220	**777**
LCS	141										**141**
Tricon II	66										**66**
Duracon	28										**28**
Kotz	27										**27**
Legion					2	1	2		4	6	**15**
Other (n<15)	10	2	1							1	**14**
Total	**1 337**	**355**	**487**	**409**	**319**	**444**	**640**	**874**	**992**	**882**	**6 739**

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Table 10a: Cemented tibial prostheses in revisions *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NexGen	177	42	61	111	110	122	114	124	132	95	**1 088**
LCS Complete	360	70	54	39	40	24	25	33	38	21	**704**
Profix	543	45	45	44	7	1	1	1			**687**
NexGen Rotating Hinge	47	12	16	18	47	50	51	39	24	61	**365**
Legion	16		1	6	26	40	38	48	64	57	**296**
Triathlon	11	18	31	35	24	24	20	31	44	42	**280**
Genesis I	256	1									**257**
LCS	232										**232**
PFC-Sigma				8	13	21	32	22	30	31	**157**
Duracon	86	14	10	7							**117**
Scorpio	72	17	8			1					**98**
AGC Universal	71	2	4								**77**
Vanguard TM	39	21	4	3							**67**
AGC Dual	59										**59**
Tricon II	57										**57**
Legion Hinge Knee					1	7	8	9	5	3	**33**
Dual Articular 2000	29										**29**
RT-Plus Modular	3	1	8	9	1						**22**
Maxim	20										**20**
E-motion	17		1								**18**
Kinemax	16										**16**
Other (n<15)	62	6	9	3	3	1	4	11	5	7	**111**
Total	**2 173**	**249**	**252**	**283**	**272**	**291**	**293**	**318**	**342**	**317**	**4 790**

Table 10b: Uncemented tibial prostheses in revisions *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
LCS Complete	20	11	13	16	6	1					**67**
PFC-Sigma				4	7	3	1	6	8	3	**32**
Other (n<15)	12		2		1	2	6	1	1		**25**
Total	**32**	**11**	**15**	**20**	**14**	**6**	**7**	**7**	**9**	**3**	**124**

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Table 10c: Material in Tibia Insert for total prostheses in primary operations

Prosthesis	Material	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Advance	Uhmwpe	161	43	42	51	12						**309**
AGC	Uhmwpe	4 346	248	223	27							**4 844**
AGC Dual	Uhmwpe	36										**36**
Attune	HXLPE							44	122	424	484	**1 074**
Dual Articular 2000	Uhmwpe	4										**4**
Duracon	Uhmwpe	2 242	396	101								**2 739**
E-motion	Uhmwpe	467										**467**
Evolution Medial-Pivot	Uhmwpe						10	19	26	42	1	**98**
Freemann/Samuelson	Uhmwpe	4										**4**
Genesis I	Uhmwpe	3 280										**3 280**
GMK Sphere	Uhmwpe							18	16	3		**37**
INTERAX I.S.A.	Uhmwpe	103										**103**
Journey II BCS	HXLPE					7	70	57	31	6	35	**206**
Kinemax	Uhmwpe	410										**410**
LCS	Uhmwpe	4 469										**4 469**
LCS Complete	Uhmwpe	6 577	1 490	1 488	802	712	675	618	613	365	155	**13 495**
LCS Universal	Uhmwpe	383										**383**
Legion	HXLPE				7	13	29	18	44	62	104	**277**
Legion	Uhmwpe			2	129	657	721	752	719	699	760	**4 439**
MAXIM	Uhmwpe	5										**5**
MG II	Uhmwpe	1										**1**
Mutars	Uhmwpe	7	1	1	1	1				1	1	**13**
NexGen	HXLPE	18	5	9	54	120	152	292	493	498	520	**2 161**
NexGen	Uhmwpe	1 575	216	647	1 558	2 315	2 543	2 411	2 115	2 168	2 334	**17 882**
NexGen Rotating Hinge	Uhmwpe	24	16	10	4	19	29	24	29	25	22	**202**
Persona	Uhmwpe							12	78	61	72	**223**
PFC-Sigma	Uhmwpe	1	3		453	707	729	753	733	859	813	**5 051**
PROFIX	Uhmwpe	10 948	1 167	1 385	1 042	131		1				**14 674**
RT-Plus Modular	Uhmwpe	5	1	6	4						1	**17**
Scan Knee	Uhmwpe	8										**8**
Scorpio	HXLPE	15	1	2								**18**
Scorpio	Uhmwpe	108	1									**109**
Search	Uhmwpe	40										**40**
S-ROM Rotating Hinge	Uhmwpe		1				1		2	1	1	**6**
Triathlon	HXLPE	357	209	284	241	222	295	499	601	632	715	**4 055**
Triathlon	Uhmwpe	83	78	45	4	7	3	9	6	5	8	**248**
Tricon II	Uhmwpe	1 414										**1 414**
Vanguard 360 Revision	Uhmwpe			2								**2**
Vanguard TM	Uhmwpe	57	80	99	134	62	65	42	2			**541**
Total		**37 148**	**3 956**	**4 346**	**4 511**	**4 985**	**5 322**	**5 569**	**5 630**	**5 851**	**6 026**	**83 344**

Table 10d: Material in Tibia Insert for unicondylar knee prostheses in primary operations

Prosthesis	Material	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Genesis UNI	Uhmwpe	230										**230**
iBalance UKA	Uhmwpe									12		**12**
Journey Uni	Uhmwpe					3	2	6	2			**13**
Miller-Galante UNI	Uhmwpe	6										**6**
Oxford Partial Knee	Uhmwpe	2	1	108	206	374	521	634	556	763	929	**4 094**
Oxford UNI (III)	Uhmwpe	3 797	412	331	232	204	191	202	292	204		**5 865**
Oxford UNI II	Uhmwpe	46										**46**
Persona Partial Knee	HXLPE										11	**11**
Preservation Uni	Uhmwpe	69										**69**
Sigma High Performance Uni	HXLPE		8	6	11	6	9	3	1	5		**49**
Thriathlon PKR - UNI	HXLPE				3							**3**
Total		**4 150**	**421**	**445**	**452**	**587**	**723**	**845**	**851**	**984**	**940**	**10 398**

Unicondylar knee prostheses

Table 11a: Cemented femoral prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Oxford UNI (III)	3 801	411	333	233	197	136	18	1			**5 130**
Oxford Partial Knee		1	106	205	374	515	631	550	575	576	**3 533**
Genesis UNI	332										**332**
Miller-Galante UNI	294										**294**
MOD III uni	198										**198**
Preservation Uni	166										**166**
LINK Schlitten UNI	9	3	14	21	15	17	17	14	8	11	**129**
Journey Uni		7	14	3	6	13	7	2			**52**
Duracon uni	50										**50**
Sigma High Performance Uni		8	6	11	6	9	3	1	5		**49**
Oxford UNI II	45										**45**
ZUK (Unicondylar)	18	8	1								**27**
Other (n<15)	17			3					12		**32**
Total	**4 930**	**438**	**474**	**476**	**598**	**690**	**676**	**568**	**600**	**587**	**10 037**

Table 11b: Uncemented femoral prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Oxford Partial Knee	1	1			7	61	187	299	400	372	**1 328**
Total	**1**	**1**	**0**	**0**	**7**	**61**	**187**	**299**	**400**	**372**	**1 328**

Table 12a: Cemented tibial prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Oxford UNI (III)	3 800	411	333	232	198	131	24	3	1		**5 133**
Oxford Partial Knee		1	106	206	373	519	628	544	573	586	**3 536**
Genesis UNI	332										**332**
Miller-Galante UNI	282										**282**
MOD III uni	199										**199**
Preservation Uni	165										**165**
LINK Schlitten UNI	9	3	14	21	15	17	17	14	8	11	**129**
Journey Uni		7	14	3	6	13	7	2			**52**
Duracon uni	49										**49**
Sigma High Performance Uni		8	6	11	6	9	3	1	5		**49**
Oxford UNI II	46										**46**
ZUK (Unicondylar)	18	8	1								**27**
Other (n<15)	16			3					12		**31**
Total	**4 916**	**438**	**474**	**476**	**598**	**689**	**679**	**564**	**599**	**597**	**10 030**

Table 12b: Uncemented tibial prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Oxford Partial Knee		1			7	62	184	303	401	363	**1 321**
Total	**0**	**1**	**0**	**0**	**7**	**62**	**184**	**303**	**401**	**363**	**1 321**

* Surgeon's report for fixation

Patellofemoral prostheses

Table 13a: Cemented femoral prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NexGen PFJ Gender	2	4	20	16	19	32	49	53	45	35	**275**
Journey PFJ	57	25	14	18	22	7	18	17	10	15	**203**
Patella Mod III / II	29										**29**
LCS PFJ	18										**18**
Legion								6			**6**
iBalance PFJ									3	2	**5**
Other (n<5)	8			4							**12**
Total	**114**	**29**	**34**	**38**	**41**	**39**	**67**	**76**	**58**	**52**	**548**

Patellofemoral femoral prostheses in primary operations are all cemented

Table 14a: Cemented patella prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NexGen PFJ Gender	2	4	20	16	19	31	48	53	45	34	**272**
Journey PFJ	55	25	14	18	22	7	18	23	10	15	**207**
Patella Mod III / II	31										**31**
LCS PFJ	11										**11**
Other (n<5)	7			4		1	1		2	3	**18**
Total	**106**	**29**	**34**	**38**	**41**	**39**	**67**	**76**	**57**	**52**	**539**

Table 14b: Uncemented patella prostheses in primary operations *

Prosthesis	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	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

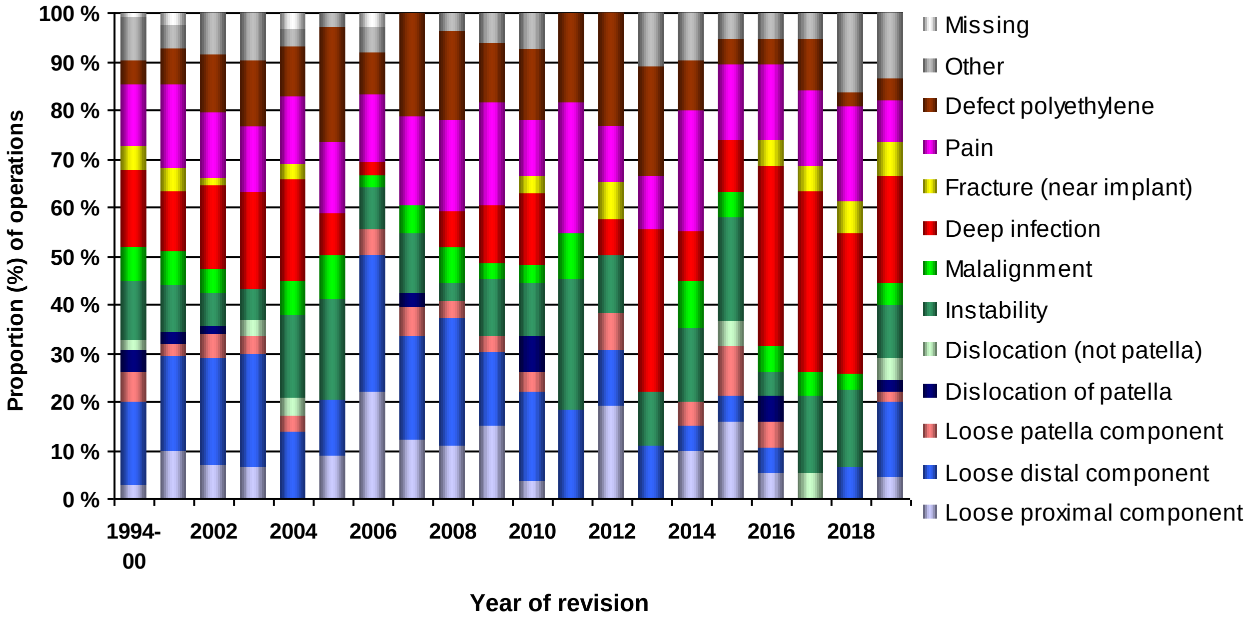
Reasons for revisions

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

Year of revision	Loose proximal comp.	Loose distal comp.	Loose patella comp.	Dislocation of patella	Dislocation (not patella)	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2019	2	7	1	1	2	5	2	10	3	4	2	6	0
2018	0	2	0	0	0	5	1	9	2	6	1	5	0
2017	0	0	0	0	1	3	1	7	1	3	2	1	0
2016	1	1	1	1	0	1	1	7	1	3	1	1	0
2015	3	1	2	0	1	4	1	2	0	3	1	1	0
2014	2	1	1	0	0	3	2	2	0	5	2	2	0
2013	0	1	0	0	0	1	0	3	0	1	2	1	0
2012	5	3	2	0	0	3	0	2	2	3	6	0	0
2011	0	2	0	0	0	3	1	0	0	3	2	0	0
2010	1	5	1	2	0	3	1	4	1	3	4	2	0
2009	5	5	1	0	0	4	1	4	0	7	4	2	0
2008	3	7	1	0	0	1	2	2	0	5	5	1	0
2007	4	7	2	1	0	4	2	0	0	6	7	0	0
2006	8	10	2	0	0	3	1	1	0	5	3	2	1
2005	3	4	0	0	0	7	3	3	0	5	8	1	0
2004	0	4	1	0	1	5	2	6	1	4	3	1	1
2003	2	7	1	0	1	2	0	6	0	4	4	3	0
2002	4	13	3	1	0	4	3	10	1	8	7	5	0
2001	4	8	1	1	0	4	3	5	2	7	3	2	1
1994-00	4	22	8	6	3	16	9	21	6	17	6	12	1
Total	**51**	**110**	**28**	**13**	**9**	**81**	**36**	**104**	**20**	**102**	**73**	**48**	**4**

Revision causes are not mutually exclusive. More than one reason for revision is possible

Figure 16: Reasons for revisions of total knee prostheses with patella



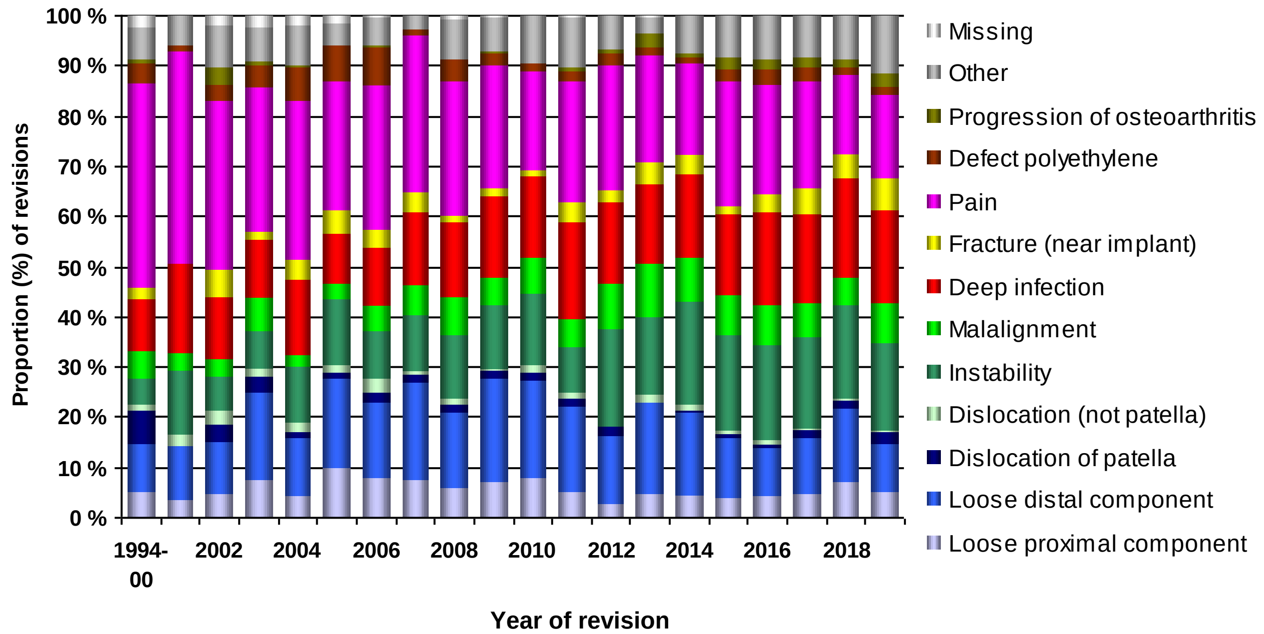
Reasons for revisions

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

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation of patella	Dislocation (not patella)	Instability	Malalignment	Deep infection	Fracture (near implant)	Fracture osteosynthesis	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2019	20	39	9	3	69	32	76	15	10	67	6	11	47	0
2018	32	67	7	1	84	26	90	15	5	73	7	6	40	0
2017	20	49	6	3	78	30	77	20	3	92	13	8	36	0
2016	19	39	3	3	81	33	78	9	5	92	13	8	37	0
2015	15	47	3	3	73	30	63	7		96	9	10	32	0
2014	16	60	2	4	75	31	61	14		67	4	2	28	0
2013	15	58	1	5	49	34	51	14		68	6	8	11	1
2012	8	42	7	0	60	28	51	7		77	8	2	21	0
2011	16	54	5	3	29	17	62	12		76	6	3	31	1
2010	21	51	4	4	38	19	43	3		52	4		25	0
2009	20	60	4	2	36	16	47	5		71	6	1	20	1
2008	15	39	4	3	32	19	39	3		69	11		20	2
2007	13	33	3	1	19	10	25	7		53	2		5	0
2006	14	26	3	5	16	9	20	6		50	13	1	9	1
2005	13	23	2	2	17	4	13	6		34	9		6	2
2004	7	19	2	3	18	4	24	7		51	11	1	13	3
2003	10	23	4	2	10	9	15	2		38	6	1	9	3
2002	5	11	4	3	7	4	13	6		36	3	4	9	2
2001	3	9	0	2	11	3	15	0		36	1		5	0
1994-00	13	24	17	3	14	14	26	6		104	10	2	16	6
Total	**295**	**773**	**90**	**55**	**816**	**372**	**889**	**164**	**23**	**1 302**	**148**	**68**	**420**	**22**

Revision causes are not mutually exclusive. More than one reason for revision is possible

Figure 17: Reasons for revisions of total knee prostheses without patella



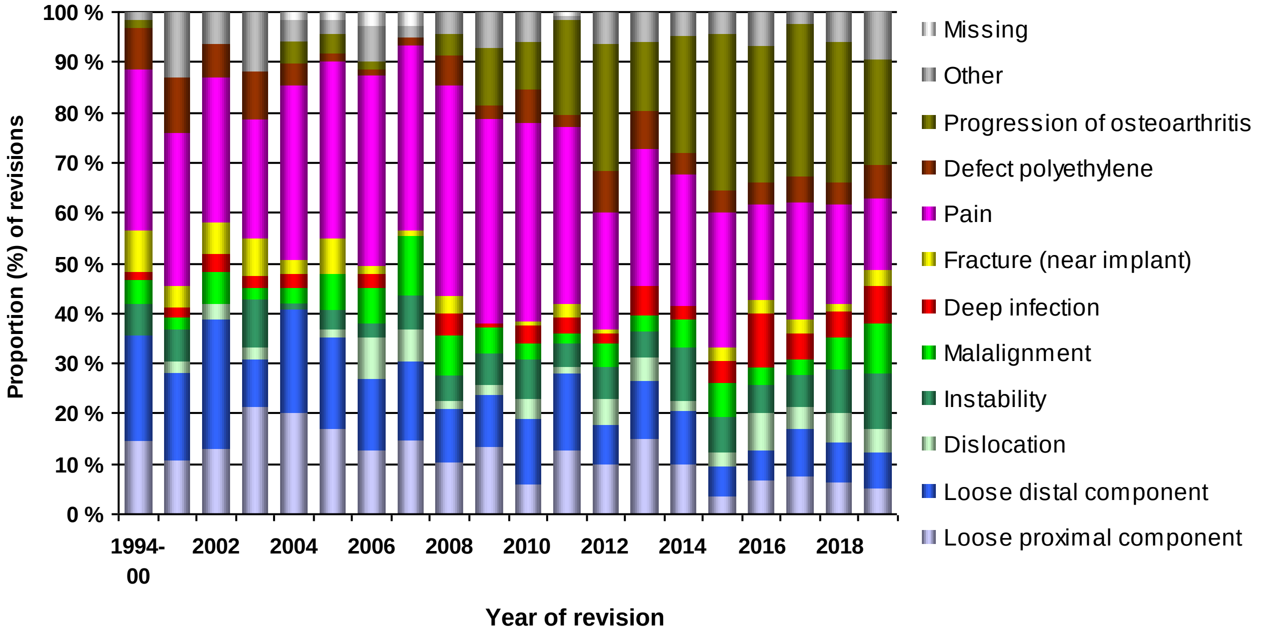
Reasons for revisions

Table 17: Reasons for revisions of unicondylar knee prostheses

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2019	9	13	9	20	18	13	6	26	12	38	17	0
2018	12	15	11	16	12	10	3	37	8	53	11	0
2017	12	15	7	10	5	8	4	37	8	48	4	0
2016	9	8	10	7	5	14	4	25	6	36	9	0
2015	5	8	4	10	9	6	4	37	6	43	6	0
2014	14	15	3	15	8	4	0	37	6	33	7	0
2013	18	14	6	6	4	7	0	33	9	17	7	0
2012	13	10	7	8	6	3	1	30	11	33	8	0
2011	15	18	1	6	2	4	3	41	3	22	1	1
2010	7	15	5	9	4	4	1	46	8	11	7	0
2009	19	14	3	9	7	1	0	57	4	16	10	0
2008	12	12	2	6	9	5	4	48	7	5	5	0
2007	11	12	5	5	9	0	1	28	1		2	2
2006	9	10	6	2	5	2	1	27	1	1	5	2
2005	12	13	1	3	5	0	5	25	1	3	2	1
2004	14	14	0	1	2	2	2	24	3	3	3	1
2003	9	4	1	4	1	1	3	10	4		5	0
2002	4	8	1	0	2	1	2	9	2		2	0
2001	5	8	1	3	1	1	2	14	5		6	0
1994-00	9	13	0	4	3	1	5	20	5	1	1	0
Total	**218**	**239**	**83**	**144**	**117**	**87**	**51**	**611**	**110**	**363**	**118**	**7**

Revision causes are not mutually exclusive. More than one reason for revision is possible

Figure 18: Reasons for revisions of unicondylar knee prostheses

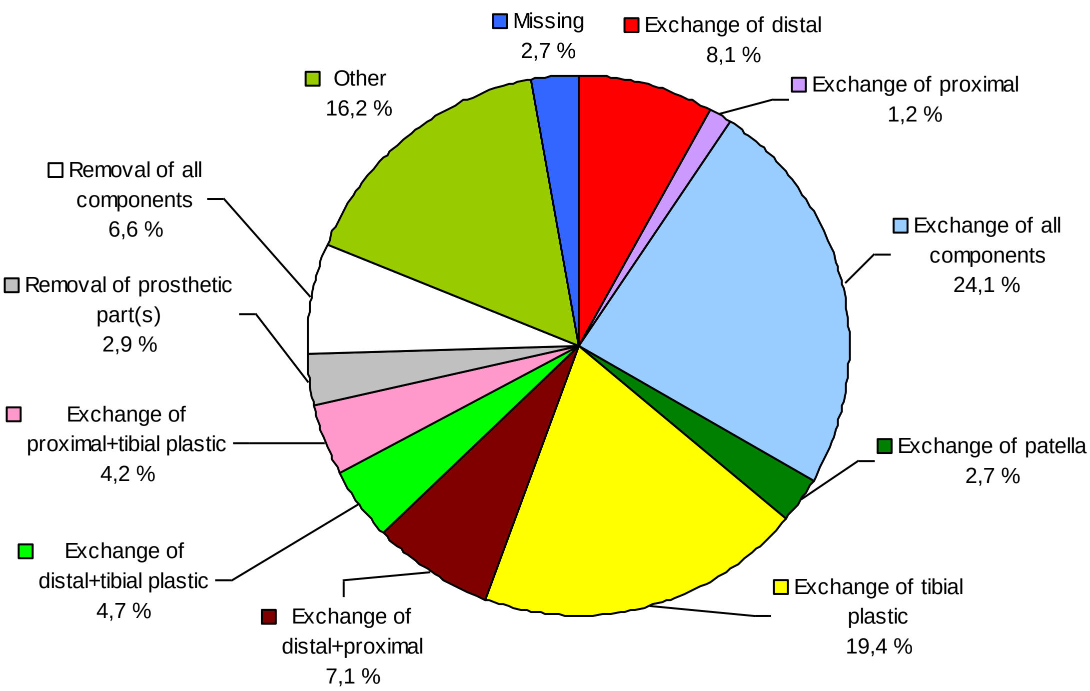


Type of revision

Table 18: Total knee prostheses with patella

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
2019		4		7		8		5			6		**30**
2018		3		2	1	8					7	1	**22**
2017				2		7		1			1	1	**12**
2016		1		1	2	6					2	1	**13**
2015	1		1	3	1	1					2		**9**
2014				5		2						2	**9**
2013				3		3						1	**7**
2012		1		6		6		2			1		**16**
2011				1	1						3		**5**
2010		1	1	7		1			2		2		**15**
2009		1		10		2		2		1	4		**20**
2008	1	1		8		2			1		2		**15**
2007	1	2	2	7	1				1			2	**16**
2006	1	1	2	8		3			1	1			**17**
2005	2		3	6		3			1	2	1		**18**
2004		1	4	2		3	1		4	2	3		**20**
2003	4		2	1	2	3			3	2	3		**20**
2002	4	1	2	7		4	1		6	1	5		**31**
2001	2		4	4		5		1	1	2	2		**21**
1994-00	17	2	8	8	3	12	3	6	7	1	22	3	**92**
Total	**33**	**19**	**29**	**98**	**11**	**79**	**5**	**17**	**27**	**12**	**66**	**11**	**408**

Figure 19: Total knee prostheses with patella

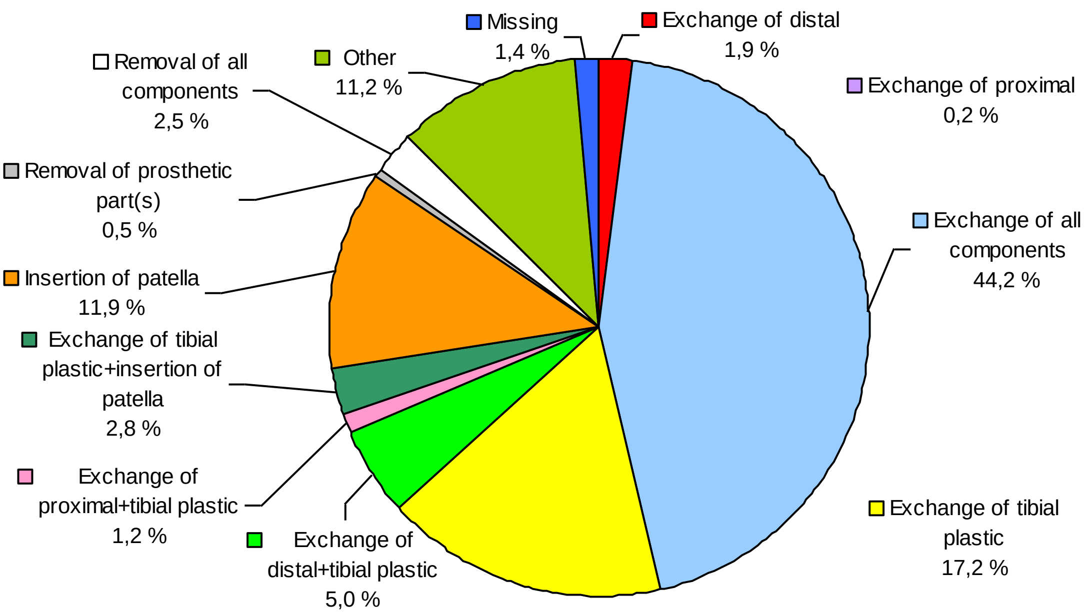


Type of revision

Table 19: Total knee prostheses without patella

Year of primary operation	Exchange of distal + proximal	Exchange of distal+tibial plastic	Exchange of whole prosthesis	Exchange of tibial plastic+ins. 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
2019		8	164	15	72		8			20	10	54	3	**354**
2018		15	202	13	89	1	5	1		18	5	49	6	**404**
2017		18	197	16	79		7			32	3	43	7	**402**
2016	1	11	179	15	72		2	4		31	5	43	5	**368**
2015		12	197	16	67	1	1	6	1	24		41	6	**372**
2014	4	17	159	10	60		1	8	2	16		28	6	**311**
2013	2	25	183	7	46		3	9	1	26		23	4	**329**
2012		25	129	2	62		4	6	1	29		30	6	**294**
2011	2	23	138	6	46		5	7	1	26		30	3	**287**
2010	2	15	134	5	46		4	13	1	15		17		**252**
2009	1	23	104	6	38		3	16	3	20		25		**239**
2008	5	18	86	4	42	1	4	8		34		14	1	**217**
2007	10	12	50	3	17		1	10	1	21		16	1	**142**
2006	13	4	54	2	22		2	5		26		22	1	**151**
2005	6	4	42	3	15		3	5		20		17		**115**
2004	13	2	45	4	29		2	6	2	36		17	3	**159**
2003	11	5	38	2	15		1	5	1	25		13	3	**119**
2002	8	6	20	7	11		2	4	3	31		6	1	**99**
2001	4	1	24	2	9			2	2	27		9	3	**83**
1994-00	20	4	38	2	10	1	2	8	4	110		31	9	**239**
Total	**102**	**248**	**2 183**	**140**	**847**	**4**	**60**	**123**	**23**	**587**	**23**	**528**	**68**	**4 936**

Figure 20: Total knee prostheses without patella

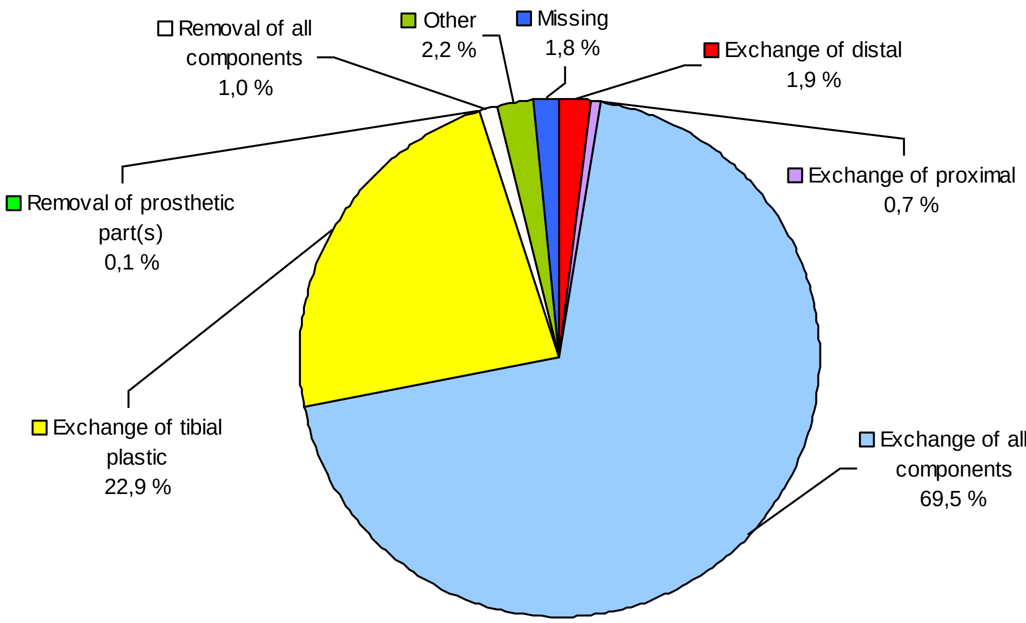


Type of revision

Table 20: Unicondylar prostheses

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
2019	2	85	46	1			3		**137**
2018	3	93	44				2	1	**143**
2017		84	32				2	1	**119**
2016	2	62	48				2	1	**115**
2015	2	75	14	1	1		4	1	**98**
2014	2	67	16	1	2		4	1	**93**
2013		68	20	1	1		1	2	**93**
2012	1	67	34				1		**103**
2011	1	72	22		1		2		**98**
2010		66	24		2				**92**
2009		82	12		3		5		**102**
2008		59	12	1			5	2	**79**
2007		35	16		1			10	**62**
2006	2	43	18				1	1	**65**
2005	1	47	2		1			2	**53**
2004	5	39	6	2	2		1	2	**57**
2003	2	24	2	1		1	1		**31**
2002	3	17	4		2		1	1	**28**
2001	2	26	4					3	**35**
1994-00	4	36	2	3	1		1	1	**48**
Total	**32**	**1 147**	**378**	**11**	**17**	**1**	**36**	**29**	**1 651**

Figure 21: Unicondylar prostheses



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
2019	705	4 749	1 506	7		194	**7 161**
2018	707	4 605	1 436	7		166	**6 921**
2017	667	4 406	1 275	13		214	**6 575**
2016	707	4 391	1 236	12		168	**6 514**
2015	682	4 152	1 189	7		88	**6 118**
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		64	**4 917**
2011	582	3 023	873	6		65	**4 549**
2010	661	2 845	797	7		90	**4 400**
2009	832	2 745	794	8		94	**4 473**
2008	787	2 355	765	8	1	80	**3 996**
2007	747	2 060	709			72	**3 588**
2005-06	1 682	3 285	1 100	12	1	284	**6 364**

Table 22: Revisions

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2019	27	358	207	11		33	**636**
2018	39	363	224	11		27	**664**
2017	50	354	192	5	1	29	**631**
2016	27	358	184	2		33	**604**
2015	35	314	180	7		20	**556**
2014	50	297	137	2		13	**499**
2013	45	292	133			12	**482**
2012	52	287	136	3		15	**493**
2011	54	249	119			9	**431**
2010	77	199	121	1		13	**411**
2009	93	212	117	1		15	**438**
2008	102	164	88			13	**367**
2007	73	141	69	2		16	**301**
2005-06	118	228	127	4		41	**518**

Figure 22: Primary operations

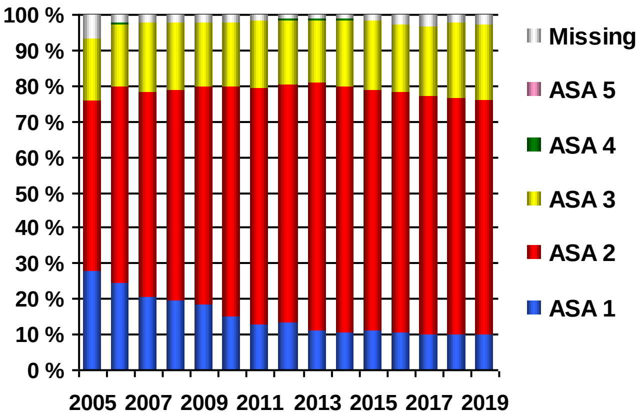
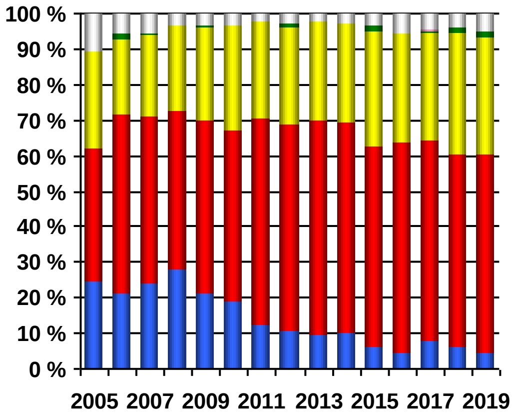


Figure 23: Revisions



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
2019	404	5 810	795	101	51	**7 161**
2018	712	5 299	832	48	30	**6 921**
2017	778	4 890	826	51	30	**6 575**
2016	846	4 793	787	59	29	**6 514**
2015	931	4 297	816	29	45	**6 118**
2014	811	4 013	763	25	28	**5 640**
2013	909	3 352	716	10	54	**5 041**
2012	1 132	2 879	871	7	28	**4 917**
2011	1 271	2 289	952	8	29	**4 549**
2010	1 412	2 408	533	8	39	**4 400**
2009	1 610	2 388	424	10	41	**4 473**
2008	1 652	1 829	464	13	38	**3 996**
2007	1 876	1 259	416	5	32	**3 588**
2005-06	3 824	1 063	1 280	22	175	**6 364**

Table 24: Revisions

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2019	73	467	69	23	4	**636**
2018	83	487	76	11	7	**664**
2017	84	460	75	7	5	**631**
2016	97	426	72	7	2	**604**
2015	65	407	68	11	5	**556**
2014	70	350	67	7	5	**499**
2013	77	317	77	6	5	**482**
2012	105	268	111	6	3	**493**
2011	97	229	100	2	3	**431**
2010	107	227	70	6	1	**411**
2009	93	262	74	4	5	**438**
2008	106	184	62	7	8	**367**
2007	146	96	46	4	9	**301**
2005-06	277	100	110	7	24	**518**

* Missing information on medication start

Figure 24: Primary operations

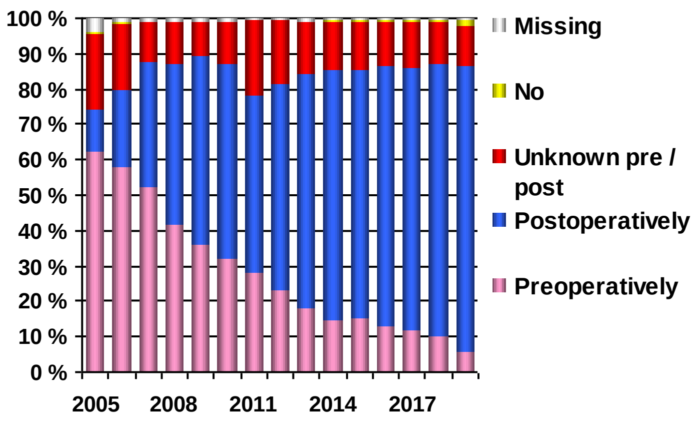
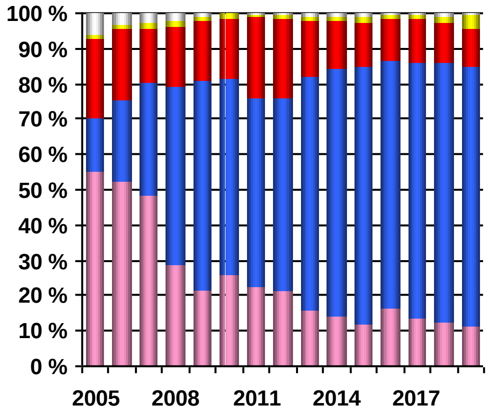


Figure 25: Revisions



Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 25: Drugs - All operations

Drugs	2005-09	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)	0,0%		0,0%	0,0%		0,3%	0,4%	0,6%	0,9%	1,0%	1,0%
Apixiban (Eliquis)					1,2%	1,1%	0,9%	1,0%	1,1%	1,3%	1,1%
Dalteparin (Fragmin)	53,4%	62,4%	64,4%	59,2%	54,1%	50,2%	56,2%	56,5%	60,6%	61,5%	52,6%
Enoksaparin (Klexane)	41,3%	32,8%	28,2%	29,3%	29,9%	32,2%	26,7%	24,4%	20,2%	19,3%	23,8%
Rivaroksaban (Xarelto)		0,1%	2,2%	2,6%	2,4%	1,8%	1,4%	1,1%	1,1%	1,1%	1,4%
Ximelagatran (Exanta, Malagatran)	0,6%										
No drugs	0,4%	0,3%	0,2%	0,2%	0,3%	0,5%	0,6%	0,9%	0,8%	0,8%	1,6%
Clinical study	0,4%										
Combination of 2 drugs	1,5%	3,1%	3,5%	7,2%	10,2%	12,5%	12,3%	14,2%	13,9%	14,0%	17,2%
Other	0,3%	0,1%	0,0%	0,2%	0,2%	0,2%	0,1%	0,0%	0,1%	0,0%	0,0%
Missing	2,1%	1,1%	1,4%	1,2%	1,6%	1,2%	1,5%	1,2%	1,3%	1,1%	1,3%

Figure 26: Drugs

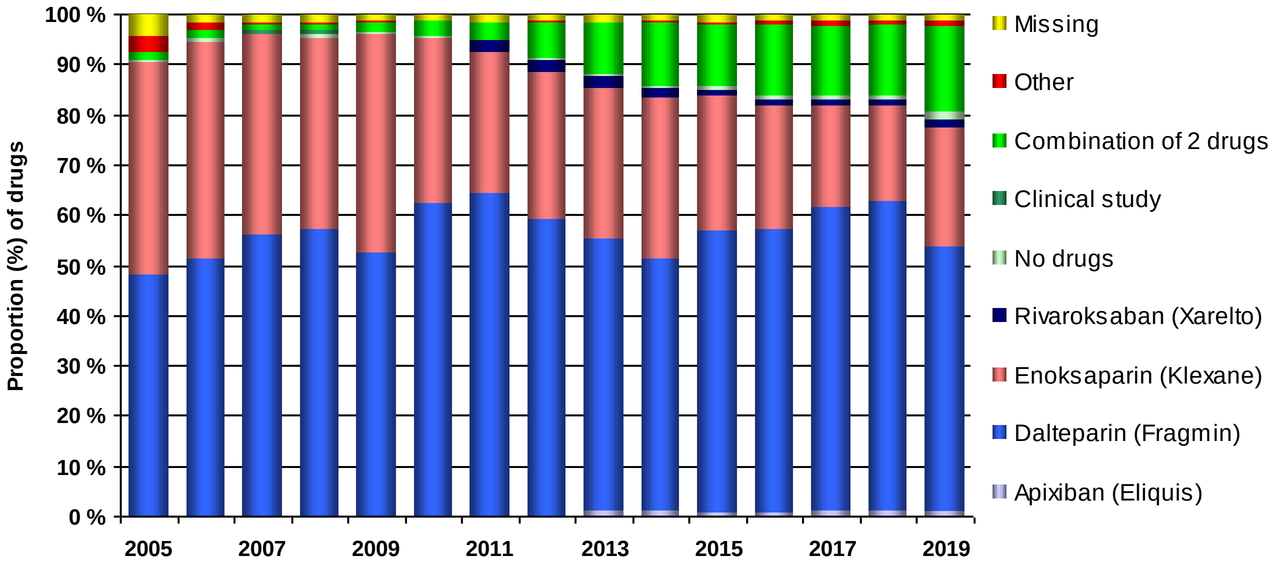


Table 26: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2019	2 143	3 282	392	29	690	9	124	1 128	**7 797**
2018	1 683	3 208	442	142	803	5	59	1 243	**7 585**
2017	1 180	3 201	502	281	781	13	58	1 190	**7 206**
2016	1 178	3 162	551	314	718	38	66	1 091	**7 118**
2015	1 018	2 388	977	326	866	143	40	916	**6 674**
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	583	1 633	1 206	335	890	96	13	654	**5 410**
2011	289	1 345	1 381	403	799	101	10	652	**4 980**
2010	348	1 348	1 321	239	779	52	14	710	**4 811**
2009	398	1 588	1 168	228	762	8	14	745	**4 911**
2008	425	1 456	828	172	754	31	20	677	**4 363**
2007	488	1 178	797	119	743	8	9	547	**3 889**
2005-06	988	2 100	1 198	224	1 074	78	29	1 191	**6 882**

Registration of thrombosis prophylaxis started in 2005

Fibrinolysis Inhibitor

Table 27: Drugs - Primary operations

Drugs	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cyclokapron (Tranexamic acid)	2	1 376	3 490	3 960	4 728	5 322	5 755	5 813	6 179	43 256
Missing		74	145	92	114	72	63	84	72	781
Total	**2**	**1 450**	**3 635**	**4 052**	**4 842**	**5 394**	**5 818**	**5 897**	**6 251**	**44 037**

Registration of fibrinolysis inhibitor started in 2011

Perioperative complications

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

Type	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Patella tendon rupture / Avulsion fractures / ligament rupture / tendon injury	68	13	12	10	21	17	15	6	11	18	191
Fracture	88	17	11	10	8	12	12	10	7	8	183
Rupture / damage MCL (medial colateral ligament)	22	5	12	12	5	5	10	19	18	22	130
Technical problem with cement	31	10	5	6	5	4		1	5	3	70
Adm. failure (missing comp. etc.)	21	2	7	7	2		4	3	7	3	56
Problem due to difficult anatomy	17	3	6	3	5	5	3	2	4	5	53
Failure of instruments	30	3	5	3	7	1	1		1		51
Blood torniquet failing	34	5	4	3		1			1	1	49
Anesthesia problems	13	7	2	4	7	4	1	3	3		44
Violation of sterility routines	8	5	2	7	4	6	1		1	1	35
Other periop. compl.	152	20	26	26	30	34	26	22	22	21	379

Previous operation in relevant joint

Table 29: For primary total prostheses

Type	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Meniscus	3 636	582	706	702	768	757	882	735	764	697	10 229
Osteotomy	1 839	110	116	111	134	119	137	111	108	150	2 935
Arthroscopy (diagnostic)	849	106	111	97	183	205	194	166	149	91	2 151
Osteosynthesis of intraarticular joint fracture	816	83	72	60	95	94	98	114	107	105	1 644
Cruciate Ligament	420	70	101	105	104	125	188	119	143	142	1 517
Synovectomy	1 001	69	65	64	66	66	41	51	41	32	1 496
Artrodesis	22	1	2	2			2	1	1		31
Other previous op.	652	72	95	89	89	78	86	119	146	118	1 544

Mini-invasive surgery

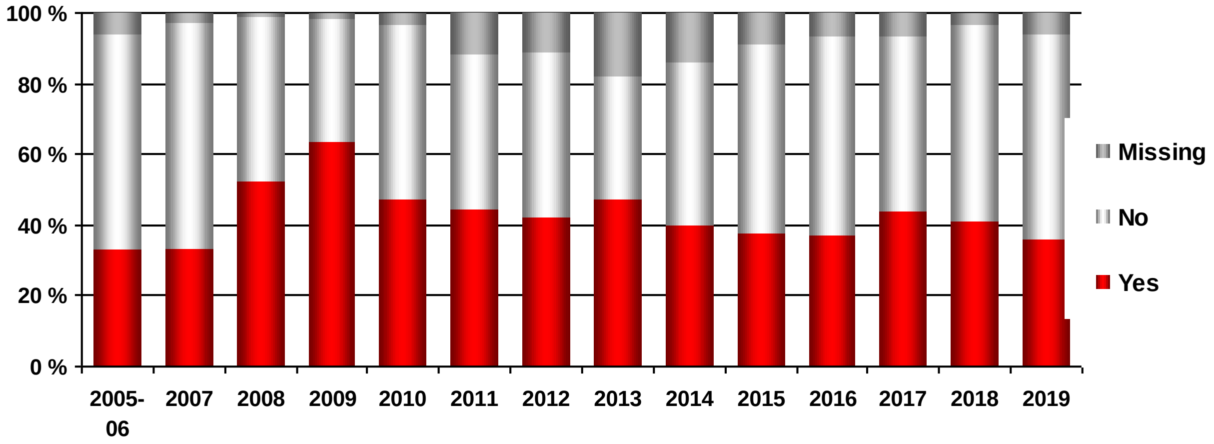
Table 30: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2019	4 (0%)	5 662 (93%)	439 (7%)	**6 105**
2018	14 (0%)	5 342 (92%)	474 (8%)	**5 830**
2017	9 (0%)	5 030 (90%)	561 (10%)	**5 600**
2016	10 (0%)	4 964 (89%)	576 (10%)	**5 550**
2015	5 (0%)	4 632 (87%)	657 (12%)	**5 294**
2014	2 (0%)	4 325 (87%)	646 (13%)	**4 973**
2013	10 (0%)	3 789 (84%)	716 (16%)	**4 515**
2012	16 (0%)	3 689 (84%)	685 (16%)	**4 390**
2011	15 (0%)	3 582 (88%)	465 (11%)	**4 062**
2010	21 (1%)	3 739 (95%)	185 (5%)	**3 945**
2009	25 (1%)	3 796 (95%)	165 (4%)	**3 986**
2008	15 (0%)	3 356 (95%)	155 (4%)	**3 526**
2007	22 (1%)	2 955 (95%)	129 (4%)	**3 106**
2005-06	8 (0%)	5 062 (92%)	415 (8%)	**5 485**

Table 31: Primary operations - Unicondylar knee prostheses

Year	Yes	No	Missing	Total
2019	351 (36%)	560 (58%)	60 (6%)	**971**
2018	409 (41%)	555 (56%)	36 (4%)	**1 000**
2017	381 (44%)	429 (49%)	57 (7%)	**867**
2016	318 (37%)	486 (56%)	59 (7%)	**863**
2015	283 (38%)	399 (53%)	69 (9%)	**751**
2014	240 (40%)	280 (46%)	85 (14%)	**605**
2013	224 (47%)	167 (35%)	86 (18%)	**477**
2012	199 (42%)	221 (47%)	54 (11%)	**474**
2011	196 (45%)	191 (44%)	52 (12%)	**439**
2010	196 (47%)	205 (50%)	13 (3%)	**414**
2009	293 (63%)	161 (35%)	9 (2%)	**463**
2008	230 (52%)	204 (46%)	6 (1%)	**440**
2007	155 (33%)	299 (64%)	12 (3%)	**466**
2005-06	283 (33%)	520 (61%)	52 (6%)	**855**

Figure 27: Primary operations - Unicondylar knee prostheses



Registration of MIS started in 2005

Computernavigation

Table 32: Primary operations - Total knee prostheses

Year	Yes		No		Missing		Total
2019	514	(8%)	5 169	(85%)	422	(7%)	**6 105**
2018	597	(10%)	4 784	(82%)	449	(8%)	**5 830**
2017	569	(10%)	4 515	(81%)	516	(9%)	**5 600**
2016	584	(11%)	4 413	(80%)	553	(10%)	**5 550**
2015	475	(9%)	4 167	(79%)	652	(12%)	**5 294**
2014	443	(9%)	3 883	(78%)	647	(13%)	**4 973**
2013	390	(9%)	3 402	(75%)	723	(16%)	**4 515**
2012	416	(9%)	3 292	(75%)	682	(16%)	**4 390**
2011	445	(11%)	3 170	(78%)	447	(11%)	**4 062**
2010	659	(17%)	3 101	(79%)	185	(5%)	**3 945**
2009	762	(19%)	3 064	(77%)	160	(4%)	**3 986**
2008	742	(21%)	2 640	(75%)	144	(4%)	**3 526**
2007	374	(12%)	2 613	(84%)	119	(4%)	**3 106**
2005-06	439	(8%)	4 665	(85%)	381	(7%)	**5 485**

Figure 28: Primary operations - Total knee prostheses

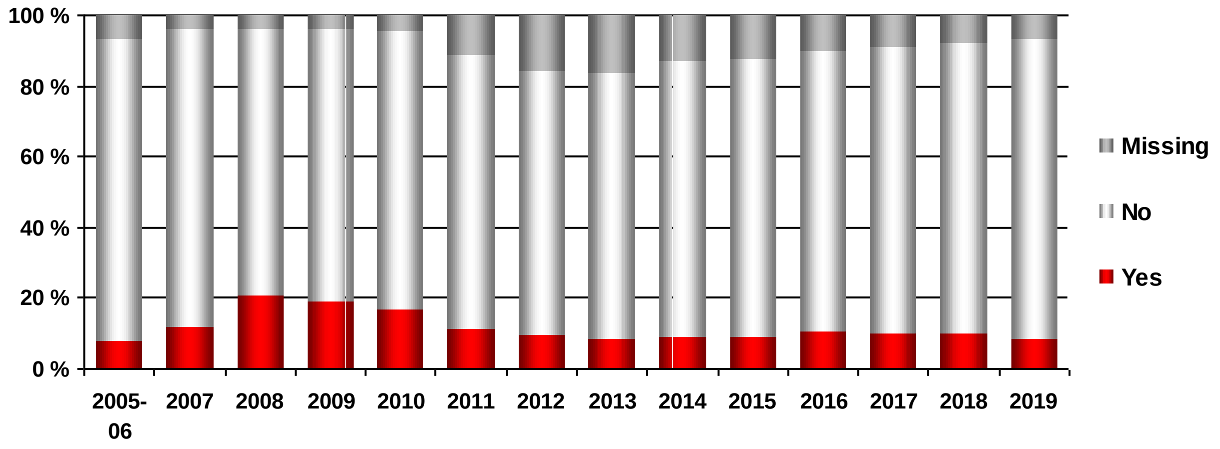


Table 33: Primary operations - Unicondylar knee prostheses

Year	Yes		No		Missing		Total
2019	0		907	(93%)	64	(7%)	**971**
2018	1	(0%)	961	(96%)	38	(4%)	**1 000**
2017	0		809	(93%)	58	(7%)	**867**
2016	0		800	(93%)	63	(7%)	**863**
2015	4	(1%)	679	(90%)	68	(9%)	**751**
2014	0		518	(86%)	87	(14%)	**605**
2013	0		389	(82%)	88	(18%)	**477**
2012	0		418	(88%)	56	(12%)	**474**
2011	1	(0%)	387	(88%)	51	(12%)	**439**
2010	7	(2%)	394	(95%)	13	(3%)	**414**
2009	3	(1%)	452	(98%)	8	(2%)	**463**
2008	15	(3%)	416	(95%)	9	(2%)	**440**
2007	4	(1%)	448	(96%)	14	(3%)	**466**
2005-06	17	(2%)	783	(92%)	55	(6%)	**855**

Registration of CAOS started in 2005

Cements used in total knee prostheses

Table 34: Primary operations - Femur

Cement	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Palacos R + G	7 530	1 312	1 271	1 406	1 444	1 479	1 429	1 001	955	627	**18 454**
Optipac Refobacin Bonecement R	1 938	1 326	1 315	1 324	1 730	2 150	1 835	1 451	1 469	483	**15 021**
Palacos w/gentamicin	14 676										**14 676**
Refobacin Bone Cement R	4 008	409	397	349	353	158	551	882	49		**7 156**
Palacos R+G pro						5	15	359	1 535	2 893	**4 807**
Cemex w/gentamicin	804	173	189	216	209	160	149	92	43	24	**2 059**
SmartSet GHV Genta. Smartmix	74	21	188	183	269	291	275	246	214	237	**1 998**
Refobacin-Palacos	1 577										**1 577**
Simplex w/Tobramycin	674										**674**
Palacos	424										**424**
Optipac Refobacin Bonecement R-3									2	251	**253**
Cemex System Genta FAST	189	13									**202**
Simplex	184										**184**
CMW I w/gentamicin	169										**169**
CMW I	53										**53**
Other (n<50)	139	2	3	7	6	7	4	21	15	14	**218**
Missing information	62	15	4	2							**83**
Total	**32 501**	**3 271**	**3 367**	**3 487**	**4 011**	**4 250**	**4 258**	**4 052**	**4 282**	**4 529**	**68 008**

Table 35: Primary operations - Tibia

Cement	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Palacos R + G	9 785	1 950	1 949	2 132	2 185	2 224	2 249	1 143	1 095	717	**25 429**
Palacos w/gentamicin	17 798										**17 798**
Optipac Refobacin Bonecement R	2 085	1 416	1 448	1 478	1 910	2 323	1 969	1 520	1 554	480	**16 183**
Refobacin Bone Cement R	4 252	446	472	394	374	171	566	931	47		**7 653**
Palacos R+G pro				1		5	40	1 131	2 315	3 974	**7 466**
Cemex w/gentamicin	929	181	190	214	222	165	150	91	43	24	**2 209**
SmartSet GHV Genta. Smartmix	84	21	188	182	270	293	277	246	214	237	**2 012**
Refobacin-Palacos	1 626										**1 626**
Simplex w/Tobramycin	679										**679**
Palacos	452										**452**
Cemex System Genta FAST	269	13									**282**
Optipac Refobacin Bonecement R-3									2	265	**267**
CMW I w/gentamicin	194										**194**
Simplex	186										**186**
CMW I	54										**54**
Other (n<50)	158	3	5	9	6	12	5	30	17	17	**262**
Missing information	68	9	3	3	1	1					**85**
Total	**38 619**	**4 039**	**4 255**	**4 413**	**4 968**	**5 194**	**5 256**	**5 092**	**5 287**	**5 714**	**82 837**

Cements used in unicondylar knee prostheses

Table 36: Primary operations - Femur

Cement	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Palacos R + G	1 085	220	255	288	390	426	364	168	130	171	**3 497**
Palacos w/gentamicin	2 211										**2 211**
Optipac Refobacin Bonecement R	237	159	164	156	171	228	222	176	250	62	**1 825**
Refobacin Bone Cement R	690	40	49	18	26	25	81	111			**1 040**
Palacos R+G pro							6	110	214	318	**648**
Refobacin-Palacos	269										**269**
Simplex w/Tobramycin	215	4		2	2						**223**
Cemex w/gentamicin	63										**63**
Cemex System Genta FAST	63										**63**
SmartSet GHV	2	8	6	11	6	9	2	1	6	1	**52**
Optipac Refobacin Bonecement R-3										45	**45**
Simplex	40										**40**
Other (n<20)	68	7		2	3	2	1	2		1	**86**
Total	**4 943**	**438**	**474**	**477**	**598**	**690**	**676**	**568**	**600**	**598**	**10 062**

Table 37: Primary operations - Tibia

Cement	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Palacos R + G	1 094	221	255	289	391	425	366	169	129	171	**3 510**
Palacos w/gentamicin	2 205										**2 205**
Optipac Refobacin Bonecement R	234	159	164	154	170	228	223	175	250	62	**1 819**
Refobacin Bone Cement R	680	40	49	18	26	25	81	109			**1 028**
Palacos R+G pro							6	108	214	328	**656**
Refobacin-Palacos	266										**266**
Simplex w/Tobramycin	210	4		2	2						**218**
Cemex w/gentamicin	63										**63**
Cemex System Genta FAST	62										**62**
SmartSet GHV	2	8	6	11	6	9	2	1	6	1	**52**
Optipac Refobacin Bonecement R-3										45	**45**
Simplex	39										**39**
Other (n<20)	63	7		2	3	2	1	2		1	**81**
Total	**4 918**	**439**	**474**	**476**	**598**	**689**	**679**	**564**	**599**	**608**	**10 044**

Antibiotic prophylaxis

Table 38: Primary operations

Drugs	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cefalotin (Keflin)	33 676	3 732	3 941	4 184	4 893	5 227	5 640	5 636	4 713	605	**72 247**
Cefazolin (Cephazolin)	38		1		1			339	1 669	5 829	**7 877**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	3 477	205	162	101	14		1			73	**4 033**
Klindamycin (Dalacin, Clindamycin)	767	146	215	227	281	316	341	346	404	363	**3 406**
Kloksacillin (Ekvacillin)	1 356	235	265	185	134	208	23	1	1	198	**2 606**
Dikloksacillin (Diclocil, Dicillin)	1 609	27	17	22	8	1	3	1	1		**1 689**
Imipenem (Tienam)	51										**51**
Cefaleksin (Keflex, Cefalexin)	19		1		1					5	**26**
Benzylpenicillin (Penicillin G)	18			1	1						**20**
Erytromycin (Ery-max, Abboticin)	16			1							**17**
Vankomycin (Vancomycin, Vancocin)	3	2		1		1		3		3	**13**
Ciprofloksasin (Ciproxin)	7		1				2				**10**
Combination of 2 drugs	1 250	158	271	283	248	312	462	223	107	57	**3 371**
Other (n<10)	21	1	1	1	2	3	6	3			**38**
Missing	253	43	42	35	57	50	36	23	26	28	**593**
Total	**42 561**	**4 549**	**4 917**	**5 041**	**5 640**	**6 118**	**6 514**	**6 575**	**6 921**	**7 161**	**95 997**

Table 39: Revisions

Drugs	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cefalotin (Keflin)	2 472	271	291	300	290	322	356	355	275	20	**4 952**
Cefazolin (Cephazolin)	1							25	158	368	**552**
Klindamycin (Dalacin, Clindamycin)	149	17	27	23	27	25	27	27	35	42	**399**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	305	6	12	2	1	1	1		1	4	**333**
Dikloksacillin (Diclocil, Dicillin)	187	8	12	8	3	6	5	4	9	1	**243**
Kloksacillin (Ekvacillin)	91	19	9	18	21	19	15	9	15	24	**240**
Vankomycin (Vancomycin, Vancocin)	75	11	13	21	19	8	14	10	8	7	**186**
Benzylpenicillin (Penicillin G)	28	2		4	2	4	4	7	5	4	**60**
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	10	2		1				1	1	1	**16**
Ciprofloksasin (Ciproxin)	8				1		1	1			**11**
Cefotaksim (Claforan)	2				1	2		3	2	1	**11**
Combination of 2 drugs	369	71	123	98	123	158	139	150	104	110	**1 445**
Other (n<10)	18	1	1	1	3	4	1	1	2	2	**34**
Missing	149	23	5	6	8	7	41	38	49	52	**378**
Total	**3 864**	**431**	**493**	**482**	**499**	**556**	**604**	**631**	**664**	**636**	**8 860**

Patient specific instruments

Table 40:

Year	Yes	No	Missing	Total
2019	7	8 135	912	**9 054**
2018	7	7 870	1 010	**8 887**
2017	1	7 190	1 147	**8 338**
2016	5	7 068	1 157	**8 230**
2015	14	6 221	1 521	**7 756**
2014	22	5 508	1 571	**7 101**
2013	25	4 682	1 784	**6 491**
2012	88	4 242	1 959	**6 289**
2011	65	1 696	4 142	**5 903**

Registration started in 2011

Drain

Table 41:

Year	Yes	No	Missing	Total
2019	808	7 540	706	**9 054**
2018	1 196	6 807	884	**8 887**
2017	1 586	5 706	1 046	**8 338**
2016	2 061	5 160	1 009	**8 230**
2015	2 277	4 693	786	**7 756**
2014	2 244	3 933	924	**7 101**
2013	2 085	3 353	1 053	**6 491**
2012	2 208	2 841	1 240	**6 289**
2011	1 096	1 129	3 678	**5 903**

Registration started in 2011

Torniquet

Table 42:

	Torniquet		
Year	**Yes**	**No**	**Mean Time (min) ***
2019	4 042	2 116	69
2018	1 900	708	70

Registration started in 2018. There are 91 forms are missing registration

* Mean duration of torniquet time

Completeness of reporting analysis for the Knee Arthroplasty Register, 2017-2018

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

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

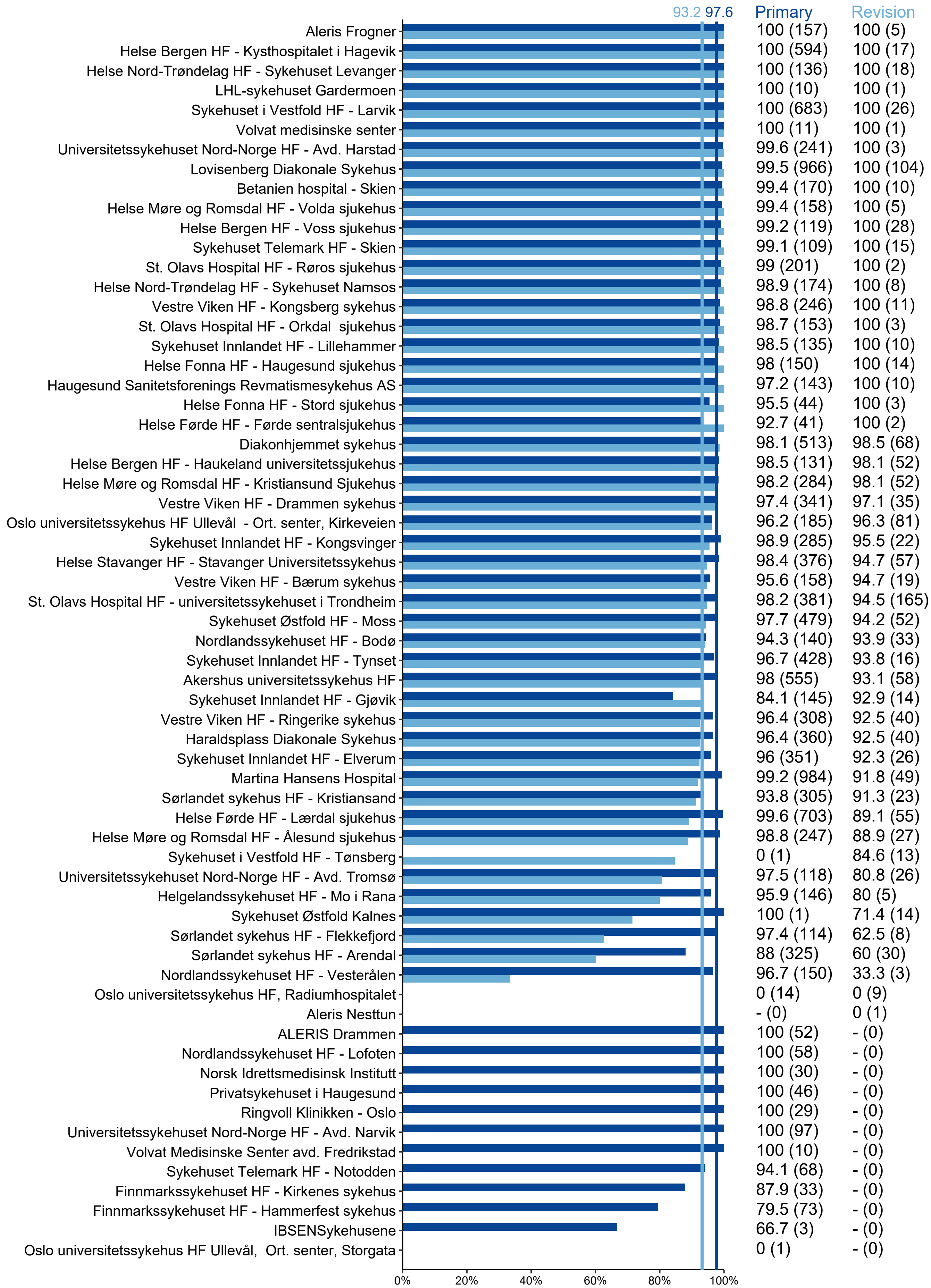
$$\text{Completeness rate NPR} = \frac{\text{only NAR + both registre}}{\text{only NPR + only NAR + both registres}}$$

Primary operations. In 2017-2018, 13669 primary knee replacements were reported to one or both of the registers. 97.6% of these were reported to the NAR while 96.5% 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 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 2017-2018, 1389 revisions were reported to one or both of the registers. 93.2% of these were reported to the NAR while 81.6% 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 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, 2017-2018



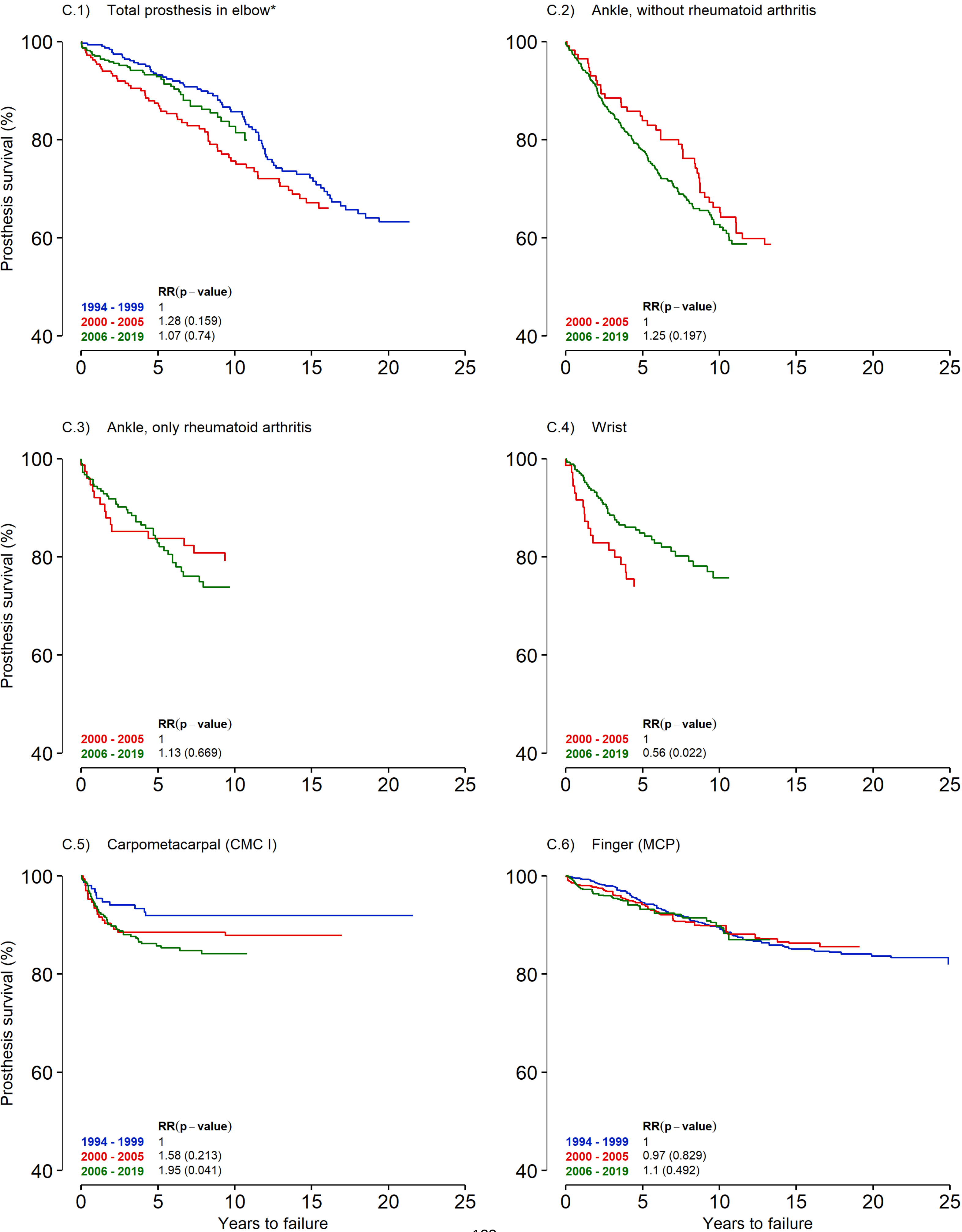
Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered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

CONTENTS

Toe joint prostheses

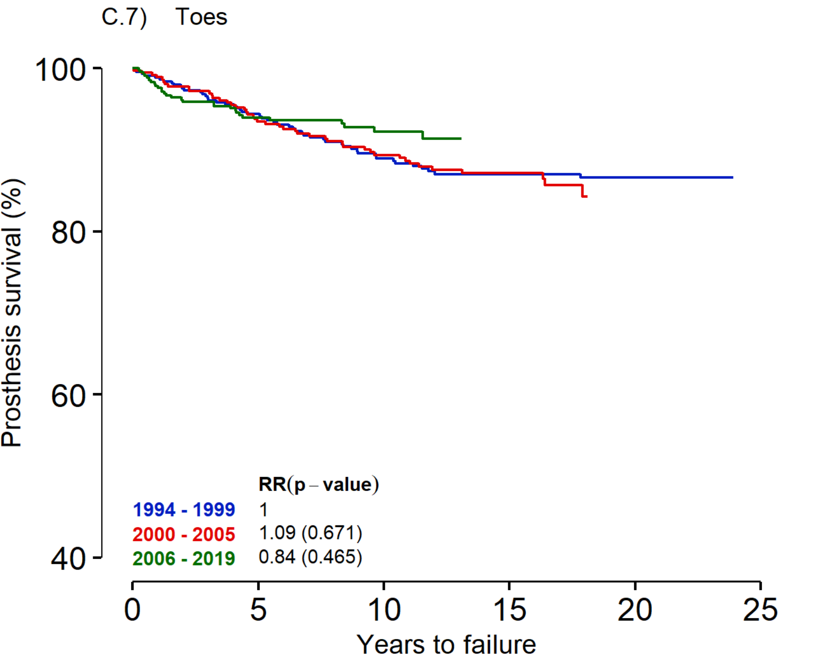
Completeness analysis

Survival curves for joint prosthesis
1994-2019



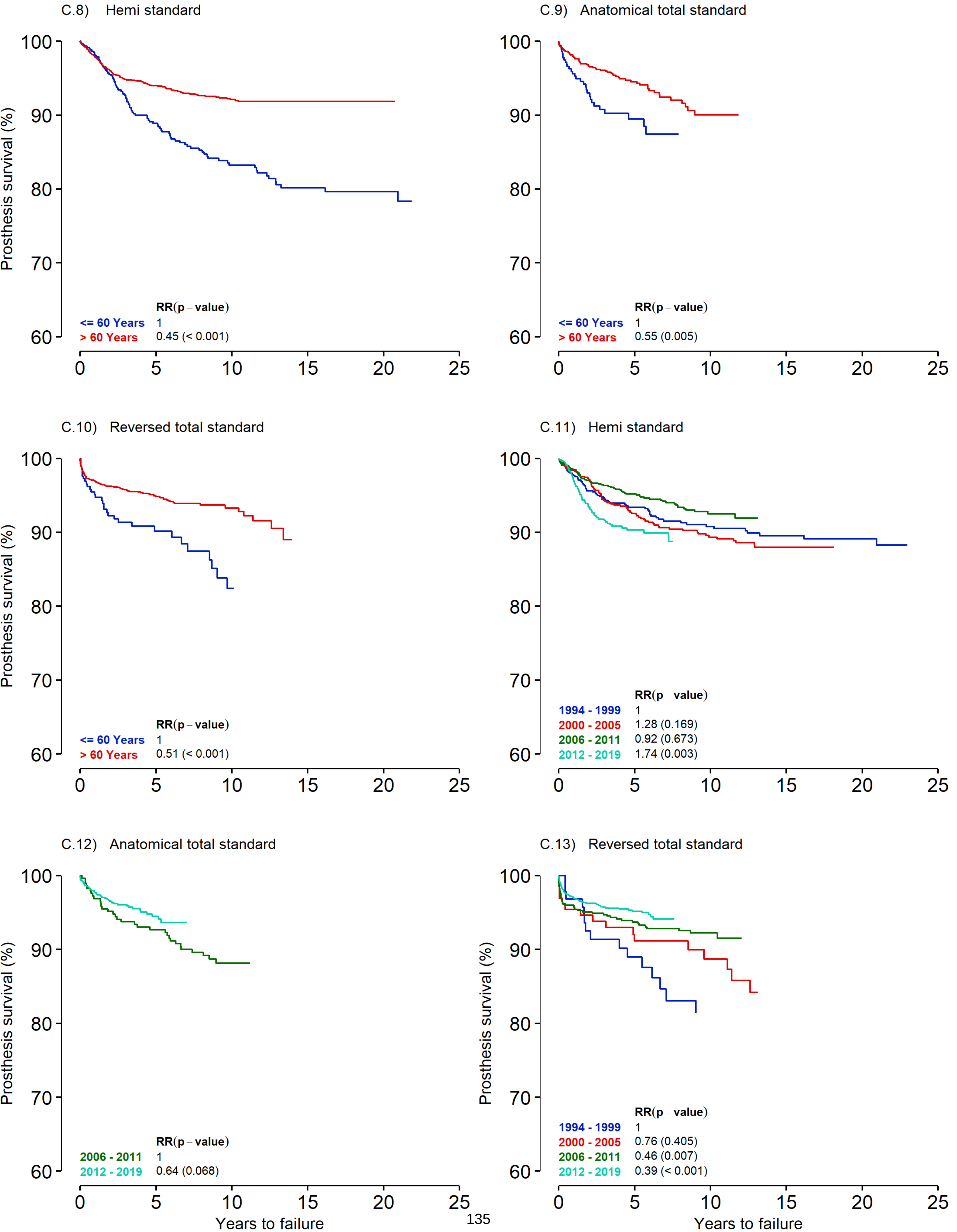
*Caput radii prosthesis for acute fracture is not included.
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.
Risk Ratio (RR) is adjusted for age and gender.

Survival curves for joint prosthesis
1994-2019



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

Survival curves of shoulder prosthesis
1994-2019



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.

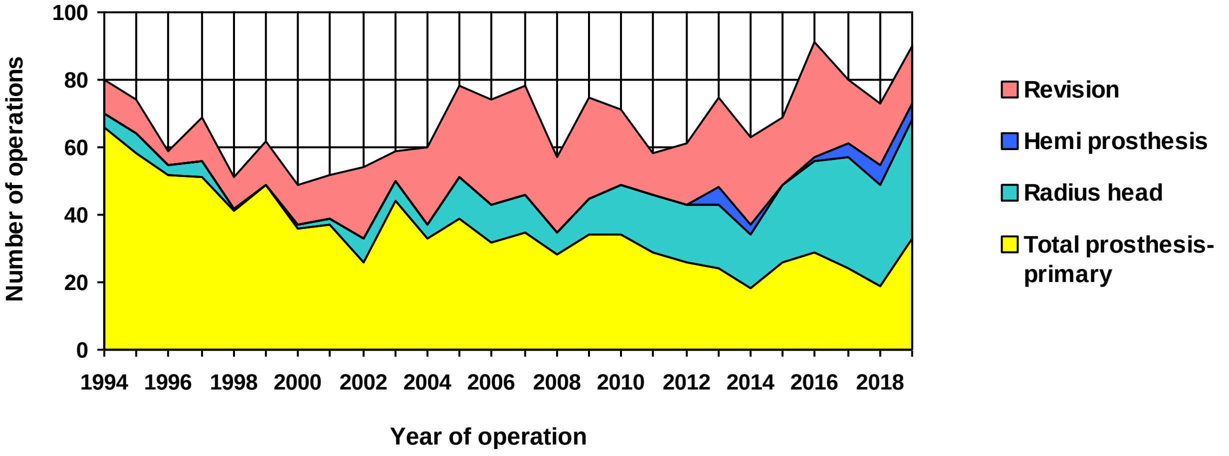
ELBOW PROSTHESES

Table 1: Annual number of prostheses

	Primary operations										
Year	**Hemi prosthesis**		**Total prosthesis**		**Radius head**		**Reoperations ***		**Revisions**		**Total**
2019	5	(5,6%)	33	(36,7%)	35	(38,9%)	1	(1,1%)	16	(17,8%)	**90**
2018	6	(8,2%)	19	(26,0%)	30	(41,1%)	1	(1,4%)	17	(23,3%)	**73**
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	3	(4,8%)	18	(28,6%)	16	(25,4%)			26	(41,3%)	**63**
2013	5	(6,7%)	24	(32,0%)	19	(25,3%)			27	(36,0%)	**75**
2012			26	(42,6%)	17	(27,9%)			18	(29,5%)	**61**
2011			29	(50,0%)	17	(29,3%)	1	(1,7%)	11	(19,0%)	**58**
2010			34	(47,9%)	15	(21,1%)			22	(31,0%)	**71**
2009			34	(45,3%)	11	(14,7%)			30	(40,0%)	**75**
2008			28	(49,1%)	7	(12,3%)			22	(38,6%)	**57**
2007			35	(44,9%)	11	(14,1%)			32	(41,0%)	**78**
2006			32	(43,2%)	11	(14,9%)			31	(41,9%)	**74**
2005			39	(50,0%)	12	(15,4%)			27	(34,6%)	**78**
2004			33	(55,0%)	4	(6,7%)			23	(38,3%)	**60**
1994-03			460	(75,5%)	35	(5,7%)			114	(18,7%)	**609**
Total	**24**	**0**	**923**	**(52,4%)**	**323**	**(18,3%)**	**4**	**(0,2%)**	488	(27,7%)	**1 762**

* 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



53 % of all operations were performed on the right side.   74,2 % performed in women.   Mean age: 62,2 years.

Table 2: Elbow disease in primary operations - Total prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2019	1	12	6		1	15		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	5			2			
2013	2	9	6		1	7		3	
2012	1	16	5			4		1	
2011	4	18	6			3		1	
2010	6	19	5			2		4	
2009	1	18	6		1	7	1	6	
2008	1	19	1			6	1	1	
2007	3	22	4			2		6	
2006	3	19	9					1	
2005	6	26	9	3	1	2		1	
2004	2	23	2	2		4		2	2
1994-03	18	416	19	1		5	1	16	5
Total	**54**	**679**	**106**	**6**	**4**	**82**	**3**	**49**	**7**

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

Table 3: Elbow disease in primary operations - Hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2019						5			
2018	1		1			5			
2017						4			
2016						1			
2014		1				3			
2013			1			4			
Total	**1**	**1**	**2**	**0**	**0**	**22**	**0**	**0**	**0**

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

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

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2019			6		2	29			
2018			1			28		1	
2017		1	4			29			
2016			3			23		1	
2015			5			20		1	
2014	1		3			12			
2013	1					19			
2012	1		3			13			
2011	2		2			13			
2010			2			13			
2009						11			
2008			2			5			
2007						11			
2006			5			5		1	
2005	2		2			7		1	1
2004	1		1			2			
1994-03	1	13	9			12		4	
Total	**9**	**14**	**48**	**0**	**2**	**252**	**0**	**9**	**1**

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

Use of cement in elbow prostheses

Table 5: Primary operations - Humerus

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2019	37	(97,4%)			1	(2,6%)			**38**
2018	25	(100,0%							**25**
2017	28	(96,6%)			1	(3,4%)			**29**
2016	30	(100,0%							**30**
2015	25	(96,2%)			1	(3,8%)			**26**
2014	19	(90,5%)					2	(9,5%)	**21**
2013	27	(93,1%)			2	(6,9%)			**29**
2012	23	(88,5%)			3	(11,5%)			**26**
2011	26	(89,7%)			1	(3,4%)	2	(6,9%)	**29**
2010	30	(88,2%)			4	(11,8%)			**34**
2009	29	(85,3%)			4	(11,8%)	1	(2,9%)	**34**
2008	24	(85,7%)			2	(7,1%)	2	(7,1%)	**28**
2007	31	(88,6%)			4	(11,4%)			**35**
2006	24	(75,0%)			8	(25,0%)			**32**
2005	23	(59,0%)			16	(41,0%)			**39**
2004	16	(48,5%)			17	(51,5%)			**33**
1994-03	245	(53,3%)	95	(20,7%)	117	(25,4%)	3	(0,7%)	**460**
Total	**662**	**(69,8%)**	**95**	**(10,0%)**	**181**	**(19,1%)**	**10**	**(1,1%)**	**948**

Table 6: Primary operations - Ulna/radius

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2019	38	(59,4%)			26	(40,6%)			**64**
2018	22	(44,9%)			27	(55,1%)			**49**
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	21	(63,6%)	1	(3,0%)	9	(27,3%)	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	43	(93,5%)			2	(4,3%)	1	(2,2%)	**46**
2006	36	(83,7%)			7	(16,3%)			**43**
2005	42	(82,4%)			9	(17,6%)			**51**
2004	30	(81,1%)			7	(18,9%)			**37**
1994-03	353	(71,3%)	96	(19,4%)	43	(8,7%)	3	(0,6%)	**495**
Total	**878**	**(70,7%)**	**97**	**(7,8%)**	**251**	**(20,2%)**	**16**	**(1,3%)**	**1 242**

Prostheses used in elbow prostheses - Total prostheses

Table 7: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Discovery	94	21	18	19	9	18	16	5	1	1	**202**
Norway	180										**180**
Kudo	162										**162**
IBP	130	2	3	1							**136**
Nexel						4	13	19	17	27	**80**
GSB III	64	2	4	3	3	1					**77**
NES	54										**54**
Mutars	3	1	1		1	2			1	1	**10**
Latitude EV					3					4	**7**
IBP Reconstruction	5										**5**
Coonrad/Morrey	1	2			1	1					**5**
Other (n < 5)	2	1		1	1						**5**
Total	**695**	**29**	**26**	**24**	**18**	**26**	**29**	**24**	**19**	**33**	**923**

Table 8: Primary operations - Ulna/radius

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Discovery	94	21	18	19	9	18	16	5	1	1	**202**
Norway	179										**179**
Kudo	162										**162**
IBP	130	2	3	1							**136**
Nexel						4	13	19	17	27	**80**
GSB III	64	2	4	3	3	1					**77**
NES	55										**55**
Mutars	3	1	1		1	2			1	1	**10**
IBP Reconstruction	5										**5**
Coonrad/Morrey	1	2			1	1					**5**
Other (n < 5)	2	1		1	3						**7**
Total	**695**	**29**	**26**	**24**	**17**	**26**	**29**	**24**	**19**	**29**	**918**

Prostheses used in elbow prostheses - Hemiprostheses

Table 9: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Latitude Anatomic hemi				5	3		1	4	6	5	**24**
Total				**5**	**3**	**0**	**1**	**4**	**6**	**5**	**24**

Prostheses used in elbow prostheses - Radius head prostheses

Table 10: Primary operations - Radius

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Acumed anatomic radial head	1	4	11	16	5	13	13	12	16	18	**109**
Explor		2	2	3	5	7	10	17	14	15	**75**
rHead	51	8	1		2		1	1			**64**
Radial Head	29										**29**
Silastic H.P. 100	20										**20**
Link radius		2	1		4	3					**10**
EVOLVE (Proline)	3		2					3		2	**10**
Other (n < 5)	2	1					3				**6**
Total	**106**	**17**	**17**	**19**	**16**	**23**	**27**	**33**	**30**	**35**	**323**

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	Other	Missing
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	3	
2015	3	4	1	1		2		1	6	1	
2014	4	4		1	1	1	1	1	4	4	
2013	2	2	1	2		2	2	1	7	3	
2012		1		1		3			3	6	
2011	3	5	1	1			2	2	3	3	1
2010	2	6	2	2			6	2	2	2	
2009	6	5		1	1	1	2	3	4	5	
2008	5	5		1	4	1	4	3	2	3	
2007	3	7	1	2	1	1		5	4	4	
2006	6	5	1	2	1	3	2		1	2	
2005	4	6	4	1			1	1	1		
2004	6	4	2	3			2	2	2	3	
1994-03	45	41	8	8	6	7	17	21	4	13	1
Total	**98**	**109**	**24**	**33**	**15**	**29**	**47**	**48**	**59**	**62**	**2**

More than one reason for revision is possible

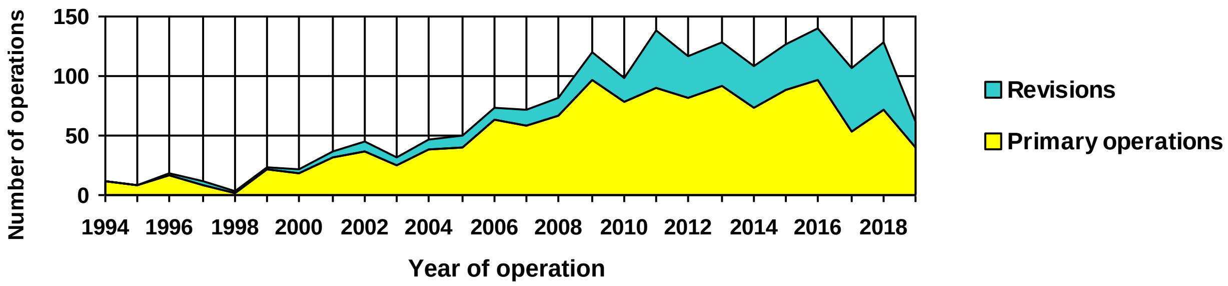
ANKLE PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Reoperations *		Revisions		Total
2019	40	(64,5%)	1	(1,6%)	21	(33,9%)	**62**
2018	71	(55,0%)	1	(0,8%)	57	(44,2%)	**129**
2017	54	(50,5%)			53	(49,5%)	**107**
2016	97	(69,3%)			43	(30,7%)	**140**
2015	89	(70,1%)			38	(29,9%)	**127**
2014	74	(68,5%)			34	(31,5%)	**108**
2013	92	(71,9%)			36	(28,1%)	**128**
2012	82	(70,7%)			34	(29,3%)	**116**
2011	90	(65,2%)			48	(34,8%)	**138**
2010	79	(79,8%)			20	(20,2%)	**99**
2009	96	(80,0%)			24	(20,0%)	**120**
2008	66	(80,5%)			16	(19,5%)	**82**
2007	58	(80,6%)			14	(19,4%)	**72**
2006	63	(86,3%)			10	(13,7%)	**73**
2005	40	(80,0%)			10	(20,0%)	**50**
2004	39	(83,0%)			8	(17,0%)	**47**
1994-03	180	(84,9%)			32	(15,1%)	**212**
Total	**1 310**	**(72,4%)**	**2**	**(0,1%)**	**498**	**(27,5%)**	**1 810**

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

Figure 1: Annual numbers of operations



57,1 % of all operations were performed on the right side. 53,5 % performed in women. Mean age: 60,1 years.

Table 2: Ankle disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2019	4	9	13		10			6	
2018	20	15	17	1	18	1	1	6	
2017	14	12	17	1	8		1	5	
2016	24	14	28	1	31			6	
2015	22	18	25	2	18			11	
2014	21	11	27	1	10			5	
2013	36	20	25	1	16			2	1
2012	21	8	44		9			2	
2011	32	18	35		5		1	3	
2010	22	20	29		9			5	
2009	31	26	28		13		1	1	
2008	20	15	24		7		2	2	
2007	13	16	20	2	6			2	
2006	19	14	24		5			5	
2005	15	9	18		3			1	
2004	8	10	17		1			3	1
1994-03	32	110	22	4	1			21	
Total	**354**	**345**	**413**	**13**	**170**	**1**	**6**	**86**	**2**

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

Use of cement in ankle prostheses

Table 3: Primary operations - Tibia

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
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%)			61	(92,4%)	4	(6,1%)	**66**
2007					58	(100,0%)			**58**
2006					63	(100,0%)			**63**
2005	1	(2,5%)			39	(97,5%)			**40**
2004					39	(100,0%)			**39**
1994-03	22	(12,2%)	10	(5,6%)	147	(81,7%)	1	(0,6%)	**180**
Total	**29**	**(2,2%)**	**10**	**(0,8%)**	**1 260**	**(96,3%)**	**9**	**(0,7%)**	**1 308**

Table 4: Primary operations - Talus

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
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%)			61	(92,4%)	4	(6,1%)	**66**
2007					58	(100,0%)			**58**
2006	1	(1,6%)			62	(98,4%)			**63**
2005	1	(2,5%)			39	(97,5%)			**40**
2004					39	(100,0%)			**39**
1994-03	23	(12,8%)	11	(6,1%)	146	(81,1%)			**180**
Total	**31**	**(2,4%)**	**11**	**(0,8%)**	**1 260**	**(96,3%)**	**7**	**(0,5%)**	**1 309**

Prostheses used in ankle prostheses

Table 5: Primary operations - Tibia

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
STAR	488	50	39	38		1					**616**
Salto Talaris				26	62	85	81	28	35		**317**
Mobility	58	16	12	15							**101**
CCI	29	17	12	11	9						**78**
TM Total Ankle					3	3	16	22	20	8	**72**
INFINITY								2	11	29	**42**
Norwegian TPR	32										**32**
Rebalance		7	8								**15**
Salto Mobile			11	1							**12**
Hintegra	11										**11**
Integra Cadence								2	4	2	**8**
AES	3										**3**
Total	**621**	**90**	**82**	**91**	**74**	**89**	**97**	**54**	**70**	**39**	**1 307**

Table 6: Primary operations - Talus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
STAR	488	50	39	38		1					**616**
Salto Talaris				22	61	84	80	27	35		**309**
Mobility	58	16	12	15							**101**
CCI	29	17	12	11	9						**78**
TM Total Ankle					3	3	16	22	20	8	**72**
INFINITY								2	11	29	**42**
Norwegian TPR	32										**32**
Rebalance		7	8								**15**
Salto Mobile			11	1							**12**
Hintegra	11										**11**
Salto XT				4	1	1	1	1			**8**
Integra Cadence								2	4	2	**8**
AES	3										**3**
Talus Hemicap										1	**1**
Total	**621**	**90**	**82**	**91**	**74**	**89**	**97**	**54**	**70**	**40**	**1 308**

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

Prostheses used in ankle total prostheses

Table 7: Primary operations - Tibia in total prostheses

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
STAR	488	50	39	32		1					**610**
Salto Talaris				26	62	85	81	28	35		**317**
Mobility	58	16	12	15							**101**
CCI	29	17	12	11	9						**78**
TM Total Ankle					3	3	16	22	20	8	**72**
INFINITY								2	11	29	**42**
Norwegian TPR	32										**32**
Rebalance		7	8								**15**
Salto Mobile			11	1							**12**
Hintegra	11										**11**
Integra Cadence								2	4	2	**8**
AES	3										**3**
Total	**621**	**90**	**82**	**85**	**74**	**89**	**97**	**54**	**70**	**39**	**1 301**

Table 8: Primary operations - Talus in total prostheses

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
STAR	488	50	39	32		1					**610**
Salto Talaris				22	61	84	80	27	35		**309**
Mobility	58	16	12	15							**101**
CCI	29	17	12	11	9						**78**
TM Total Ankle					3	3	16	22	20	8	**72**
INFINITY								2	11	29	**42**
Norwegian TPR	32										**32**
Rebalance		7	8								**15**
Salto Mobile			11	1							**12**
Hintegra	11										**11**
Salto XT				4	1	1	1	1			**8**
Integra Cadence								2	4	2	**8**
AES	3										**3**
Total	**621**	**90**	**82**	**85**	**74**	**89**	**97**	**54**	**70**	**39**	**1 301**

Prostheses used in ankle total prostheses (cont.)

Table 9: Primary operations - Tibia Insert in total prostheses

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Totalt
STAR	488	50	39	32		1					**610**
Salto Talaris				25	62	85	81	28	35		**316**
Mobility	58	16	12	15							**101**
CCI	29	17	12	10	9						**77**
TM Total Ankle					3	3	16	22	20	8	**72**
INFINITY								2	11	29	**42**
Rebalance		7	8								**15**
Salto Mobile			11	1							**12**
Hintegra	11										**11**
Integra Cadence								2	4	2	**8**
AES	3										**3**
Salto XT				1							**1**
Totalt	**589**	**90**	**82**	**84**	**74**	**89**	**97**	**54**	**70**	**39**	**1 268**

Table 10: Primary operations - Material in Tibia Insert for total prostheses

Prostheses	Materiale	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Totalt
STAR	Uhmwpe	485	50	39	32		1					**607**
Salto Talaris					25	62	85	81	28	35		**316**
Mobility		58	16	12	15							**101**
CCI		29	17	12	10	9						**77**
TM Total Ankle	HXLPE					3	3	16	22	20	8	**72**
INFINITY	Uhmwpe								2	11	29	**42**
Rebalance			7	8								**15**
Salto Mobile				11	1							**12**
Hintegra		11										**11**
Integra Cadence	HXLPE								2	4	2	**8**
AES		3										**3**
STAR		3										**3**
Salto XT					1							**1**
Totalt		**589**	**90**	**82**	**84**	**74**	**89**	**97**	**54**	**70**	**39**	**1 268**

Reasons for revisions in ankle prostheses

Table 11:

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
2019		2		1		2	1	6	4	2		3	
2018	9	8		1	7	4	3	19	14	1			
2017	8	8		2	8		1	23	8	8		4	
2016	10	10		2	1	1	2	13	4	2	1		
2015	5	5			6	1		13	9	6			
2014	11	9		1	3	1		9	8				
2013	5	2	1	3	8	2	1	14	16	3			
2012	6	3		2	1	2	1	12	9	1		1	
2011	6	6	1	5	4	1	1	16	8		1	1	
2010	2	1		2	3	1	2	10	3		3		
2009	5	2	1	4	7	3	1	8	3				
2008	3	4	1	1	5			4	1			2	
2007	2	2		2	1	1		5	3		1		
2006	3	2		2	2	1	1	4	1				
2005	1	2			1	1		2			1		
2004	4	3		1	1	1		1	1			1	
1994-03	18	12		3	7	1	1	10	2			2	
Total	**98**	**81**	**4**	**32**	**65**	**23**	**15**	**169**	**94**	**23**	**7**	**14**	**0**

More than one reason for revision is possible

FINGER JOINT PROSTHESES

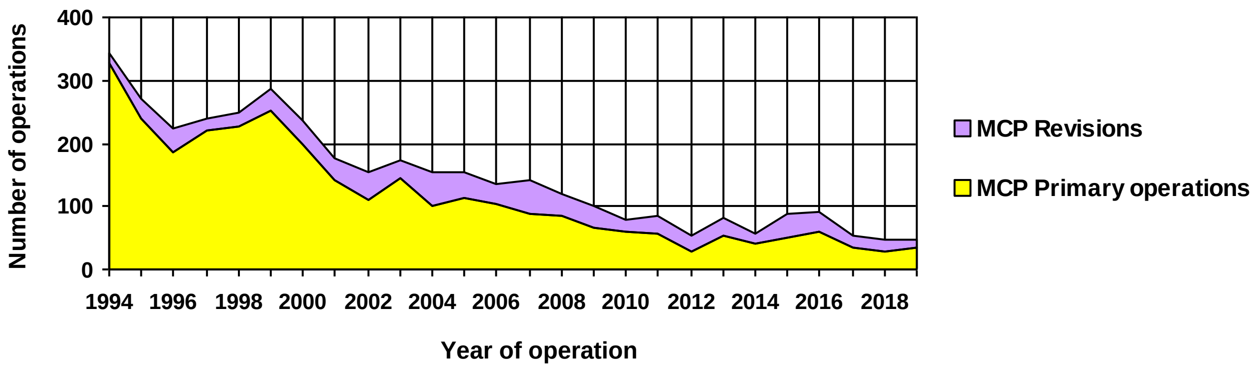
Table 1: Annual number of operations - MCP

Year	Primary operations		Revisions		Total
2019	35	(74,5%)	12	(25,5%)	**47**
2018	28	(59,6%)	19	(40,4%)	**47**
2017	35	(67,3%)	17	(32,7%)	**52**
2016	61	(67,0%)	30	(33,0%)	**91**
2015	51	(57,3%)	38	(42,7%)	**89**
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	84	(70,0%)	36	(30,0%)	**120**
2007	88	(61,5%)	55	(38,5%)	**143**
2006	104	(77,6%)	30	(22,4%)	**134**
2005	112	(72,7%)	42	(27,3%)	**154**
2004	101	(66,0%)	52	(34,0%)	**153**
1994-03	2 047	(87,1%)	302	(12,9%)	**2 349**
Total	**3 053**	**(79,7%)**	**780**	**(20,3%)**	**3 833**

Table 2: Annual number of operations - PIP

Year	Primary operations		Revisions		Total
2019	9	(90,0%)	1	(10,0%)	**10**
2018	8	(80,0%)	2	(20,0%)	**10**
2017	6	(100,0%)			**6**
2016	3	(75,0%)	1	(25,0%)	**4**
2015	5	(100,0%)			**5**
2014	4	(100,0%)			**4**
2013	6	(100,0%)			**6**
2011	3	(100,0%)			**3**
2010	6	(100,0%)			**6**
2009	3	(100,0%)			**3**
2008	4	(57,1%)	3	(42,9%)	**7**
2007	6	(85,7%)	1	(14,3%)	**7**
2006	7	(87,5%)	1	(12,5%)	**8**
2005	6	(85,7%)	1	(14,3%)	**7**
2004	7	(87,5%)	1	(12,5%)	**8**
1994-03	31	(81,6%)	7	(18,4%)	**38**
Total	**114**	**(86,4%)**	**18**	**(13,6%)**	**132**

Figure 1: Annual number of operations



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

Reasons for primary operations

Table 3: MCP prostheses - Finger disease

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2019	3	28						4	
2018	4	22		1			1	1	
2017	6	27						2	
2016	4	57						2	
2015	5	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	81						1	
2007	2	85		1				4	
2006	10	91	1		1			3	
2005	9	91	9				1	3	1
2004	5	95						1	1
1994-03	35	1 962	3	8		1	1	54	1
Total	**91**	**2 859**	**16**	**11**	**1**	**1**	**4**	**99**	**3**

More than one reason for primary operation is possible

Table 4: PIP prostheses - Finger disease

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2019	6	2	1						
2018	5	1	2						
2017	6								
2016	1						2		
2015	3		2						
2014	3		1						
2013	1	5							
2011		2	1						
2010		2	2		1			1	
2009	2						1		
2008	2		1					1	
2007	3		1		1				1
2006	4	3							
2005	4	2	1						
2004	6	1						1	
1994-03	6	21	2			2		3	
Total	**52**	**39**	**14**	**0**	**2**	**2**	**3**	**6**	**1**

More than one reason for primary operation is possible

Use of cement in MCP prostheses

Table 5: Primary operations - Proximal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2019					35	(100,0%)			**35**
2018					28	(100,0%)			**28**
2017					35	(100,0%)			**35**
2016	2	(3,3%)			59	(96,7%)			**61**
2015	1	(2,0%)			48	(94,1%)	2	(3,9%)	**51**
2014					41	(97,6%)	1	(2,4%)	**42**
2013					52	(98,1%)	1	(1,9%)	**53**
2012					27	(100,0%)			**27**
2011					57	(100,0%)			**57**
2010					60	(100,0%)			**60**
2009					66	(100,0%)			**66**
2008	1	(1,2%)			83	(98,8%)			**84**
2007					88	(100,0%)			**88**
2006					103	(99,0%)	1	(1,0%)	**104**
2005			2	(1,8%)	109	(97,3%)	1	(0,9%)	**112**
2004	1	(1,0%)			100	(99,0%)			**101**
2003					145	(100,0%)			**145**
2002					108	(99,1%)	1	(0,9%)	**109**
2001	1	(0,7%)			140	(99,3%)			**141**
2000					198	(100,0%)			**198**
1999					253	(100,0%)			**253**
1998					228	(100,0%)			**228**
1997					216	(98,6%)	3	(1,4%)	**219**
1996					187	(100,0%)			**187**
1995					238	(100,0%)			**238**
1994					326	(99,4%)	2	(0,6%)	**328**
Total	**6**	**(0,2%)**	**2**	**(0,1%)**	**3 030**	**(99,3%)**	**12**	**(0,4%)**	**3 050**

Table 6: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented		Missing	Total
2019			2	(100,0%)		**2**
2018			2	(100,0%)		**2**
2016			2	(100,0%)		**2**
2014			1	(100,0%)		**1**
2011			2	(100,0%)		**2**
2010			1	(100,0%)		**1**
2009			1	(100,0%)		**1**
2008			2	(100,0%)		**2**
2007			2	(100,0%)		**2**
2006			7	(100,0%)		**7**
2005			4	(100,0%)		**4**
2004			1	(100,0%)		**1**
2003			1	(100,0%)		**1**
2002			5	(100,0%)		**5**
2001			1	(100,0%)		**1**
2000			1	(100,0%)		**1**
1996			2	(100,0%)		**2**
1995			4	(100,0%)		**4**
Total			**41**	**(100,0%)**		**41**

Use of cement in PIP prostheses

Table 7: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2019			9 (100,0%)		**9**
2018			8 (100,0%)		**8**
2017			6 (100,0%)		**6**
2016			3 (100,0%)		**3**
2015			5 (100,0%)		**5**
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			**111 (97,4%)**	**3 (2,6%)**	**114**

Table 8: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2019			7 (100,0%		**7**
2018			8 (100,0%		**8**
2017			6 (100,0%		**6**
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			**50 (98,0%)**	**1 (2,0%)**	**51**

Finger prostheses

Table 9: MCP prostheses in primary operations - Proximal

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Silastic HP 100	1 867	49	27	25		5	1	5		3	**1 982**
Avanta	555					1		4			**560**
Silastic HP 100 II	7	6		28	41	45	56	26	26	27	**262**
NeuFlex	198										**198**
Ascension MCP	27	2			1		2		2	1	**35**
MCS	6										**6**
SR Avanta							2				**2**
HAPY										2	**2**
TACTYS										1	**1**
Moje	1										**1**
Integra										1	**1**
Total	**2 661**	**57**	**27**	**53**	**42**	**51**	**61**	**35**	**28**	**35**	**3 050**

Table 10: MCP prostheses in primary operations - Distal

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Ascension MCP	25	2			1		2		2	1	**33**
MCS	6										**6**
TACTYS										1	**1**
Moje	1										**1**
Total	**32**	**2**			**1**		**2**		**2**	**2**	**41**

Table 11: PIP prostheses in primary operations - Proximal

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Silastic HP 100	21			4	2						**27**
SR Avanta	14	1		1	1	5	1			2	**25**
Ascension MCP	18										**18**
TACTYS							2	6	6	3	**17**
Ascension PIP PyroCarbon	2	2			1				2	1	**8**
NeuFlex	7										**7**
MCS	4										**4**
Avanta	3			1							**4**
CapFlex PIP										3	**3**
Moje	1										**1**
Total	**70**	**3**		**6**	**4**	**5**	**3**	**6**	**8**	**9**	**114**

Table 12: PIP prostheses in primary operations - Distal

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Ascension MCP	18										**18**
TACTYS							2	6	6	3	**17**
Ascension PIP PyroCarbon	2	2			1				2	1	**8**
MCS	4										**4**
CapFlex PIP										3	**3**
Moje	1										**1**
Total	**25**	**2**			**1**		**2**	**6**	**8**	**7**	**51**

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
2019			2	2	2		2	5		4		
2018			4	3	1		3	4		6		
2017			1	1			1	2			4	
2016			5	1	4		2	6	5		8	
2015	5	2		4		1		15	8	4	10	
2014		1		1					2		4	
2013				4	12			8		8	1	
2012				2				10	3	12		
2011					4	2		8		7	5	
2010	1	1	1				2	3		6	1	
2009	1	2	3	1	1	3		5	3	16	2	
2008		1	2	4	11	1		9	1	5	3	
2007		2	10	7	2	1		7		28		3
2006			2	10	4	1		4	4	8		1
2005			5	5	5			12	1	19	3	2
2004	1	5		7	4			11		22	4	2
1994-03	4	11	9	30	43	5	20	77	4	128	44	9
Total	**12**	**25**	**44**	**82**	**93**	**14**	**30**	**186**	**31**	**273**	**89**	**17**

Revision reasons are not mutually exclusive. More than one reason for revision is possible

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
2019											1	
2018	1								1			
2016	1											
2008	1	1	1	1	1			2				
2007								1			1	
2006					1							
2005										1		
2004	1	1										
1994-03	2	1		1						5		
Total	**6**	**3**	**1**	**2**	**2**	**0**	**0**	**3**	**1**	**6**	**2**	**0**

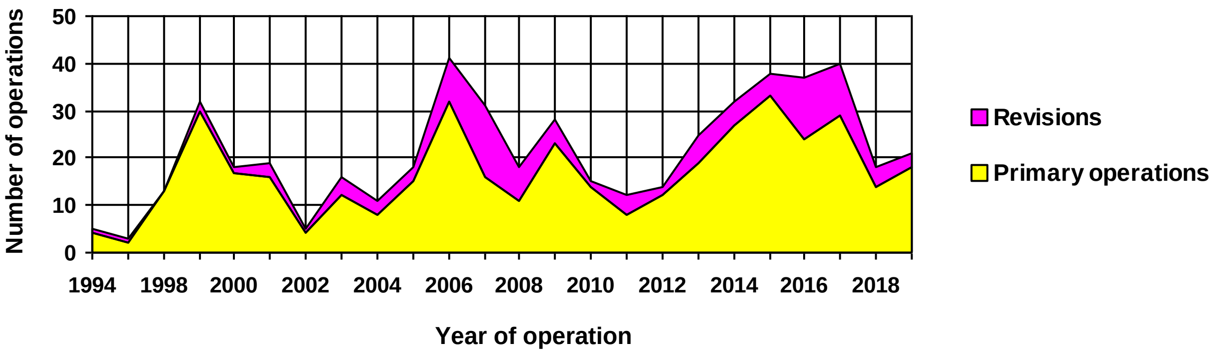
Revision reasons are not mutually exclusive. More than one reason for revision is possible

WRIST PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2019	18	(85,7%)	3	(14,3%)	**21**
2018	14	(77,8%)	4	(22,2%)	**18**
2017	29	(72,5%)	11	(27,5%)	**40**
2016	24	(64,9%)	13	(35,1%)	**37**
2015	33	(86,8%)	5	(13,2%)	**38**
2014	27	(84,4%)	5	(15,6%)	**32**
2013	19	(76,0%)	6	(24,0%)	**25**
2012	12	(85,7%)	2	(14,3%)	**14**
2011	8	(66,7%)	4	(33,3%)	**12**
2010	14	(93,3%)	1	(6,7%)	**15**
2009	23	(82,1%)	5	(17,9%)	**28**
2008	11	(61,1%)	7	(38,9%)	**18**
2007	16	(51,6%)	15	(48,4%)	**31**
2006	32	(78,0%)	9	(22,0%)	**41**
2005	15	(83,3%)	3	(16,7%)	**18**
2004	8	(72,7%)	3	(27,3%)	**11**
1994-03	98	(88,3%)	13	(11,7%)	**111**
Total	**401**	**(78,6%)**	**109**	**(21,4%)**	**510**

Figure 1: Annual number of operations



56,9 % of all operations were performed on the right side. 60,6 % performed in women. Mean age: 56,5 years.

Table 2: Wrist disease in primary operations

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2019	4	3	6		3			2	
2018	4	2	2		4			3	
2017	2	3	11		12	1	1	4	
2016	4		10		9	1		1	
2015	4	2	13		10			7	
2014	7	1	11		9			3	
2013	4	3	5		3		1	3	
2012	3	5	2		2			1	
2011	1	3	4					2	
2010		4	4		4			2	
2009	4	5	9		4		1	1	
2008	4	2	2		2				1
2007	1	6	6		1			2	
2006	5	19	6		1			3	
2005	5		4					6	
2004		8							
1994-03	3	82	5	1				7	
Total	**55**	**148**	**100**	**1**	**64**	**2**	**3**	**47**	**1**

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

Use of cement in wrist prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2019					5	(100,0%)			**5**
2018					5	(100,0%)			**5**
2017					27	(100,0%)			**27**
2016					24	(100,0%)			**24**
2015					31	(96,9%)	1	(3,1%)	**32**
2014					27	(100,0%)			**27**
2013					19	(100,0%)			**19**
2012					11	(91,7%)	1	(8,3%)	**12**
2011					8	(100,0%)			**8**
2010					14	(100,0%)			**14**
2009					21	(91,3%)	2	(8,7%)	**23**
2008					10	(100,0%)			**10**
2007					16	(100,0%)			**16**
2006					32	(100,0%)			**32**
2005					15	(100,0%)			**15**
2004	2	(25,0%)			6	(75,0%)			**8**
2003	1	(8,3%)			11	(91,7%)			**12**
2002					4	(100,0%)			**4**
2001	1	(6,3%)	1	(6,3%)	14	(87,5%)			**16**
2000	3	(17,6%)			14	(82,4%)			**17**
1999					29	(96,7%)	1	(3,3%)	**30**
1998					13	(100,0%)			**13**
1995					2	(100,0%)			**2**
1994					4	(100,0%)			**4**
Total	**7**	**(1,9%)**	**1**	**(0,3%)**	**362**	**(96,5%)**	**5**	**(1,3%)**	**375**

Table 4: Primary operations - Distal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2019					18	(100,0%)			**18**
2018					14	(100,0%)			**14**
2017					29	(100,0%)			**29**
2016					24	(100,0%)			**24**
2015					33	(100,0%)			**33**
2014					27	(100,0%)			**27**
2013					19	(100,0%)			**19**
2012					12	(100,0%)			**12**
2011					8	(100,0%)			**8**
2010					14	(100,0%)			**14**
2009					20	(95,2%)	1	(4,8%)	**21**
2008					9	(100,0%)			**9**
2007					15	(100,0%)			**15**
2006					32	(100,0%)			**32**
2005					15	(100,0%)			**15**
2004	4	(50,0%)			4	(50,0%)			**8**
2003	3	(25,0%)			9	(75,0%)			**12**
2002					3	(100,0%)			**3**
2001	1	(6,7%)			14	(93,3%)			**15**
2000	1	(5,9%)			16	(94,1%)			**17**
1999					30	(100,0%)			**30**
1998					13	(100,0%)			**13**
Total	**9**	**(2,3%)**			**378**	**(97,4%)**	**1**	**(0,3%)**	**388**

Wrist prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Motec Wrist	91	5	5	4	9	17	11	9	4	1	**156**
Biax	90										**90**
Remotion Wrist		3	3	10	13	13	8	6		1	**57**
Scheker Radio-ulnar	2		1	3	3	1	3	8	1	3	**25**
Elos[1]	23										**23**
Uhead (Druj)			3	2	2	1	2	4			**14**
Silastic ulnar head	7										**7**
Eclypse radio-ulnar	2										**2**
TMW	1										**1**
Total	**216**	**8**	**12**	**19**	**27**	**32**	**24**	**27**	**5**	**5**	**375**

Table 6: Primary operations - Distal

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Motec Wrist	91	5	5	4	9	17	11	9	4	1	**156**
Biax	89										**89**
Remotion Wrist		3	3	10	13	14	8	6		1	**58**
Scheker Radio-ulnar			1	3	3	1	3	8	1	3	**23**
Elos[1]	23										**23**
Uhead (Druj)			3	2	2	1	2	4			**14**
RCPI								2	3	8	**13**
Herbert UHP									6	5	**11**
TMW	1										**1**
Total	**204**	**8**	**12**	**19**	**27**	**33**	**24**	**29**	**14**	**18**	**388**

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
2019	1				1			2	1			5
2018	2	1					1	1				5
2017	3	5			1			3		1		13
2016		4	2	1		2		3	1			13
2015		2		1		1		1	1			6
2014		1						1		2		4
2013		1			1			2	1	1		6
2012					1			1				2
2011		2			1	1		2				6
2010										1		1
2009		2		1	1			2				6
2008		4	1			1		2		1		9
2007		5		1	1	1		2	1	2		13
2006	3	5				1						9
2005		2		1								3
2004	1	1			2	1		2				7
1994-03	1	4	1	1	4	1		6				18
Total	**11**	**39**	**4**	**6**	**13**	**9**	**1**	**30**	**5**	**8**	**0**	**125**

Revision reasons are not mutually exclusive. More than one reason for revision is possible

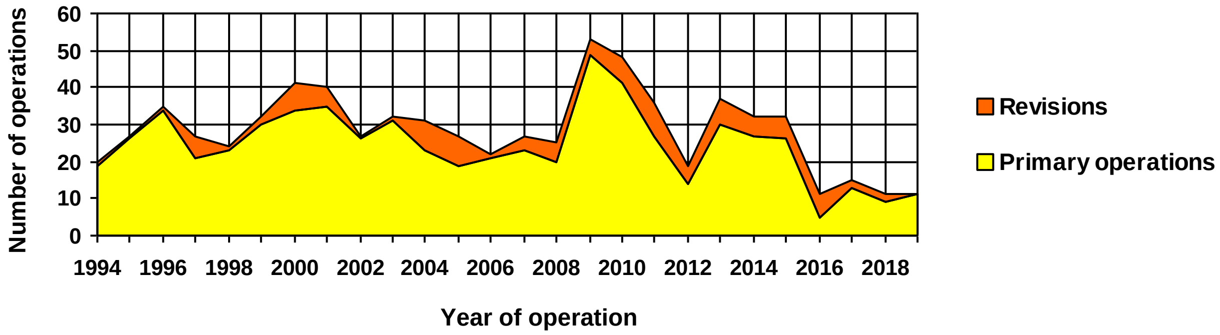
[1]Elos are 3 different development models of Motec Wrist. Motec Wrist was previously sold under the name Gibbon.

CARPOMETACARPAL PROSTHESES (CMC I)

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2019	11	(100,0%)			**11**
2018	9	(81,8%)	2	(18,2%)	**11**
2017	13	(86,7%)	2	(13,3%)	**15**
2016	5	(45,5%)	6	(54,5%)	**11**
2015	26	(81,3%)	6	(18,8%)	**32**
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	20	(80,0%)	5	(20,0%)	**25**
2007	23	(85,2%)	4	(14,8%)	**27**
2006	21	(95,5%)	1	(4,5%)	**22**
2005	19	(70,4%)	8	(29,6%)	**27**
2004	23	(74,2%)	8	(25,8%)	**31**
1994-03	279	(91,5%)	26	(8,5%)	**305**
Total	**637**	**(85,8%)**	**105**	**(14,2%)**	**742**

Figure 1: Annual number of operations



47,8 % of all operations were performed on the right side. 81,5 % performed in women. Mean age: 62,6 years.

Table 2: Carpometacarpal disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2019	9				2				
2018	9								
2017	13								
2016	3	2							
2015	24	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	17	3							
2007	17	6						1	
2006	15	4						2	
2005	16	2						1	
2004	21							2	
1994-03	190	77	2	4				12	
Total	**504**	**109**	**3**	**5**	**2**	**1**	**0**	**21**	**0**

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

Use of cement in carpometacarpal prostheses

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

Year	Cement with antibiotics		Cement without antibiotics	Uncemented		Missing		Total
2019				11	(100,0%)			**11**
2018				9	(100,0%)			**9**
2017				13	(100,0%)			**13**
2016				5	(100,0%)			**5**
2015				26	(100,0%)			**26**
2014				26	(96,3%)	1	(3,7%)	**27**
2013				30	(100,0%)			**30**
2012				14	(100,0%)			**14**
2011				27	(100,0%)			**27**
2006-10				148	(96,7%)	5	(3,3%)	**153**
2001-05	2	(1,5%)		132	(98,5%)			**134**
1994-00	1	(0,5%)		185	(98,9%)	1	(0,5%)	**187**
Total	**3**	**(0,5%)**		**626**	**(98,4%)**	**7**	**(1,1%)**	**636**

Carpometacarpal prostheses - Prosthesis brand

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

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Swanson Silastic Trapezium	325	9	6	8	8	4	2		1		**363**
Swanson Titanium Basal	72										**72**
Motec	38	15	2								**55**
Elektra	27	3	5	4	5	8	2				**54**
Motec II			1	18	14	14					**47**
ARPE							1	9	4		**14**
Moovis									4	7	**11**
Avanta Trapezium	7										**7**
Custom made	5										**5**
Pyrocardan										4	**4**
IVORY								4			**4**
Total	**474**	**27**	**14**	**30**	**27**	**26**	**5**	**13**	**9**	**11**	**636**

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
2018	2					1					
2017			1								
2016	3							1			
2015	4		1	1		1		3			
2014	2		2							1	
2013	3		4					1			
2012	4		1					1			
2011	7		2				1	5			
2010	4		2	1		1		3			
2009	1		2					1		1	
2008			2					4			
2007			1	3				1			
2006			1								
2005			3	1				6		1	
2004	1		3					6		1	
1994-03	1		11	2				13	1	6	1
Total	**32**	**0**	**36**	**8**	**0**	**3**	**1**	**45**	**1**	**10**	**1**

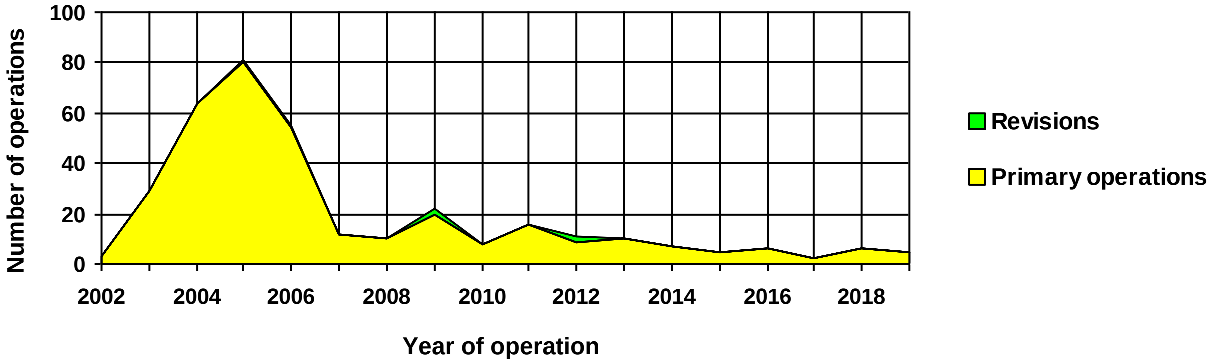
Revision reasons are not mutually exclusive. More than one reason for revision is possible

LUMBAR DISC PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2019	5	(100,0%)			**5**
2018	6	(100,0%)			**6**
2017	2	(100,0%)			**2**
2016	6	(100,0%)			**6**
2015	5	(100,0%)			**5**
2014	7	(100,0%)			**7**
2013	10	(100,0%)			**10**
2012	9	(81,8%)	2	(18,2%)	**11**
2011	16	(100,0%)			**16**
2010	8	(100,0%)			**8**
2009	20	(90,9%)	2	(9,1%)	**22**
2008	10	(100,0%)			**10**
2007	12	(100,0%)			**12**
2006	54	(98,2%)	1	(1,8%)	**55**
2005	80	(98,8%)	1	(1,2%)	**81**
2004	64	(100,0%)			**64**
2003	29	(100,0%)			**29**
2002	3	(100,0%)			**3**
Total	**346**	**(98,3%)**	**6**	**(1,7%)**	**352**

Figure 1: Annual number of operations



59,7 % performed in women. Mean age: 43,4 years.

Table 2: Back disease - Primary operations

Year	Idiopathic osteoarthritis	Sequelae after fracture	Spondylitis	Sequelae after prolapse surgery	Disc degeneration	Sequelae of infection	Other	Missing
2019					5			
2018	1				6			
2017					2			
2016	1				6			
2015					5			
2014			5		2			
2013				1	9			
2012					9			
2011			6		10			
2006-10	2		26	20	66		5	
2001-05	8	1	124	22	17	1	23	
Totalt	**12**	**1**	**161**	**43**	**137**	**1**	**28**	**0**

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

Use of cement in lumbar disc prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2019			5 (100,0%)		**5**
2018			6 (100,0%)		**6**
2017			2 (100,0%)		**2**
2016			6 (100,0%)		**6**
2015			5 (100,0%)		**5**
2014			7 (100,0%)		**7**
2013			10 (100,0%)		**10**
2012			9 (100,0%)		**9**
2011			16 (100,0%)		**16**
2006-10			104 (100,0%)		**104**
2001-05			176 (100,0%)		**176**
Total			**346 (100,0%)**		**346**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2019			5 (100,0%)		**5**
2018			6 (100,0%)		**6**
2017			2 (100,0%)		**2**
2016			6 (100,0%)		**6**
2015			5 (100,0%)		**5**
2014			7 (100,0%)		**7**
2013			10 (100,0%)		**10**
2012			9 (100,0%)		**9**
2011			16 (100,0%)		**16**
2006-10	3 (2,9%)		99 (95,2%)	2 (1,9%)	**104**
2001-05			176 (100,0%)		**176**
Total	**3 (0,9%)**		**341 (98,6%)**	**2 (0,6%)**	**346**

Lumbar disc prostheses - Prosthesis brand

Table 5: Primary operations - Proximal

Prostheses	2002-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Prodisc	218	16	9	10	7	5	6	2	1		**274**
Charité	62										**62**
BAGUERA L									3	5	**8**
Mobidisc L									2		**2**
Total	**280**	**16**	**9**	**10**	**7**	**5**	**6**	**6**	**6**	**5**	**346**

Table 6: Primary operations - Distal

Prostheses	2002-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Prodisc	218	16	9	10	7	5	6	2	1		**274**
Charité	62										**62**
BAGUERA L									3	5	**8**
Mobidisc L									2		**2**
Total	**280**	**16**	**9**	**10**	**7**	**5**	**6**	**6**	**6**	**5**	**346**

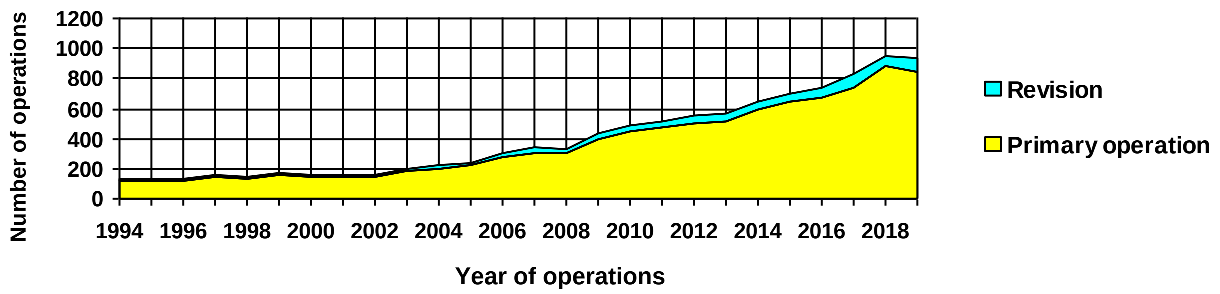
SHOULDER PROSTHESES

Table 1: Annual number of operations in shoulder prostheses

Year	Primary operations		Reoperations *		Revisions		Total
2019	842	(90,3%)	1	(0,1%)	89	(9,5%)	**932**
2018	877	(91,8%)			78	(8,2%)	**955**
2017	742	(89,6%)	1	(0,1%)	85	(10,3%)	**828**
2016	673	(90,3%)			72	(9,7%)	**745**
2015	644	(91,7%)			58	(8,3%)	**702**
2014	596	(92,5%)			48	(7,5%)	**644**
2013	517	(90,9%)	2	(0,4%)	50	(8,8%)	**569**
2012	500	(89,1%)	1	(0,2%)	60	(10,7%)	**561**
2011	481	(92,5%)			39	(7,5%)	**520**
1994-10	3 569	(91,3%)			342	(8,7%)	**3 911**
Total	**9 441**	**(91,1%)**	**5**	**(0,0%)**	**921**	**(8,9%)**	**10 367**

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

Figure 1: Annual number of operations - All prostheses



53,6 % of all operations were performed on the right side   70,1 % performed in women.   Mean age: 70 years.

Figure 2a: Prostheses - all operations

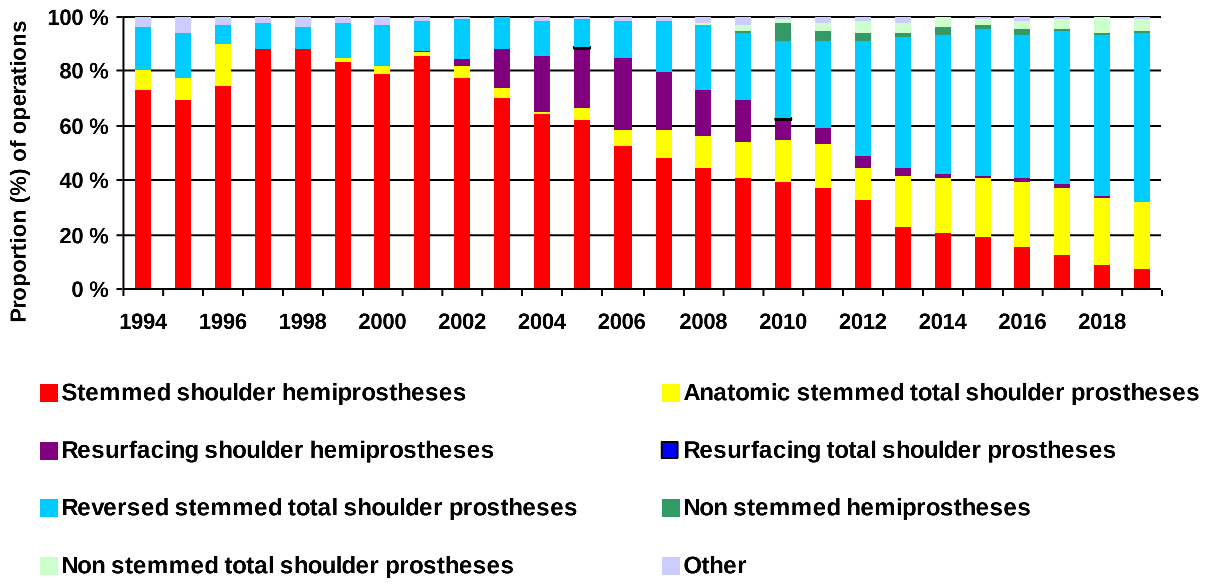


Figure 2b: Prostheses - Idiopathic osteoarthritis

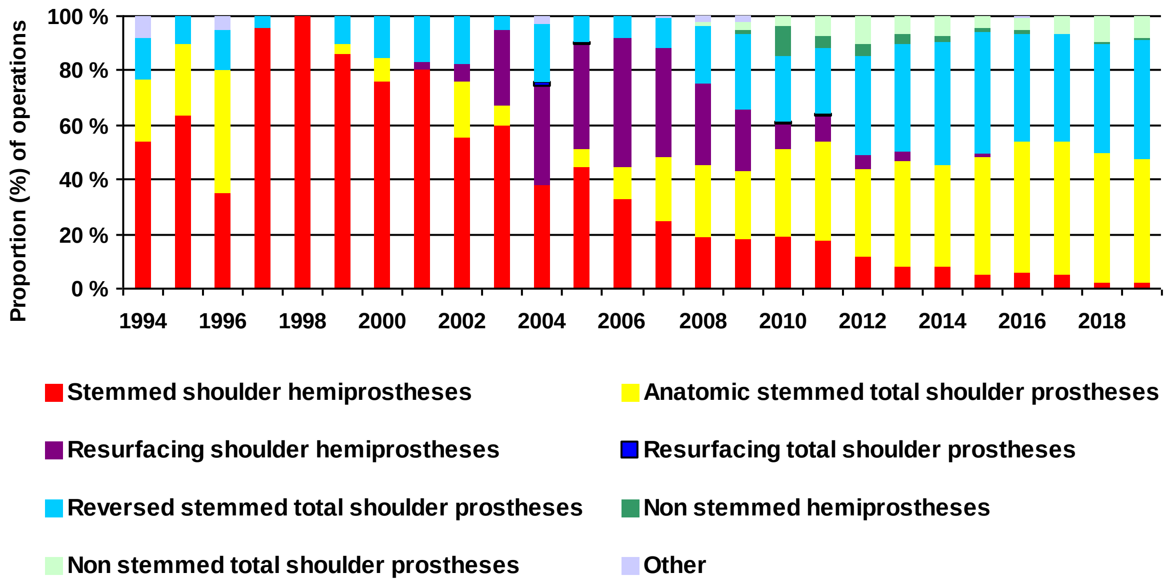


Figure 2c: Prostheses - Acute fracture

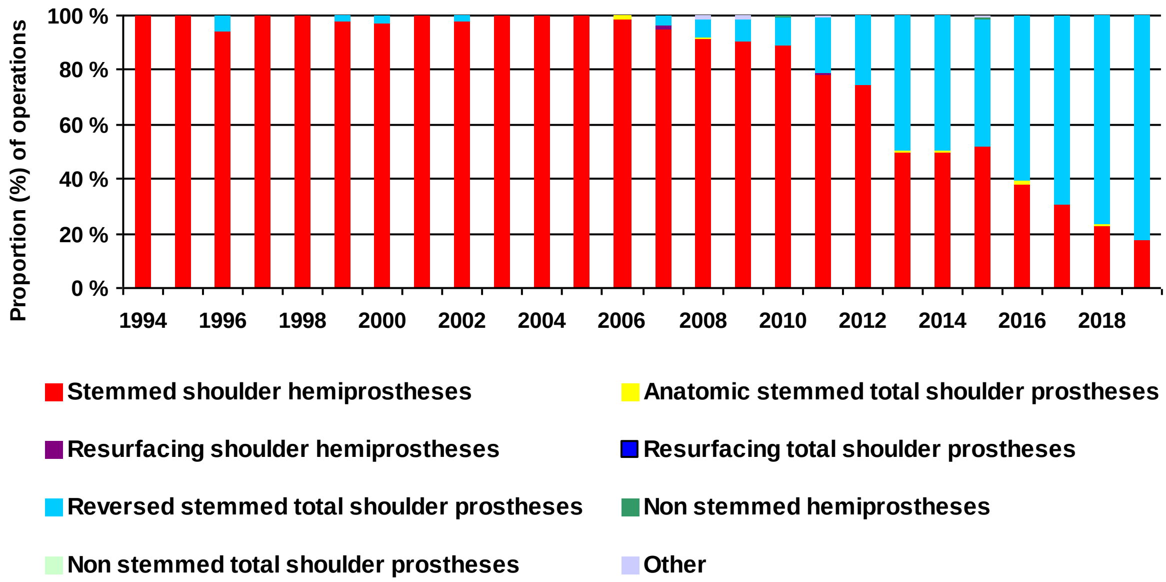


Figure 3: Age at the insertion of primary total prostheses

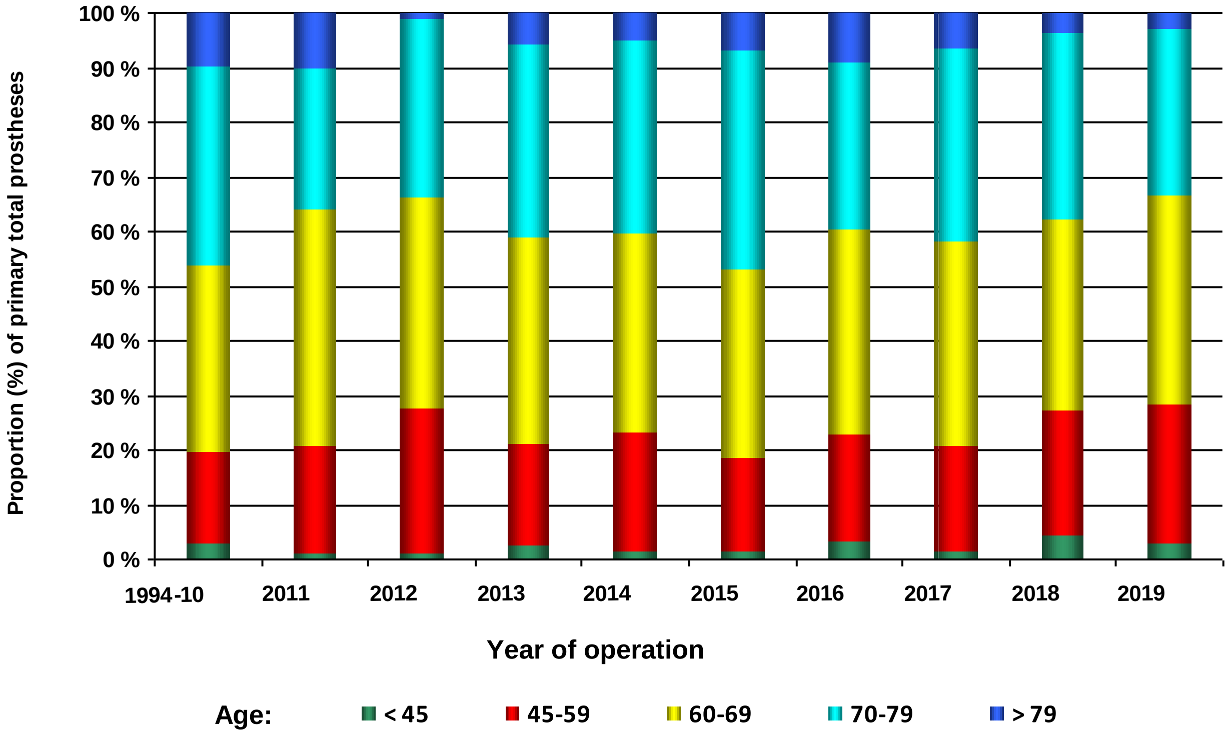


Figure 4: Age at the insertion of primary reversed total prostheses

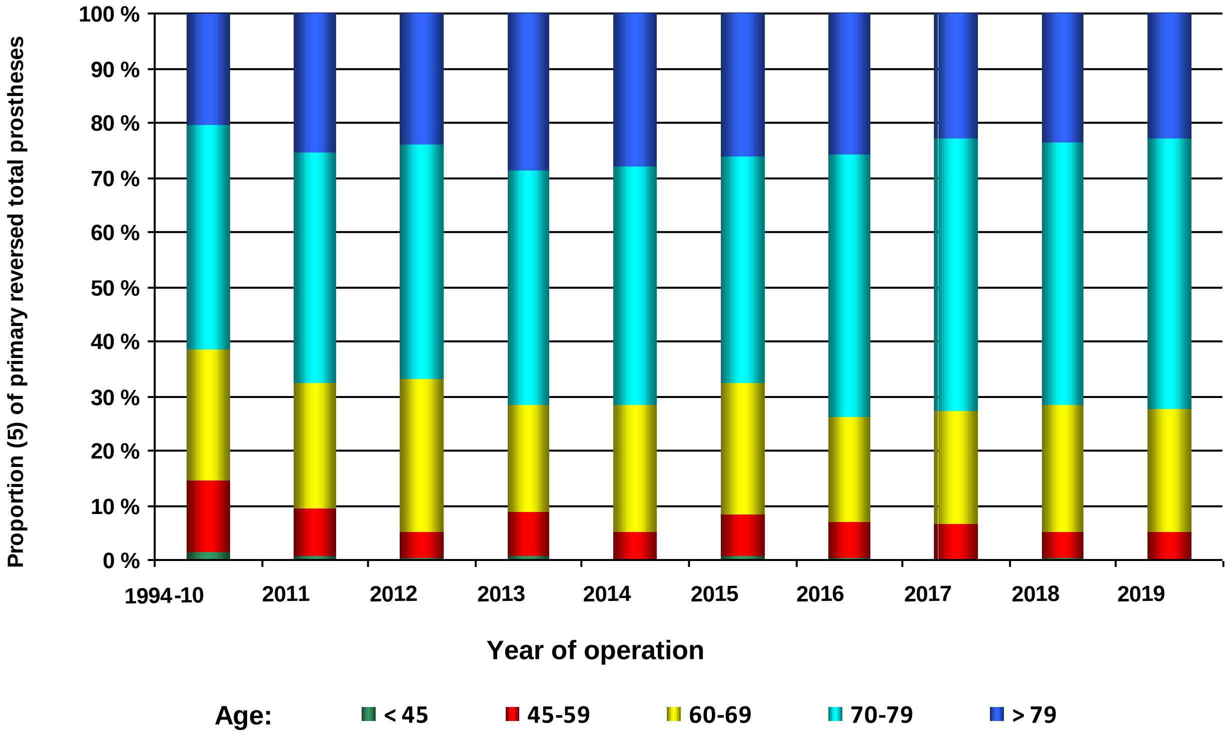


Figure 5: Age at the insertion of primary hemiprostheses

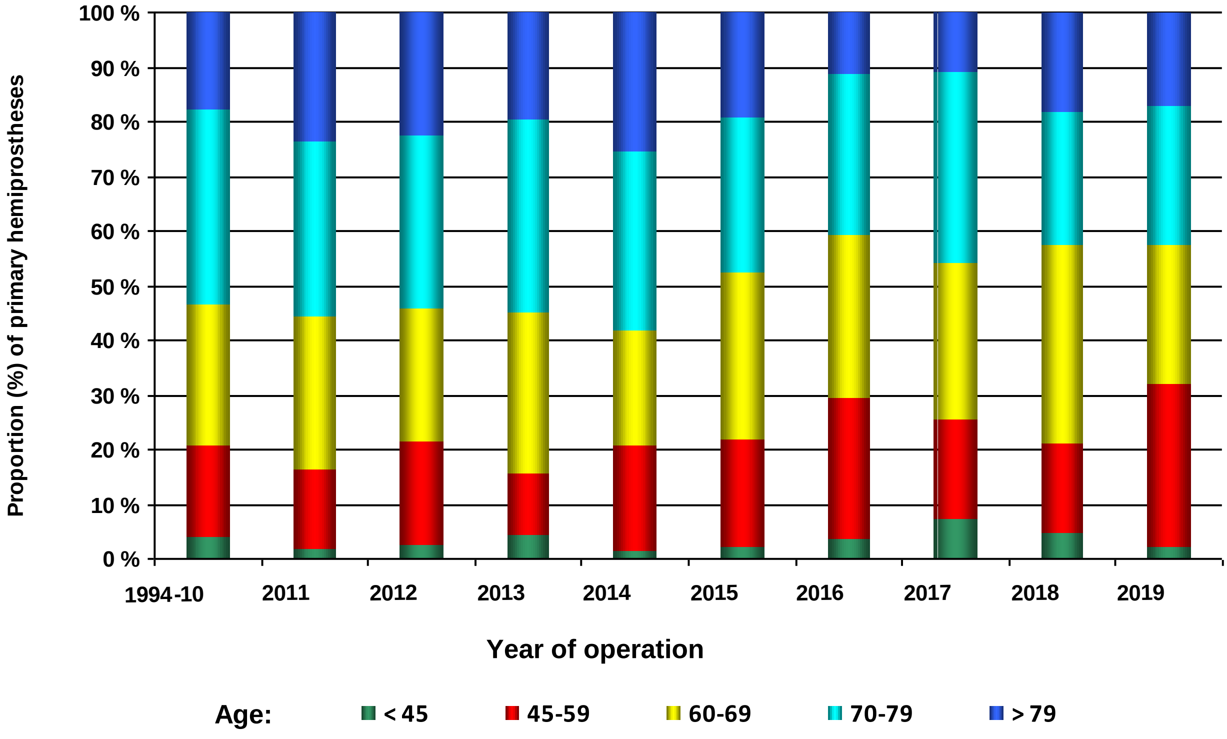


Table 2: Annual number of operations - Stemmed shoulder hemiprostheses

Year	Primary operations		Reoperations *		Revisions		Total
2019	46	(65,7%)			24	(34,3%)	**70**
2018	65	(76,5%)			20	(23,5%)	**85**
2017	83	(77,6%)	1	(0,9%)	23	(21,5%)	**107**
2016	95	(82,6%)			20	(17,4%)	**115**
2015	115	(85,8%)			19	(14,2%)	**134**
2014	123	(93,2%)			9	(6,8%)	**132**
2013	107	(85,6%)			18	(14,4%)	**125**
2012	164	(91,6%)			15	(8,4%)	**179**
2011	178	(92,7%)			14	(7,3%)	**192**
1994-10	2 180	(92,8%)			169	(7,2%)	**2 349**
Total	**3 156**	**(90,5%)**	**1**	**(0,0%)**	**331**	**(9,5%)**	**3 488**

* 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

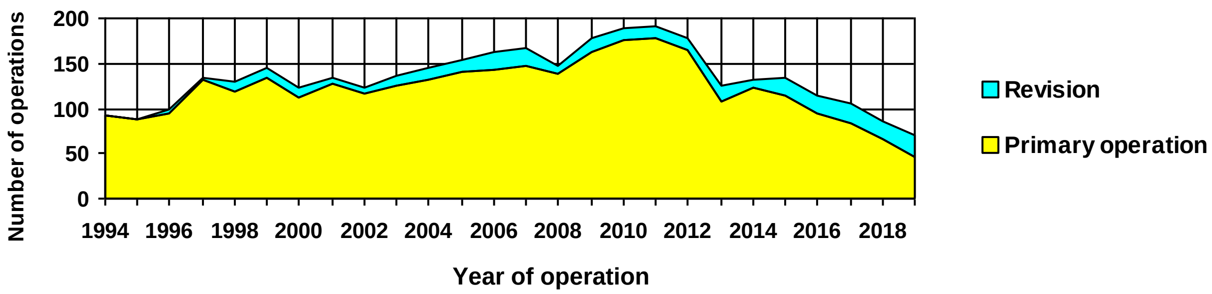


Table 3: Annual number of operations - Anatomic stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2019	208	(90,8%)	21	(9,2%)	**229**
2018	224	(94,9%)	12	(5,1%)	**236**
2017	190	(92,2%)	16	(7,8%)	**206**
2016	169	(91,8%)	15	(8,2%)	**184**
2015	141	(95,9%)	6	(4,1%)	**147**
2014	120	(91,6%)	11	(8,4%)	**131**
2013	101	(95,3%)	5	(4,7%)	**106**
2012	63	(94,0%)	4	(6,0%)	**67**
2011	80	(94,1%)	5	(5,9%)	**85**
1994-10	276	(87,3%)	40	(12,7%)	**316**
Total	**1 572**	**(92,1%)**	**135**	**(7,9%)**	**1 707**

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

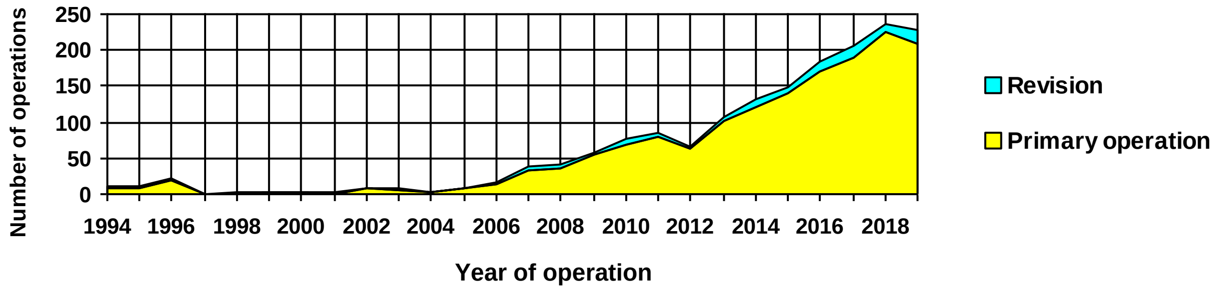


Table 4: Annual number of operations - Resurfacing shoulder hemiprostheses

Year	Primary operations		Revisions		Total
2019			3	(100,0%)	**3**
2018			9	(100,0%)	**9**
2017			10	(100,0%)	**10**
2016			11	(100,0%)	**11**
2015	3	(37,5%)	5	(62,5%)	**8**
2014			11	(100,0%)	**11**
2013	9	(52,9%)	8	(47,1%)	**17**
2012	11	(45,8%)	13	(54,2%)	**24**
2011	20	(71,4%)	8	(28,6%)	**28**
1994-10	395	(91,0%)	39	(9,0%)	**434**
Total	**438**	**(78,9%)**	**117**	**(21,1%)**	**555**

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

Year	Primary operations		Revisions		Total
2011	1	(100,0%)			**1**
1994-10	3	(75,0%)	1	(25,0%)	**4**
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
2019	548	(93,5%)	1	(0,2%)	37	(6,3%)	**586**
2018	536	(92,3%)	2	(0,3%)	43	(7,4%)	**581**
2017	440	(93,8%)			29	(6,2%)	**469**
2016	378	(95,0%)	1	(0,3%)	19	(4,8%)	**398**
2015	353	(92,4%)			29	(7,6%)	**382**
2014	309	(94,2%)			19	(5,8%)	**328**
2013	254	(95,1%)			13	(4,9%)	**267**
2012	217	(90,4%)	1	(0,4%)	22	(9,2%)	**240**
2011	161	(95,8%)			7	(4,2%)	**168**
1994-10	638	(90,6%)			66	(9,4%)	**704**
Total	**3 834**	**(93,0%)**	**5**	**(0,1%)**	**284**	**(6,9%)**	**4 123**

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

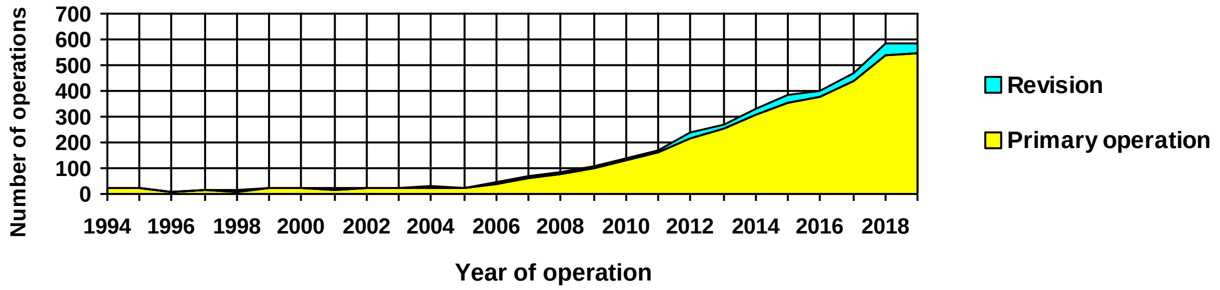


Table 7: Annual number of operations - Non stemmed hemiprostheses

Year	Primary operations		Revisions		Total
2019	1	(14,3%)	6	(85,7%)	**7**
2018	1	(16,7%)	5	(83,3%)	**6**
2017			4	(100,0%)	**4**
2016	13	(76,5%)	4	(23,5%)	**17**
2015	16	(72,7%)	6	(27,3%)	**22**
2014	23	(82,1%)	5	(17,9%)	**28**
2013	26	(100,0%)			**26**
2012	24	(82,8%)	5	(17,2%)	**29**
2011	21	(95,5%)	1	(4,5%)	**22**
1994-10	40	(100,0%)			**40**
Total	**165**	**(82,1%)**	**36**	**(17,9%)**	**201**

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

Year	Primary operations		Revisions		Total
2019	39	(92,9%)	3	(7,1%)	**42**
2018	50	(87,7%)	7	(12,3%)	**57**
2017	28	(90,3%)	3	(9,7%)	**31**
2016	18	(85,7%)	3	(14,3%)	**21**
2015	15	(75,0%)	5	(25,0%)	**20**
2014	21	(95,5%)	1	(4,5%)	**22**
2013	18	(100,0%)			**18**
2012	20	(80,0%)	5	(20,0%)	**25**
2011	16	(100,0%)			**16**
1994-10	19	(100,0%)			**19**
Total	**244**	**(90,0%)**	**27**	**(10,0%)**	**271**

Reasons for primary operations

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

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2019	8		2			36			2	
2018	9		7			48		4	5	
2017	17	3	10			52	1	1	7	
2016	16	1	9	1		64		2	3	
2015	14	2	15			85	1		5	
2014	20		15			89			3	
2013	19	1	7		1	78		2	3	
2012	20	3	13			126			4	
2011	33	4	27			116			2	
1994-10	406	455	444	16	7	838	8	6	86	10
Total	**562**	**469**	**549**	**17**	**8**	**1 532**	**10**	**15**	**120**	**10**

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

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

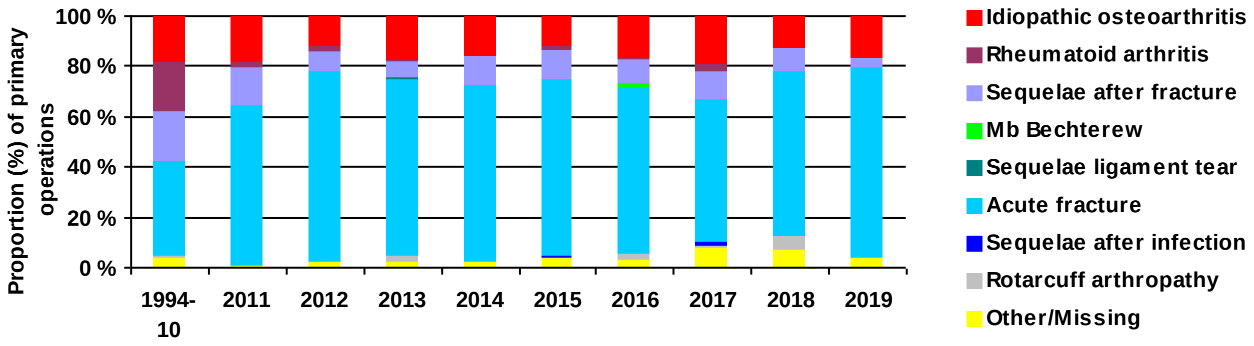


Table 10: Shoulder disease in primary operations - Anatomic stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2019	180	7	17		5		2	1	9	
2018	195	14	11	1	3	1		2	9	
2017	161	3	16		4				11	
2016	140	7	20		1	2	1		2	
2015	125	4	7		1		1		6	
2014	96	5	14		3				4	
2013	86	3	10		1	1	1			
2012	56	1	4		1				2	
2011	69	3	10				1			
1994-10	196	23	33	1	4	2	2		16	2
Total	**1 304**	**70**	**142**	**2**	**23**	**6**	**8**	**3**	**59**	**2**

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

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

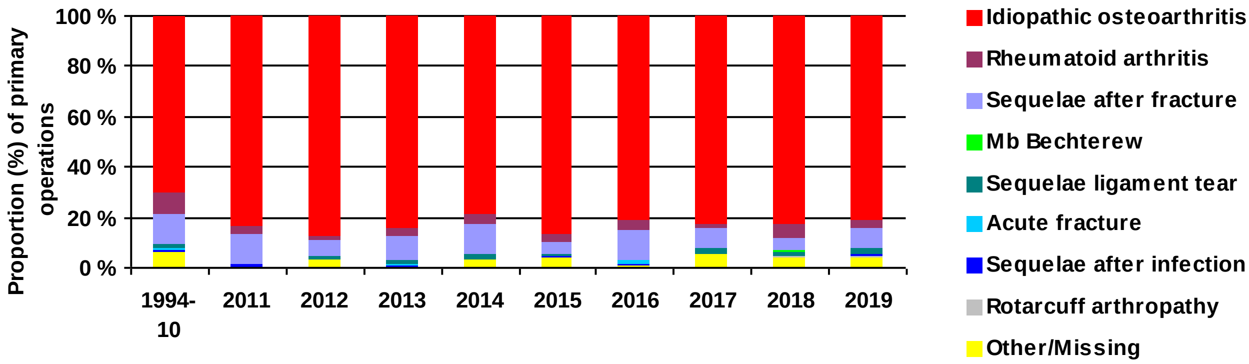


Table 11: Shoulder disease in primary operations - Resurfacing shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	3									
2013	8		1	1						
2012	9								2	
2011	18	1						1	1	
1994-10	256	93	33	3	5	1	3	4	16	3
Total	**294**	**94**	**34**	**4**	**5**	**1**	**3**	**5**	**19**	**3**

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

Figure 11:Shoulder disease in primary operations - Resurfacing shoulder hemiprostheses

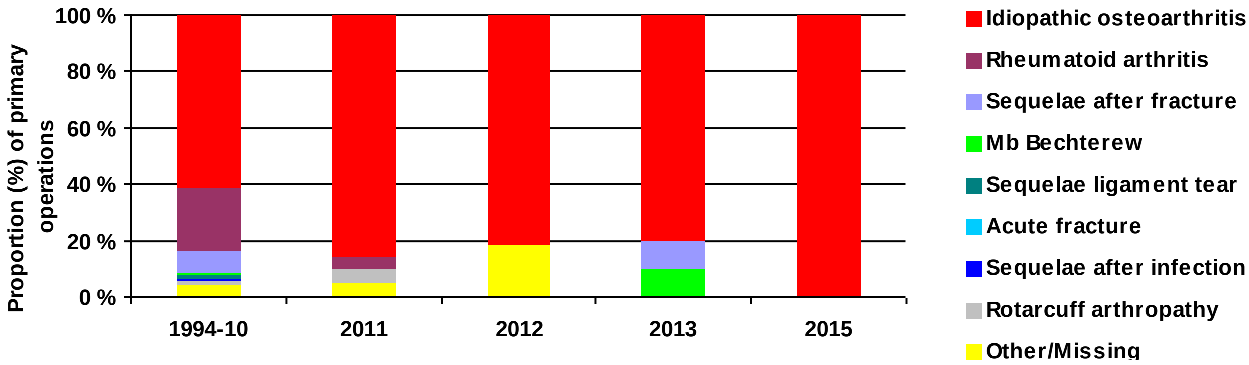


Table 12: Shoulder disease in primary operations - Resurfacing total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2011	1									
1994-10	3								1	
Total	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

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

Figure 12: Shoulder disease in primary operations - Resurfacing total shoulder prostheses

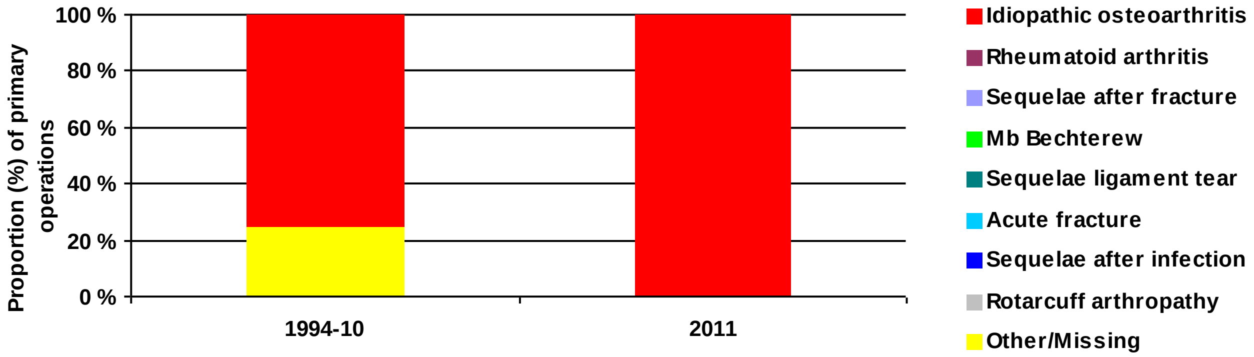


Table 13: Shoulder disease in primary operations - Reversed stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2019	173	19	87		10	167	2	125	26	
2018	165	31	81		16	163	5	124	22	
2017	134	34	73		8	115	2	123	20	
2016	119	29	62	2	13	102	2	82	14	
2015	126	30	63	1	17	78	4	60	19	
2014	117	24	45	2	18	88	2	39	12	
2013	87	26	37		15	78	1	24	4	
2012	61	19	50		24	44	4	33	10	
2011	46	21	30	1	9	30	1	35	9	1
1994-10	175	213	128	3	9	33	9	72	40	2
Total	**1 203**	**446**	**656**	**9**	**139**	**898**	**32**	**717**	**176**	**3**

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

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

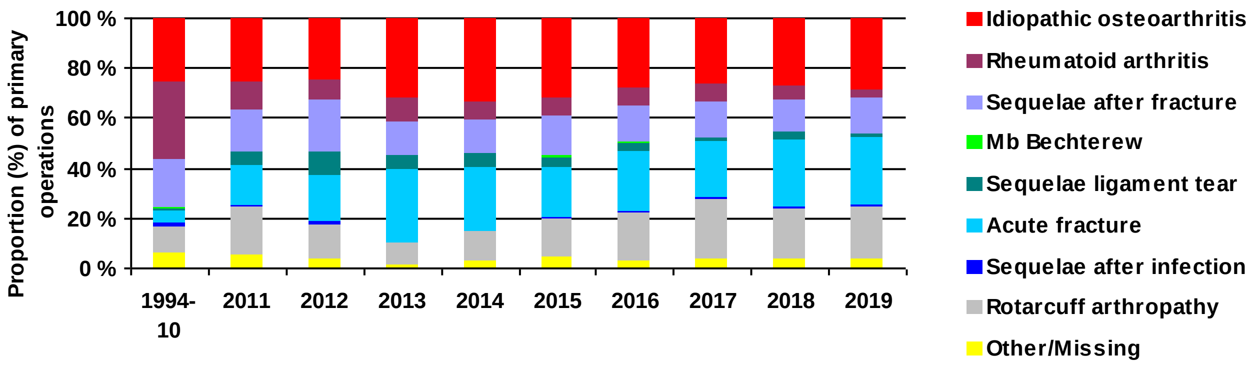


Table 14: Shoulder disease in primary operations - Non stemmed shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2019	1									
2018	1									
2016	7		5		1				1	
2015	13		3			1		1		
2014	16		2		1				4	
2013	23	1	2						2	
2012	16	3	3	2				1		
2011	13	6	2						1	
1994-10	26	3	9		1	1			4	
Total	**116**	**13**	**26**	**2**	**3**	**2**	**0**	**2**	**12**	**0**

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

Figure 14: Shoulder disease in primary operations - Non stemmed shoulder hemiprostheses

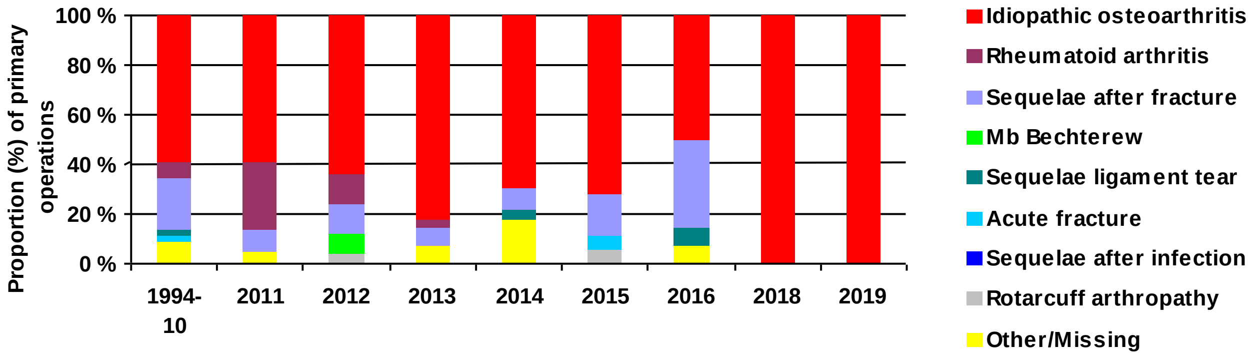
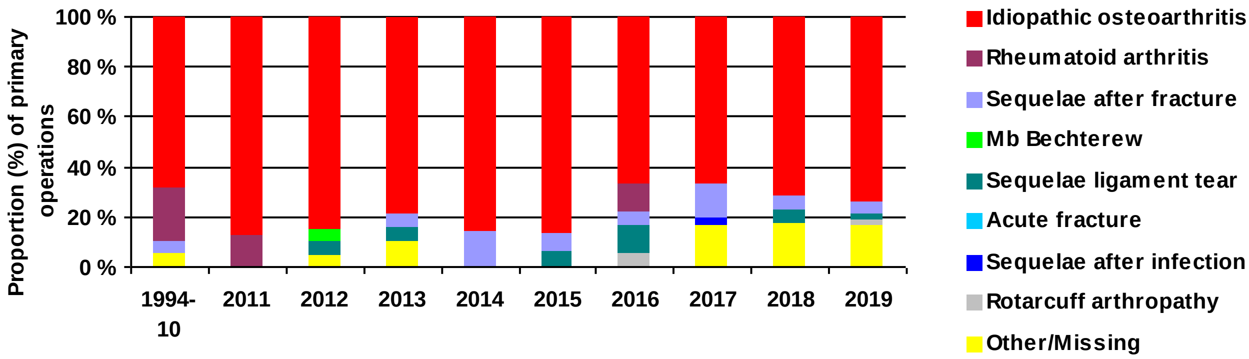


Table 15: Shoulder disease in primary operations - Non stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2019	31		2		1			1	7	
2018	37		3		3				9	
2017	20		4				1		5	
2016	12	2	1		2			1		
2015	13		1		1					
2014	18		3							
2013	15		1		1				2	
2012	17			1	1				1	
2011	14	2								
1994-10	13	4	1						1	
Total	**190**	**8**	**16**	**1**	**9**	**0**	**1**	**2**	**25**	**0**

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

Figure 15: Shoulder disease in primary operations - Non stemmed total shoulder prostheses



Use of cement in shoulder prostheses

Figure 16: Stemmed shoulder hemiprostheses - Primary operations - Humerus

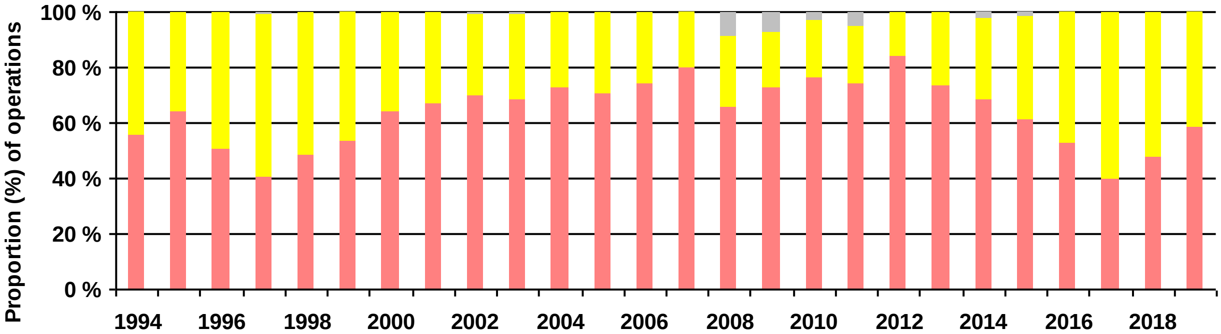


Figure 17: Anatomic stemmed total shoulder prostheses - Primary operations - Glenoid

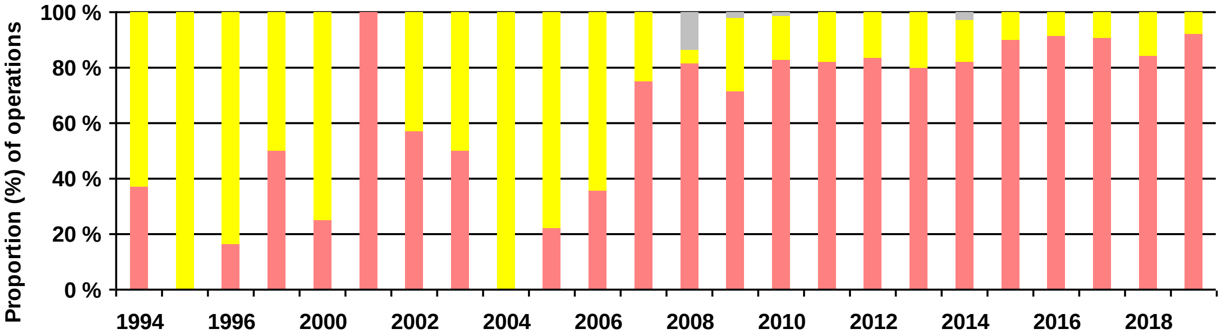


Figure 18: Anatomic stemmed total shoulder prostheses - Primary operations - Humerus

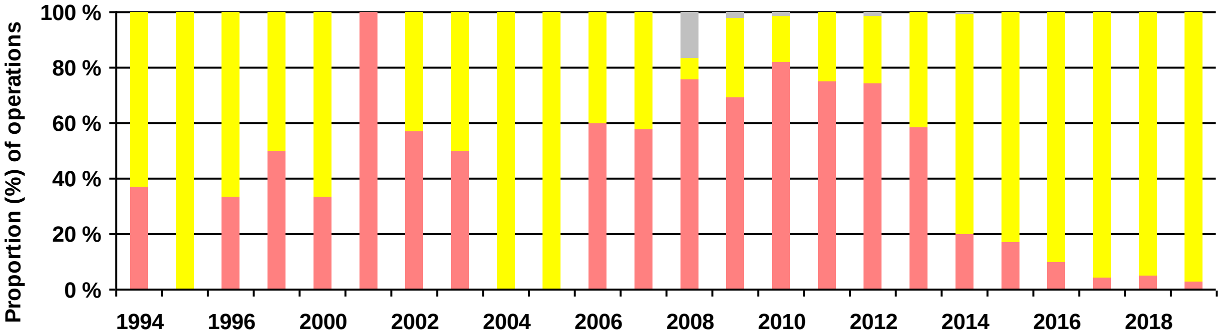


Figure 19: Resurfacing shoulder hemiprostheses - Primary operations - Humerus

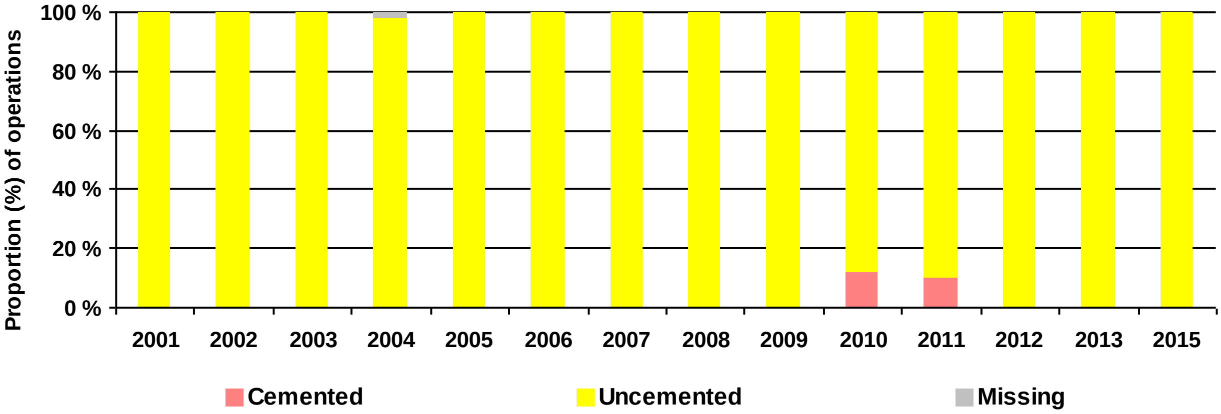


Figure 20: Resurfacing total shoulder prostheses - Primary operations - Glenoid

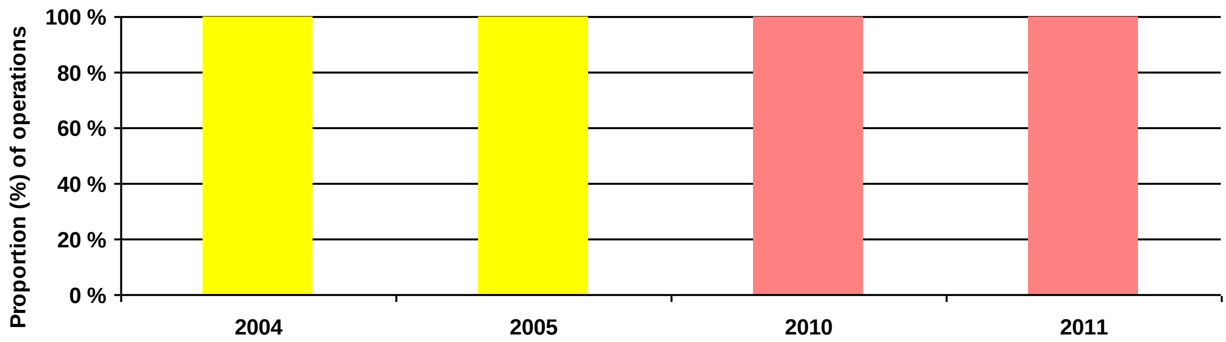


Figure 21: Resurfacing total shoulder prostheses - Primary operations - Humerus

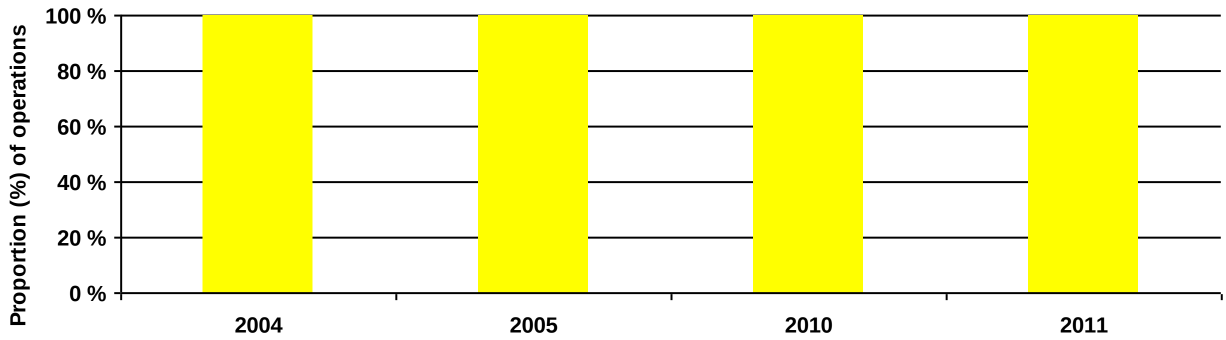


Figure 22: Reversed stemmed total shoulder prostheses - Primary operations - Glenoid

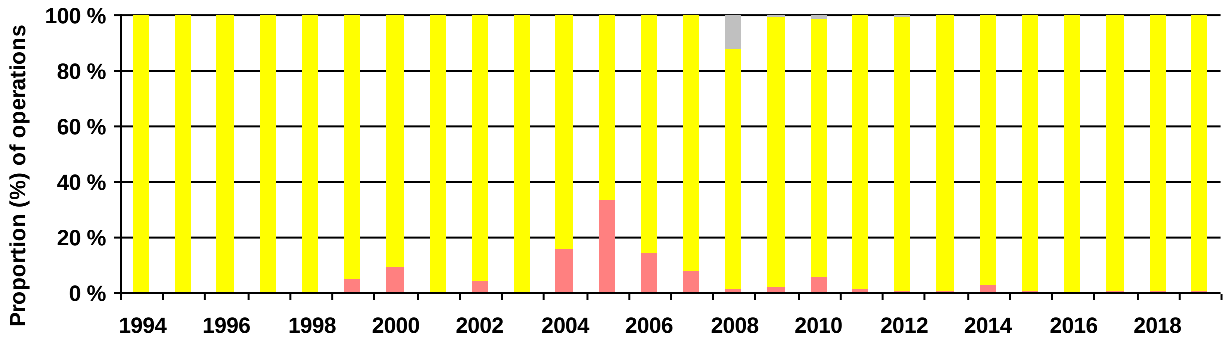


Figure 23: Reversed stemmed total shoulder prostheses - Primary operations - Humerus

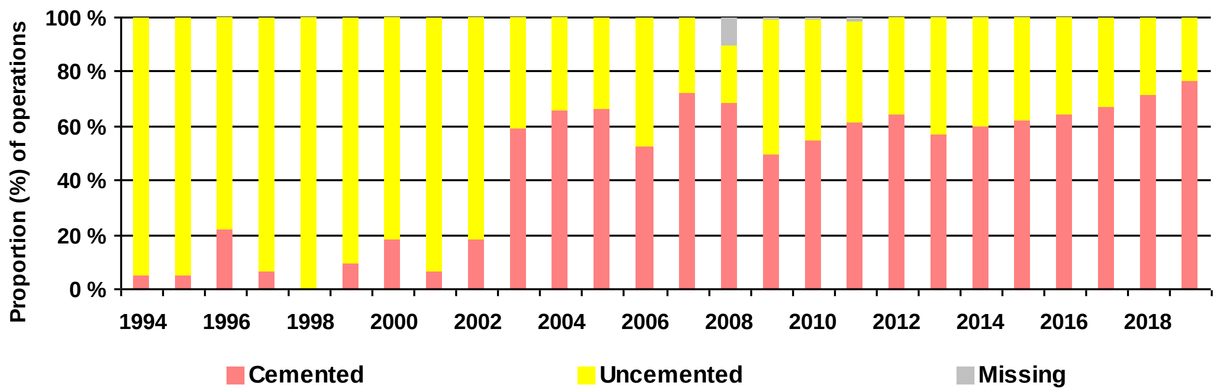


Figure 24: Non stemmed shoulder hemiprostheses - Primary operations - Humerus

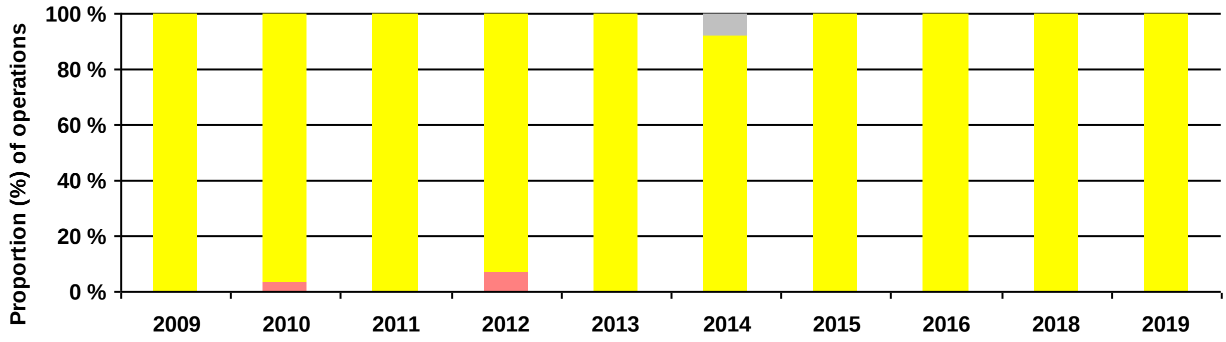


Figure 25: Non stemmed total shoulder prostheses - Primary operations - Glenoid

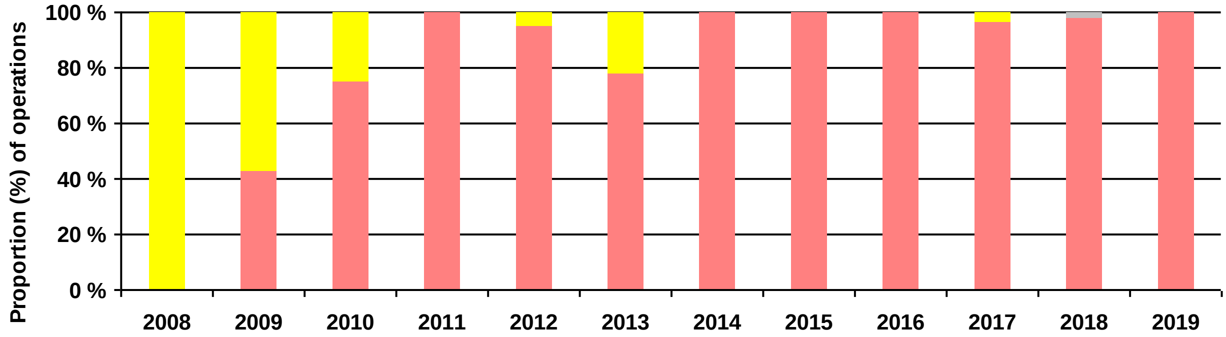
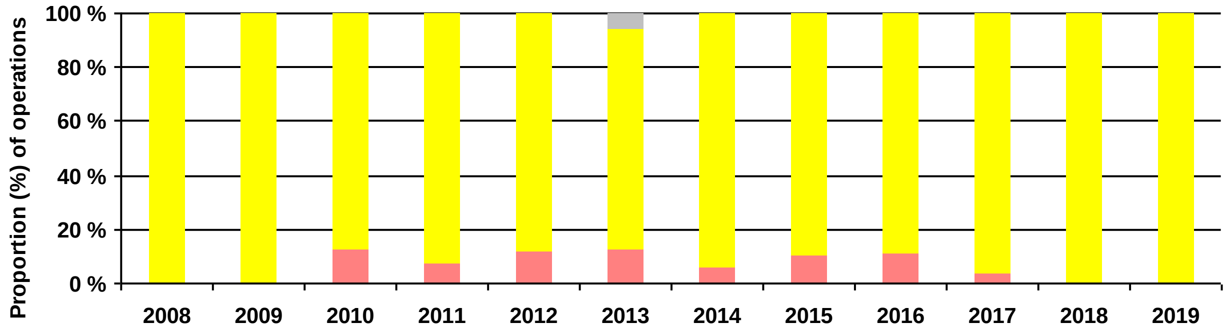


Figure 26: Non stemmed total shoulder prostheses - Primary operations - Humerus



Prosthesis brand

Stemmed hemiprostheses shoulder

Table 16: Primary operations- Caput humeri

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Bio - Modular	719	15	20	2	1	2			2		**761**
Global Advantage	492	66	44	36	40	34	15	1			**728**
Global Fx	124	47	50	17	16	13	11			1	**279**
Global	248										**248**
Nottingham	198	3	3								**204**
Global Unite			1		14	23	34	31	37	26	**166**
EPOCA	47	28	24	20	21	5					**145**
Delta I	63										**63**
Comprehensive			2	4	6	5	13	16	4	5	**55**
Promos standard			8	14	11	11	6	2			**52**
SMR- anatomic					1	2	7	13	11	8	**42**
Aequalis	25	7	5	5							**42**
Aequalis-Fracture	19	7	2	3	3	1	1	3	2		**41**
Nottingham 1	29	2	4	2							**37**
Aequalis Ascend Flex Anatomic				1	2	8	2	11	6	4	**34**
Modular	33										**33**
Bigliani/Flatow	24	3		2		1			1	1	**32**
JR-Vaios Anatomic				1	7	9	3	6	2	1	**29**
Other (n < 10)	7				1	1	3				**12**
Total	**2 028**	**178**	**163**	**107**	**123**	**115**	**95**	**83**	**65**	**46**	**3 003**

Table 17: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Bio - Modular	736	15	20	2	1	2			2		**778**
Global Advantage	309	60	41	35	38	33	15	1			**532**
Global Fx	308	53	54	18	18	14	11			1	**477**
Global	261										**261**
Nottingham	199	4	7								**210**
Global Unite			1		14	23	34	31	37	26	**166**
EPOCA	48	28	24	20	21	5					**146**
Delta I	64										**64**
Scan Shoulder	56										**56**
Promos standard			8	14	11	11	6	2			**52**
Neer II	47										**47**
Aequalis-Fracture	22	7	2	4	3	1	1	3	2		**45**
SMR- anatomic					1	2	7	13	11	8	**42**
Aequalis	22	7	5	4							**38**
Aequalis Ascend Flex Anatomic				1	2	8	2	11	6	4	**34**
Modular	33										**33**
Bigliani/Flatow	24	3		2		1			1	1	**32**
Nottingham 1	29	1		2							**32**
JR-Vaios Anatomic				1	7	9	3	6	2	1	**29**
Comprehensive Fracture	1		2	4	6	5	3	3	2	3	**29**
Comprehensive							10	13	2	2	**27**
Monosperical	14										**14**
Other (n < 10)	7				1	1	3				**12**
Total	**2 180**	**178**	**164**	**107**	**123**	**115**	**95**	**83**	**65**	**46**	**3 156**

Anatomic stemmed total shoulder prostheses

Table 18: Primary operations - Glenoid

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Global unite anatomic					3	82	100	130	136	140	**591**
Aequalis	122	52	34	37	3						**248**
Aequalis Ascend Flex Anatomic				12	68	15	30	25	25	10	**185**
Global	52	18	14	30	9	1					**124**
Comprehensive		2	3	2		1		10	24	41	**83**
Global Advantage	4			2	17	27	19	1			**70**
SMR- anatomic					1		4	11	27	15	**58**
Bio - Modular	50										**50**
JR-Vaios Anatomic				4	8	8	11	8	8	1	**48**
Promos standard			1	3	7	6	4	3	3		**27**
Bigliani/Flatow	11	2	4	1	2		1	2	1		**24**
Anatomical shoulder			5	8	2	1					**16**
Nottingham	13										**13**
Elos	13										**13**
Other (n < 10)	9	6	1							1	**17**
Total	**274**	**80**	**62**	**99**	**120**	**141**	**169**	**190**	**224**	**208**	**1 567**

Table 19: Primary operations - Caput humeri

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Global unite anatomic					3	82	100	130	135	139	**589**
Aequalis	122	52	35	37	6						**252**
Global Advantage	56	18	14	31	26	28	18	1			**192**
Aequalis Ascend Flex Anatomic				13	65	14	30	25	25	10	**182**
Comprehensive		2	3	2		1		10	24	41	**83**
SMR- anatomic					1		4	11	27	15	**58**
Bio - Modular	49										**49**
JR-Vaios Anatomic				4	8	8	11	8	8	1	**48**
Promos standard			1	4	7	6	4	3	3		**28**
Bigliani/Flatow	11	2	4	1	2		1	2	1		**24**
Anatomical shoulder			5	8	2	2					**17**
Nottingham	15										**15**
Other (n < 10)	10	6	1	1			1		1	2	**22**
Total	**263**	**80**	**63**	**101**	**120**	**141**	**169**	**190**	**224**	**208**	**1 559**

Table 20: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Global unite anatomic					3	82	100	130	135	139	**589**
Aequalis	122	52	35	37	6						**252**
Global Advantage	54	18	14	31	26	27	17	1			**188**
Aequalis Ascend Flex Anatomic				13	63	14	30	25	25	10	**180**
Comprehensive		2	3	2		1		10	24	41	**83**
SMR- anatomic					1		4	11	27	15	**58**
Bio - Modular	48										**48**
JR-Vaios Anatomic				3	8	8	11	8	8	1	**47**
Promos standard			1	4	7	6	4	3	3		**28**
Bigliani/Flatow	11	2	4	1	2		1	2	1		**24**
Anatomical shoulder			5	8	1	2					**16**
Nottingham	15										**15**
Other (n < 10)	9	5	1	2	2	1	2		1	2	**25**
Total	**259**	**79**	**63**	**101**	**119**	**141**	**169**	**190**	**224**	**208**	**1 553**

Resurfacing shoulder hemiprostheses

Table 21: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Copeland	296	4	4								**304**
Global C.A.P.	74	11	4	2		2					**93**
EPOCA Resurfacing	5	4	2	7		1					**19**
Aequalis Resurfacing	13	1	1								**15**
Other (n < 10)	7										**7**
Total	**395**	**20**	**11**	**9**	**0**	**3**	**0**	**0**	**0**	**0**	**438**

Resurfacing total shoulder prostheses

Table 22: Primary operations - Glenoid

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Copeland	2										**2**
Aequalis Resurfacing	1	1									**2**
Total	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**

Table 23: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Copeland	2										**2**
Aequalis Resurfacing	1	1									**2**
Total	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**

Reversed stemmed total shoulder prostheses

Table 24: Primary operations - Glenoid

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Delta Xtend	219	114	147	142	181	222	245	304	394	411	**2 379**
Delta III	314										**314**
Tess Reversed	76	28	32	30	38	39	28	22	3		**296**
Aequalis Ascend Flex Reversed				17	38	47	40	32	33	20	**227**
SMR-reverse					2	3	11	31	51	47	**145**
Comprehensive Reverse		1	1	1	4	8	29	22	20	43	**129**
Aequalis Reversed II		1	18	37	11	13	5	8	19	17	**129**
Promos Reverse		9	11	17	21	14	17	11	9		**109**
JRI-Vaios Inverse				9	5	4	3	5	5	6	**37**
Aequalis-Reversed	23	7	2								**32**
Trebecular Metal Reverse Shou	3	1	1	1	3	2		2			**13**
Anatomical shoulder Reversed			5		5						**10**
Other (n < 10)					1	1				2	**4**
Total	**635**	**161**	**217**	**254**	**309**	**353**	**378**	**437**	**534**	**546**	**3 824**

Table 25: Primary operations - Caput humeri

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Delta Xtend	221	115	147	142	181	222	245	307	396	413	**2 389**
Delta III	307										**307**
Tess Reversed	75	27	32	30	38	39	28	22	3		**294**
Aequalis Ascend Flex Reversed				17	41	44	34	32	31	26	**225**
SMR-reverse					2	4	11	31	51	48	**147**
Comprehensive Reverse		1	1	1	4	8	29	22	20	43	**129**
Promos Reverse		9	11	17	21	14	17	11	9		**109**
Aequalis Reversed Fracture			3	16	8	16	11	8	21	12	**95**
Aequalis-Reversed	20	8	10	13							**51**
JRI-Vaios Inverse				9	5	4	3	5	5	6	**37**
Aequalis Reversed II			6	8							**14**
Trebecular Metal Reverse Shou	3	1	1		3	2		2			**12**
Anatomical shoulder Reversed			5		5						**10**
Other (n < 10)					1						**1**
Total	**626**	**161**	**216**	**253**	**309**	**353**	**378**	**440**	**536**	**548**	**3 820**

Table 26: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Delta Xtend	219	115	147	142	182	222	245	304	394	411	**2 381**
Delta III	315										**315**
Tess Reversed	76	27	32	30	38	39	28	22	3		**295**
Aequalis Ascend Flex Reversed				17	41	44	34	32	31	26	**225**
SMR-reverse					2	4	11	31	51	48	**147**
Comprehensive Reverse		1	1	1	4	8	27	21	19	33	**115**
Promos Reverse		9	11	17	21	14	17	11	9		**109**
Aequalis Reversed Fracture			3	16	8	16	11	8	21	12	**95**
Aequalis-Reversed	23	8	12	19							**62**
JRI-Vaios Inverse				9	5	4	3	5	5	6	**37**
Trebecular Metal Reverse Shou	3	1	1	1	3	2		2			**13**
Comprehensive Fracture							2	1	1	9	**13**
Anatomical shoulder Reversed			5		5						**10**
Other (n < 10)	2		5	2				3	2	3	**17**
Total	**638**	**161**	**217**	**254**	**309**	**353**	**378**	**440**	**536**	**548**	**3 834**

Non stemmed shoulder hemiprostheses

Table 27: Primary operations - Caput humeri

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Tess-Anatomic	35	16	13	7	7	3	6				**87**
ECLIPSE TM	5	5	10	15	10	11	3				**59**
Simpliciti			1	3	4		1		1	1	**11**
Other (n < 10)				1	2	2	3				**8**
Total	**40**	**21**	**24**	**26**	**23**	**16**	**13**	**0**	**1**	**1**	**165**

Table 28: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Tess-Anatomic	35	16	13	7	7	3	6				**87**
Simpliciti			1	3	4		1		1	1	**11**
Other (n < 10)				1	2	2	3				**8**
Total	**35**	**16**	**14**	**11**	**13**	**5**	**10**	**0**	**1**	**1**	**106**

Non stemmed total shoulder prostheses

Table 29: Primary operations - Glenoid

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Aequalis Ascend Flex Anatomic					13	7	12	13	24	11	**80**
Tess-Anatomic	18	14	7	3	3	3	4	2	3		**57**
Global unite anatomic								9	16	24	**49**
ECLIPSE TM		2	3	2	4	5		2	1	2	**21**
Simpliciti			10	10							**20**
Other (n < 10)				3	1		2	1	1		**8**
Total	**18**	**16**	**20**	**18**	**21**	**15**	**18**	**27**	**45**	**37**	**235**

Table 30: Primary operations - Caput humeri

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Simpliciti			10	12	13	7	12	13	24	11	**102**
Tess-Anatomic	19	14	7	4	3	3	4	2	3		**59**
Global Icon								10	21	26	**57**
ECLIPSE TM		2	3	2	4	5		2	1	2	**21**
Other (n < 10)					1		2	1	1		**5**
Total	**19**	**16**	**20**	**18**	**21**	**15**	**18**	**28**	**50**	**39**	**244**

Table 31: Primary operations - Humerus

Prostheses	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Simpliciti			10	12	14	7	12	13	24	11	**103**
Tess-Anatomic	19	14	7	4	3	3	4	2	3		**59**
Global Icon								9	16	24	**49**
Other (n < 10)							2	2	6	2	**12**
Total	**19**	**14**	**17**	**16**	**17**	**10**	**18**	**26**	**49**	**37**	**223**

Reasons for revisions

Table 32: Stemmed shoulder hemiprostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2019		2	1			1	2	8		9	
2018		1		2		2		7		5	
2017			2	2		2	2	9		10	
2016		1	1	1				7		6	
2015			1	3		1		8		5	
2014			2	1				6		2	
2013		1	2	5		1	1	10		2	
2012		2	3	1			2	4		3	1
2011			2	2		1		5		2	
2010		3	2	1		1	1	8		5	
2009				1		2	1	6		1	
2008				2		1		4		2	1
2007		1	1	2		1		10		2	2
2006		2		4		1	2	9		3	
2005				1	1	1		4		4	
2004		1	5	2				5		4	
1994-03		4	6	3		4	2	36		14	1
Total	**0**	**18**	**28**	**33**	**1**	**19**	**13**	**146**	**0**	**79**	**5**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 33: Anatomic stemmed total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2019	3	2	1	5		2	1	3	2	7	
2018			2	3	1			1	1	5	
2017	4		2	4			1	2		5	
2016	3	1		1		3		2		1	
2015								3		1	
2014	2			4	1		1	3		3	
2013	1					1		1	1		
2012				1				1	1		
2011	1	1	2					1			
2010			1	2						1	
2009			1								
2008								1	3		
2007	1		1						2		
2006			1								
2004	1										
1994-03	3		5			1		4		2	
Total	**19**	**4**	**16**	**20**	**2**	**7**	**3**	**22**	**10**	**25**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 34: Resurfacing shoulder hemiprostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2019		1					1	2			
2018							1	5		3	
2017				1				6			
2016		3		1				7		2	
2015		2						1		1	
2014		1		1			1	9		2	
2013		1						7		1	
2012		1	1	2		1		5		3	
2011					1			5		5	
2010								8		1	
2009								9		2	
2008		2		1				11		2	
2007			1			1		2	1	1	
2006		1		1		1		2			
2005		1						1			
Total	**0**	**13**	**2**	**7**	**1**	**3**	**3**	**80**	**1**	**23**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 35: Resurfacing total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2005			1	1							
Total	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 36: Reversed stemmed total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
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	7	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		1	
2013	3	2	3	1		3		1		1	
2012	4	4	6	1		5			2	2	
2011	1		2	1			3				
2010	3	1	2	1		1	1			2	
2009	2	1				2				1	
2008	1		3		1						
2007	2	1	2	2		3		1			
2006			1	1					1		
2005	1	1						1			
2004	4	3	3	1						3	
1994-03	7	1	1	1		5	1	2		1	
Total	**39**	**26**	**56**	**17**	**4**	**50**	**19**	**21**	**10**	**16**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 37: Non stemmed shoulder hemiprostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2019		1		2				2		1	
2018		1						1		2	
2017								3			
2016							1	3		2	
2015								3		2	
2014		1						4		1	
2012			1			2		1		1	
2011										1	
Total	**0**	**3**	**1**	**2**	**0**	**2**	**1**	**17**	**0**	**10**	**0**

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 38: Non stemmed total shoulder prostheses

Year of revision	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2019	1							1	1		
2018	3			1		1		1	1	3	
2017	1		1							1	
2016								1		1	
2015	2			1		2					
2014	1							1			
2012	2					1		1			
Total	**10**	**0**	**1**	**2**	**0**	**4**	**0**	**5**	**2**	**5**	**0**

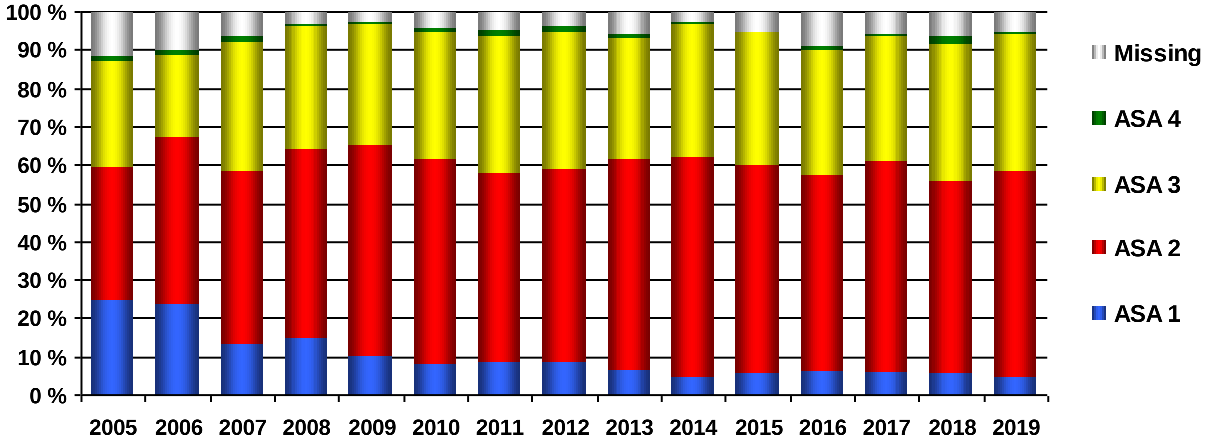
Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

ASA classification all shoulder prostheses

Table 39: Primary operations

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2019	38	453	302	6		43	**842**
2018	49	442	313	20		53	**877**
2017	45	409	243	4		41	**742**
2016	41	347	220	7		58	**673**
2015	37	349	223	3		32	**644**
2014	28	343	207	4		14	**596**
2013	36	283	163	5		30	**517**
2012	44	252	177	8		19	**500**
2011	42	236	174	6		23	**481**
2010	36	240	147	6		18	**447**
2009	41	215	123	3		10	**392**
2008	46	148	97	2		9	**302**
2007	41	140	104	4		20	**309**
2006	66	121	60	4		27	**278**
2005	56	79	62	3		26	**226**

Figure 27: 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.

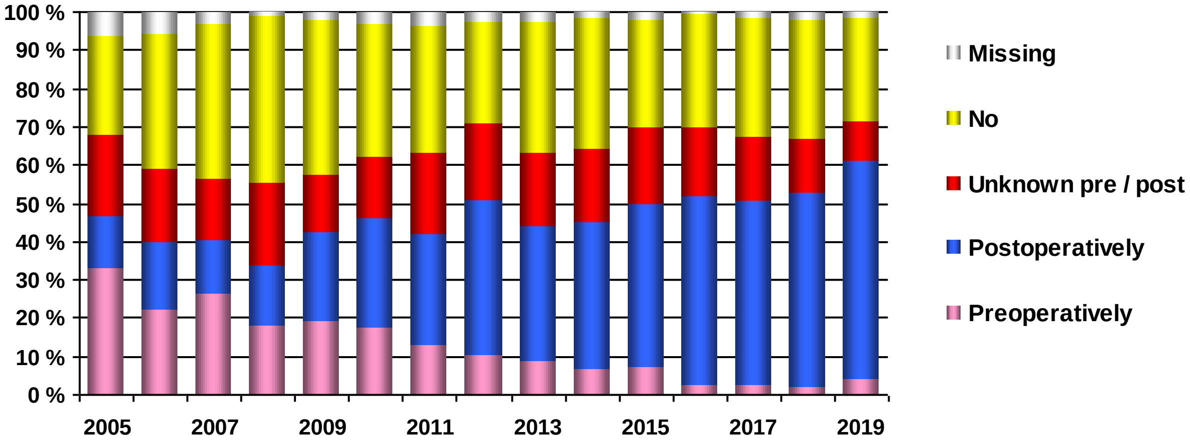
Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 40: Primary operations

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2019	33	480	88	228	13	**842**
2018	18	444	122	273	20	**877**
2017	18	360	123	229	12	**742**
2016	18	329	123	198	5	**673**
2015	46	276	129	180	13	**644**
2014	40	230	113	205	8	**596**
2013	46	183	99	176	13	**517**
2012	52	201	101	134	12	**500**
2011	62	141	100	160	18	**481**
2010	78	128	72	155	14	**447**
2009	75	92	58	159	8	**392**
2008	54	47	67	131	3	**302**
2007	82	43	50	125	9	**309**
2006	62	49	53	98	16	**278**
2005	75	30	48	59	14	**226**

Figure 28: Primary operations



Registration of thrombosis prophylaxis started in 2005

Previous operation in relevant joint

Table 41: For primary total prostheses

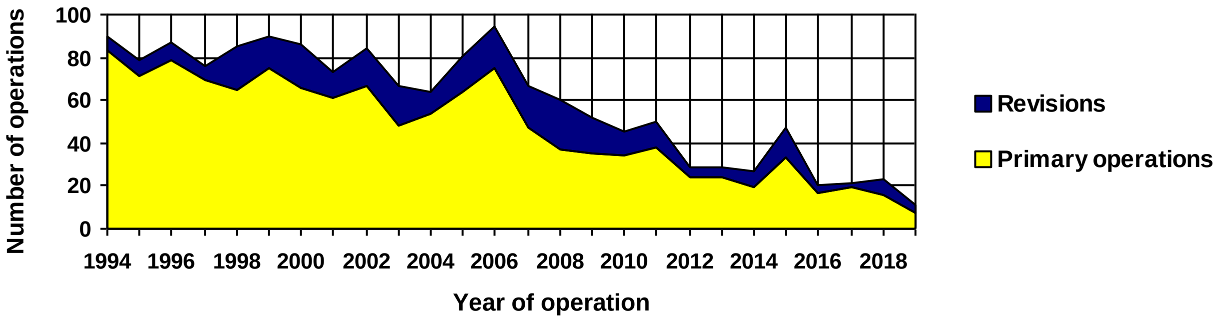
Type	1994-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Osteosynthesis of intraarticular joint fracture	236	23	35	24	30	37	46	54	46	47	578
Synovectomy	118	12	7	9	6	5	5	7	9	4	182
"Shaving"/Cleanup (Debridement)	7	4		2	1		1	5	3		23
Osteotomy	8			2	1	1	4	1	3	1	21
Ligament	1	1				1	2	6			11
Artrodesis	3						1	1		1	6
Other previous op.	177	33	49	45	59	54	68	84	145	91	805

TOE JOINT PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
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	(70,1%)	20	(29,9%)	**67**
2006	75	(79,8%)	19	(20,2%)	**94**
2005	64	(79,0%)	17	(21,0%)	**81**
2004	54	(84,4%)	10	(15,6%)	**64**
1994-03	684	(83,7%)	133	(16,3%)	**817**
Total	**1 227**	**(79,8%)**	**310**	**(20,2%)**	**1 537**

Figure 1: Annual number of operations



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

Table 2: Toe disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2019	7								
2018	11	3	1					1	
2017	14	3						2	
2016	14	3						1	
2015	22	5	2					4	
2014	10	9							
2013	11	11	1					1	
2012	15	9							
2011	18	16						4	
2010	13	20	1	1	1	1	1	8	
2009	12	20		1				2	
2008	6	29						2	
2007	13	28		1				4	1
2006	21	46	2					8	
2005	31	22	9				1	10	
2004	13	37						5	
1994-03	59	580	4	7	1			35	3
Total	**290**	**841**	**20**	**10**	**2**	**1**	**2**	**87**	**4**

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

Use of cement in toe joint prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics		Cement without antibiotics	Uncemented		Missing		Total
2019				7	(100,0%)			**7**
2018				16	(100,0%)			**16**
2017				19	(100,0%)			**19**
2016				17	(100,0%)			**17**
2015				32	(97,0%)	1	(3,0%)	**33**
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%)		64	(97,0%)			**66**
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				81	(97,6%)	2	(2,4%)	**83**
Total	**6**	**(0,5%)**		**1 212**	**(98,9%)**	**8**	**(0,7%)**	**1 226**

Table 4: Primary operations - Distal

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

Toe joint prostheses

Table 5: Primary operations - Proximal

Prostheses	2002-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Silastic HP 100	853	22	14	13	11	11	5	6	4		**939**
LPT	41	14	9	10	8	20	12		6	6	**126**
Toefit-plus	47	2	1	1		1					**52**
Sutter	26										**26**
Biomet Total Toe	25										**25**
Moje	18										**18**
LaPorta	14										**14**
Epyc						1		10			**11**
HAPY								3	6		**9**
Swanson Titanium	5										**5**
CARTIVA										1	**1**
Total	**1 029**	**38**	**24**	**24**	**19**	**33**	**17**	**17**	**16**	**7**	**1 226**

Table 6: Primary operations - Distal

Prostheses	2002-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Toefit-plus	47	2	1	1		1					**52**
Biomet Total Toe	25										**25**
Moje	18										**18**
Total	**90**	**2**	**1**	**1**	**0**	**1**	**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	Other	Missing
2019		1						3		1	
2018					3	1	1	3	3	3	
2017	1							1		1	
2016								1			
2015				1	3			2	5	2	
2014		1		1	2			1	2		
2013					1			3	2		
2012								2		3	
2011					1			2	1	2	
2010		2			1	2		3	2	3	
2009					2	2		6	2	3	
2008				2	9			13	1	6	
2007	2	2	2	1	3	2	1	9		4	
2006		1		1	4	2		10	1	6	1
2005	1	1	1		6	2		5	1	4	2
2004					2			5		6	
1994-03	1	13	2	9	32	15	2	52	2	41	5
Total	**5**	**21**	**5**	**15**	**69**	**26**	**4**	**121**	**22**	**85**	**8**

Revision reasons are not mutually exclusive. More than one reason for revision is possible

Completeness of reporting analysis for the Elbow Arthroplasty Register, 2017-2018

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

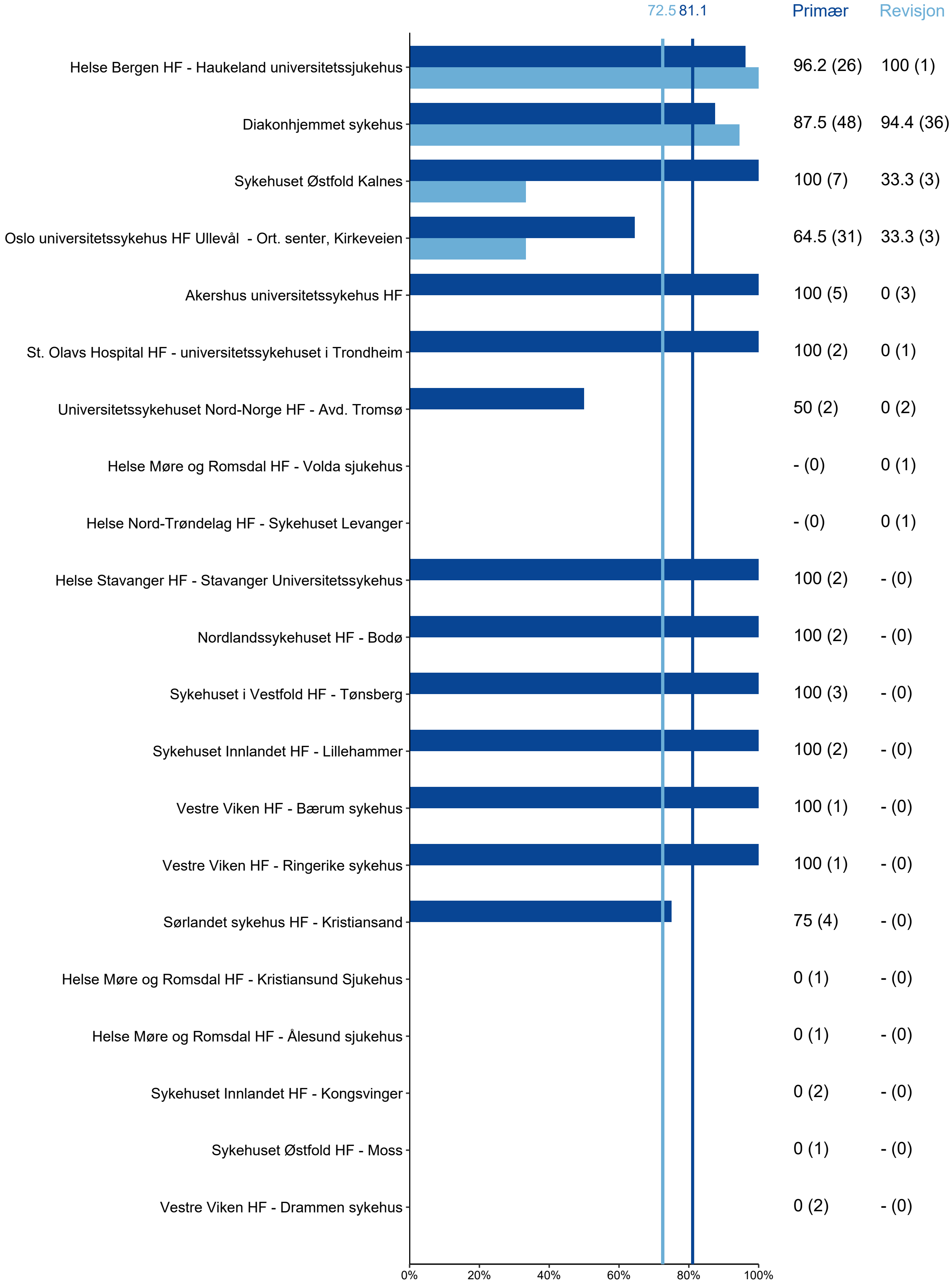
Primary operations. From 2017-2018, 143 primary total elbow arthroplasties were reported to one or both of the registers. 81.1% were reported to the NAR while 52.4% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of 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 2017-2018, 51 revisions were reported to one or both of the registers. 72.5% of these were reported to the NAR, while 76.5% 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 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, 2017-2018



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

Completeness of reporting analysis for the Ankle Arthroplasty Register, 2017-2018

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

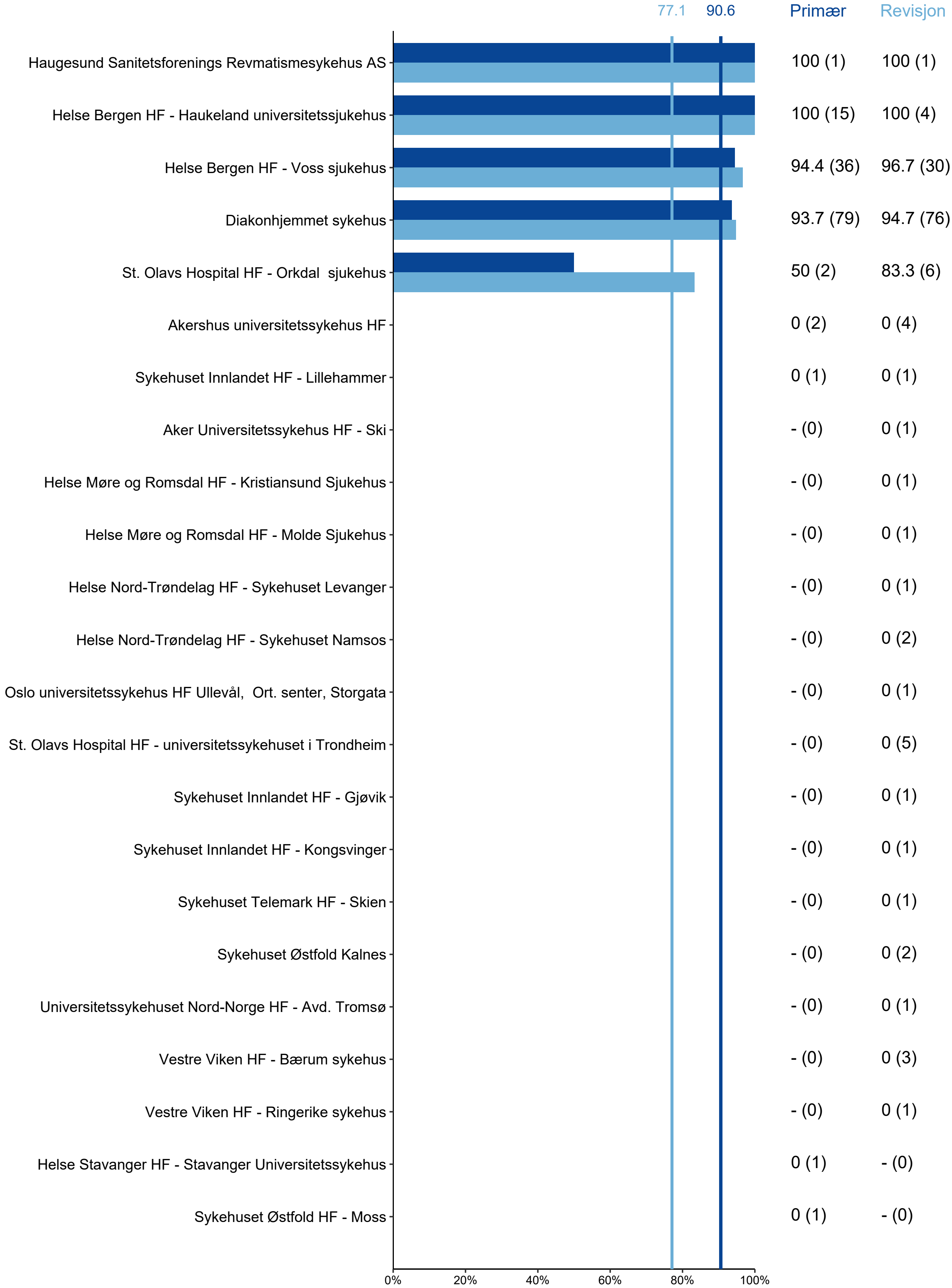
Type	Code	Description
Primary operation	NHB 0y	Primary partial prosthetic replacement of ankle joint not using cement
	NHB 1y	Primary partial prosthetic replacement of ankle joint using cement
	NHB 20	Primary total prosthetic replacement of ankle joint not using cement
	NHB 30	Primary total prosthetic 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 2017-2018, 138 primary total ankle arthroplasties were reported to one or both of the registers. 90.6% were reported to the NAR while 94.9% 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 2017-2018, 144 revisions were reported to one or both of the registers. 77.1% of these were reported to the NAR, while 85.4% 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, 2017-2018



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

Completeness of reporting analysis for the Finger Arthroplasty Register, 2017-2018

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

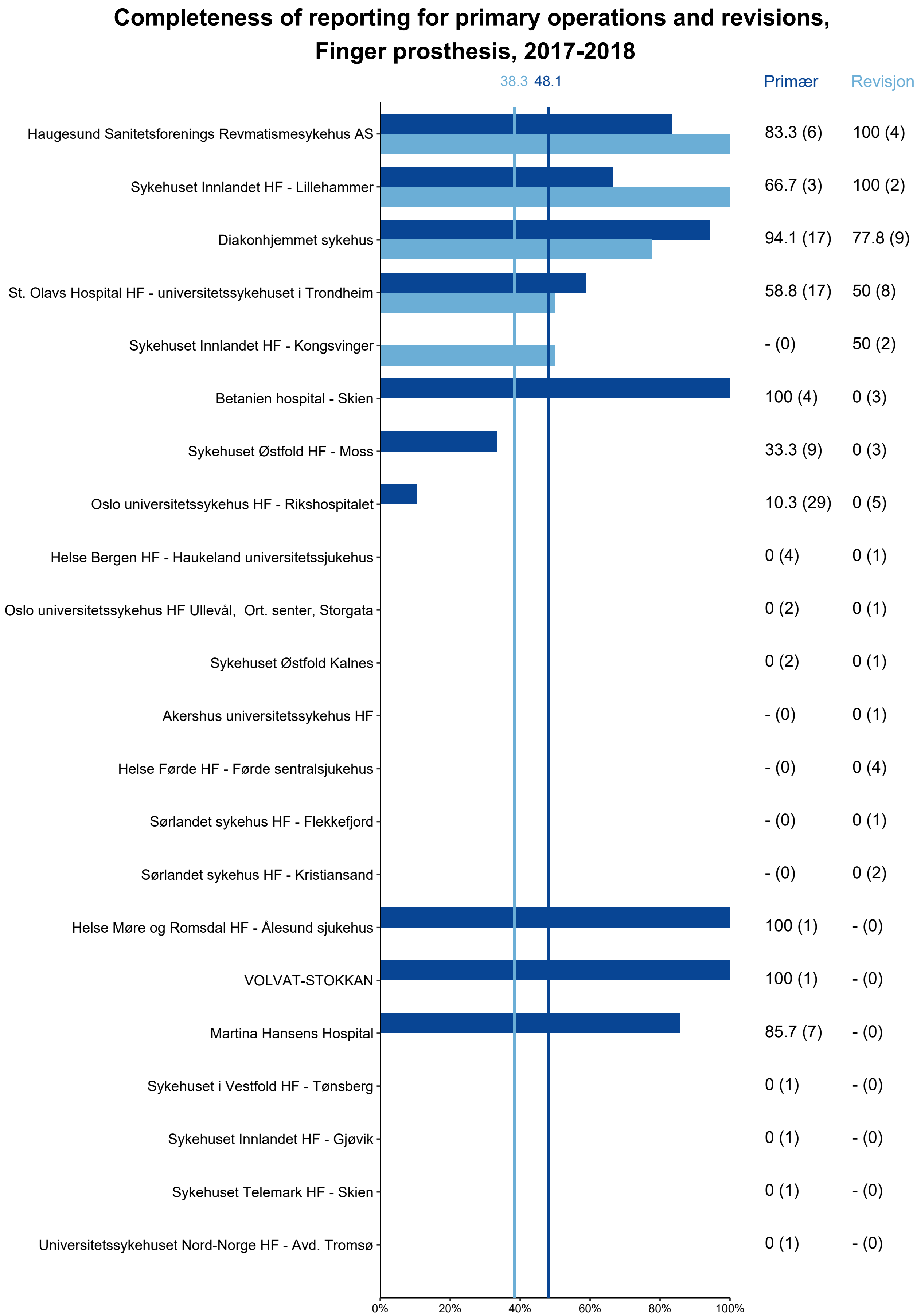
Type	Code	Description
Primary operation	NDB 8y	Primary prosthetic replacement of joint of finger or metacarpal
	NDB 99	Other primary prosthetic replacement in other joint of hand
Revision (level 1)	NDC 8y	Secondary prosthetic replacement in joint of finger or metacarpal
	NDU 2y	Removal of prosthesis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

Primary operations. From 2017-2018, 106 primary total finger arthroplasties were reported to one or both of the registers. 48.1% were reported to the NAR while 98.1% 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 2017-2018, 47 revisions were reported to one or both of the registers. 38.3% of these were reported to the NAR, while 95.7% 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



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

Completeness of reporting analysis for the Wrist/Carpus/Distal radioulnar joint Arthroplasty Register, 2017-2018

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

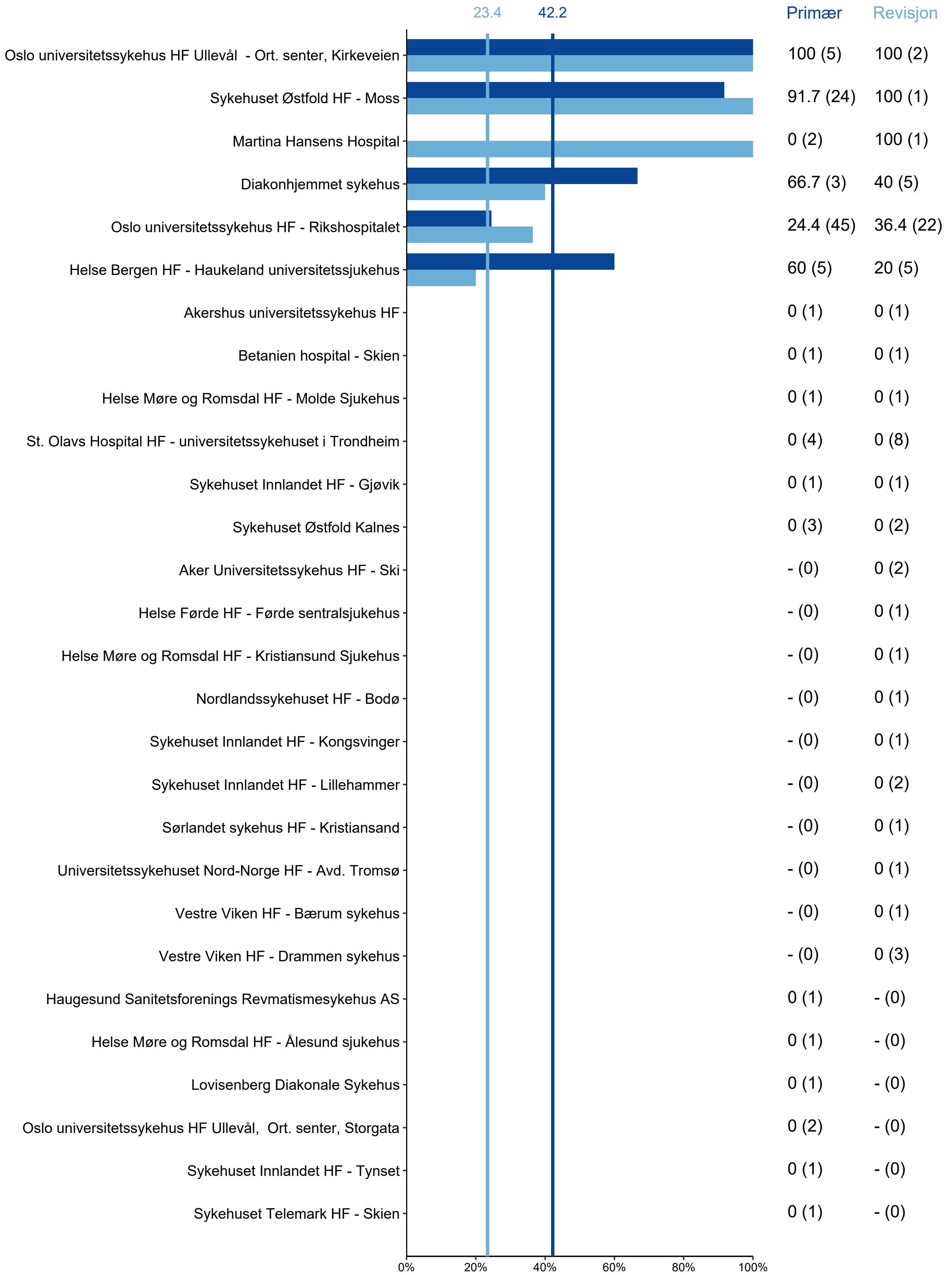
Primary operations. From 2017-2018, 102 primary total wrist/carpus/distal radioulnar joint arthroplasties were reported to one or both of the registers. 42.2% were reported to the NAR while 98% were reported to the NPR. Completeness of reporting varies much between the different hospitals.

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

Revision operations. From 2017-2018, 64 revisions were reported to one or both of the registers. 23.4% of these were reported to the NAR, while 93.8% 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:
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, 2017-2018



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

Completeness of reporting analysis for the Shoulder Arthroplasty Register, 2017-2018

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

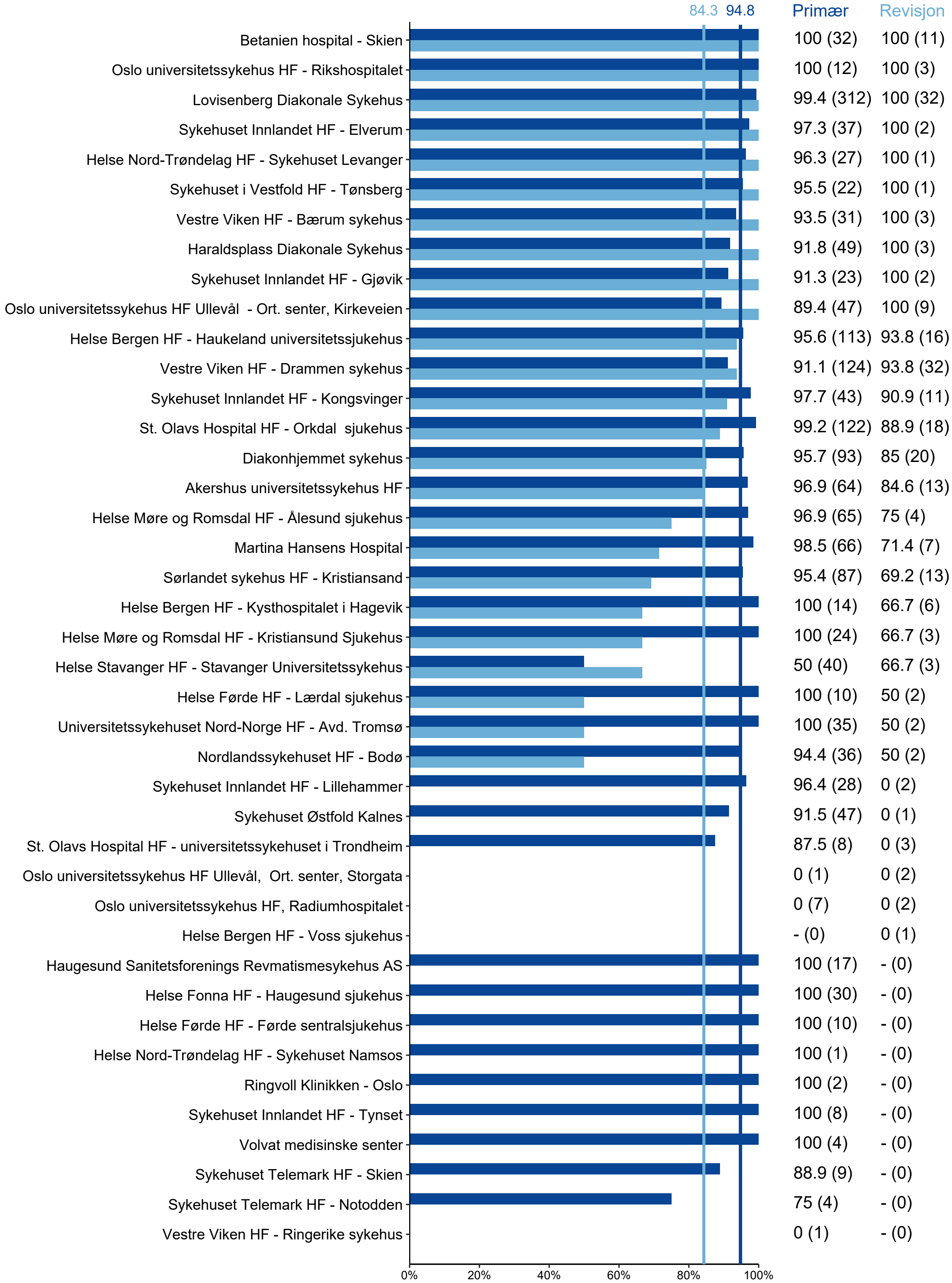
Primary operations. From 2017-2018, 1705 primary total shoulder arthroplasties were reported to one or both of the registers. 94.8% were reported to the NAR while 98.2% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness 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 2017-2018, 230 revisions were reported to one or both of the registers. 84.3% of these were reported to the NAR, while 82.6% 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, 2017-2018



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

Completeness of reporting analysis for the Toe Arthroplasty Register, 2017-2018

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

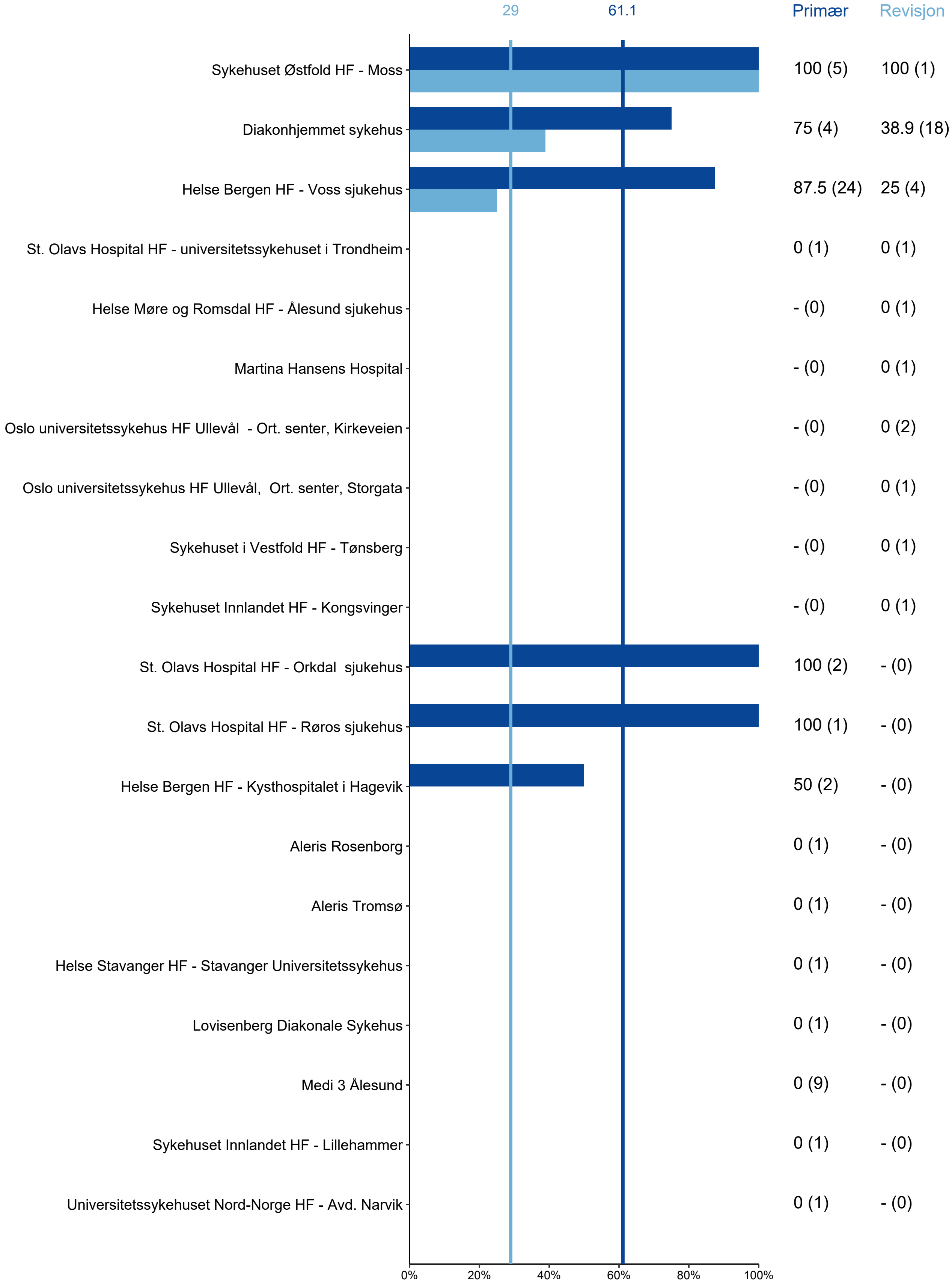
Primary operations. From 2017-2018, 54 primary total toe arthroplasties were reported to one or both of the registers. 61.1% were reported to the NAR while 94.4% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting 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 2017-2018, 31 revisions were reported to one or both of the registers. 29% of these were reported to the NAR, while 96.8% 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:
NHC 6y - NHC 7y - NHC 8y - NHU 2y

Completeness of reporting for primary operations and revisions, Toe prosthesis, 2017-2018



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

CONTENTS

Norwegian Hip Fracture Register

HIP FRACTURE REGISTER: ANNUAL REPORT

Work on this year's report has been carried out at a time of great uncertainty for the health care system. The Covid-19 pandemic this spring has brought major changes to the daily work of orthopaedic wards throughout Norway. In most wards, elective surgery has been reduced to a minimum, but acute surgery has fortunately been less affected. International recommendations have stated that treatment goals for hip fractures should not change due to the pandemic situation. In the future, it will be interesting to see whether the pandemic has in fact led to changes in treatment, and whether it has affected the number of hip fracture operations.

The Norwegian Hip Fracture Register now contains data from more than 121 000 primary operations and over 13 000 reoperations. In 2019, 7 877 primary and 876 revision operations were reported to the Register. There has been a marked decline in the number of primary operations compared to previous years, and this decrease is greater than might be expected within natural variability. It is therefore likely that the reporting rate by hospitals has become poorer. When the annual report with the hospital results is sent out later this year, we would therefore like all hospitals to compare their numbers of primary operations and reoperations with those recorded in the Hip Fracture Register. The main reason for the lower numbers of patients reported is probably problems in obtaining consent from hip fracture patients.

We are currently conducting a DProtection Impact Assessment (DPIA) for the Hip Fracture Register, and we hope this will be completed in 2020. There are three main reasons why a DPIA is necessary for our register. The new health register regulations have allowed for quality registers to be based on the right of refusal rather than consent, and this will be appropriate for the Hip Fracture Register. Conducting a DPIA is the first stage of this process. In addition, a transition to electronic recording of information is planned to replace filling out paper forms. We hope to start electronic reporting from a selection of hospitals during 2020, followed by the introduction of the solution to the remaining hospitals. The last major change planned is that we want the Register to be used to an even greater extent for quality improvement over time, by ensuring that hip fracture patients are treated in accordance with Norwegian interdisciplinary guidelines. We wish to expand the list of variables in the Register to include e.g. length of hospital stay, in-hospital mobilisation, fall prevention, osteoporosis treatment, medical complications in connection with the hospital stay and level of care after discharge. The new variables can probably be included in the Hip Fracture Register by using a new electronic form to be completed by a doctor or nurse at discharge. The introduction of new variables will enable the Register's hospital results and interactive results to provide greater clarification as to whether the recommendations in the national interdisciplinary guidelines are being followed.

The Centre for Clinical Documentation and Evaluation (SKDE) assesses all medical quality registers in Norway every year. The Norwegian Hip Fracture Register is still assessed as a stage 3 register. The main reason why our register again did not quite qualify as a stage 4 register in last year's evaluation was that it still lacks an online reporting solution that provides the units that report data with continuous information on their own and national data. The Hip Fracture Register has published interactive results online since 2017. The interactive results are hospital-based and are available at www.kvalitetsregistre.no. These results have so far been well received and we hope that they will be used for local quality improvement work. In connection with the introduction of electronic reporting, all reported data will be continuously made available for each hospital, and we hope this will enable the Hip Fracture Register to qualify as a stage 4 register.

The Hip Fracture Register is currently collaborating with the Norwegian Arthroplasty Register on a quality improvement project. The aim is to reduce the use of uncemented femoral stems in older hip fracture patients. The Hip Fracture Register has previously recommended avoiding the use of uncemented femoral stems in hip fracture surgery for patients over 70 years. We are therefore pleased to note that the proportion of uncemented prostheses has been steadily decreasing in recent years. In 2019, just under 7% of hemiprostheses were uncemented. However, uncemented stems are still routinely used by a few hospitals. We hope that their use will continue to decline.

There is still considerable variation between hospitals in the time patients have to wait from fracture to surgery. The Norwegian Knowledge Centre for the Health Services, the new interdisciplinary guidelines for hip fracture treatment, and the Hip Fracture Register all recommend that hip fractures are operated on within 24 hours, or within 48 hours as a maximum. Particularly the larger hospitals fail to operate a large proportion of their hip fracture patients within these time limits. There are few reasons to postpone hip fracture surgery for more than 48 hours, and hospitals should make every effort to give priority to hip fracture patients. When we have an electronic reporting solution for hip fracture surgery, we will inquire about the reason in cases of patients having to wait for longer than 48 hours.

Torbjørn Berge Kristensen successfully defended his PhD dissertation at the University of Bergen on 29.11.19. The dissertation was entitled "Hemiarthroplasty for femoral neck fracture. Results of surgical approach, fixation method, and stem design reported to the Norwegian hip fracture register". Congratulations to Torbjørn for three important publications using data from the Hip Fracture Register and for his excellent defence of his dissertation!

PUBLICATIONS SINCE 1 JANUARY 2019

Christian Pollmann examined whether the introduction of a fast-track care pathway reduced 30-day mortality following hip fracture. Data from the Hip Fracture Register were linked to a local patient register at Akershus University Hospital. The results showed that the fast-track pathway reduced waiting time for surgery and risk of reoperation for the first 30 days, but did not affect mortality.

Christian Pollmann also published an article on prosthetic joint infection and mortality following hemiarthroplasty performed at Akershus University Hospital. Data from the Hip Fracture Register and the Norwegian Surveillance System for Hospital-Acquired Infections (NOIS) were linked to a local patient register at the hospital. The results showed that early prosthetic joint infection increases mortality after hemiarthroplasty.

Målfrid Holen Kristoffersen examined how well surgeons are able to determine patients' cognitive functioning. Data from the Hip Fracture Register were compared with data in two hospital databases. The study concluded that surgeons' ability to identify patients with chronic cognitive impairment (dementia) was acceptable and that dementia patients should also be included in the Register's studies.

Målfrid Holen Kristoffersen also published an article comparing the surgical treatment of hip fractures in patients with and without cognitive impairment. The study showed that cognitively impaired patients were operated in the same way as those without cognitive impairment, but that they had a greater risk of revision after hemiarthroplasty than non-impaired patients. The risk of revision was particularly high in cases of dislocation after surgery using the posterior approach and periprosthetic fracture with an uncemented stem.

The study therefore concluded that hemiarthroplasty with the posterior approach or an uncemented stem should be avoided in patients with cognitive impairment.

Sunniva Leer-Salvesen has studied how waiting time for hip fracture surgery affects mortality and intraoperative medical complications. The study found that mortality increased if patients waited longer than 48 hours for surgery. The risk of intraoperative complications increased when patients waited for more than 24 hours. The study thus supports national recommendations for surgery within 24-48 hours and preferably within 24 hours.

Andrea Boutera explored a possible weekend effect in relation to hip fractures. Regarding time of surgery, the results showed no difference in reoperation risk or mortality between weekends and weekdays. However, there was a slight increase in mortality for patients who fractured their hip during the weekend compared to weekdays.

Torbjørn Berge Kristensen compared the results of cemented and uncemented hemiarthroplasties. The study found no difference in pain, satisfaction with surgery, quality of life or mortality after one year. However, uncemented prostheses had a higher risk of reoperation, especially due to periprosthetic fracture and infection, and the study supports recommendations in international and national guidelines to use cemented stems in hip fracture patients.

Jan-Erik Gjertsen was invited in 2019 to write an editorial for the New England Journal of Medicine (NEJM) in connection with the publication of the HEALTH study, a large international RCT to compare hemiarthroplasty and total arthroplasty for the treatment of femoral neck fractures. The study showed only small differences between the groups, but only followed up the patients for two years. The results support Norwegian practice of generally performing hemiarthroplasty for dislocated femoral neck fractures. An invitation to write an editorial in NEJM was surprising and welcome, and showed that data from the Hip Fracture Register receive international attention.

Please also see the list of publications at the end of this report and on the website of the Advisory Unit: http://nrlweb.ihelse.net/

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

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

Bergen, 6 June 2020

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

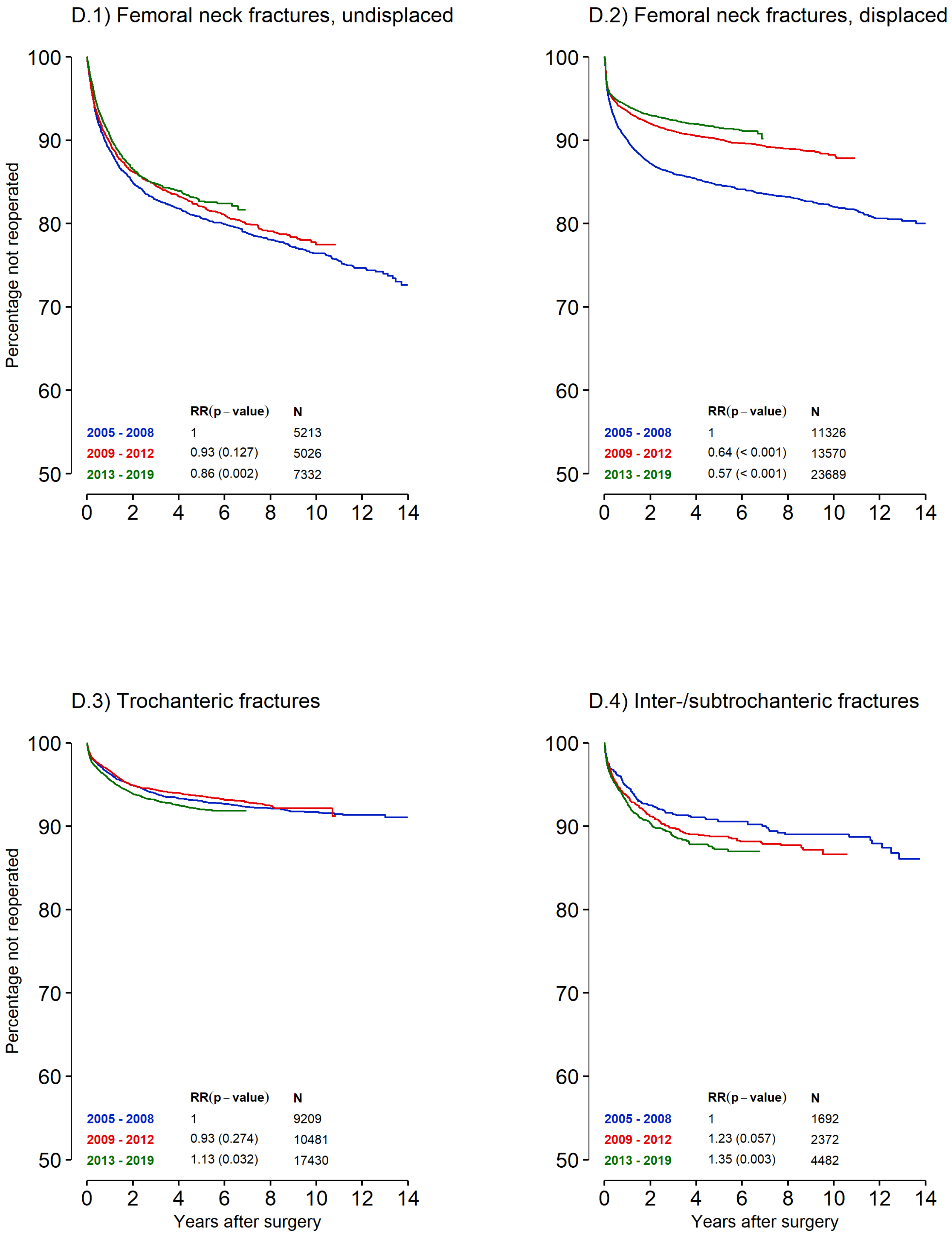
Eva Dybvik
Biostatistician

Gard Kroken
Biostatistician

Randi K. Furnes
Consultant

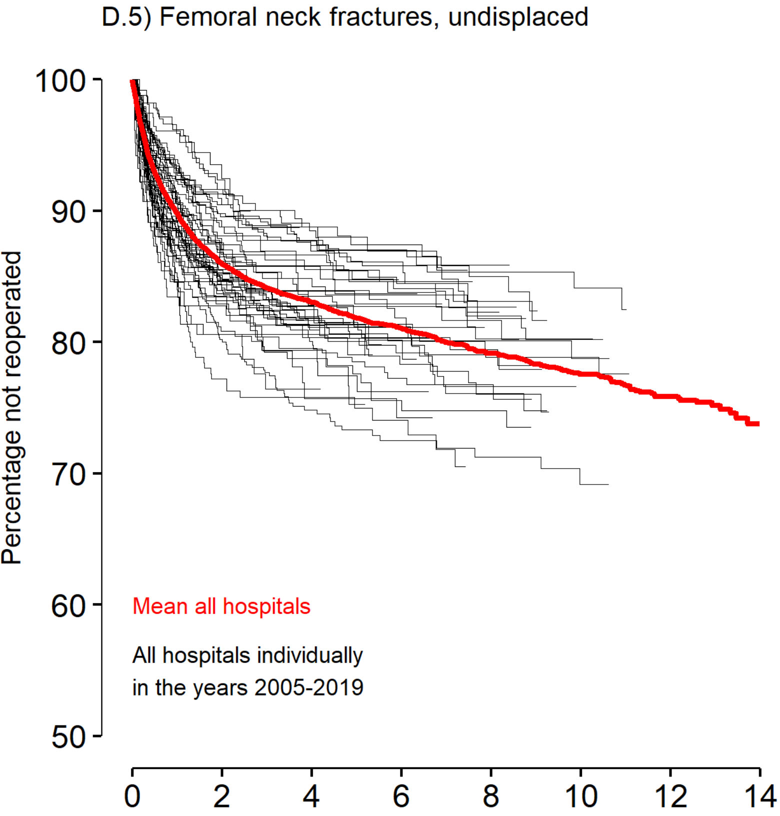
Irina Kvinnesland
IT Consultant

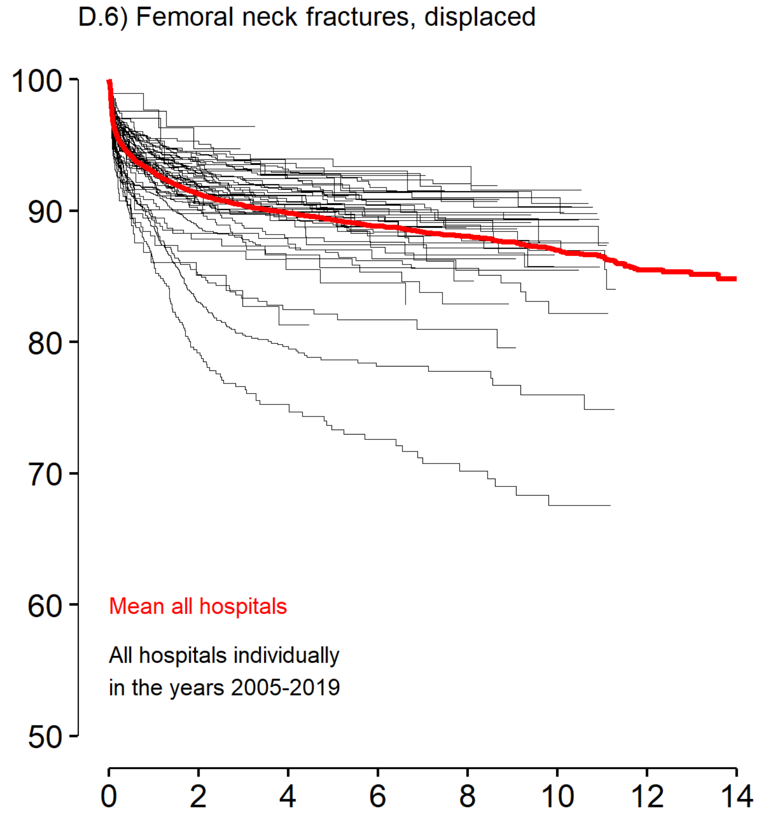
Survival of hip fracture implants, 2005-2019
Endpoint: All reoperations

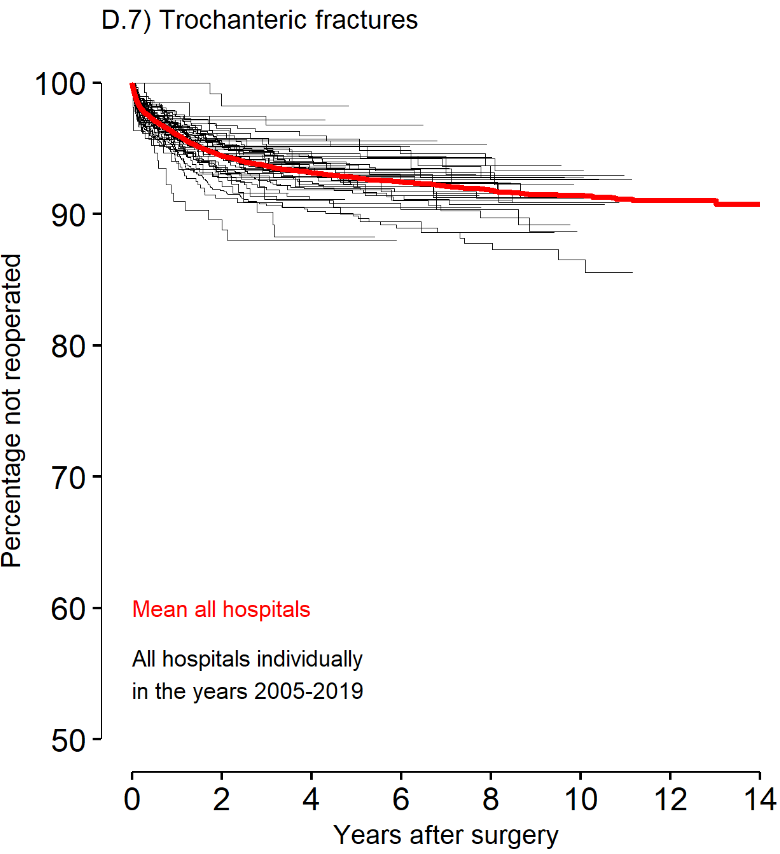


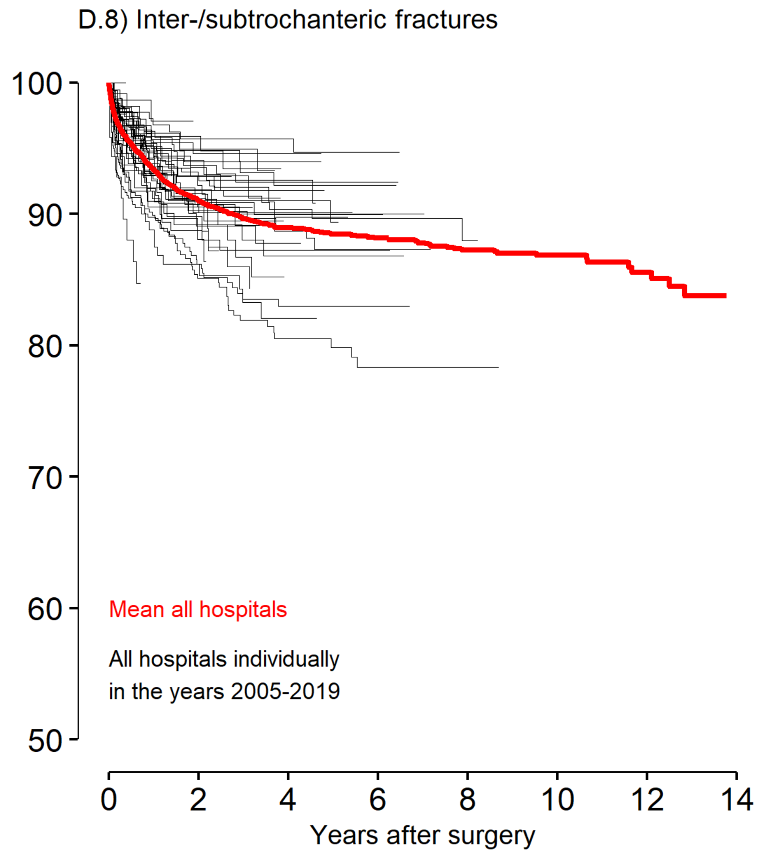
Kaplan-Meier estimatet survival curves (unadjusted). Survival is calculated as long as the number of prosthesis at risk of reoperation is greater than 50.

Hospital results after hip fractures 2005-2019
Endpoint: All reoperations



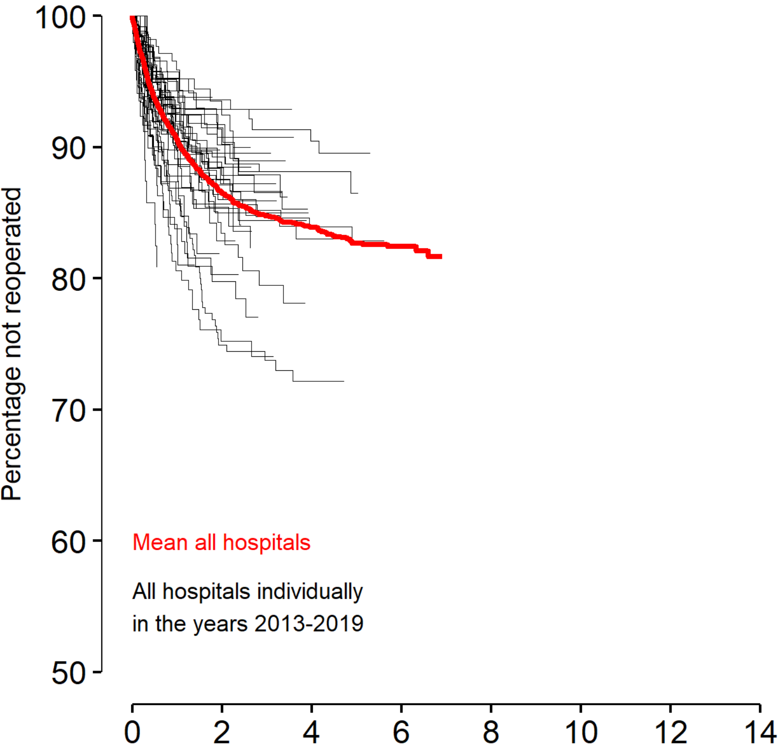




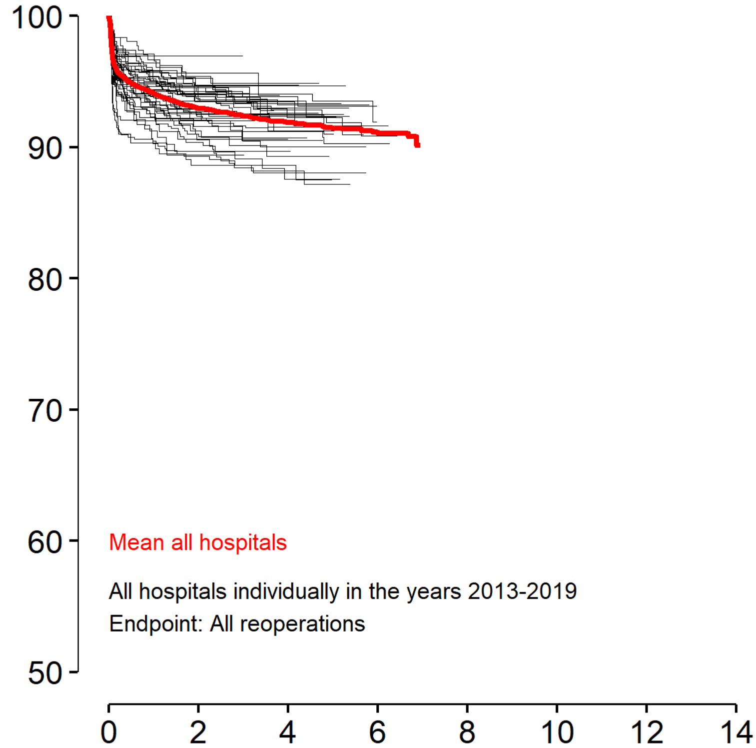


Hospital results after hip fractures 2013-2019
Endpoint: All reoperations

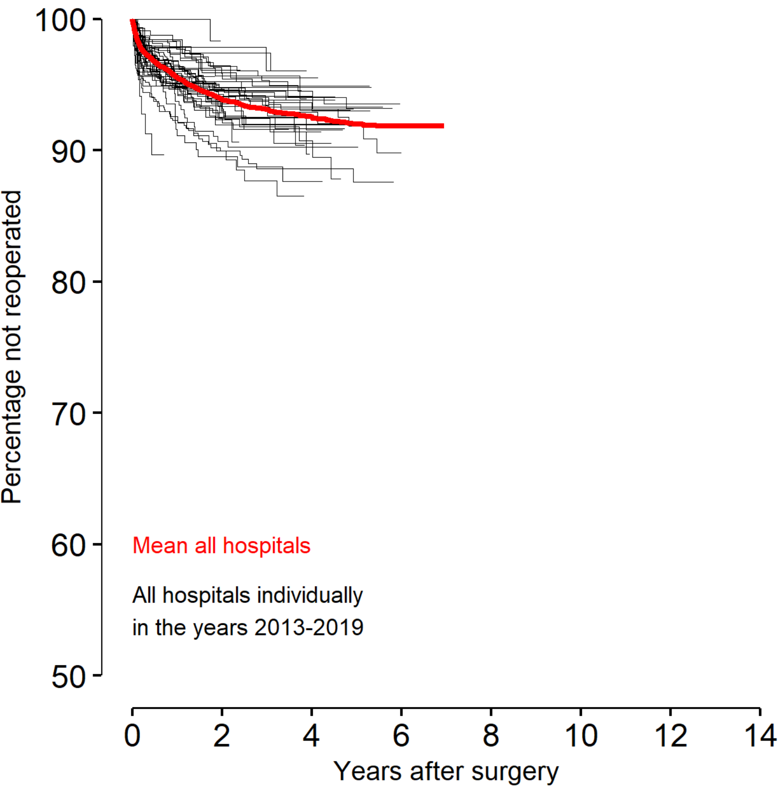
D.9) Femoral neck fractures, undisplaced



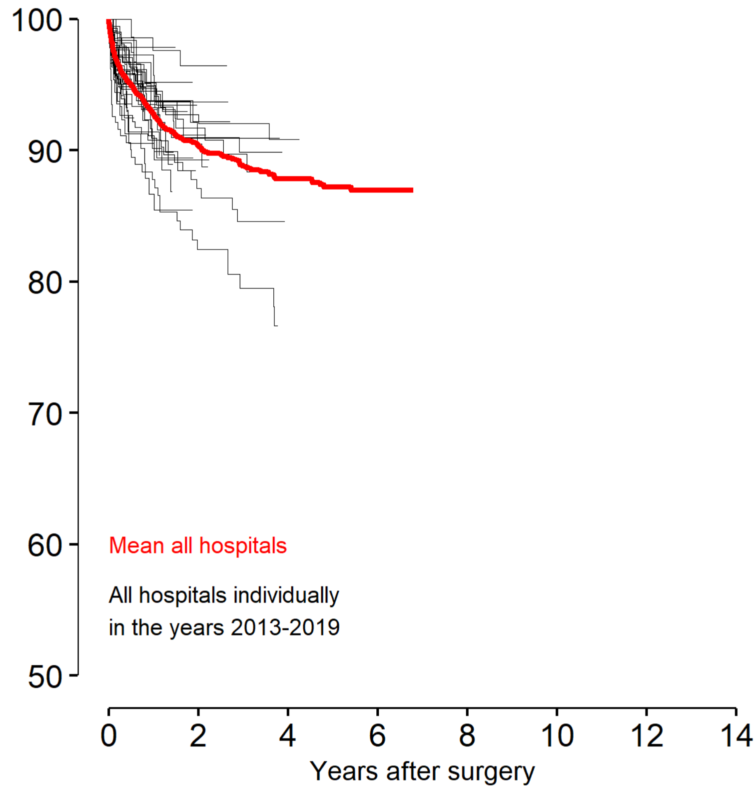
D.10) Femoral neck fractures, displaced



D.11) Trochanteric fractures



D.12) Inter-/subtrochanteric fractures



HIP FRACTURES

Numbers of operations

Table 1: Annual numbers of operations

Year	Primary operation		Reoperation		Total
2019	7 877	(90,0%)	876	(10,0%)	**8 753**
2018	8 410	(90,0%)	937	(10,0%)	**9 347**
2017	8 350	(90,3%)	901	(9,7%)	**9 251**
2016	8 499	(89,6%)	987	(10,4%)	**9 486**
2015	8 411	(90,0%)	938	(10,0%)	**9 349**
2014	8 182	(91,2%)	793	(8,8%)	**8 975**
2013	8 309	(90,2%)	899	(9,8%)	**9 208**
2012	8 437	(90,4%)	896	(9,6%)	**9 333**
2011	8 600	(90,3%)	925	(9,7%)	**9 525**
2010	8 363	(90,7%)	861	(9,3%)	**9 224**
2009	8 258	(89,5%)	970	(10,5%)	**9 228**
2008	8 362	(89,9%)	942	(10,1%)	**9 304**
2007	7 870	(89,4%)	933	(10,6%)	**8 803**
2005-06	13 396	(89,6%)	1 557	(10,4%)	**14 953**
Total	**121 324**	**(90,0%) ***	**13 415**	**(10,0%) ****	**134 739**

49% of primary operations were on the right side. 69% of primary operations were performed on women.
Mean age at primary surgery was 80 years: 82 years for women and 77 years for men.
* 4 132 (3%) were primary operations with total hip prostheses from the Norwegian Arthroplasty Register
** 4 799 (36%) were reoperations with total hip prostheses from the Norwegian Arthroplasty Register.

Figure 1: Annual numbers of operations

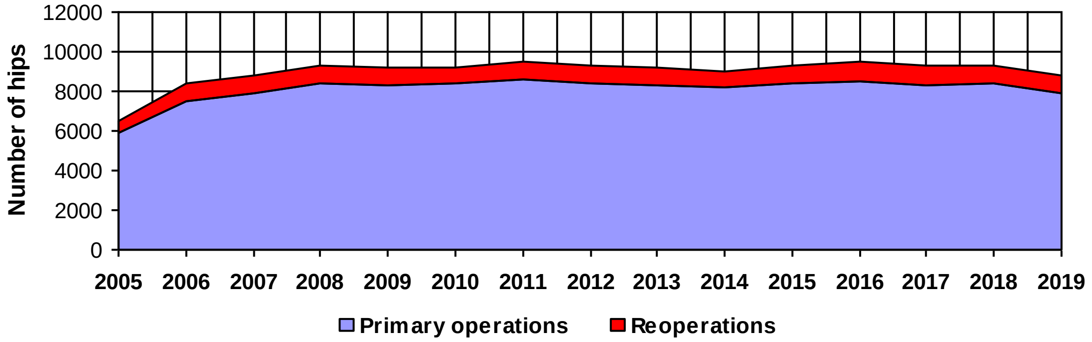
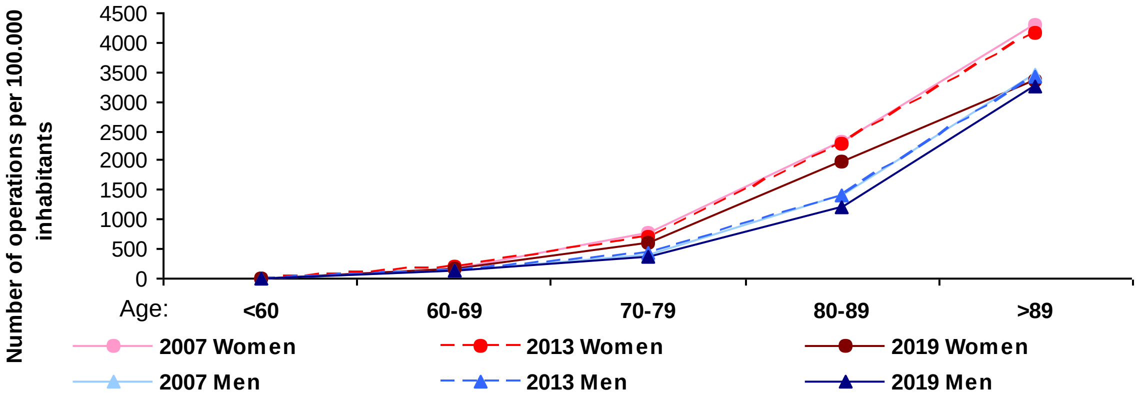


Figure 2: Incidence of primary operation (in 2007, 2013 and 2019)



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
2019	213 (2,9%)	859 (11,8%)	2 581 (35,6%)	2 431 (33,5%)	1 043 (14,4%)	132 (1,8%)	**7 259**
2018	278 (3,5%)	956 (12,2%)	2 714 (34,7%)	2 415 (30,8%)	1 287 (16,4%)	182 (2,3%)	**7 832**
2017	298 (3,8%)	1 112 (14,0%)	2 773 (34,9%)	2 378 (30,0%)	1 208 (15,2%)	169 (2,1%)	**7 938**
2016	299 (3,7%)	1 107 (13,6%)	2 897 (35,5%)	2 425 (29,7%)	1 235 (15,1%)	189 (2,3%)	**8 152**
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%)	180 (2,3%)	**7 893**
2013	314 (3,9%)	1 129 (14,1%)	2 932 (36,6%)	2 260 (28,2%)	1 198 (15,0%)	179 (2,2%)	**8 012**
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%)	1 206 (14,3%)	2 844 (33,8%)	2 419 (28,8%)	1 421 (16,9%)	207 (2,5%)	**8 410**
2010	355 (4,3%)	1 218 (14,9%)	2 882 (35,1%)	2 216 (27,0%)	1 340 (16,3%)	190 (2,3%)	**8 201**
2009	354 (4,4%)	1 290 (15,9%)	2 857 (35,3%)	2 128 (26,3%)	1 306 (16,1%)	166 (2,0%)	**8 101**
2008	385 (4,7%)	1 321 (16,1%)	2 834 (34,5%)	2 201 (26,8%)	1 292 (15,7%)	179 (2,2%)	**8 212**
2007	452 (5,9%)	1 434 (18,6%)	2 610 (33,8%)	1 872 (24,3%)	1 188 (15,4%)	155 (2,0%)	**7 711**
2006	465 (6,3%)	1 488 (20,2%)	2 647 (35,9%)	1 683 (22,8%)	983 (13,3%)	115 (1,6%)	**7 381**
2005	445 (7,7%)	1 294 (22,4%)	1 974 (34,2%)	1 147 (19,9%)	809 (14,0%)	105 (1,8%)	**5 774**
Total	**5 122 (4,4%)**	**17 824 (15,2%)**	**41 531 (35,4%)**	**32 403 (27,6%)**	**17 786 (15,2%)**	**2 526 (2,2%)**	**117 192**

* Total hip prostheses are not counted

Figure 3: Time from fracture to operation - grouped in hours (n=117 192)

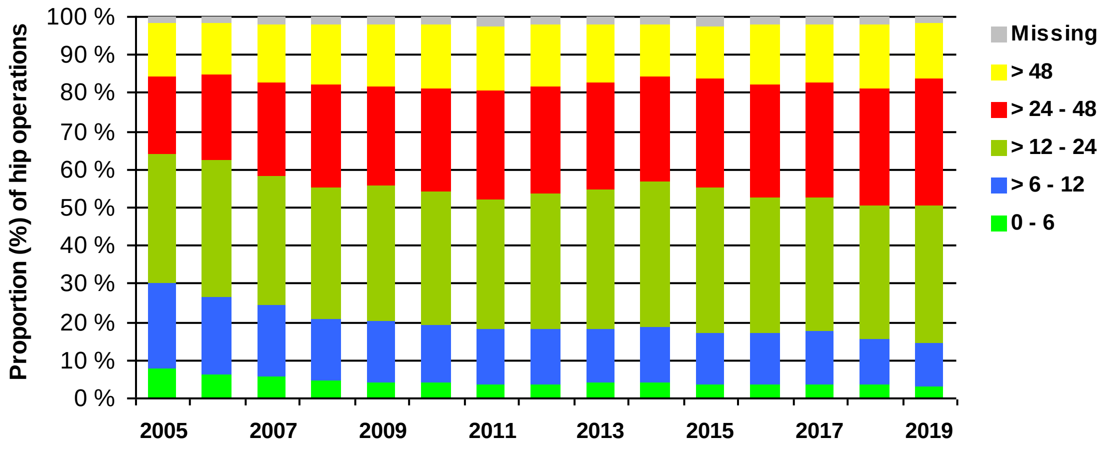
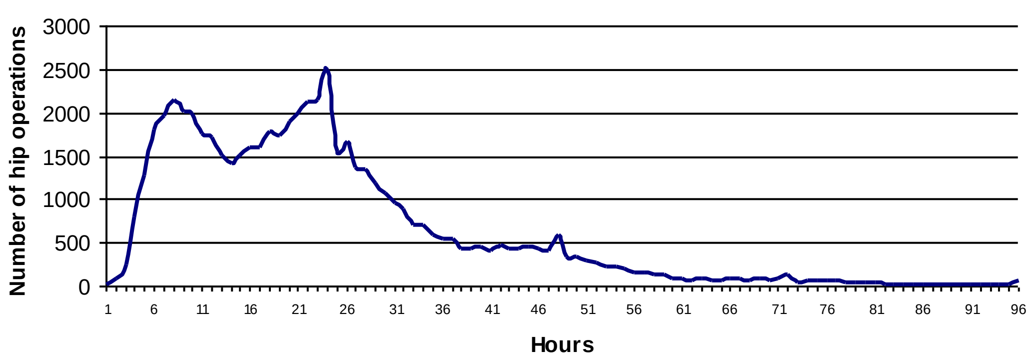


Figure 4: Time from fracture to operation - continuous (n=60 347)



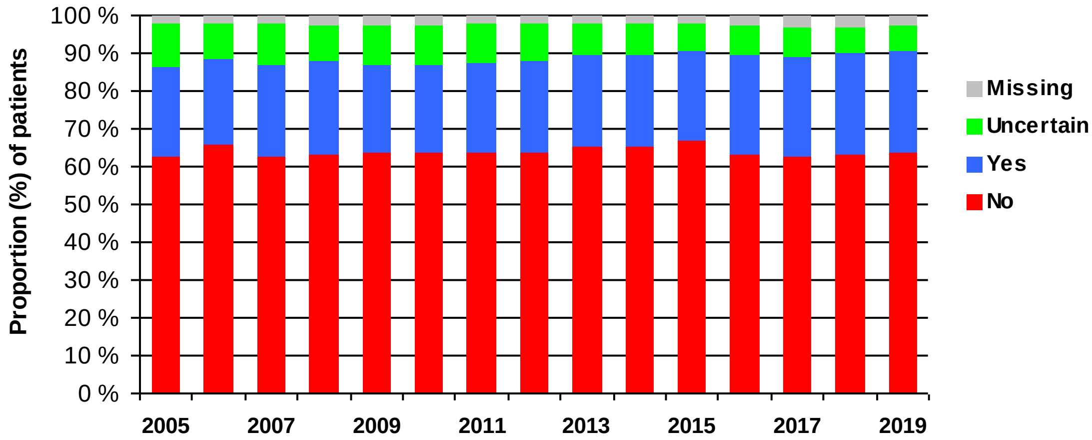
Mean time from fracture to operation was 24 hours (median 21 hours).

Cognitive impairment

Table 3: Cognitive impairment - primary operations*

	No		Yes		Uncertain		Missing		Total
2019	4 617	(63,6%)	1 952	(26,9%)	516	(7,1%)	174	(2,4%)	**7 259**
2018	4 965	(63,4%)	2 067	(26,4%)	559	(7,1%)	241	(3,1%)	**7 832**
2017	4 981	(62,7%)	2 084	(26,3%)	637	(8,0%)	236	(3,0%)	**7 938**
2016	5 158	(63,3%)	2 139	(26,2%)	635	(7,8%)	220	(2,7%)	**8 152**
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%)	182	(2,3%)	**7 893**
2013	5 235	(65,3%)	1 938	(24,2%)	675	(8,4%)	164	(2,0%)	**8 012**
2012	5 222	(63,5%)	2 007	(24,4%)	821	(10,0%)	179	(2,2%)	**8 229**
2011	5 348	(63,6%)	1 990	(23,7%)	901	(10,7%)	171	(2,0%)	**8 410**
2010	5 220	(63,7%)	1 917	(23,4%)	834	(10,2%)	230	(2,8%)	**8 201**
2009	5 157	(63,7%)	1 890	(23,3%)	832	(10,3%)	222	(2,7%)	**8 101**
2008	5 186	(63,2%)	2 026	(24,7%)	794	(9,7%)	206	(2,5%)	**8 212**
2007	4 834	(62,7%)	1 873	(24,3%)	836	(10,8%)	168	(2,2%)	**7 711**
2006	4 845	(65,6%)	1 675	(22,7%)	720	(9,8%)	141	(1,9%)	**7 381**
2005	3 610	(62,5%)	1 384	(24,0%)	649	(11,2%)	131	(2,3%)	**5 774**
Total	**74 901**	**(63,9%)**	**28 794**	**(24,6%)**	**10 652**	**(9,1%)**	**2 845**	**(2,4%)**	**117 192**

Figure 5: Cognitive impairment - primary operations*



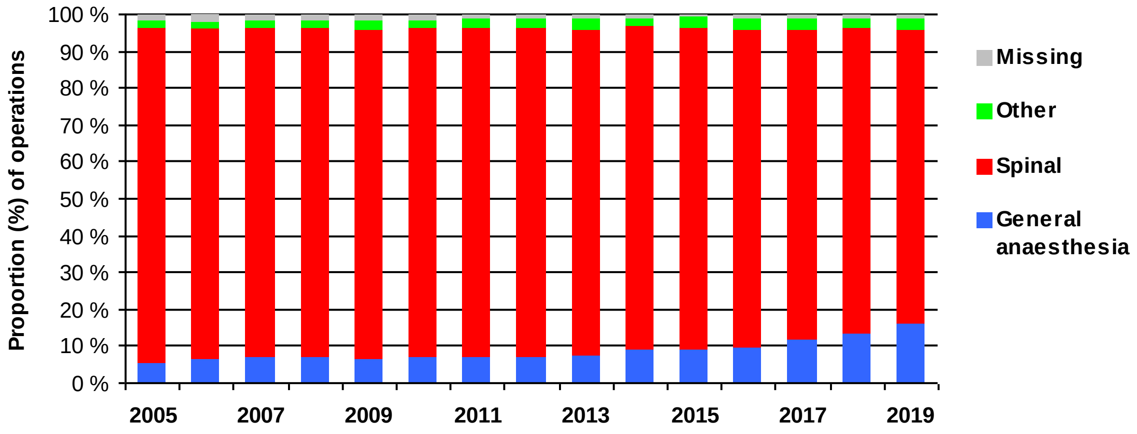
* Total hip prostheses are not counted

Type of anaesthesia

Table 4: Type of anaesthesia - primary operations*

	General anaesthesia		Spinal		Other		Missing		Total
2019	1 165	(16,0%)	5 778	(79,6%)	257	(3,5%)	59	(0,8%)	**7 259**
2018	1 062	(13,6%)	6 471	(82,6%)	230	(2,9%)	69	(0,9%)	**7 832**
2017	929	(11,7%)	6 669	(84,0%)	259	(3,3%)	81	(1,0%)	**7 938**
2016	810	(9,9%)	6 975	(85,6%)	282	(3,5%)	84	(1,0%)	**8 151**
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%)	68	(0,9%)	**7 893**
2013	588	(7,3%)	7 094	(88,5%)	256	(3,2%)	74	(0,9%)	**8 012**
2012	560	(6,8%)	7 364	(89,5%)	219	(2,7%)	86	(1,0%)	**8 229**
2011	586	(7,0%)	7 506	(89,3%)	219	(2,6%)	99	(1,2%)	**8 410**
2010	565	(6,9%)	7 321	(89,3%)	194	(2,4%)	121	(1,5%)	**8 201**
2009	520	(6,4%)	7 246	(89,4%)	188	(2,3%)	147	(1,8%)	**8 101**
2008	591	(7,2%)	7 297	(88,9%)	182	(2,2%)	142	(1,7%)	**8 212**
2007	550	(7,1%)	6 852	(88,9%)	187	(2,4%)	122	(1,6%)	**7 711**
2006	472	(6,4%)	6 632	(89,9%)	137	(1,9%)	140	(1,9%)	**7 381**
2005	323	(5,6%)	5 222	(90,4%)	123	(2,1%)	106	(1,8%)	**5 774**
Total	**10 211**	**(8,7%)**	**102 357**	**(87,3%)**	**3 162**	**(2,7%)**	**1 461**	**(1,2%)**	**117 191**

Figure 6: Type of anaesthesia in primary operations*



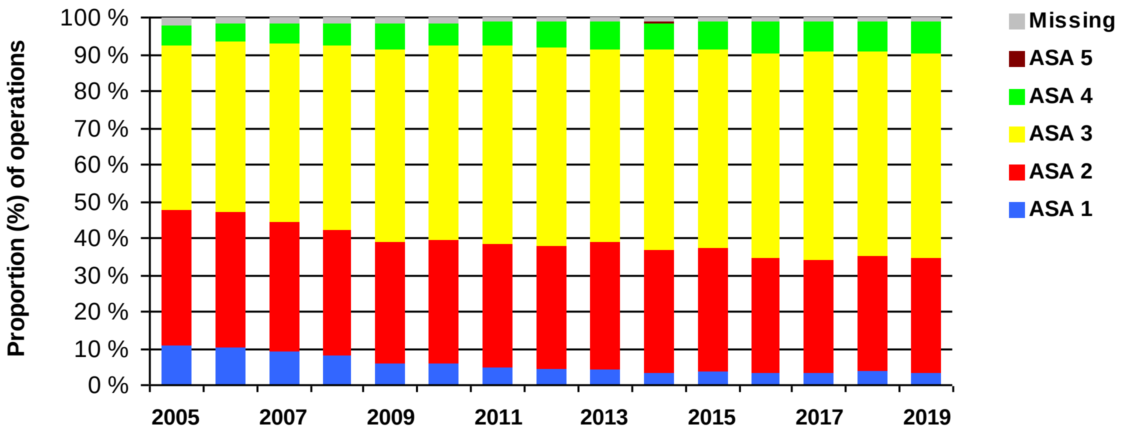
* Total hip prostheses are not counted

ASA classification (ASA = American Society of Anesthesiologists)

Table 5: ASA classification - primary operations

	ASA 1		ASA 2		ASA 3		ASA 4		ASA 5		Missing		Total
2019	275	(3,5%)	2 460	(31,2%)	4 391	(55,7%)	661	(8,4%)	6	(0,1%)	84	(1,1%)	**7 877**
2018	319	(3,8%)	2 650	(31,5%)	4 688	(55,7%)	644	(7,7%)	13	(0,2%)	96	(1,1%)	**8 410**
2017	283	(3,4%)	2 552	(30,6%)	4 729	(56,6%)	679	(8,1%)	15	(0,2%)	92	(1,1%)	**8 350**
2016	264	(3,1%)	2 693	(31,7%)	4 730	(55,7%)	708	(8,3%)	10	(0,1%)	93	(1,1%)	**8 498**
2015	303	(3,6%)	2 851	(33,9%)	4 525	(53,8%)	624	(7,4%)	12	(0,1%)	96	(1,1%)	**8 411**
2014	256	(3,1%)	2 732	(33,4%)	4 471	(54,6%)	608	(7,4%)	14	(0,2%)	101	(1,2%)	**8 182**
2013	378	(4,5%)	2 839	(34,2%)	4 382	(52,7%)	609	(7,3%)	17	(0,2%)	84	(1,0%)	**8 309**
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%)	2 877	(33,5%)	4 612	(53,6%)	558	(6,5%)	6	(0,1%)	110	(1,3%)	**8 600**
2010	493	(5,9%)	2 806	(33,6%)	4 410	(52,7%)	498	(6,0%)	16	(0,2%)	140	(1,7%)	**8 363**
2009	509	(6,2%)	2 720	(32,9%)	4 309	(52,2%)	564	(6,8%)	10	(0,1%)	146	(1,8%)	**8 258**
2008	677	(8,1%)	2 858	(34,2%)	4 172	(49,9%)	527	(6,3%)	9	(0,1%)	119	(1,4%)	**8 362**
2007	716	(9,1%)	2 767	(35,2%)	3 820	(48,5%)	451	(5,7%)	7	(0,1%)	109	(1,4%)	**7 870**
2006	772	(10,3%)	2 746	(36,5%)	3 496	(46,5%)	372	(4,9%)	13	(0,2%)	118	(1,6%)	**7 517**
2005	639	(10,9%)	2 166	(36,8%)	2 620	(44,6%)	316	(5,4%)	13	(0,2%)	125	(2,1%)	**5 879**
Total	**6 677**	(5,5%)	**40 550**	(33,4%)	**63 903**	(52,7%)	**8 414**	(6,9%)	**169**	(0,1%)	**1 610**	(1,3%)	**121 324**

Figure 7: ASA classification - 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.

Primary operations

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

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 9	Type 6	Type 7	Type 8	Other	Missing	Total
2019	862	3 296	183	1 025	1 224	175	403	609	9	81	10	**7 877**
	10,9%	41,8%	2,3%	13,0%	15,5%	2,2%	5,1%	7,7%	0,1%	1,0%	0,1%	
2018	972	3 439	199	1 113	1 287	227	498	573	5	94	3	**8 410**
	11,6%	40,9%	2,4%	13,2%	15,3%	2,7%	5,9%	6,8%	0,1%	1,1%	0,0%	
2017	1 037	3 434	217	1 154	1 316	206	476	405	7	98	0	**8 350**
	12,4%	41,1%	2,6%	13,8%	15,8%	2,5%	5,7%	4,9%	0,1%	1,2%	0,0%	
2016	1 086	3 543	234	1 243	1 321	162	467	343	4	94	2	**8 499**
	12,8%	41,7%	2,8%	14,6%	15,5%	1,9%	5,5%	4,0%	0,0%	1,1%	0,0%	
2015	1 154	3 350	243	1 336	1 255	228	442	322	2	78	1	**8 411**
	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	1	**8 182**
	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	448	293	4	91	1	**8 309**
	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	3 444	276	1 346	1 393	162	398	186	4	74	0	**8 600**
	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	1 313	1 364	167	431	160	2	67	2	**8 363**
	14,9%	39,3%	3,8%	15,7%	16,3%	2,0%	5,2%	1,9%	0,0%	0,8%	0,0%	
2009	1 234	3 368	328	1 306	1 211	149	425	150	7	72	8	**8 258**
	14,9%	40,8%	4,0%	15,8%	14,7%	1,8%	5,1%	1,8%	0,1%	0,9%	0,1%	
2008	1 316	3 222	351	1 475	1 240	83	439	148	2	83	3	**8 362**
	15,7%	38,5%	4,2%	17,6%	14,8%	1,0%	5,2%	1,8%	0,0%	1,0%	0,0%	
2007	1 416	2 993	391	1 353	1 052	0	438	158	1	66	2	**7 870**
	18,0%	38,0%	5,0%	17,2%	13,4%	0,0%	5,6%	2,0%	0,0%	0,8%	0,0%	
2006	1 408	2 820	343	1 311	1 010	0	414	131	5	71	4	**7 517**
	18,7%	37,5%	4,6%	17,4%	13,4%	0,0%	5,5%	1,7%	0,1%	0,9%	0,1%	
2005	1 073	2 291	276	1 011	757	0	318	102	3	35	13	**5 879**
	18,3%	39,0%	4,7%	17,2%	12,9%	0,0%	5,4%	1,7%	0,1%	0,6%	0,2%	
Total	**17 571**	**48 585**	**4 170**	**18 898**	**18 222**	**2 060**	**6 486**	**4 072**	**60**	**1 147**	**53**	**121 324**
	14,5%	**40,0%**	**3,4%**	**15,6%**	**15,0%**	**1,7%**	**5,3%**	**3,4%**	**0,0%**	**0,9%**	**0,0%**	

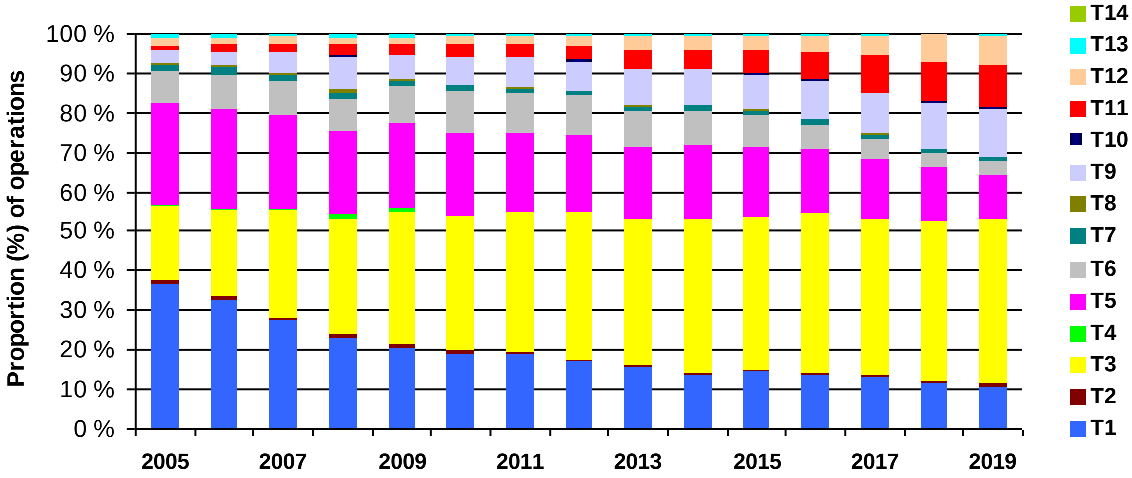
Type 1: Intracapsular fracture, undisplaced
Type 2: Intracapsular fracture, displaced
Type 3: Basocervical fracture
Type 4: Trochanteric fracture (2 fragments) (AO / OTA A1)
Type 5: Trochanteric fracture (multifragment) (AO / OTA A2)
Type 9: Intertrochanteric fracture (AO / OTA A3) (The registration 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
2019	829	74	3 286	0	894	247	73	21	967	4	842	618	21	0	**7 877**
	10,5%	0,9%	41,7%	0,0%	11,3%	3,1%	0,9%	0,3%	12,3%	0,1%	10,7%	7,8%	0,3%	0,0%	
2018	969	63	3 414	1	1 121	315	79	13	963	17	858	578	19	0	**8 410**
	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	3 334	1	1 263	402	104	19	828	24	802	412	35	0	**8 350**
	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	3 445	2	1 384	520	97	21	817	11	617	347	39	0	**8 499**
	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	324	25	0	**8 411**
	14,8%	0,4%	38,4%	0,0%	17,8%	7,9%	1,1%	0,2%	9,0%	0,1%	6,1%	3,9%	0,3%	0,0%	
2014	1 127	31	3 189	1	1 551	689	102	17	734	8	418	289	26	0	**8 182**
	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	1 495	749	109	20	747	4	431	297	33	0	**8 309**
	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	3 005	19	1 697	870	112	12	658	14	281	190	42	0	**8 600**
	19,2%	0,6%	34,9%	0,2%	19,7%	10,1%	1,3%	0,1%	7,7%	0,2%	3,3%	2,2%	0,5%	0,0%	
2010	1 616	83	2 782	29	1 733	899	127	17	571	4	280	162	60	0	**8 363**
	19,3%	1,0%	33,3%	0,3%	20,7%	10,7%	1,5%	0,2%	6,8%	0,0%	3,3%	1,9%	0,7%	0,0%	
2009	1 688	81	2 756	82	1 765	788	101	50	489	8	228	157	65	0	**8 258**
	20,4%	1,0%	33,4%	1,0%	21,4%	9,5%	1,2%	0,6%	5,9%	0,1%	2,8%	1,9%	0,8%	0,0%	
2008	1 943	64	2 440	70	1 784	690	128	64	686	10	266	150	65	0	**8 362**
	23,2%	0,8%	29,2%	0,8%	21,3%	8,3%	1,5%	0,8%	8,2%	0,1%	3,2%	1,8%	0,8%	0,0%	
2007	2 181	50	2 115	48	1 868	644	127	36	430	6	157	159	48	1	**7 870**
	27,7%	0,6%	26,9%	0,6%	23,7%	8,2%	1,6%	0,5%	5,5%	0,1%	2,0%	2,0%	0,6%	0,0%	
2006	2 466	60	1 643	34	1 891	628	142	43	272	4	127	136	69	1	**7 517**
	32,8%	0,8%	21,9%	0,5%	25,2%	8,4%	1,9%	0,6%	3,6%	0,1%	1,7%	1,8%	0,9%	0,0%	
2005	2 154	52	1 112	24	1 492	469	110	28	211	3	55	105	61	2	**5 879**
	36,6%	0,9%	18,9%	0,4%	25,4%	8,0%	1,9%	0,5%	3,6%	0,1%	0,9%	1,8%	1,0%	0,0%	
Total	**22 848**	**788**	**41 997**	**321**	**23 069**	**9 422**	**1 604**	**394**	**9 766**	**133**	**6 204**	**4 132**	**636**	**4**	**121 324**
	18,8%	**0,6%**	**34,6%**	**0,3%**	**19,0%**	**7,8%**	**1,3%**	**0,3%**	**8,0%**	**0,1%**	**5,1%**	**3,4%**	**0,5%**	**0,0%**	

T1: Two screws or pins
T2: Three screws or pins
T3: Bipolar hemiprosthesis
T4: Unipolar hemiprosthesis
T5: Hip compression screw and plate
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



T1: Two screws or pins
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T11: Long intramedullary nail with distal locking
T12: Total hip prosthesis
T13: Other
T14: Missing

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	15 585	294	1 149	4	372	2	105	7	30	0	4	0	17	0	**17 675**
	88,2%	1,7%	6,5%	0,0%	2,1%	0,0%	0,6%	0,0%	0,2%	0,0%	0,0%	0,0%	0,1%	0,0%	
Intracapsular fracture, displaced	7 081	489	39 902	302	382	7	181	5	48	0	16	0	171	1	**48 766**
	14,5%	1,0%	81,8%	0,6%	0,8%	0,0%	0,4%	0,0%	0,1%	0,0%	0,0%	0,0%	0,4%	0,0%	
Basocervical fracture	139	2	422	12	2 262	87	731	30	423	1	28	0	32	0	**4 901**
	2,8%	0,0%	8,6%	0,2%	46,2%	1,8%	14,9%	0,6%	8,6%	0,0%	0,6%	0,0%	0,7%	0,0%	
Trochanteric fracture (2 fragments)	12	0	61	0	12 907	1 005	350	263	3 881	11	360	0	44	2	**19 248**
	0,1%	0,0%	0,3%	0,0%	67,1%	5,2%	1,8%	1,4%	20,2%	0,1%	1,9%	0,0%	0,2%	0,0%	
Trochanteric fracture (multifragment)	3	1	134	0	5 864	5 801	158	76	4 372	39	1 568	0	205	0	**18 380**
	0,0%	0,0%	0,7%	0,0%	31,9%	31,6%	0,9%	0,4%	23,8%	0,2%	8,5%	0,0%	1,1%	0,0%	
Intertrochanteric fracture **	0	0	17	0	172	789	6	5	384	11	646	0	30	0	**2 066**
	0,0%	0,0%	0,8%	0,0%	8,3%	38,2%	0,3%	0,2%	18,6%	0,5%	31,3%	0,0%	1,5%	0,0%	
Subtrochanteric fracture	5	1	43	0	945	1 512	19	6	527	65	3 293	0	70	0	**6 505**
	0,1%	0,0%	0,7%	0,0%	14,5%	23,2%	0,3%	0,1%	8,1%	1,0%	50,6%	0,0%	1,1%	0,0%	
Intracapsular fracture, unspecified *	0	0	0	0	0	0	0	0	0	0	0	4 072	0	0	**4 072**
	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	0,0%	
Trochanteric fracture unspecified *	0	0	0	0	0	0	0	0	0	0	0	60	0	0	**60**
	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	0,0%	
Other	18	1	243	2	157	215	51	2	98	6	287	0	67	0	**1 198**
	1,5%	0,1%	20,3%	0,2%	13,1%	17,9%	4,3%	0,2%	8,2%	0,5%	24,0%	0,0%	5,6%	0,0%	
Missing	5	0	26	1	8	4	3	0	3	0	2	0	0	1	**56**
	8,9%	0,0%	46,4%	1,8%	14,3%	7,1%	5,4%	0,0%	5,4%	0,0%	3,6%	0,0%	0,0%	1,8%	
Total	**22 848**	**788**	**41 997**	**321**	**23 069**	**9 422**	**1 604**	**394**	**9 766**	**133**	**6 204**	**4 132**	**636**	**4**	**122 927**
	18,6%	**0,6%**	**34,2%**	**0,3%**	**18,8%**	**7,7%**	**1,3%**	**0,3%**	**7,9%**	**0,1%**	**5,0%**	**3,4%**	**0,5%**	**0,0%**	

T1: Two screws or pins
T2: Three screws or pins
T3: Bipolar hemiprosthesis
T4: Unipolar hemiprosthesis
T5: Hip compression screw and plate
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

* Total hip prostheses reported to the Norwegian Arthroplasty Register

** The registration started in 2008

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

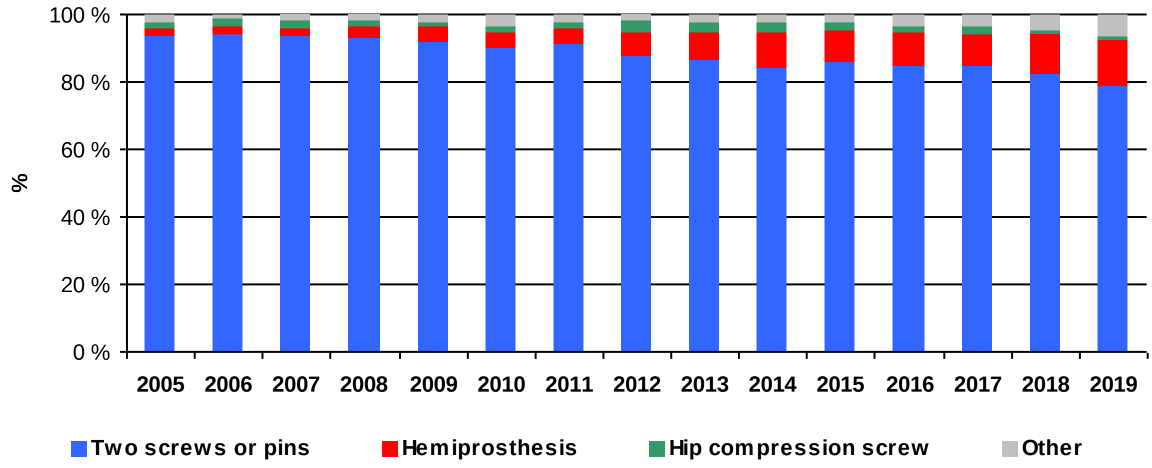
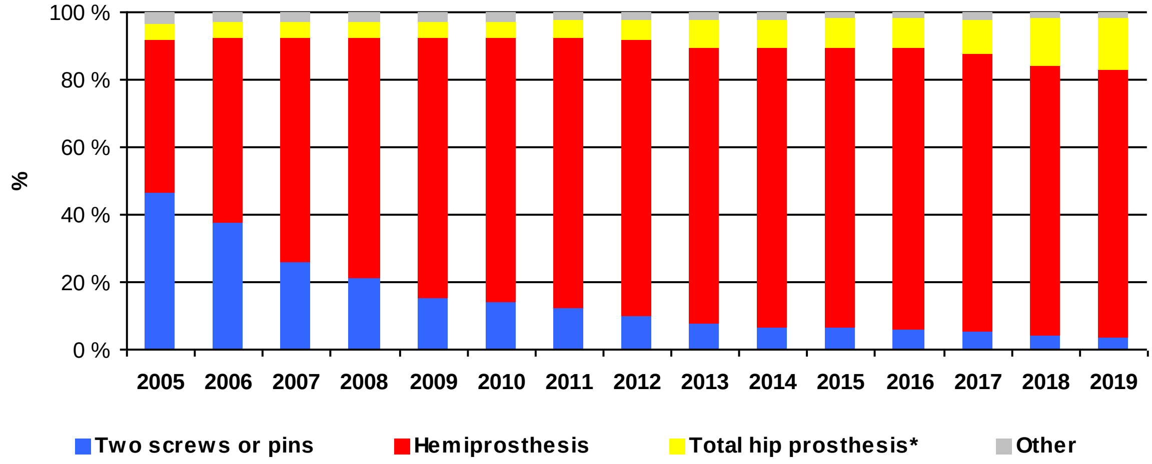


Figure 9b: Time trend for treatment of displaced femoral neck fractures



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

Figure 9c: Time trend for treatment of basocervical fracture

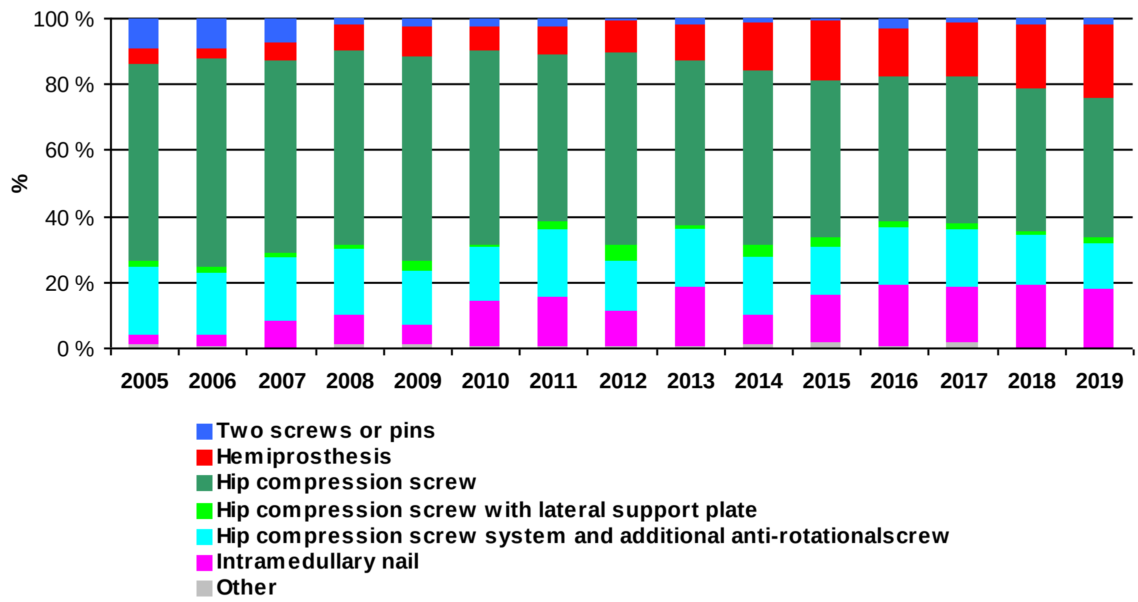


Figure 9d: Time trend for treatment of trochanteric fractures (AO / OTA type A1)

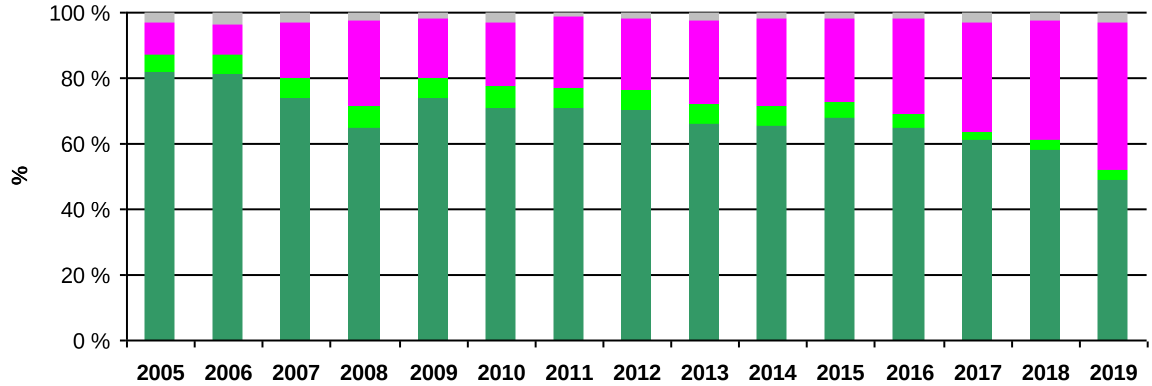


Figure 9e: Time trend for treatment of trochanteric fractures (AO / OTA type A2)

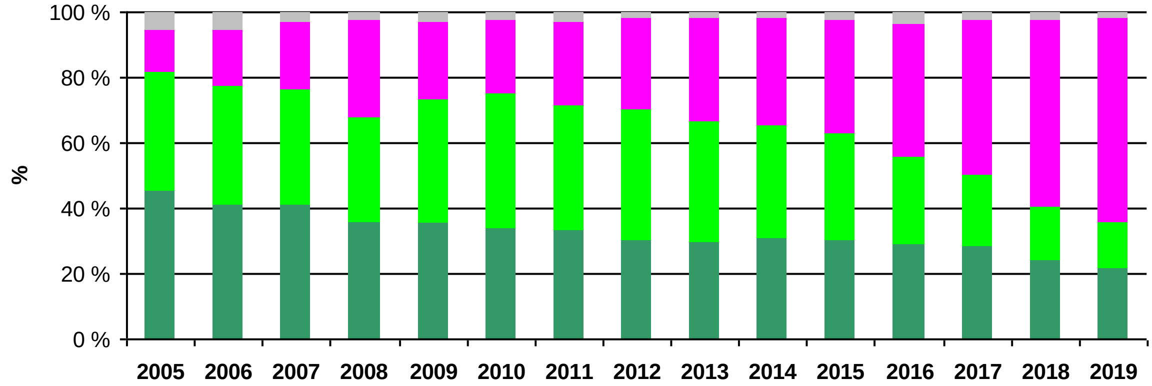
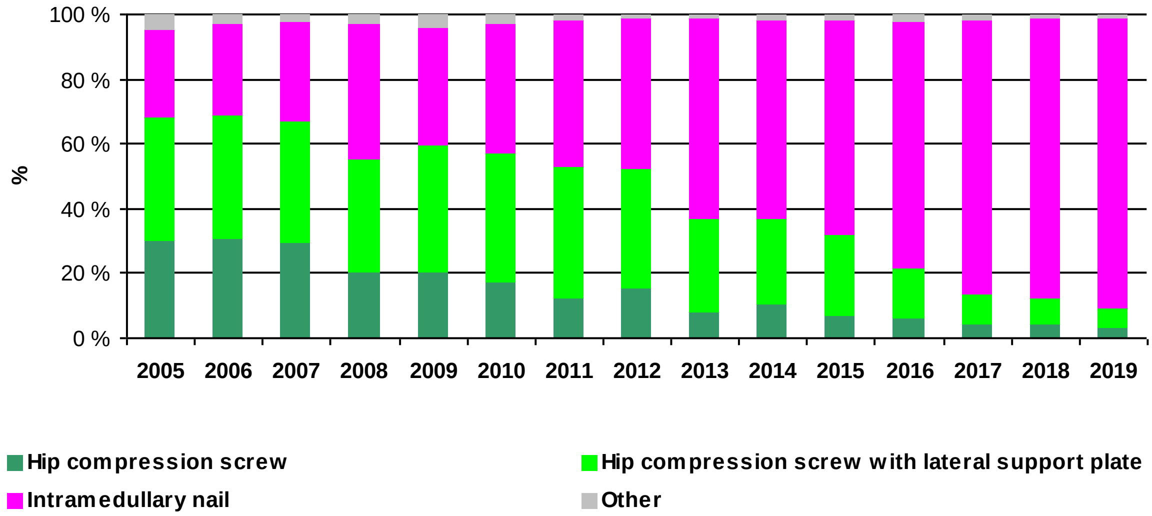


Figure 9f: Time trend for treatment of inter-* and subtrochanteric fractures



* Intertrochanteric fracture (AO / OTA type A3)

Reoperations

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

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	Total
2019	87	46	19	69	10	8	172	12	28	19	92	7	39	427	**1 035**
	8,4%	4,4%	1,8%	6,7%	1,0%	0,8%	16,6%	1,2%	2,7%	1,8%	8,9%	0,7%	3,8%	41,3%	
2018	98	46	17	70	3	8	220	10	35	24	75	9	44	414	**1 073**
	9,1%	4,3%	1,6%	6,5%	0,3%	0,7%	20,5%	0,9%	3,3%	2,2%	7,0%	0,8%	4,1%	38,6%	
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	383	**1 148**
	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	164	15	28	22	76	7	47	389	**1 069**
	13,2%	5,3%	3,1%	7,0%	0,5%	0,9%	15,3%	1,4%	2,6%	2,1%	7,1%	0,7%	4,4%	36,4%	
2012	153	65	38	75	19	9	187	15	34	22	63	4	43	349	**1 076**
	14,2%	6,0%	3,5%	7,0%	1,8%	0,8%	17,4%	1,4%	3,2%	2,0%	5,9%	0,4%	4,0%	32,4%	
2011	158	75	59	83	12	5	152	12	41	23	67	8	33	352	**1 080**
	14,6%	6,9%	5,5%	7,7%	1,1%	0,5%	14,1%	1,1%	3,8%	2,1%	6,2%	0,7%	3,1%	32,6%	
2010	177	79	48	79	11	11	132	14	44	26	58	10	37	292	**1 018**
	17,4%	7,8%	4,7%	7,8%	1,1%	1,1%	13,0%	1,4%	4,3%	2,6%	5,7%	1,0%	3,6%	28,7%	
2009	216	96	59	95	8	18	155	7	38	36	49	9	57	301	**1 144**
	18,9%	8,4%	5,2%	8,3%	0,7%	1,6%	13,5%	0,6%	3,3%	3,1%	4,3%	0,8%	5,0%	26,3%	
2008	245	104	63	102	10	10	110	20	39	42	57	10	33	269	**1 114**
	22,0%	9,3%	5,7%	9,2%	0,9%	0,9%	9,9%	1,8%	3,5%	3,8%	5,1%	0,9%	3,0%	24,1%	
2007	287	132	85	111	10	10	86	13	32	39	48	9	31	252	**1 145**
	25,1%	11,5%	7,4%	9,7%	0,9%	0,9%	7,5%	1,1%	2,8%	3,4%	4,2%	0,8%	2,7%	22,0%	
2006	318	125	64	101	7	8	79	20	21	30	33	7	21	205	**1 039**
	30,6%	12,0%	6,2%	9,7%	0,7%	0,8%	7,6%	1,9%	2,0%	2,9%	3,2%	0,7%	2,0%	19,7%	
2005	281	107	71	85	9	12	50	16	25	27	33	2	23	79	**820**
	34,3%	13,0%	8,7%	10,4%	1,1%	1,5%	6,1%	2,0%	3,0%	3,3%	4,0%	0,2%	2,8%	9,6%	
Total	**2 681**	**1 157**	**656**	**1 215**	**141**	**140**	**2 242**	**217**	**489**	**416**	**957**	**129**	**573**	**4 894**	**15 907**
	16,9%	**7,3%**	**4,1%**	**7,6%**	**0,9%**	**0,9%**	**14,1%**	**1,4%**	**3,1%**	**2,6%**	**6,0%**	**0,8%**	**3,6%**	**30,8%**	

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

Table 10: 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	633	256	206	321	33	6	142	15	26	59	203	6	112	**2 018**
	31,4%	12,7%	10,2%	15,9%	1,6%	0,3%	7,0%	0,7%	1,3%	2,9%	10,1%	0,3%	5,6%	
Intracapsular fracture, displaced	661	260	168	295	25	76	1 273	126	397	55	292	85	119	**3 832**
	17,2%	6,8%	4,4%	7,7%	0,7%	2,0%	33,2%	3,3%	10,4%	1,4%	7,6%	2,2%	3,1%	
Basocervical fracture	129	61	31	62	8	1	47	5	11	31	18	2	24	**430**
	30,0%	14,2%	7,2%	14,4%	1,9%	0,2%	10,9%	1,2%	2,6%	7,2%	4,2%	0,5%	5,6%	
Trochanteric fracture (2 fragments)	165	57	21	71	15	13	102	16	5	60	70	0	63	**658**
	25,1%	8,7%	3,2%	10,8%	2,3%	2,0%	15,5%	2,4%	0,8%	9,1%	10,6%	0,0%	9,6%	
Trochanteric fracture (multifragment)	356	150	33	126	22	18	268	29	9	104	95	3	86	**1 299**
	27,4%	11,5%	2,5%	9,7%	1,7%	1,4%	20,6%	2,2%	0,7%	8,0%	7,3%	0,2%	6,6%	
Intertrochanteric fracture*	63	28	6	26	5	2	46	6	3	15	10	0	17	**227**
	27,8%	12,3%	2,6%	11,5%	2,2%	0,9%	20,3%	2,6%	1,3%	6,6%	4,4%	0,0%	7,5%	
Subtrochanteric fracture	173	99	7	68	6	6	125	11	5	23	41	3	59	**626**
	27,6%	15,8%	1,1%	10,9%	1,0%	1,0%	20,0%	1,8%	0,8%	3,7%	6,5%	0,5%	9,4%	
Other	30	12	2	5	2	3	28	2	4	8	9	2	12	**119**
	25,2%	10,1%	1,7%	4,2%	1,7%	2,5%	23,5%	1,7%	3,4%	6,7%	7,6%	1,7%	10,1%	
Missing	2	0	0	0	0	0	1	0	0	0	0	0	0	**3**
	66,7%	0,0%	0,0%	0,0%	0,0%	0,0%	33,3%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	
Total	**2 212**	**923**	**474**	**974**	**116**	**125**	**2 032**	**210**	**460**	**355**	**738**	**101**	**492**	**9 212**
	24,0%	**10,0%**	**5,1%**	**10,6%**	**1,3%**	**1,4%**	**22,1%**	**2,3%**	**5,0%**	**3,9%**	**8,0%**	**1,1%**	**5,3%**	

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

* The registration started in 2008

** Total hip prostheses are not counted

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

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2019	65	21	124	0	84	139	16	4	168	408	**1 029**
	6,3%	2,0%	12,1%	0,0%	8,2%	13,5%	1,6%	0,4%	16,3%	39,7%	
2018	71	27	114	0	108	167	16	7	189	420	**1 119**
	6,3%	2,4%	10,2%	0,0%	9,7%	14,9%	1,4%	0,6%	16,9%	37,5%	
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	371	**1 080**
	6,9%	3,3%	16,9%	0,0%	10,6%	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	288	**962**
	8,9%	4,2%	23,0%	0,2%	9,3%	11,0%	1,6%	1,1%	10,8%	29,9%	
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%	
2008	112	40	317	1	84	83	10	15	91	266	**1 019**
	11,0%	3,9%	31,1%	0,1%	8,2%	8,1%	1,0%	1,5%	8,9%	26,1%	
2007	118	31	371	1	78	67	5	11	64	239	**985**
	12,0%	3,1%	37,7%	0,1%	7,9%	6,8%	0,5%	1,1%	6,5%	24,3%	
2006	97	37	371	6	82	63	8	5	56	206	**931**
	10,4%	4,0%	39,8%	0,6%	8,8%	6,8%	0,9%	0,5%	6,0%	22,1%	
2005	82	25	322	35	46	39	9	7	42	81	**688**
	11,9%	3,6%	46,8%	5,1%	6,7%	5,7%	1,3%	1,0%	6,1%	11,8%	
Total	**1 250**	**500**	**3 287**	**45**	**1 383**	**1 698**	**194**	**120**	**1 701**	**4 799**	**14 977**
	8,3%	**3,3%**	**21,9%**	**0,3%**	**9,2%**	**11,3%**	**1,3%**	**0,8%**	**11,4%**	**32,0%**	

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

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

	R1	R2	R3	R4	R5	R6	R9	R10	Total
2019	29 15,4%	0 0,0%	40 21,3%	0 0,0%	10 5,3%	3 1,6%	6 3,2%	100 53,2%	**188**
2018	27 12,2%	1 0,5%	30 13,5%	0 0,0%	25 11,3%	3 1,4%	7 3,2%	129 58,1%	**222**
2017	24 11,2%	4 1,9%	37 17,3%	0 0,0%	21 9,8%	2 0,9%	2 0,9%	124 57,9%	**214**
2016	36 12,7%	3 1,1%	53 18,7%	0 0,0%	27 9,5%	3 1,1%	4 1,4%	157 55,5%	**283**
2015	29 11,3%	3 1,2%	66 25,7%	0 0,0%	22 8,6%	3 1,2%	6 2,3%	128 49,8%	**257**
2014	17 6,7%	0 0,0%	70 27,7%	0 0,0%	25 9,9%	3 1,2%	3 1,2%	135 53,4%	**253**
2013	35 12,2%	2 0,7%	72 25,2%	0 0,0%	35 12,2%	1 0,3%	2 0,7%	139 48,6%	**286**
2012	31 10,2%	10 3,3%	99 32,5%	0 0,0%	27 8,9%	4 1,3%	3 1,0%	131 43,0%	**305**
2011	38 11,5%	9 2,7%	113 34,1%	0 0,0%	23 6,9%	2 0,6%	7 2,1%	139 42,0%	**331**
2010	43 13,2%	11 3,4%	114 35,1%	1 0,3%	26 8,0%	2 0,6%	4 1,2%	124 38,2%	**325**
2009	65 17,9%	8 2,2%	126 34,7%	0 0,0%	15 4,1%	7 1,9%	5 1,4%	137 37,7%	**363**
2008	54 13,9%	12 3,1%	161 41,4%	0 0,0%	21 5,4%	3 0,8%	3 0,8%	135 34,7%	**389**
2007	64 14,8%	8 1,8%	198 45,7%	1 0,2%	15 3,5%	1 0,2%	5 1,2%	141 32,6%	**433**
2006	34 8,8%	5 1,3%	193 49,9%	5 1,3%	21 5,4%	2 0,5%	2 0,5%	125 32,3%	**387**
2005	4 1,9%	6 2,9%	124 59,6%	12 5,8%	6 2,9%	4 1,9%	4 1,9%	48 23,1%	**208**
Total	**530** **11,9%**	**82** **1,8%**	**1 496** **33,7%**	**19** **0,4%**	**319** **7,2%**	**43** **1,0%**	**63** **1,4%**	**1 892** **42,6%**	**4 444**

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

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

	R2	R3	R6	R7	R8	R9	R10	Total
2019	7	30	77	10	3	92	41	**260**
	2,7%	11,5%	29,6%	3,8%	1,2%	35,4%	15,8%	
2018	9	28	105	10	4	113	45	**314**
	2,9%	8,9%	33,4%	3,2%	1,3%	36,0%	14,3%	
2017	9	28	78	8	4	84	48	**259**
	3,5%	10,8%	30,1%	3,1%	1,5%	32,4%	18,5%	
2016	12	20	81	9	6	98	42	**268**
	4,5%	7,5%	30,2%	3,4%	2,2%	36,6%	15,7%	
2015	5	18	66	16	1	74	47	**227**
	2,2%	7,9%	29,1%	7,0%	0,4%	32,6%	20,7%	
2014	9	20	48	5	4	61	37	**184**
	4,9%	10,9%	26,1%	2,7%	2,2%	33,2%	20,1%	
2013	11	15	68	9	4	78	37	**222**
	5,0%	6,8%	30,6%	4,1%	1,8%	35,1%	16,7%	
2012	11	23	55	10	8	56	31	**194**
	5,7%	11,9%	28,4%	5,2%	4,1%	28,9%	16,0%	
2011	10	14	60	16	8	70	32	**210**
	4,8%	6,7%	28,6%	7,6%	3,8%	33,3%	15,2%	
2010	8	17	59	10	9	69	16	**188**
	4,3%	9,0%	31,4%	5,3%	4,8%	36,7%	8,5%	
2009	9	10	44	7	9	49	20	**148**
	6,1%	6,8%	29,7%	4,7%	6,1%	33,1%	13,5%	
2008	10	7	46	5	12	45	20	**145**
	6,9%	4,8%	31,7%	3,4%	8,3%	31,0%	13,8%	
2007	5	9	27	3	10	35	11	**100**
	5,0%	9,0%	27,0%	3,0%	10,0%	35,0%	11,0%	
2006	6	2	28	4	3	29	10	**82**
	7,3%	2,4%	34,1%	4,9%	3,7%	35,4%	12,2%	
2005	1	1	12	3	3	13	2	**35**
	2,9%	2,9%	34,3%	8,6%	8,6%	37,1%	5,7%	
Total	**122**	**242**	**854**	**125**	**88**	**966**	**439**	**2 836**
	4,3%	**8,5%**	**30,1%**	**4,4%**	**3,1%**	**34,1%**	**15,5%**	

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 -10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cable Ready plate + cerclage	2		1		2			1	1		**7**
Cement spacer	2	2	1	3	3	4	4	3	1	2	**25**
Cerclage	4	2	1	3	2	3	2	2		4	**23**
Dall Miles plate + cerclage	4	3	1		4	4	3	2	2	1	**24**
DCP plate + possibly cerclage							3	4	4	2	**13**
Drainage of haematoma	22	2	1				1	1			**27**
Exchange of caput/bipolar head	188	58	42	67	43	55	77	67	95	66	**758**
Exchange of caput/bipolar head + osteosynthesis with plate/cerclage	2			1	1	1			1		**6**
Fixation of trochanter (Dall Miles)	1	1	1				1			1	**5**
NCB-plate + cerclage									4	10	**14**
Suture of muscle/fascie	5		1			1	2	1	1	2	**13**
Unspecified plate + cerclage	3	1	3	2	2	5	1	2	2	2	**23**
Other (n<5)	7	1	4	2	4	1	4	1	2	2	**28**
Total	**240**	**70**	**56**	**78**	**61**	**74**	**98**	**84**	**113**	**92**	**966**

Implants

Table 15: Cemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Charnley		Hastings bipolar head	2 309	142	118	98	61						**2 728**
Charnley Modular	Elite	Hastings bipolar head	814	142	160	152	1						**1 269**
Charnley Modular	Elite	Landos bipolar cup	24										**24**
Charnley Modular	Elite	Self-centering bipolar	62	23	36	55	241	258	71	45			**791**
Corail	Articul/Eze CoCr	Self-centering bipolar	1	8	34	48	72	117	93	80	83	48	**584**
Corail	Articul/Eze CoCr	Vario-Cup	1	7	8	8	35	48	64	7			**178**
Corail	Cobalt chrome (DePuy)	Self-centering bipolar	38	17	9								**64**
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	21	2									**23**
CPT	Protasul/Metasul	Multipolar								779	350	97	**1 226**
CPT	Protasul/Metasul	Self-centering bipolar								67	92	88	**247**
CPT	Protasul/Metasul	UHR								22	3		**25**
CPT	Zimmer hoder	Multipolar								8	7		**15**
C-Stem	Articul/Eze CoCr	Self-centering bipolar						5	86	69	165	295	**620**
C-Stem	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar						12	99	97			**208**
Elite	Elite	Hastings bipolar head	15										**15**
ETS			273	16	3	2	2	2	1				**299**
Exeter/V40	Exeter/V40	Multipolar								39	116	79	**234**
Exeter/V40	Exeter/V40	Self-centering bipolar	8	42	31	94	240	228	217	46			**906**
Exeter/V40	Exeter/V40	UHR	3 373	1138	1 241	1 262	1 318	1 456	1 567	890	1 354	1 530	**15 129**
MS-30	Protasul/Metasul	Multipolar								106	265	226	**597**
MS-30	Protasul/Metasul	UHR	21										**21**
MS-30	Versys	Multipolar										56	**56**
MS-30	Versys	Self-centering bipolar						11	45	38	11		**105**
MS-30	Versys	UHR									21	35	**56**
SP II	Articul/Eze CoCr	Self-centering bipolar			1		17	8		1			**27**
SP II	Articul/Eze CoCr	UHR					3	2	2	5	1	2	**15**
SP II	CoCrMo (Link)	Self-centering bipolar				7	49	70	98	17			**241**
SP II	CoCrMo (Link)	UHR				62	204	218	257	258	260	232	**1 491**
SP II	CoCrMo (Link)	Vario-Cup	914	251	237	263	72	90	113	178	270	268	**2 656**
Spectron	Cobalt Chrom (S&N)	Biarticular cup	31	2									**33**
Spectron	Cobalt Chrom (S&N)	HIP Bipolar Cup	20	19	9	16	21	19	15	15	13	10	**157**
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup	112										**112**
Spectron	Cobalt Chrom (S&N)	Self-centering bipolar	20										**20**
Spectron	Cobalt Chrom (S&N)	Tandem	803	104	95	65							**1 067**
Spectron	Cobalt Chrom (S&N)	Vario-Cup	82										**82**
Titan	Cobalt chrome (DePuy)	Landos bipolar cup	664										**664**
Titan	Cobalt chrome (DePuy)	Self-centering bipolar	226	1									**227**
Other	(n < 15)		392	50	28	32	34	18	40	116	79	97	**886**
Unknown			29	1			1	2	1	1	2	1	**38**
Total			**10 253**	**1 965**	**2 010**	**2 164**	**2 371**	**2 564**	**2 769**	**2 884**	**3 092**	**3 064**	**33 136**

Table 16: Uncemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	2005 -10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Accolade II	Exeter/V40	Vario-Cup				2	8	11	4	2		2	**29**
Corail	Alumina Biolox (DePuy)	Vario-Cup	10										**10**
Corail	Articul/Eze CoCr	Bipolar Ball Head		17	39	8							**64**
Corail	Articul/Eze CoCr	Landos bipolar cup	102										**102**
Corail	Articul/Eze CoCr	Self-centering bipolar	311	348	614	532	470	429	486	295	165	102	**3 752**
Corail	Articul/Eze CoCr	UHR	16	49	41	40	82	74	67	33	39	27	**468**
Corail	Articul/Eze CoCr	Vario-Cup	21	37	32	47	17	4	1				**159**
Corail	Articul/Eze Ultamet (M-Spec)	Multipolar									6	4	**10**
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar		21	143	146	80	9	6	1			**406**
Corail	Cobalt Chrom (S&N)	Self-centering bipolar	37										**37**
Corail	Cobalt Chrom (S&N)	Vario-Cup	13										**13**
Corail	Cobalt chrome (DePuy)	Landos bipolar cup	757										**757**
Corail	Cobalt chrome (DePuy)	Self-centering bipolar	755	341	31								**1 127**
Corail	Cobalt chrome (DePuy)	Tandem	9	2									**11**
Corail	Cobalt chrome (DePuy)	UHR	6	5									**11**
Corail	Metal Ball Head	Bipolar Ball Head	6	19									**25**
Corail	Modular Cathcart (Fracture head hip ball)		11	3									**14**
Filler	Biotechni fem. head	Biarticular cup	24										**24**
Filler	Cobalt Chrom (S&N)	Biarticular cup	18		1								**19**
Filler	Hipball Premium	Biarticular cup	190										**190**
Filler	Hipball Premium	HIP Bipolar Cup	119	129	126	99	37	44	36	35	63	49	**737**
Filler	Hipball Premium	UHR				10	20	2					**32**
Furlong	Furlong	UHR						21	57	31			**109**
HACTIV	HACTIV head	Moonstone	22										**22**
HACTIV	HACTIV head	Tandem	15	1	2	1							**19**
HACTIV	HACTIV head	UHR					41	22		1			**64**
Polarstem	Cobalt Chrom (S&N)	Tandem	18	64	74	39	16	2					**213**
Polarstem	Cobalt Chrom (S&N)	UHR					25	33	9	12	16	13	**108**
SL-PLUS	HACTIV head	Bipolar Ball Head	16										**16**
SL-PLUS	Metal Ball Head	Bipolar Ball Head	155										**155**
Other	(n < 10)		247	24	35	15	23	22	20	45	36	28	**495**
Unknown			5				1					1	**7**
Total			**2 883**	**1 060**	**1 138**	**939**	**820**	**673**	**686**	**455**	**325**	**226**	**9 205**

Table 17: Cemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Charnley		Hastings bipolar head	442	22	8	3	3						**478**
Charnley Modular	Elite	Hastings bipolar head	61	11	2	8							**82**
Charnley Modular	Elite	Landos bipolar cup	7										**7**
Charnley Modular	Elite	Self-centering bipolar	3	3	7	1	8	7					**29**
Corail	Articul/Eze CoCr	Self-centering bipolar		3	5		2	4	6	1	3	1	**25**
Corail	Articul/Eze CoCr	Vario-Cup		1			3	1	1				**6**
Corail	Cobalt chrome (DePuy)	Self-centering bipolar	2	3									**5**
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	15										**15**
CPT	Protasul/Metasul	Multipolar								3	5	4	**12**
CPT	Protasul/Metasul	Self-centering bipolar								2	4	4	**10**
C-Stem	Articul/Eze CoCr	Self-centering bipolar							3	2	2	2	**9**
C-Stem	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar							5	3			**8**
ETS			21			1							**22**
Exeter/V40	Exeter/V40	Multipolar									6	1	**7**
Exeter/V40	Exeter/V40	Self-centering bipolar	1	3	7	7	14	11	6	1			**50**
Exeter/V40	Exeter/V40	UHR	439	55	64	52	47	73	46	31	37	48	**892**
Fjord	Cobalt chrome (DePuy)	Landos bipolar cup	5										**5**
MS-30	Protasul/Metasul	Multipolar								4	1	4	**9**
MS-30	Protasul/Metasul	UHR	5										**5**
MS-30	Versys	Self-centering bipolar							2	1	1	1	**5**
Restoration Modular	Exeter/V40	Self-centering bipolar	7	3	1	1		1			3	3	**19**
Restoration Modular	Exeter/V40	UHR				5	2	2	3	5	3		**20**
SP II	CoCrMo (Link)	Self-centering bipolar						3	7	2			**12**
SP II	CoCrMo (Link)	UHR				2	12	15	12	11	7	2	**61**
SP II	CoCrMo (Link)	Vario-Cup	77	25	20	12	7	4	6	11	2	7	**171**
Spectron	Cobalt Chrom (S&N)	HIP Bipolar Cup	1	3				1		1		1	**7**
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup	11										**11**
Spectron	Cobalt Chrom (S&N)	Tandem	97	5	11	6	1						**120**
Titan	Cobalt chrome (DePuy)	Landos bipolar cup	132										**132**
Titan	Cobalt chrome (DePuy)	Self-centering bipolar	14	1									**15**
Other	(n < 5)		119	4	9	4	15	10	15	24	13	19	**232**
Unknown			4	1				1		2			**8**
Total			**1 463**	**143**	**134**	**102**	**114**	**133**	**112**	**104**	**87**	**97**	**2 489**

Table 18: Uncemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	2005 -10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Arcos	Modular Head (Biomet)	Multipolar								4	2	1	**7**
Arcos	Modular Head (Biomet)	Self-centering bipolar					2	3	5				**10**
Arcos	Modular Head (Biomet)	UHR								1	2	6	**9**
Corail	Articul/Eze CoCr	Landos bipolar cup	19										**19**
Corail	Articul/Eze CoCr	Self-centering bipolar	25	9	13	14	11	13	13	6	6	1	**111**
Corail	Articul/Eze CoCr	UHR							4	1			**5**
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar		4	13	10	2						**29**
Corail	Cobalt chrome (DePuy)	Landos bipolar cup	81										**81**
Corail	Cobalt chrome (DePuy)	Self-centering bipolar	49	16	1								**66**
Filler	Biotechni fem. head	Biarticular cup	18										**18**
Filler	Cobalt chrome (DePuy)	Biarticular cup	5										**5**
Filler	Hipball Premium	Biarticular cup	56										**56**
Filler	Hipball Premium	HIP Bipolar Cup	10	20	7	12	11	8	7	9	5	1	**90**
HACTIV	HACTIV head	Moonstone	5										**5**
KAR	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar			4	3							**7**
KAR	Cobalt chrome (DePuy)	Landos bipolar cup	9										**9**
KAR	Cobalt chrome (DePuy)	Self-centering bipolar	4	1	1								**6**
Polarstem	Cobalt Chrom (S&N)	UHR					2	1	1	2	1	2	**9**
REEF	Cobalt chrome (DePuy)	Self-centering bipolar	5										**5**
Restoration-HA	C-Taper Head	Landos bipolar cup	7										**7**
SL-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	4	1									**5**
Other	(n < 5)		126	22	16	18	12	20	6	10	10	16	**256**
Unknown			3							1			**4**
Total			**438**	**73**	**55**	**57**	**45**	**50**	**39**	**34**	**26**	**28**	**845**

Table 19: Screws - primary operations

Product	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Asnis III	565	177	156	105	121	120	118	114	119	212	**1 807**
Cannulated screw (S&N)		2							18	82	**102**
Hansson pin system (LIH)	1 671	112	69	60	41	60	49	79	62	55	**2 258**
Olmed	7 181	675	660	563	448	483	433	272	195	81	**10 991**
Richards CHP	3 038	734	597	593	547	614	595	658	635	466	**8 477**
Other (n<10)					1		3	2	5	10	**21**
Total	**12 455**	**1 700**	**1 482**	**1 321**	**1 158**	**1 277**	**1 198**	**1 125**	**1 034**	**906**	**23 656**

Table 20: Hip compression screws - primary operations

Product	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
DHS	4 103	58	28	8	13	25	25	29	11	5	**4 305**
LCP DHS	1 215	485	458	468	662	1 357	1 161	1 094	922	719	**8 541**
Omega	104	3	2	2							**111**
Richards CHS	9 226	2 021	1 992	1 764	1 564	773	711	534	493	404	**19 482**
Swemac CHS System						8	5	6	10	13	**42**
Other (n<10)	3			1	1		2	2			**9**
Total	**14 651**	**2 567**	**2 480**	**2 243**	**2 240**	**2 163**	**1 904**	**1 665**	**1 436**	**1 141**	**32 490**

Table 21: Intramedullary nails - primary operations

Product	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
ACE	49										**49**
AFFIXUS								5	14	23	**42**
Gamma 3	2 186	672	657	766	710	467	429	369	512	1 014	**7 782**
IMHS	27										**27**
IMHS CP	10										**10**
LFN	31	8	8	8	7	4	3	5	2	7	**83**
PFN	26										**26**
PFNA	182	40	91	136	117	174	200	186	231	127	**1 484**
T2	7	3	1		2	1				1	**15**
T2 recon	21	38	29	61	33	24	28	34	31	36	**335**
TFNA femoral nail									1	170	**171**
T-Gamma	507										**507**
Trigen Intertan	838	190	186	198	285	561	744	990	985	407	**5 384**
Trigen TAN/FAN	156	14	22	34	22	62	65	88	76	47	**586**
Other (n<10)	7		1		2	1			2	2	**15**
Total	**4 047**	**965**	**995**	**1 203**	**1 178**	**1 294**	**1 469**	**1 677**	**1 854**	**1 834**	**16 516**

Fixation of hemiprostheses

Table 22: Primary operations

	Uncemented		Cement with antibiotics		Cement without antibiotics		Missing		Total
2019	227	(6,9%)	3 062	(93,1%)	0	(0,0%)	0	(0,0%)	**3 289**
2018	332	(9,7%)	3 076	(90,0%)	1	(0,0%)	8	(0,2%)	**3 417**
2017	455	(13,6%)	2 883	(86,3%)	0	(0,0%)	1	(0,0%)	**3 339**
2016	687	(19,9%)	2 767	(80,1%)	0	(0,0%)	1	(0,0%)	**3 455**
2015	667	(20,6%)	2 563	(79,2%)	1	(0,0%)	6	(0,2%)	**3 237**
2014	811	(25,4%)	2 361	(74,0%)	3	(0,1%)	16	(0,5%)	**3 191**
2013	921	(29,7%)	2 154	(69,4%)	0	(0,0%)	28	(0,9%)	**3 103**
2012	1 064	(33,8%)	1 963	(62,4%)	11	(0,3%)	110	(3,5%)	**3 148**
2011	987	(32,6%)	1 927	(63,7%)	6	(0,2%)	105	(3,5%)	**3 025**
2010	837	(29,8%)	1 897	(67,5%)	7	(0,2%)	71	(2,5%)	**2 812**
2009	568	(20,0%)	2 175	(76,6%)	8	(0,3%)	87	(3,1%)	**2 838**
2008	399	(15,9%)	2 011	(80,1%)	8	(0,3%)	92	(3,7%)	**2 510**
2007	387	(17,9%)	1 726	(79,8%)	1	(0,0%)	49	(2,3%)	**2 163**
2006	323	(19,3%)	1 331	(79,4%)	3	(0,2%)	20	(1,2%)	**1 677**
2005	233	(20,5%)	882	(77,6%)	4	(0,4%)	17	(1,5%)	**1 136**
Total	**8 898**	**(21,0%)**	**32 778**	**(77,4%)**	**53**	**(0,1%)**	**611**	**(1,4%)**	**42 340**

Figure 10: Time trend for fixation of primary hemiprostheses

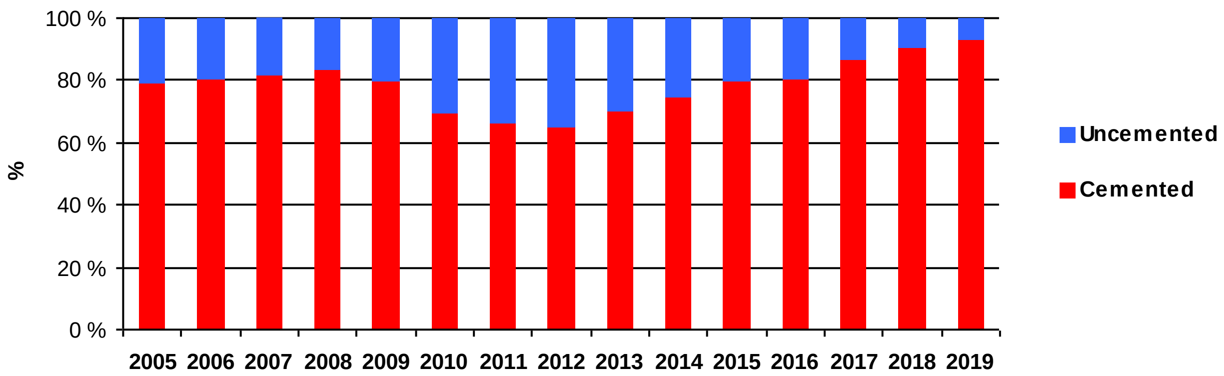


Table 23: Type of cement - primary operations

Product	Manufacturer	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cemex System Genta FAST	Alere	283	83	74	84	86	29					**639**
Cemex system genta ID green	Alere			1				16	126	106	67	**316**
Cemex w/gentamicin	Alere	50			11	10	71	111			1	**254**
Copal G+ V	Heraeus					1	1	2	8	4	5	**21**
Optipac Refobacin Bonecement R	Biomet	783	718	790	725	911	1 248	1 040	947	766	35	**7 963**
Optipac Refobacin Bonecement R-3	Zimmer Bio										13	**13**
Optipac Refobacin Revision	Biomet		2	1	58	67						**128**
Palacos R + G	Heraeus	5 760	714	692	869	881	958	1 007	763	882	556	**13 082**
Palacos R+G pro	Heraeus	1					1	93	374	1 078	2 250	**3 797**
Palacos w/gentamicin	Heraeus/Sc	353										**353**
Refobacin Bone Cement R	Biomet	2 220	357	368	394	380	221	366	524	77		**4 907**
Refobacin-Palacos	Biomet	314										**314**
Simplex unknown	Stryker	75										**75**
SmartSet GHV Genta. Smartmix	Ortomedic	66					3	39	31	21	11	**171**
Other (n<10)		2					1	1	3		1	**8**
Missing information		115	53	37	13	25	30	92	107	142	123	**737**
Total		**10 022**	**1 927**	**1 963**	**2 154**	**2 361**	**2 563**	**2 767**	**2 883**	**3 076**	**3 062**	**32 778**

Table 24: Hydroxyapatite (HA) - uncemented prostheses

	With HA		Without HA		Missing		Total
2019	223	(98,2%)	2	(0,9%)	2	(0,9%)	**227**
2018	325	(97,9%)	3	(0,9%)	4	(1,2%)	**332**
2017	452	(99,3%)	0	(0,0%)	3	(0,7%)	**455**
2016	680	(99,0%)	5	(0,7%)	2	(0,3%)	**687**
2015	664	(99,6%)	3	(0,4%)	0	(0,0%)	**667**
2014	805	(99,3%)	5	(0,6%)	1	(0,1%)	**811**
2013	920	(99,9%)	1	(0,1%)	0	(0,0%)	**921**
2012	1 062	(99,8%)	2	(0,2%)	0	(0,0%)	**1 064**
2011	986	(99,9%)	1	(0,1%)	0	(0,0%)	**987**
2010	824	(98,4%)	13	(1,6%)	0	(0,0%)	**837**
2009	524	(92,3%)	44	(7,7%)	0	(0,0%)	**568**
2008	362	(90,7%)	37	(9,3%)	0	(0,0%)	**399**
2007	351	(90,7%)	36	(9,3%)	0	(0,0%)	**387**
2006	284	(87,9%)	39	(12,1%)	0	(0,0%)	**323**
2005	192	(82,4%)	41	(17,6%)	0	(0,0%)	**233**
Total	**8 654**	**(97,3%)**	**232**	**(2,6%)**	**12**	**(0,1%)**	**8 898**

Pathological fractures

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

	No		Yes		Missing		Total
2019	6 248	(86,1%)	100	(1,4%)	911	(12,5%)	**7 259**
2018	6 776	(86,5%)	109	(1,4%)	947	(12,1%)	**7 832**
2017	6 851	(86,3%)	118	(1,5%)	969	(12,2%)	**7 938**
2016	7 063	(86,6%)	117	(1,4%)	972	(11,9%)	**8 152**
2015	7 077	(87,5%)	117	(1,4%)	893	(11,0%)	**8 087**
2014	6 919	(87,7%)	81	(1,0%)	893	(11,3%)	**7 893**
2013	6 987	(87,2%)	133	(1,7%)	892	(11,1%)	**8 012**
2012	7 191	(87,4%)	106	(1,3%)	932	(11,3%)	**8 229**
2011	7 485	(89,0%)	135	(1,6%)	790	(9,4%)	**8 410**
2010	7 611	(92,8%)	93	(1,1%)	497	(6,1%)	**8 201**
2009	7 307	(90,2%)	107	(1,3%)	687	(8,5%)	**8 101**
2008	7 388	(90,0%)	104	(1,3%)	720	(8,8%)	**8 212**
2007	6 956	(90,2%)	95	(1,2%)	660	(8,6%)	**7 711**
2006	6 653	(90,1%)	91	(1,2%)	637	(8,6%)	**7 381**
2005	5 135	(88,9%)	65	(1,1%)	574	(9,9%)	**5 774**
Total	**103 647**	**(88,4%)**	**1 571**	**(1,3%)**	**11 974**	**(10,2%)**	**117 192**

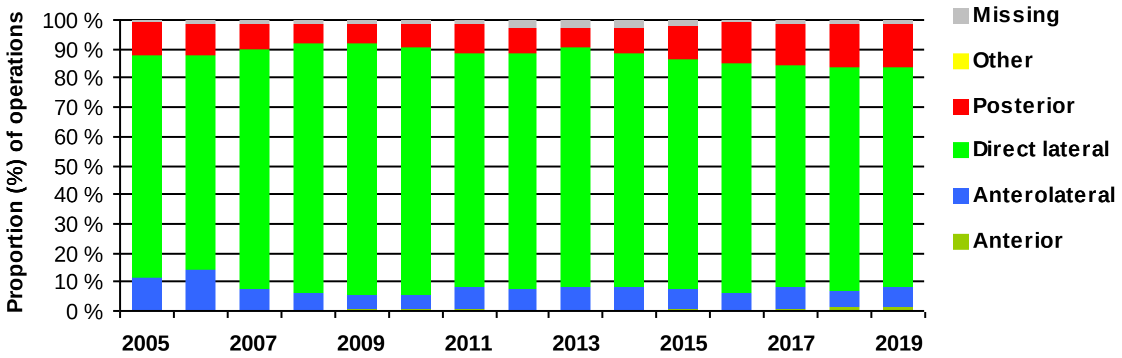
* Patients operated with total hip prostheses were excluded

Surgical approach used in hemiarthroplasty

Table 26: Surgical approach used in hemiarthroplasty

	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing		Total
2019	42	(1,3%)	227	(6,9%)	2 481	(75,4%)	495	(15,0%)	5	(0,2%)	40	(1,2%)	**3 290**
2018	45	(1,3%)	196	(5,7%)	2 628	(76,9%)	501	(14,7%)	0	(0,0%)	47	(1,4%)	**3 417**
2017	24	(0,7%)	247	(7,4%)	2 539	(76,0%)	493	(14,8%)	0	(0,0%)	36	(1,1%)	**3 339**
2016	11	(0,3%)	210	(6,1%)	2 713	(78,5%)	487	(14,1%)	0	(0,0%)	34	(1,0%)	**3 455**
2015	14	(0,4%)	232	(7,2%)	2 544	(78,6%)	388	(12,0%)	1	(0,0%)	58	(1,8%)	**3 237**
2014	3	(0,1%)	252	(7,9%)	2 561	(80,3%)	291	(9,1%)	1	(0,0%)	83	(2,6%)	**3 191**
2013	8	(0,3%)	255	(8,2%)	2 538	(81,8%)	224	(7,2%)	0	(0,0%)	78	(2,5%)	**3 103**
2012	6	(0,2%)	239	(7,6%)	2 538	(80,6%)	278	(8,8%)	1	(0,0%)	86	(2,7%)	**3 148**
2011	11	(0,4%)	228	(7,5%)	2 445	(80,8%)	290	(9,6%)	0	(0,0%)	51	(1,7%)	**3 025**
2010	14	(0,5%)	142	(5,0%)	2 391	(85,0%)	230	(8,2%)	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%)	35	(1,2%)	**2 838**
2008	1	(0,0%)	155	(6,2%)	2 144	(85,4%)	176	(7,0%)	0	(0,0%)	34	(1,4%)	**2 510**
2007	0	(0,0%)	162	(7,5%)	1 777	(82,2%)	201	(9,3%)	0	(0,0%)	23	(1,1%)	**2 163**
2006	1	(0,1%)	244	(14,5%)	1 224	(73,0%)	189	(11,3%)	0	(0,0%)	19	(1,1%)	**1 677**
2005	0	(0,0%)	131	(11,5%)	864	(76,1%)	136	(12,0%)	0	(0,0%)	5	(0,4%)	**1 136**
Total	**194**	**(0,5%)**	**3 067**	**(7,2%)**	**33 829**	**(79,9%)**	**4 579**	**(10,8%)**	**8**	**(0,0%)**	**664**	**(1,6%)**	**42 341**

Figure 11: Surgical approach used in hemiarthroplasty



Definition of operative approach:

- **Anterior** (between sartorius and tensor)
- **Anterolateral** (between gluteus medius and tensor)
- **Direct latera**l (transgluteal)
- **Posterior** (behind the gluteus medius)

Intraoperative complications

Table 27: Intraoperative complications - primary operations

	Yes		No		Missing		Total
2019	221	(2,8%)	7 428	(94,3%)	228	(2,9%)	**7 877**
2018	266	(3,2%)	7 898	(93,9%)	246	(2,9%)	**8 410**
2017	267	(3,2%)	7 862	(94,2%)	221	(2,7%)	**8 350**
2016	335	(3,9%)	7 906	(93,0%)	258	(3,0%)	**8 499**
2015	305	(3,6%)	7 812	(92,9%)	294	(3,5%)	**8 411**
2014	308	(3,8%)	7 586	(92,7%)	288	(3,5%)	**8 182**
2013	306	(3,7%)	7 745	(93,2%)	258	(3,1%)	**8 309**
2012	340	(4,0%)	7 772	(92,1%)	325	(3,9%)	**8 437**
2011	353	(4,1%)	7 959	(92,6%)	288	(3,4%)	**8 600**
2010	322	(3,9%)	7 762	(92,8%)	279	(3,3%)	**8 363**
2009	302	(3,7%)	7 684	(93,1%)	272	(3,3%)	**8 258**
2008	365	(4,4%)	7 726	(92,4%)	271	(3,2%)	**8 362**
2007	273	(3,5%)	7 359	(93,5%)	238	(3,0%)	**7 870**
2006	244	(3,3%)	7 020	(93,4%)	253	(3,4%)	**7 517**
2005	188	(3,2%)	5 557	(94,5%)	134	(2,3%)	**5 879**
Total	**4 395**	**(3,6%)**	**113 076**	**(93,2%)**	**3 853**	**(3,2%)**	**121 324**

Antibiotic prophylaxis

Table 28: Screw - primary operations

	Yes		No		Missing		Total
2019	881	(97,6%)	14	(1,6%)	8	(0,9%)	**903**
2018	995	(96,4%)	30	(2,9%)	7	(0,7%)	**1 032**
2017	1 063	(94,4%)	54	(4,8%)	9	(0,8%)	**1 126**
2016	1 129	(94,2%)	63	(5,3%)	7	(0,6%)	**1 199**
2015	1 166	(91,3%)	102	(8,0%)	9	(0,7%)	**1 277**
2014	988	(85,3%)	162	(14,0%)	8	(0,7%)	**1 158**
2013	1 008	(76,3%)	307	(23,2%)	6	(0,5%)	**1 321**
2012	1 016	(68,6%)	455	(30,7%)	11	(0,7%)	**1 482**
2011	1 000	(58,8%)	682	(40,1%)	18	(1,1%)	**1 700**
2010	952	(56,0%)	721	(42,4%)	26	(1,5%)	**1 699**
2009	885	(50,0%)	859	(48,6%)	25	(1,4%)	**1 769**
2008	930	(46,3%)	1 050	(52,3%)	27	(1,3%)	**2 007**
2007	905	(40,6%)	1 300	(58,3%)	26	(1,2%)	**2 231**
2006	812	(32,1%)	1 663	(65,8%)	51	(2,0%)	**2 526**
2005	533	(24,2%)	1 626	(73,7%)	47	(2,1%)	**2 206**
Total	**14 263**	**(60,3%)**	**9 088**	**(38,4%)**	**285**	**(1,2%)**	**23 636**

Table 29: Hemiprosthesis - primary operations

	Yes		No		Missing		Total
2019	3 270	(99,5%)	1	(0,0%)	15	(0,5%)	**3 286**
2018	3 396	(99,4%)	4	(0,1%)	15	(0,4%)	**3 415**
2017	3 319	(99,5%)	2	(0,1%)	14	(0,4%)	**3 335**
2016	3 430	(99,5%)	3	(0,1%)	14	(0,4%)	**3 447**
2015	3 229	(99,8%)	2	(0,1%)	5	(0,2%)	**3 236**
2014	3 184	(99,8%)	0	(0,0%)	6	(0,2%)	**3 190**
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	3 011	(99,6%)	4	(0,1%)	9	(0,3%)	**3 024**
2010	2 803	(99,7%)	4	(0,1%)	4	(0,1%)	**2 811**
2009	2 827	(99,6%)	8	(0,3%)	3	(0,1%)	**2 838**
2008	2 488	(99,1%)	13	(0,5%)	9	(0,4%)	**2 510**
2007	2 150	(99,4%)	7	(0,3%)	6	(0,3%)	**2 163**
2006	1 665	(99,3%)	9	(0,5%)	3	(0,2%)	**1 677**
2005	1 129	(99,4%)	2	(0,2%)	5	(0,4%)	**1 136**
Total	**42 129**	**(99,6%)**	**70**	**(0,2%)**	**119**	**(0,3%)**	**42 318**

Table 30: Hip compression screw and plate - primary operations

	Yes		No		Missing		Total
2019	1 136	(99,6%)	0	(0,0%)	5	(0,4%)	**1 141**
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	1 895	(99,5%)	1	(0,1%)	8	(0,4%)	**1 904**
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%)	2	(0,1%)	**2 244**
2012	2 461	(99,2%)	14	(0,6%)	5	(0,2%)	**2 480**
2011	2 527	(98,4%)	28	(1,1%)	12	(0,5%)	**2 567**
2010	2 583	(98,1%)	37	(1,4%)	12	(0,5%)	**2 632**
2009	2 490	(97,5%)	53	(2,1%)	10	(0,4%)	**2 553**
2008	2 376	(96,0%)	82	(3,3%)	16	(0,6%)	**2 474**
2007	2 361	(94,0%)	138	(5,5%)	13	(0,5%)	**2 512**
2006	2 342	(93,0%)	161	(6,4%)	16	(0,6%)	**2 519**
2005	1 822	(92,9%)	121	(6,2%)	18	(0,9%)	**1 961**
Total	**31 694**	**(97,5%)**	**653**	**(2,0%)**	**144**	**(0,4%)**	**32 491**

Table 31: Intramedullary nail - primary operations

	Yes		No		Missing		Total
2019	1 821	(99,3%)	2	(0,1%)	11	(0,6%)	**1 834**
2018	1 838	(99,3%)	1	(0,1%)	12	(0,6%)	**1 851**
2017	1 667	(99,6%)	2	(0,1%)	4	(0,2%)	**1 673**
2016	1 458	(99,5%)	1	(0,1%)	7	(0,5%)	**1 466**
2015	1 280	(99,2%)	6	(0,5%)	4	(0,3%)	**1 290**
2014	1 160	(98,6%)	5	(0,4%)	12	(1,0%)	**1 177**
2013	1 182	(98,3%)	15	(1,2%)	5	(0,4%)	**1 202**
2012	935	(94,1%)	53	(5,3%)	6	(0,6%)	**994**
2011	864	(89,5%)	96	(9,9%)	5	(0,5%)	**965**
2010	796	(91,3%)	68	(7,8%)	8	(0,9%)	**872**
2009	712	(91,9%)	58	(7,5%)	5	(0,6%)	**775**
2008	914	(89,1%)	105	(10,2%)	7	(0,7%)	**1 026**
2007	573	(91,1%)	54	(8,6%)	2	(0,3%)	**629**
2006	397	(89,0%)	48	(10,8%)	1	(0,2%)	**446**
2005	236	(79,5%)	56	(18,9%)	5	(1,7%)	**297**
Total	**15 833**	**(96,0%)**	**570**	**(3,5%)**	**94**	**(0,6%)**	**16 497**

Table 32: Reoperations

	Yes		No		Missing		Total
2019	767	(87,6%)	100	(11,4%)	9	(1,0%)	**876**
2018	794	(84,7%)	127	(13,6%)	16	(1,7%)	**937**
2017	771	(85,6%)	121	(13,4%)	9	(1,0%)	**901**
2016	859	(87,0%)	115	(11,7%)	13	(1,3%)	**987**
2015	856	(91,3%)	65	(6,9%)	17	(1,8%)	**938**
2014	746	(94,1%)	45	(5,7%)	2	(0,3%)	**793**
2013	822	(91,4%)	67	(7,5%)	10	(1,1%)	**899**
2012	814	(90,8%)	76	(8,5%)	6	(0,7%)	**896**
2011	816	(88,2%)	95	(10,3%)	14	(1,5%)	**925**
2010	739	(85,8%)	110	(12,8%)	12	(1,4%)	**861**
2009	801	(82,6%)	151	(15,6%)	18	(1,9%)	**970**
2008	794	(84,3%)	131	(13,9%)	17	(1,8%)	**942**
2007	800	(85,7%)	125	(13,4%)	8	(0,9%)	**933**
2006	754	(84,4%)	122	(13,7%)	17	(1,9%)	**893**
2005	548	(82,5%)	108	(16,3%)	8	(1,2%)	**664**
Total	**11 681**	**(87,1%)**	**1 558**	**(11,6%)**	**176**	**(1,3%)**	**13 415**

Table 33: Type of antibiotics - primary operations

Antibiotics (generic name)	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Cefalotin (Keflin)	31 964	6 418	6 544	6 745	6 947	7 306	7 835	7 030	5 821	816	87 426
	84,4%	81,8%	81,7%	83,3%	85,8%	87,1%	92,0%	84,5%	69,5%	10,4%	78,5%
Cefazolin (Cephazolin)	1	1	1		1		2	748	2 067	6 127	8 948
	0,0%	0,0%	0,0%		0,0%		0,0%	9,0%	24,7%	77,8%	8,0%
Klindamycin (Dalacin, Clindamycin)	880	269	288	325	338	366	397	394	377	376	4 010
	2,3%	3,4%	3,6%	4,0%	4,2%	4,4%	4,7%	4,7%	4,5%	4,8%	3,6%
Kloksacillin (Ekvacillin)	732	497	422	511	532	510	80	15	9	445	3 753
	1,9%	6,3%	5,3%	6,3%	6,6%	6,1%	0,9%	0,2%	0,1%	5,6%	3,4%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1 882	321	385	193	87	31	27	21	6	30	2 983
	5,0%	4,1%	4,8%	2,4%	1,1%	0,4%	0,3%	0,3%	0,1%	0,4%	2,7%
Dikloksacillin (Diclocil, Dicillin)	1 714	176	201	141	18	18	14	3	12	13	2 310
	4,5%	2,2%	2,5%	1,7%	0,2%	0,2%	0,2%	0,0%	0,1%	0,2%	2,1%
Other *	535	144	148	139	133	121	130	75	67	69	1 561
	1,4%	1,8%	1,8%	1,7%	1,6%	1,4%	1,5%	0,9%	0,8%	0,9%	1,4%
Missing information	155	22	18	41	38	34	28	30	12	3	381
	0,4%	0,3%	0,2%	0,5%	0,5%	0,4%	0,3%	0,4%	0,1%	0,0%	0,3%
Total	**37 863**	**7 848**	**8 007**	**8 095**	**8 094**	**8 386**	**8 513**	**8 316**	**8 371**	**7 879**	**111 372**

* 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
2019	7 649	(97,1%)	193	(2,1%)	35	(0,8%)	**7 877**
2018	8 194	(97,4%)	190	(2,0%)	26	(0,6%)	**8 410**
2017	8 147	(97,6%)	182	(1,9%)	21	(0,5%)	**8 350**
2016	8 280	(97,4%)	186	(1,9%)	32	(0,6%)	**8 499**
2015	8 210	(97,6%)	168	(1,8%)	33	(0,6%)	**8 411**
2014	7 966	(97,4%)	191	(1,9%)	25	(0,7%)	**8 182**
2013	8 162	(98,2%)	139	(1,3%)	8	(0,4%)	**8 309**
2012	8 310	(98,5%)	125	(1,1%)	2	(0,4%)	**8 437**
2011	8 488	(98,7%)	92	(1,0%)	20	(0,3%)	**8 600**
2010	8 238	(98,5%)	94	(1,1%)	31	(0,4%)	**8 363**
2009	8 150	(98,7%)	78	(0,9%)	30	(0,4%)	**8 258**
2008	8 218	(98,3%)	112	(1,3%)	32	(0,4%)	**8 362**
2007	7 707	(97,9%)	135	(1,7%)	28	(0,4%)	**7 870**
2006	7 274	(96,8%)	197	(2,6%)	46	(0,6%)	**7 517**
2005	5 736	(97,6%)	117	(2,0%)	26	(0,4%)	**5 879**
Total	**118 729**	**(97,9%)**	**2 199**	**(1,8%)**	**395**	**(0,3%)**	**121 324**

Table 35: Number of drugs in antithrombotic prophylaxis

	One drug		Two drugs		Total
2019	7 427	(97,1%)	222	(2,9%)	**7 649**
2018	8 010	(97,8%)	184	(2,2%)	**8 194**
2017	7 963	(97,7%)	184	(2,3%)	**8 147**
2016	8 097	(97,8%)	183	(2,2%)	**8 280**
2015	7 963	(97,0%)	247	(3,0%)	**8 210**
2014	7 749	(97,3%)	217	(2,7%)	**7 966**
2013	7 902	(96,8%)	260	(3,2%)	**8 162**
2012	8 136	(97,9%)	174	(2,1%)	**8 310**
2011	8 402	(99,0%)	86	(1,0%)	**8 488**
2010	8 204	(99,6%)	34	(0,4%)	**8 238**
2009	8 132	(99,8%)	18	(0,2%)	**8 150**
2008	8 202	(99,8%)	16	(0,2%)	**8 218**
2007	7 692	(99,8%)	15	(0,2%)	**7 707**
2006	7 259	(99,8%)	15	(0,2%)	**7 274**
2005	5 715	(99,6%)	21	(0,4%)	**5 736**
Total	**116 853**	**(98,4%)**	**1 876**	**(1,6%)**	**118 729**

Table 36: Antithrombotic prophylaxis if one drug - primary operation (n=116 846)

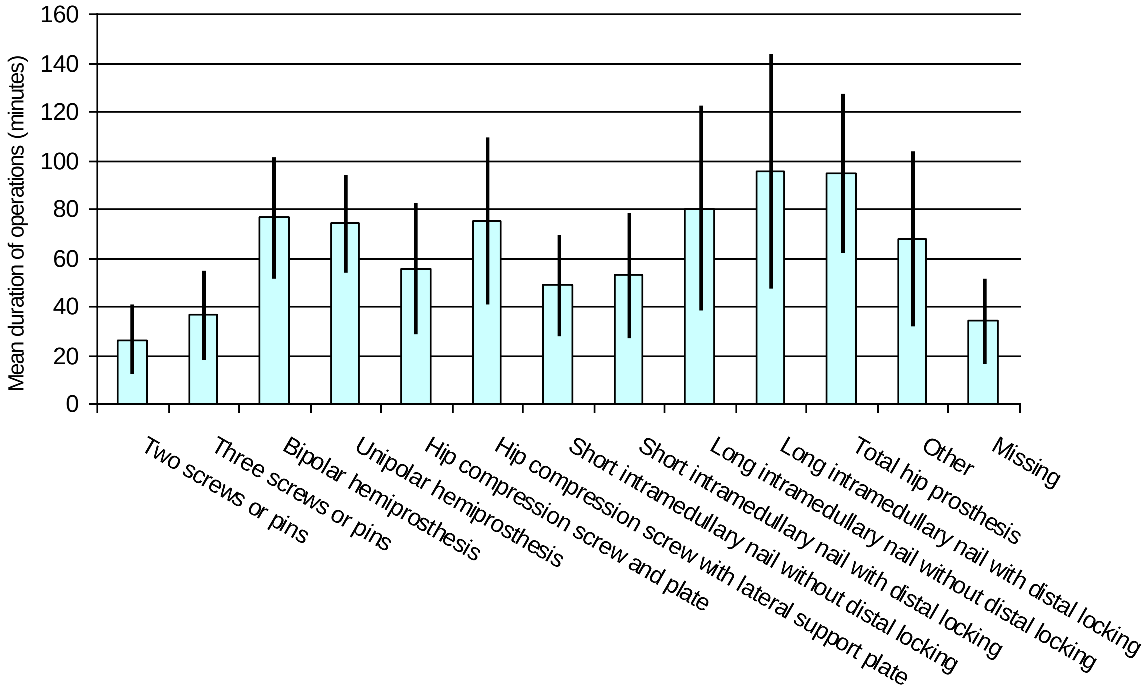
	2005-10	2011	2012	2013	2014	2015	2016	2017	2018	2019
Dalteparin (Fragmin)	55,72%	62,97%	62,92%	53,35%	51,05%	59,81%	64,76%	70,51%	71,57%	58,66%
Enoksaparin (Klexane)	43,98%	36,62%	36,34%	45,68%	48,02%	39,12%	34,26%	28,22%	27,50%	40,15%
Other	0,02%	0,02%	0,02%	0,05%	0,05%	0,06%	0,07%	0,06%	0,07%	0,11%
Missing information	0,17%	0,31%	0,70%	0,68%	0,55%	0,62%	0,59%	0,73%	0,37%	0,31%

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

	Preoperatively		Postoperatively		Missing		Total
2019	2 123	(27,8%)	4 727	(61,8%)	800	(10,4%)	**7 650**
2018	2 405	(29,4%)	4 923	(60,1%)	866	(10,5%)	**8 194**
2017	2 345	(28,8%)	4 846	(59,5%)	956	(11,7%)	**8 147**
2016	2 595	(31,4%)	4 760	(57,5%)	926	(11,2%)	**8 281**
2015	2 633	(32,1%)	4 698	(57,2%)	879	(10,7%)	**8 210**
2014	2 618	(32,9%)	4 477	(56,2%)	871	(11,0%)	**7 966**
2013	2 818	(34,6%)	4 352	(53,3%)	992	(12,1%)	**8 162**
2012	3 109	(37,4%)	4 133	(49,8%)	1 068	(12,9%)	**8 310**
2011	3 322	(39,2%)	4 060	(47,8%)	1 106	(9,8%)	**8 488**
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**
2008	3 509	(42,7%)	2 973	(36,2%)	1 736	(16,3%)	**8 218**
2007	2 925	(38,0%)	2 968	(38,5%)	1 814	(17,6%)	**7 707**
2006	2 931	(40,4%)	2 058	(28,3%)	2 285	(19,6%)	**7 274**
2005	2 188	(38,7%)	44	(0,8%)	3 504	(26,7%)	**5 736**
Total	**42 590**	**(35,9%)**	**55 650**	**(46,9%)**	**20 491**	**(17,3%)**	**118 731**

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	21 777	26	14
Three screws or pins	734	36	19
Bipolar hemiprosthesis	40 490	76	25
Unipolar hemiprosthesis	301	74	20
Hip compression screw and plate	22 045	56	27
Hip compression screw with lateral support plate	9 043	75	34
Short intramedullary nail without distal locking	364	49	21
Short intramedullary nail with distal locking	9 312	53	26
Long intramedullary nail without distal locking	124	80	42
Long intramedullary nail with distal locking	5 938	96	48
Total hip prosthesis	4 030	95	32
Other	2 141	68	36
Missing	4	34	18

PROM (Patient Reported Outcome Measures)

Table 39: Number of issued and answered patient questionnaires

	4 months *			12 months *			36 months *			Total		
	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)	Issued	Answered	(%)
2019	6 748	3 722	(55,2%)	5 837	3 049	(52,2%)	4 241	2 219	(52,3%)	**16 826**	**8 990**	(53,4%)
2018	7 332	4 169	(56,9%)	5 997	3 435	(57,3%)	4 346	2 380	(54,8%)	**17 675**	**9 984**	(56,5%)
2017	7 009	4 060	(57,9%)	5 952	3 420	(57,5%)	4 091	2 255	(55,1%)	**17 052**	**9 735**	(57,1%)
2016	7 011	3 962	(56,5%)	6 077	3 519	(57,9%)	4 206	2 326	(55,3%)	**17 294**	**9 807**	(56,7%)
2015	6 919	3 980	(57,5%)	5 844	3 346	(57,3%)	4 384	2 393	(54,6%)	**17 147**	**9 719**	(56,7%)
2014	6 816	3 823	(56,1%)	6 003	3 272	(54,5%)	4 332	2 350	(54,2%)	**17 151**	**9 445**	(55,1%)
2013	6 901	3 954	(57,3%)	6 095	3 516	(57,7%)	4 442	2 439	(54,9%)	**17 438**	**9 909**	(56,8%)
2012	7 575	4 202	(55,5%)	6 784	3 816	(56,3%)	1 788	1 049	(58,7%)	**16 147**	**9 067**	(56,2%)
2011	6 457	3 555	(55,1%)	5 551	3 117	(56,2%)	1 410	816	(57,9%)	**13 418**	**7 488**	(55,8%)
2010	4 985	2 826	(56,7%)	2 263	1 308	(57,8%)	3 752	2 134	(56,9%)	**11 000**	**6 268**	(57,0%)
2009	2 552	1 482	(58,1%)	2 358	1 361	(57,7%)	4 095	2 207	(53,9%)	**9 005**	**5 050**	(56,1%)
2008	2 273	1 305	(57,4%)	1 902	1 084	(57,0%)	3 180	1 817	(57,1%)	**7 355**	**4 206**	(57,2%)
2007	3 503	1 967	(56,2%)	5 068	2 836	(56,0%)				**8 571**	**4 803**	(56,0%)
2006	6 160	3 607	(58,6%)	4 848	2 787	(57,5%)				**11 008**	**6 394**	(58,1%)
2005	2 817	1 640	(58,2%)							**2 817**	**1 640**	(58,2%)
Total	**85 058**	**48 254**	**(56,7%)**	**70 579**	**39 866**	**(56,5%)**	**44 267**	**24 385**	**(55,1%)**	**199 904**	**112 505**	**(56,3%)**

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

Figure D.13: EQ-5D-3L index score before fracture

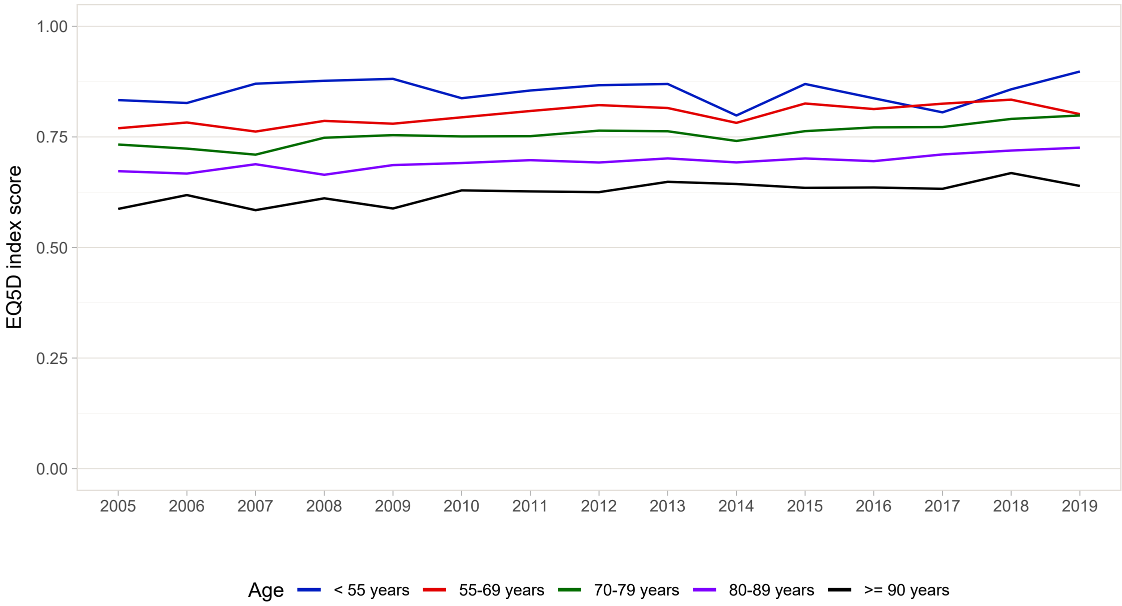


Figure D.13 shows change over time of mean pre-fracture EQ-5D-3L index score for different age groups. 1 represents the best possible quality of life and 0 represents quality of life equivalent to death.

Figure D.14: EQ-5D-3L index score 12 months postoperatively

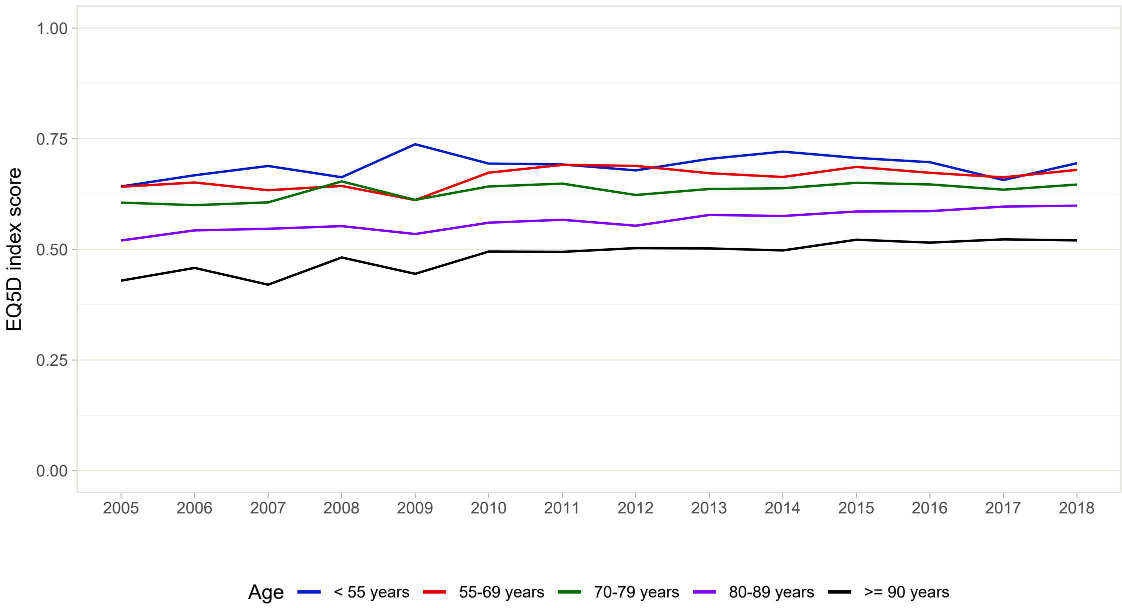


Figure D.14 shows change over time of mean EQ-5D-3L index score for different age groups 12 months postoperatively. 1 represents the best possible quality of life and 0 represents quality of life equivalent to death.

Figure D.15: EQ-5D-3L walking ability before fracture

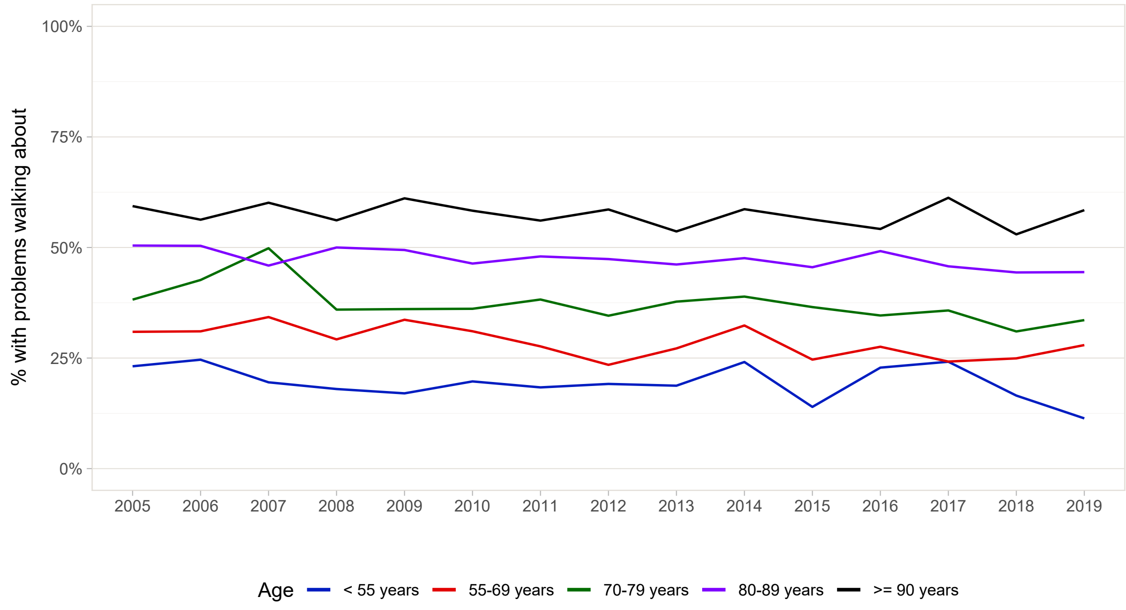


Figure D.15 shows change over time of walking ability before fracture for different age groups evaluated using the first question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have problems in walking around" or "I am confined to bed".

Figure D.16: EQ-5D-3L walking ability 12 months postoperatively

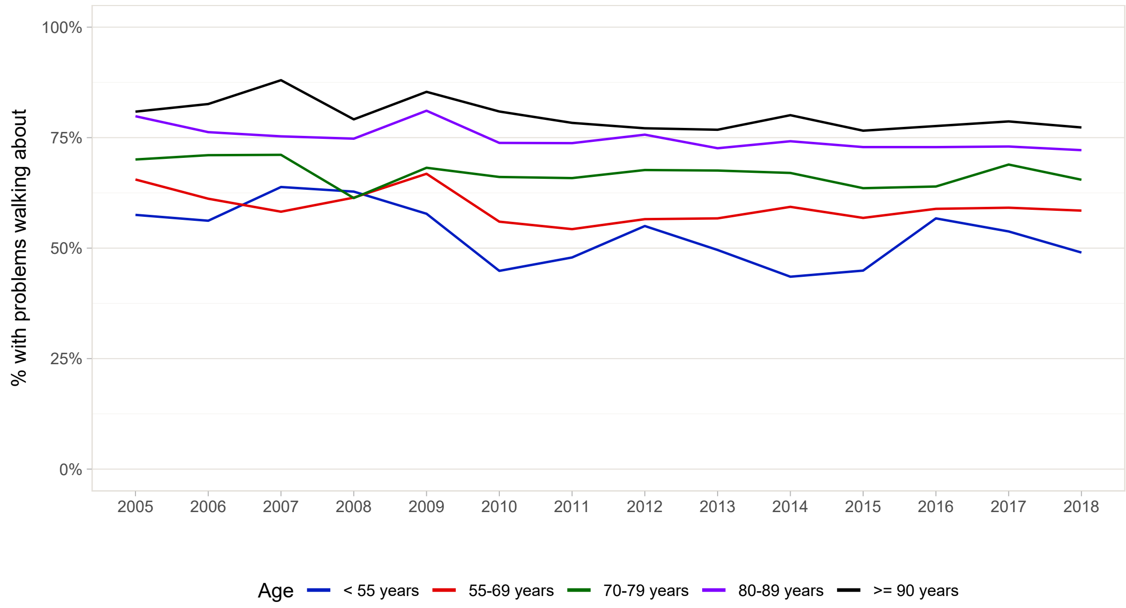


Figure D.16 shows change over time of walking ability 12 months postoperatively for different age groups evaluated using the first question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have problems in walking around" or "I am confined to bed".

Figure D.17: EQ-5D-3L Ability to perform self-care before fracture

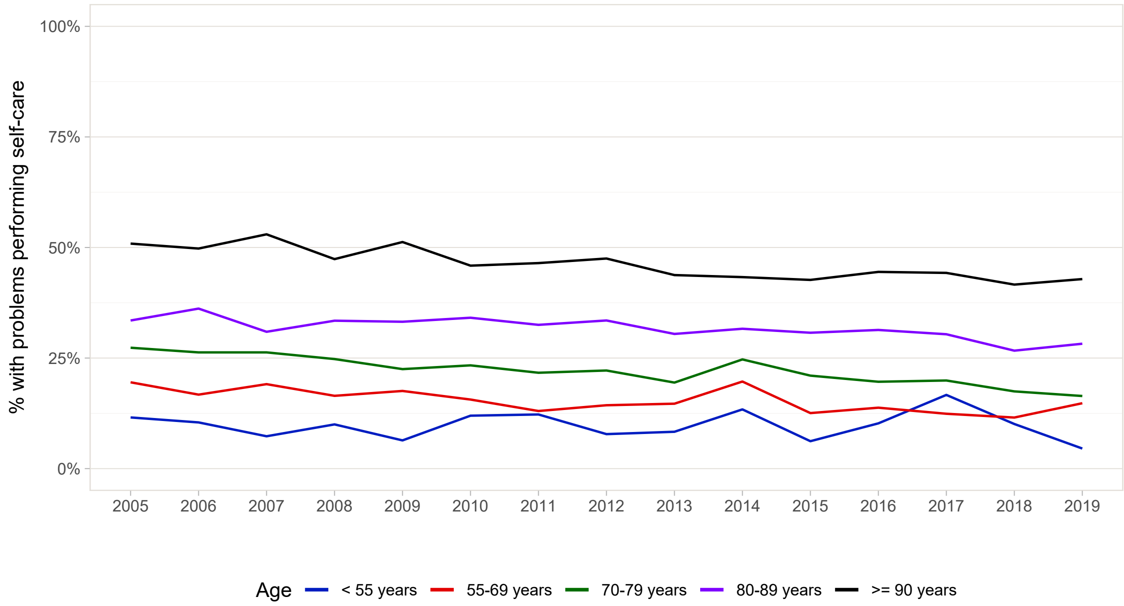


Figure D.17 shows change over time of ability to perform self-care before fracture for different age groups evaluated using the second question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have problems with self-care" or "I am unable to wash or dress myself".

Figure D.18: EQ-5D-3L Ability to perform self-care 12 months postoperatively

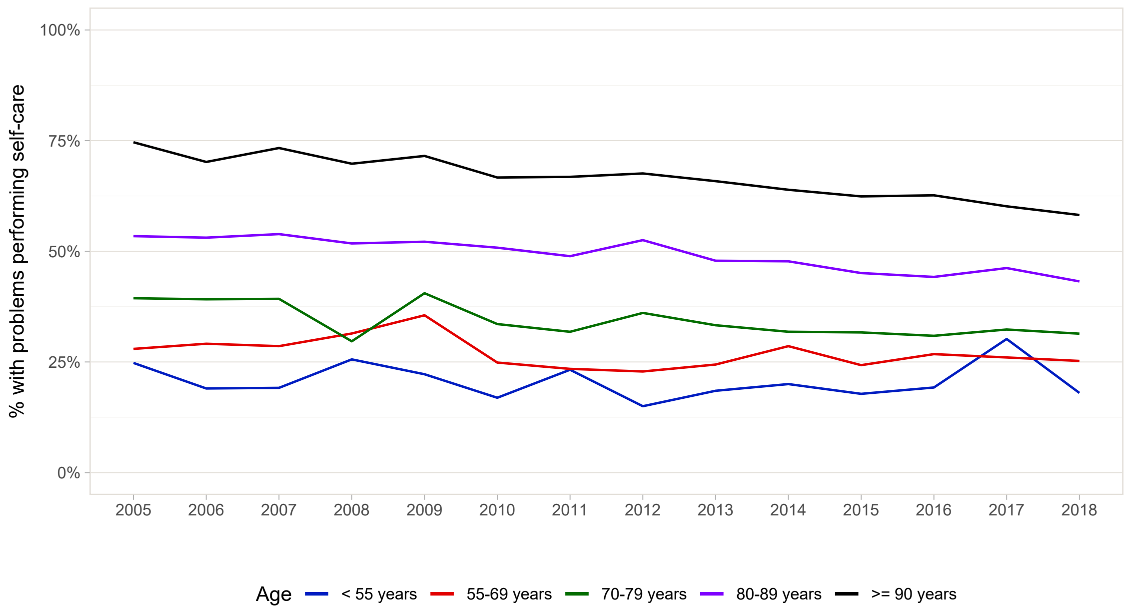


Figure D.18 shows change over time of ability to perform self-care 12 months postoperatively for different types of fractures evaluated using the second question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have problems with self-care" or "I am unable to wash or dress myself".

Figure D.19: EQ-5D-3L Ability to perform usual activities before fracture

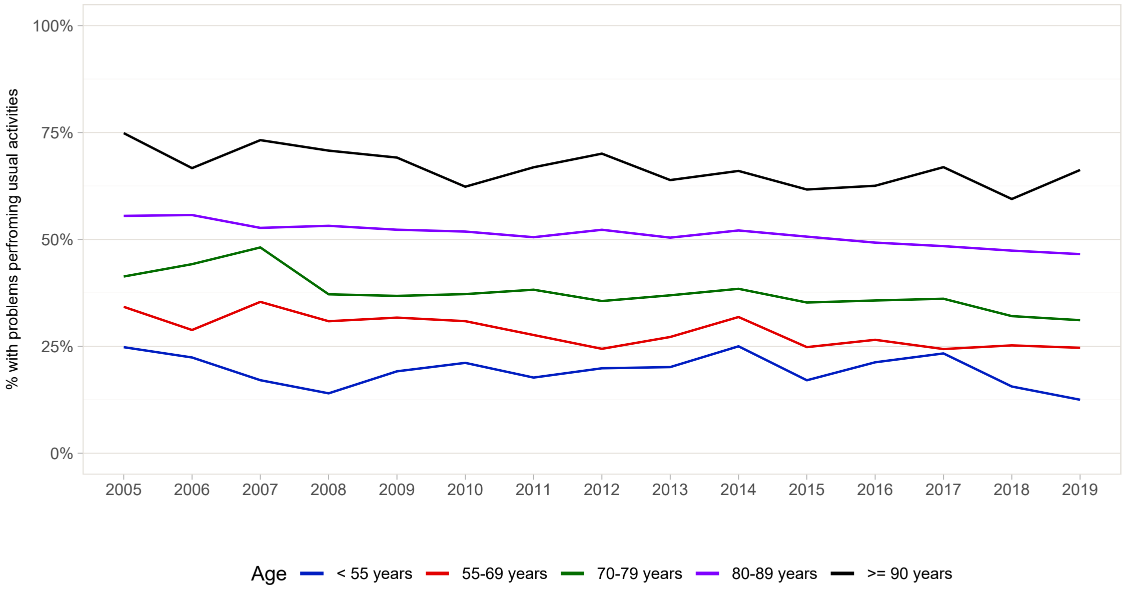


Figure D.19 shows change over time of ability to perform usual activities (e.g. work, study, housework, family or leisure activities) before fracture for different age groups evaluated using the third question in EQ-5D- 3L. The figure shows the proportion of patients reporting "I have problems with performing my usual activities" or "I am unable to perform my usual activities".

Figure D.20: EQ-5D-3L Ability to perform usual activities 12 months postoperatively

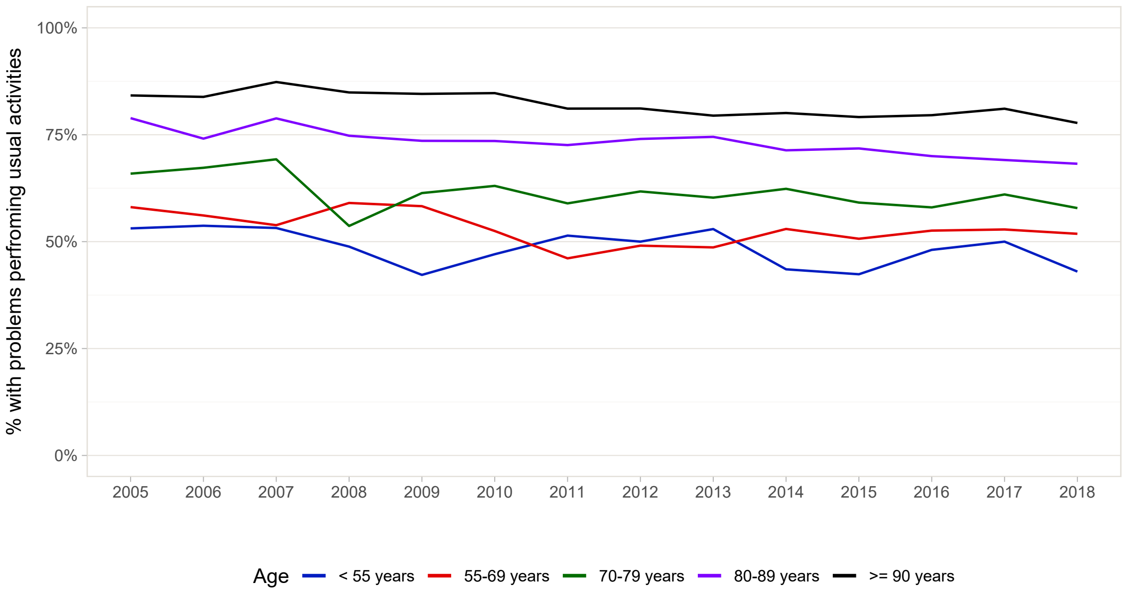


Figure D.20 shows change over time of ability to perform usual activities (e.g. work, study, housework, family or leisure activities) 12 months postoperatively for different age groups evaluated using the third question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have problems with performing my usual activities" or "I am unable to perform my usual activities".

Figure D.21: EQ-5D-3L Pain / discomfort before fracture

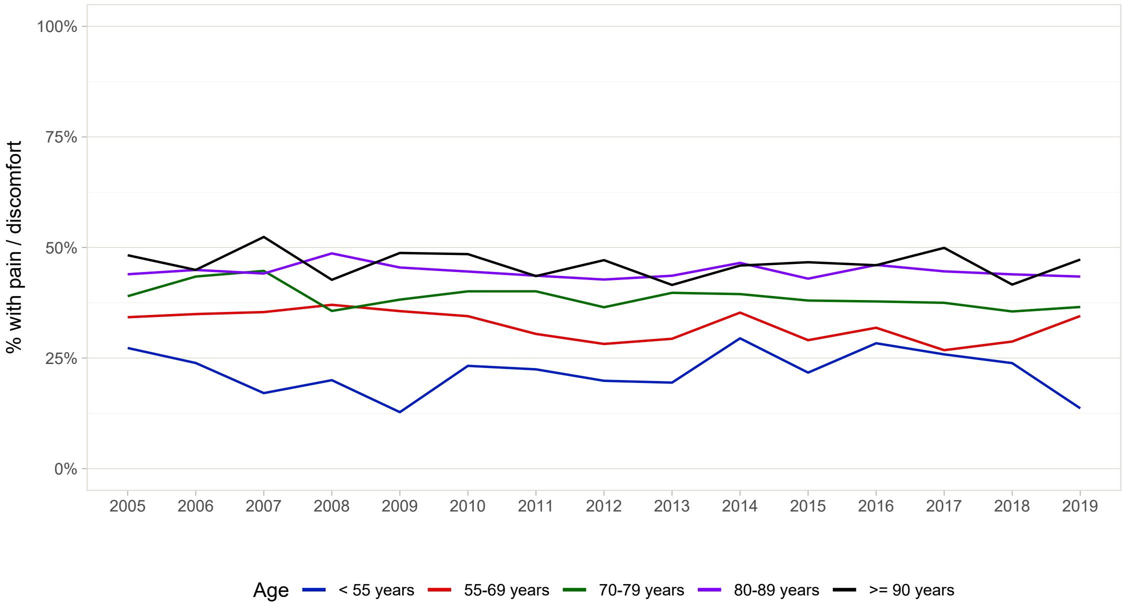


Figure D.21 shows change over time of pain/discomfort before fracture for different age groups evaluated using the forth question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have moderate pain or discomfort" or "I have extreme pain or discomfort".

Figure D.22: EQ-5D-3L Pain / discomfort 12 months postoperatively

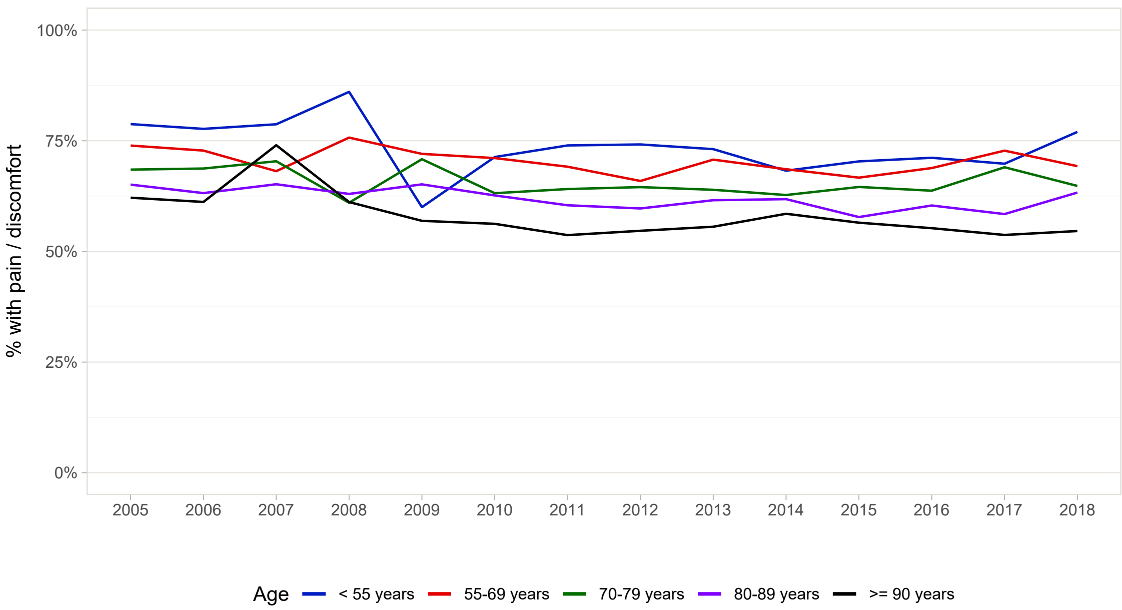


Figure D.22 shows change over time of pain/discomfort 12 months postoperatively for different age groups evaluated using the forth question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have moderate pain or discomfort" or "I have extreme pain or discomfort".

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.24 to D.28 present updated results for the different hospitals for operations performed in the period 2017-2019.

Figure D.23: Number of primary operations in 2019 at each hospital

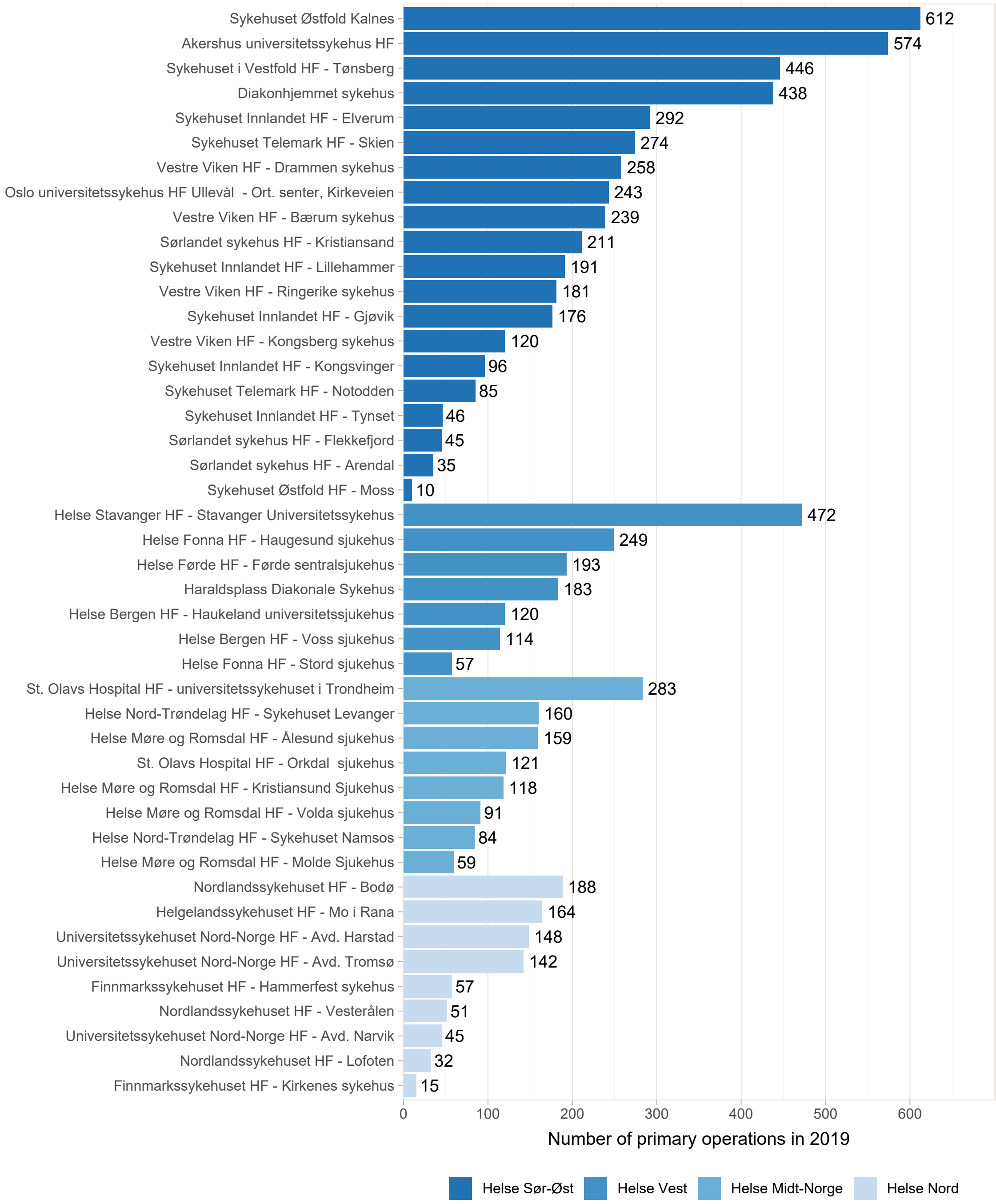


Figure D.24: Treatment of displaced femoral neck fracutres in patients over 70 years of age

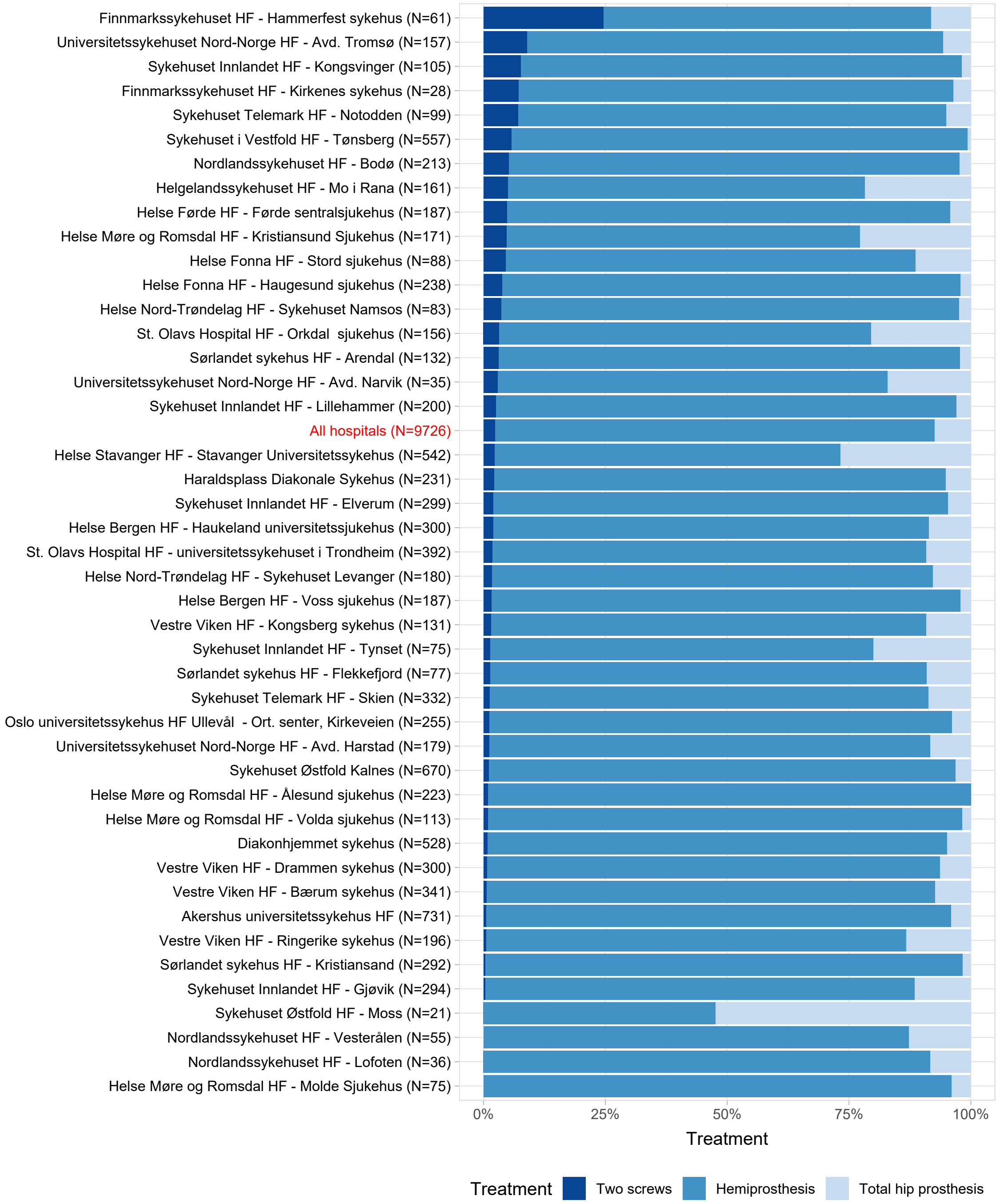


Figure D.24 shows the proportion of patients treated with screw osteosynthesis/hemiprosthesis/total hip prosthesis at each hospital in the period 2015-2017. Hospitals with n<10 have been excluded.

Figure D.25: Fixation of hemiprosthesis in patients over 70 years of age

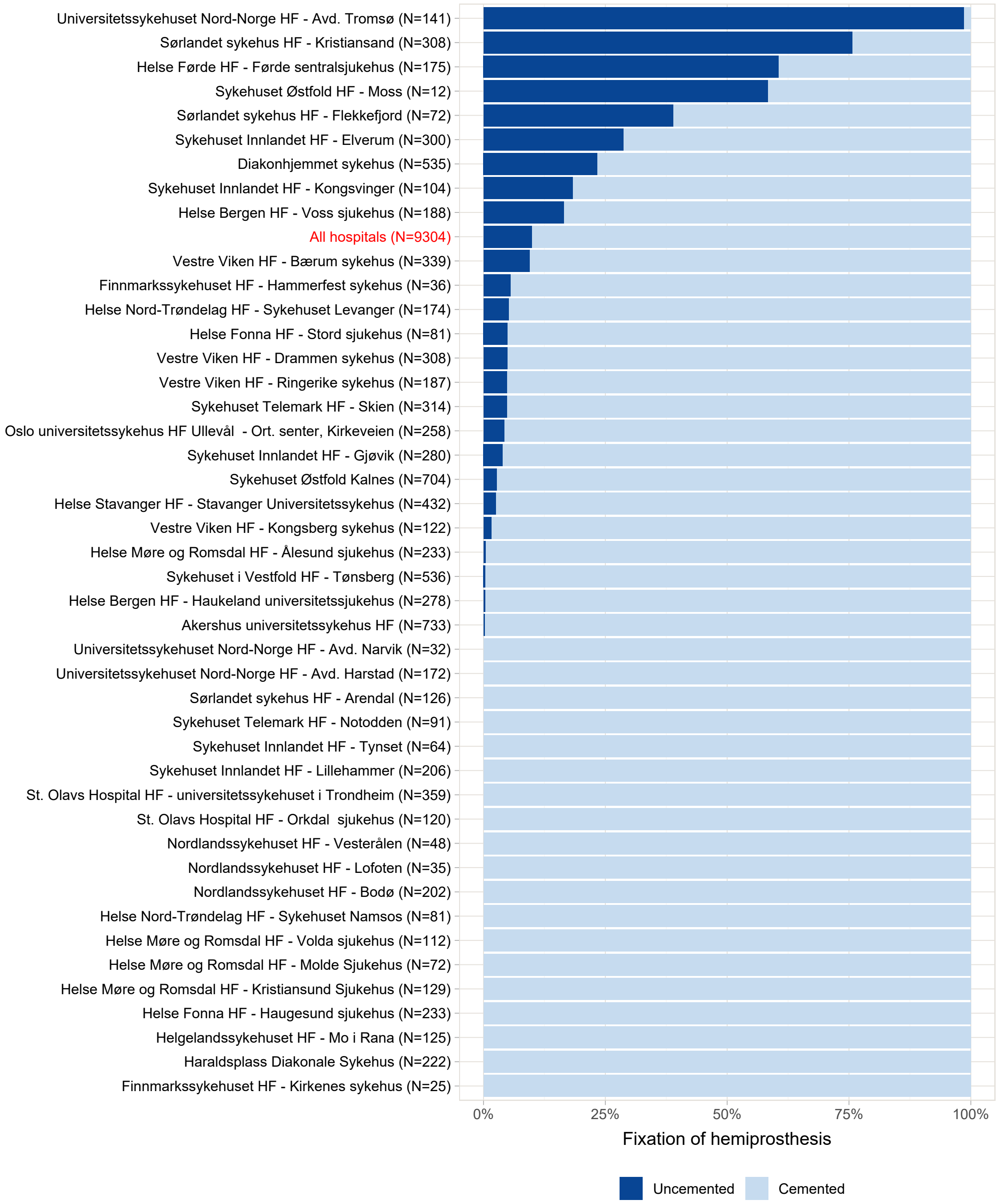


Figure D.25 shows the proportion of patients treated with uncemented/cemented hemiprosthesis at each hospital in the period 2015-2017. Hospitals with n<10 have been excluded.

Figure D.26: Waiting time from fracture to surgery

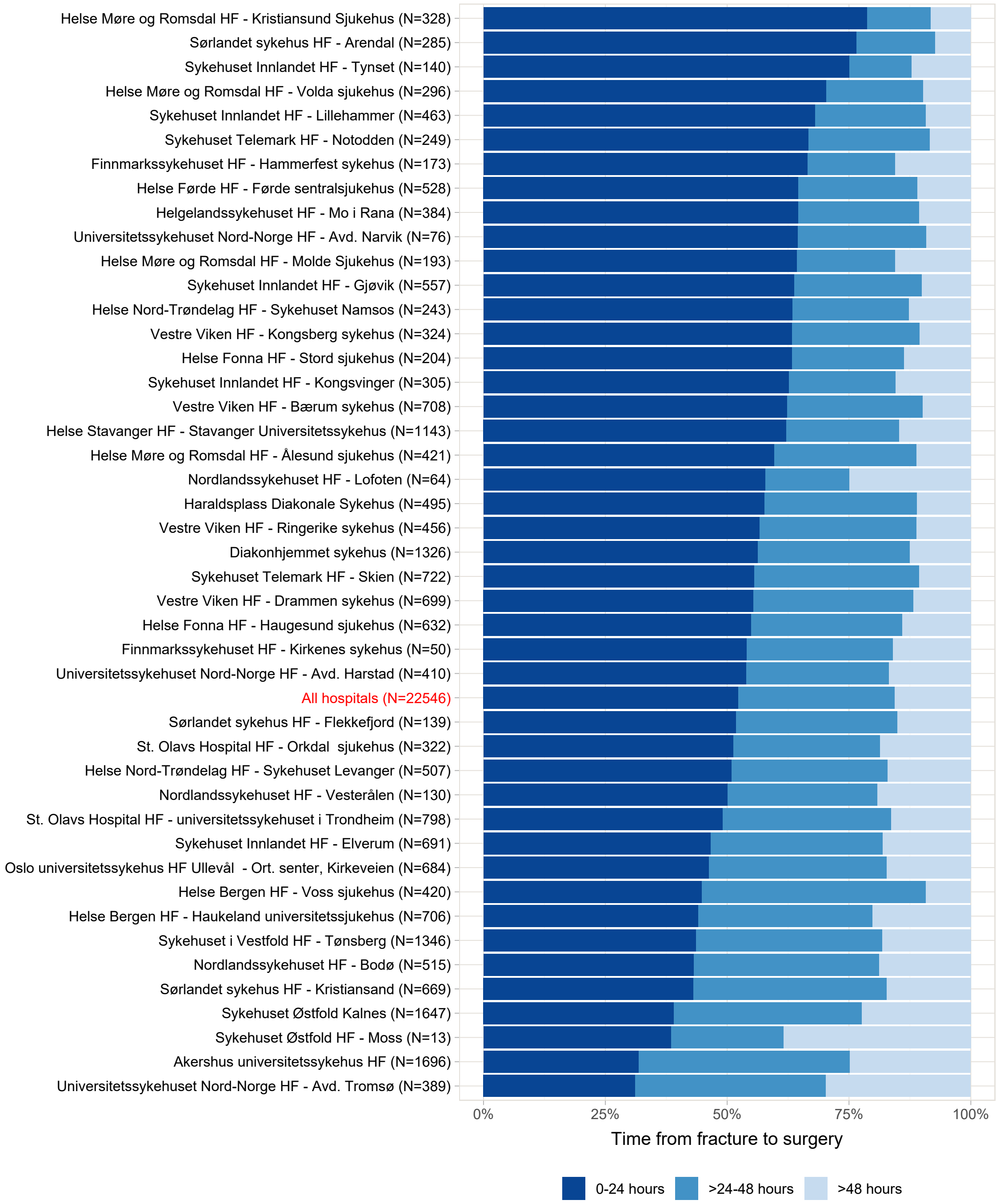


Figure D.26 shows waiting time, sorted by proportion of fractures treated within 24 hours after the fracture at the different hospitals in the period 2017-2019. Hospitals with n<10 have been excluded.

Figure D.27: Reoperations in the period 2017-2019. All types of hip fractures.

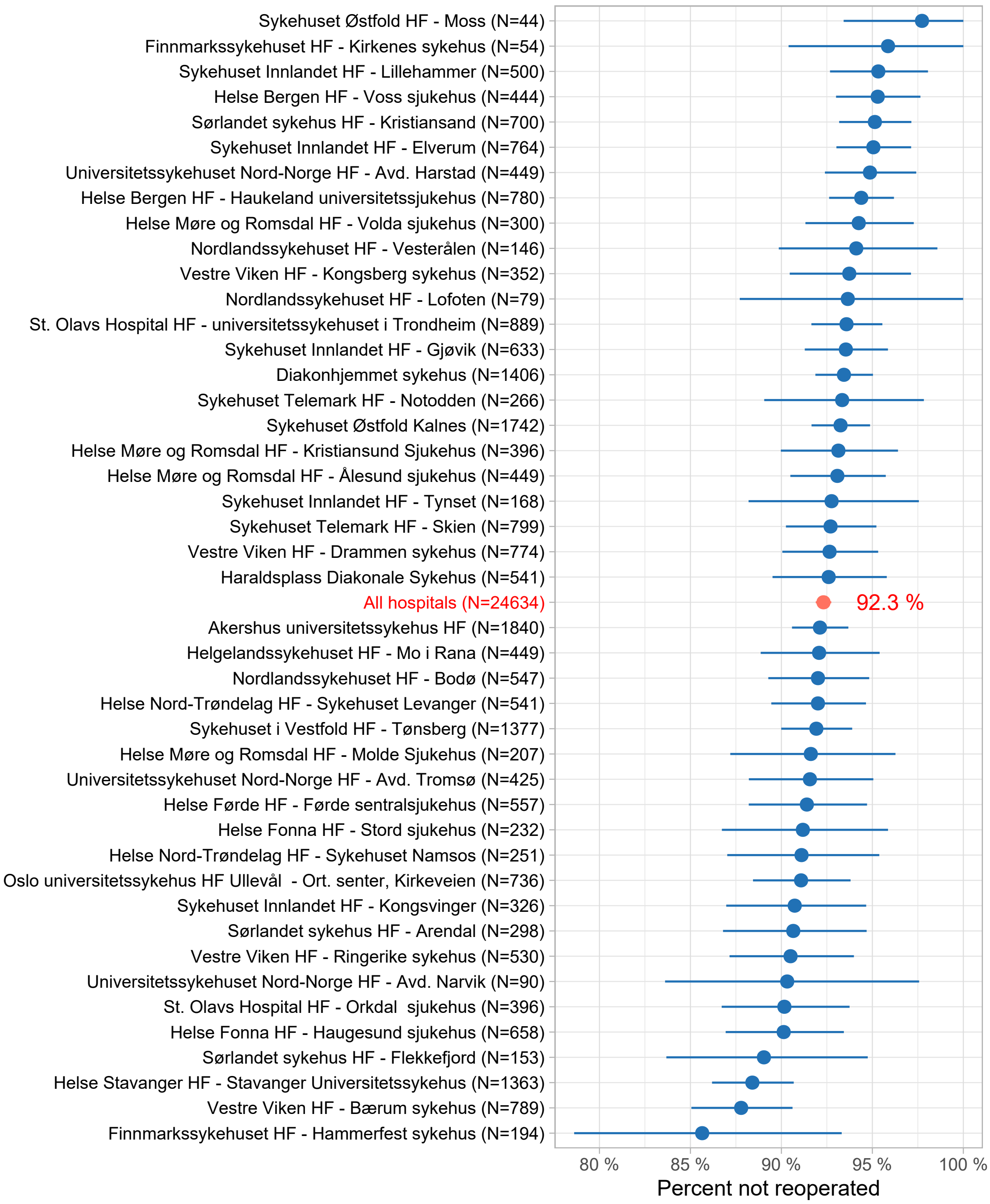


Figure D.27 shows proportion of patients not reoperated at each hospital. Hospitals with n<10 have been excluded.

Figure D.28: Reoperations in the period 2017-2019. Displaced femoral neck fractures in patients over 70 years of age, regardless of type of primary operation.

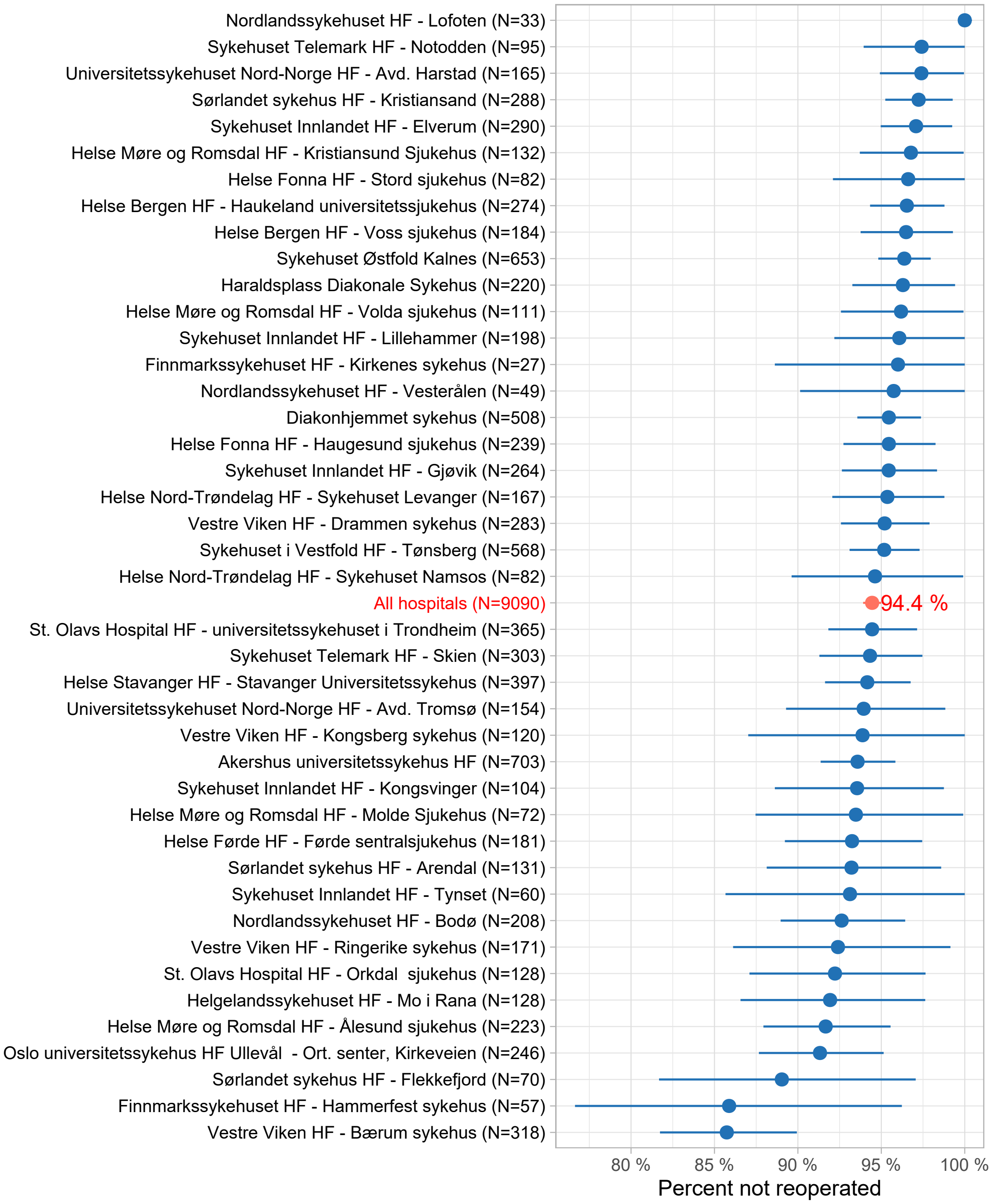


Figure D.28 shows proportion of patients not reoperated at each hospital. Hospitals with n<10 have been excluded.

Completeness analysis for the Norwegian Hip Fracture Register, 2017-2018

A completeness analysis has been conducted for the Norwegian Hip Fracture Register (NHFR) for primary operations (osteosynthesis, partial and total arthroplasty) and revisions (following primary osteosynthesis, partial and total arthroplasty for hip fractures) performed in the period 2017-2018. 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:

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

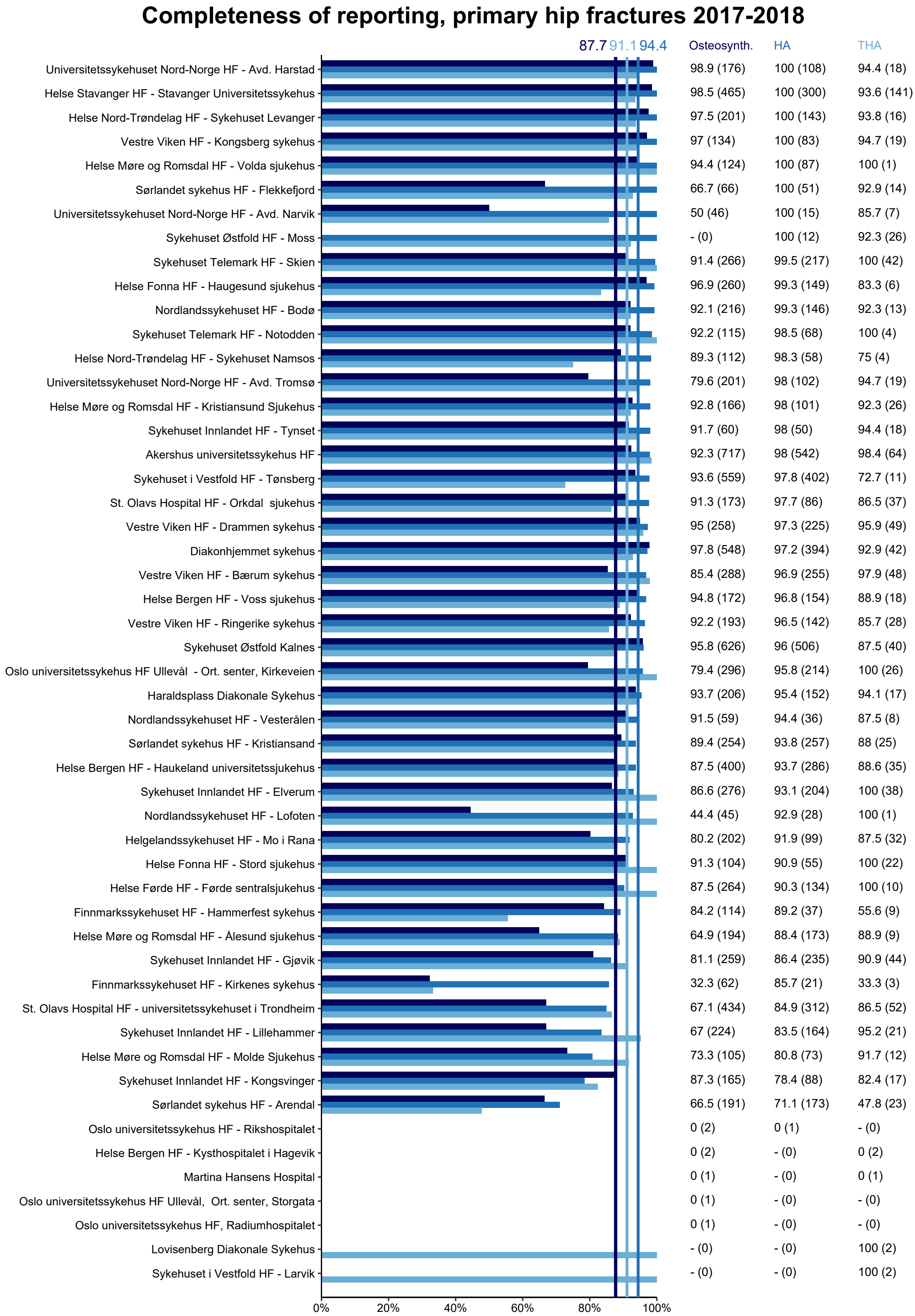
$$\text{Dekningsgrad NPR} = \frac{\text{only NPR} + \text{inclusion both registers}}{\text{only NPR} + \text{only NHFR} + \text{inclusion both registers}}$$

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

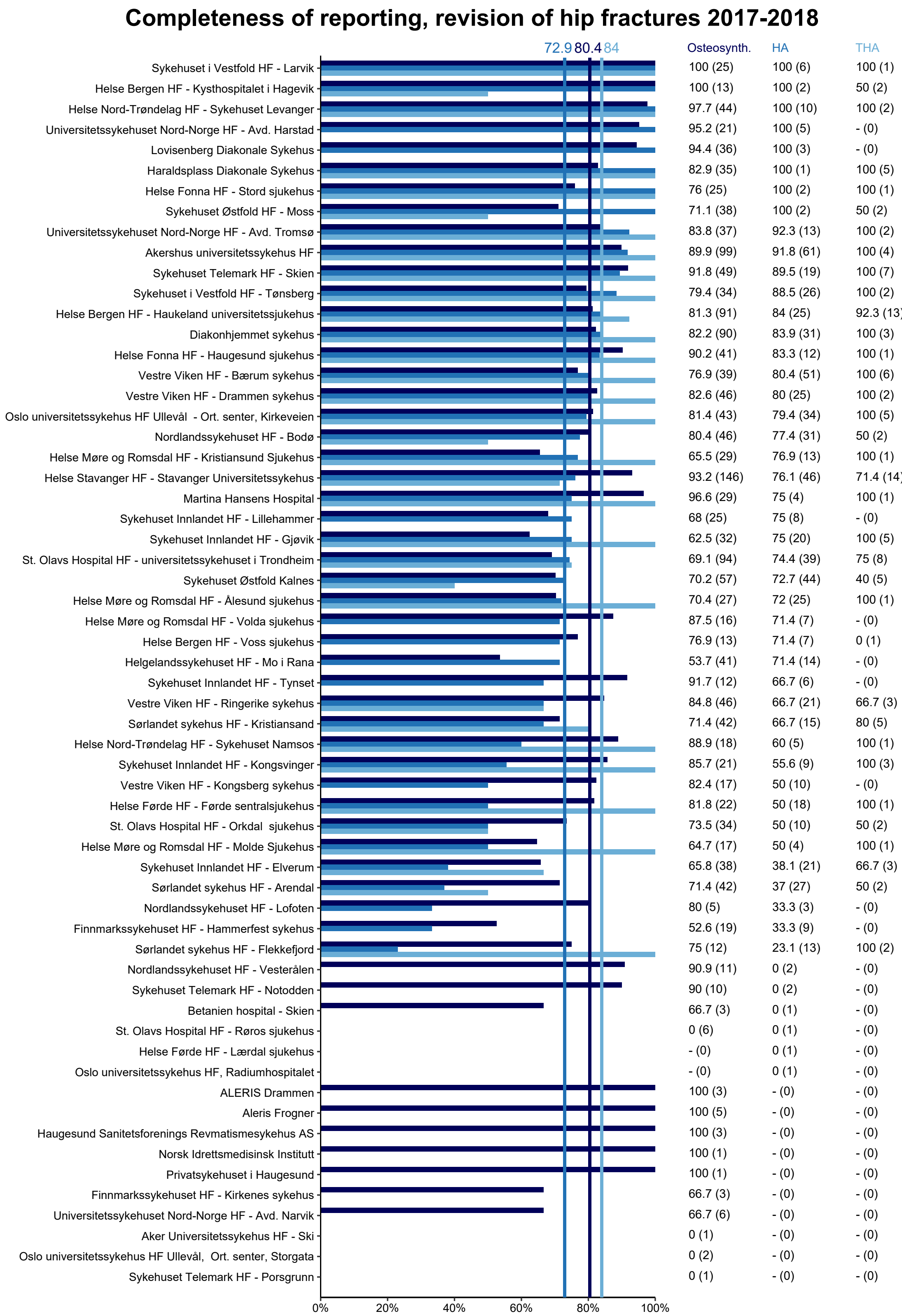
Primary hip fracture surgery. Information in the NHFR showed a high degree of agreement with the information in the NPR. Completeness for osteosynthesis was 88 %, for hemiarthroplasty 94 % and for total arthroplasty 91 %. However, there are considerable variations in completeness between hospitals. Many 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.

Revisions. The information in the NHFR did not agree with NPR data as well as for primary surgery. Completeness for reoperations after osteosynthesis was 80 %, after hemiarthroplasty 73 %, and after total arthroplasty 84 %. 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 revisions reported to the NPR is often imprecise or incorrect. Low completeness may mean that the revision 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 revisions 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.



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 (HA). Light blue bars and third number to the right of the bars gives completensess of reporting for total prosthesis (THA). The numbers in paranthesis gives the number ofoperations registered at both NHFR and NPR. Vertical lines shows the national averages.



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 (HA). Light blue bars and third number to the right of the bars gives completensess of reporting for total prosthesis (THA). The numbers in paranthesis gives the number ofoperations registered at both NHFR and NPR. Vertical lines shows the national averages.

CONTENTS

Norwegian Cruciate Ligament Register

CRUCIATE LIGAMENT REGISTER: ANNUAL REPORT

The management and administration of the Cruciate Ligament Register are proud to present the 2019 report from the Register.

We are very pleased to note the enthusiasm for ACL surgery and all the research in this field. This report contains many of the same tables and figures as before. Data from the Cruciate Ligament Register are also available in a report presented by SKDE (the Centre for Clinical Documentation and Evaluation) each autumn, which aims to simplify the information a little and make it easier to read for interested patients.

2019 has been an important year for the Register; we have tried to persuade as many hospitals as possible to start recording surgeon and patient data electronically. The electronic form allows for better registration, and the report will eventually become more reader-friendly. Work on the electronic ACL form is making good progress. We are attempting to contact all the hospitals and many have started using the form. High-volume hospitals have been the most positive. In our report, we have chosen to highlight the hospitals that submit electronic forms. We would also like to point out that we would be pleased to help the other hospitals in any way possible with the transition to electronic forms. It is obligatory to submit the ACL form to the Cruciate Ligament Register. The 2017 and 2018 coverage analyses show the percentage of operations reported to the Register. This was 85.5%, which is basically acceptable, but we would like to see over 90%. We will also analyse these figures in more detail in 2020 to ascertain whether there are any systematic errors.

In 2019, 1881 primary ACL reconstructions and 145 revisions were recorded. The number of primary operations is stable, while revisions have decreased sharply (1887/207). The reason for this is unknown.

In the past year, there has been much media coverage of cruciate ligament injuries and we now see that the incidence of primary reconstructions is clearly increasing in girls aged 10-19 years. Details of this can be read in the results portal under key figures. This is a cause for concern because of the high revision rate of that group if they return to twisting and turning sports.

Surgeons' graft choices are relatively unchanged; patellar tendon graft is most frequently used, at 64.1%, followed by hamstring and quadriceps tendon grafts. The Danish register has reported increased risk of revision for quadriceps tendon grafts and we plan to follow this closely in Norway.

In primary ACL reconstructions with meniscus repair, it has become more common in recent years to suture the damaged meniscus (Figure 7). In 2011, just over 20% were sutured, but this has gradually increased to about 59% in 2019. The effects of this change have so far been difficult to measure, but it may result in a decrease in osteoarthritis in the long term. In the new electronic form, more details of root damage and ramp lesions of the meniscus will be easier to identify.
The number of forms received on patients who have been reoperated on the same knee after ACL surgery is still far too low. For the whole country, only four post-operative infections were reported in 2019. We therefore ask surgeons to please improve this practice.

Cephalotin has been the dominant infection prophylaxis for many years (97% in 2016). Due to short supply, however, Cephazolin has now become most widely used (70% in 2019).

Two-thirds of surgeons use thromboprophylaxis in ACL surgery and the rest do not. This is due to differences in hospital procedures.

We have previously commented on volume, and we see that last year the number of hospitals with 1-5 ACL reconstructions annually decreased from 15 to 10. The Cruciate Ligament Register plans to publish an article on this in the coming year.

The proportion of day surgeries was 72.9% in 2019.

SUMMARY OF THE MAIN SCIENTIFIC FINDINGS IN THE PAST YEAR
Research is important and much good research was again produced in 2019. We are very proud of having had three PhDs based on the Register in 2019:

Cathrine Aga: The effect of an anatomic double-bundle surgical technique on the outcome of anterior cruciate ligament reconstructions, University of Oslo.

Andreas Persson: Risk factors for revision after anterior cruciate ligament reconstruction, University of Bergen.

Svend Ulstein: Prognosis and treatment of focal cartilage lesions of the knee joint. Medium to long-term results, University of Oslo.

PUBLICATIONS:
Inderhaug E, Drogset JO, Lygre SHL, Gifstad T. No effect of graft size or body mass index on risk of revision after ACL reconstruction using hamstrings autograft. Knee Surg Sports Traumatol Arthrosc. 2019 Feb 7;28(3):707-713.

Hamrin-Senorski E, Svantesson E, Engebretsen L, Lind M, Forssblad M, Karlsson J, Samuelsson K. 15 years of the Scandinavian knee ligament registries: lessons, limitations and likely prospects. Br J Sports Med. 2019 Apr 9;53(20):1259-1260.

Vap AR, Persson A, Fenstad AM, Moatshe G, LaPrade RF, Engebretsen L. Re-revision anterior cruciate ligament reconstruction: An evaluation from the Norwegian knee ligament registry. Arthroscopy. 2019 Apr 30;35(6):1695-1701.

Lie MM, Risberg MA, Storheim K, Engebretsen L, Øiestad BE. What's the rate of knee osteoarthritis 10 years after anterior cruciate ligament injury? An updated systematic review. Br J Sports Med. 2019 Sep;53(18):1162-1167.

Snaebjörnsson T, Hamrin-Senorski E, Svantesson E, Karlsson L, Engebretsen L, Karlsson J, Samuelsson K. Graft diameter and graft type as predictors of anterior cruciate ligament revision: A cohort study including 18,425 patients from the Swedish and Norwegian national knee ligament registries. J Bone Joint Surg Am. 2019 Oct 16;101(20):1812-1820.

Snaebjörnsson T, Svantesson E, Sundemo D, Westin O, Sansone M, Engebretsen L, Hamrin-Senorski E. Young age and high BMI are predictors of early revision surgery after primary anterior cruciate ligament reconstruction: a cohort study from the Swedish and Norwegian knee ligament registries based on 30,747 patients. Knee Surg Sports Traumatol Arthrosc. 2019 Nov;27(11):3583-3591.

Snaebjörnsson T, Hamrin Senorski E, Svantesson E, Westin O, Persson A, Karlsson J, Samuelsson K. Graft fixation and timing of surgery are predictors of early anterior cruciate ligament revision: A cohort study from the Swedish and Norwegian knee ligament registries based on 18,425 patients. JB JS Open Access. 2019 Dec 12;4(4):e0037.

The Cruciate Ligament Register is intended to be of benefit to surgeons. Each hospital receives its own figures, and we will be happy to answer any questions you may have. In 2019, the members of the Steering Committee were Jon Olav Drogset, Lars Engebretsen, Stig Heir, Mette Andersen, Ove Furnes, Jonas Meling Fevang and patient representative Jostein Bildøy.

A special thanks to all those of you who submit the ACL forms.

Bergen, June 2020

Lars Engebretsen
Chairman of the steering Committee

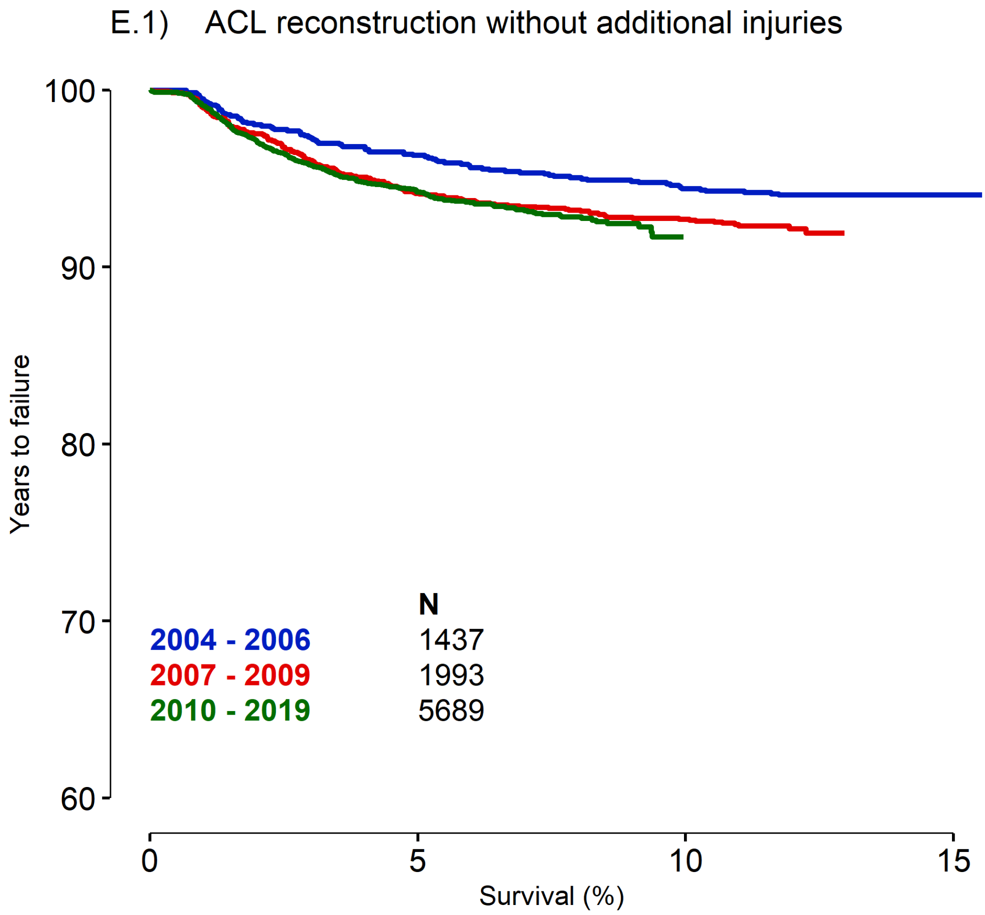
Håvard Visnes
Specialist Physician
Head of Cruciate Ligament Register

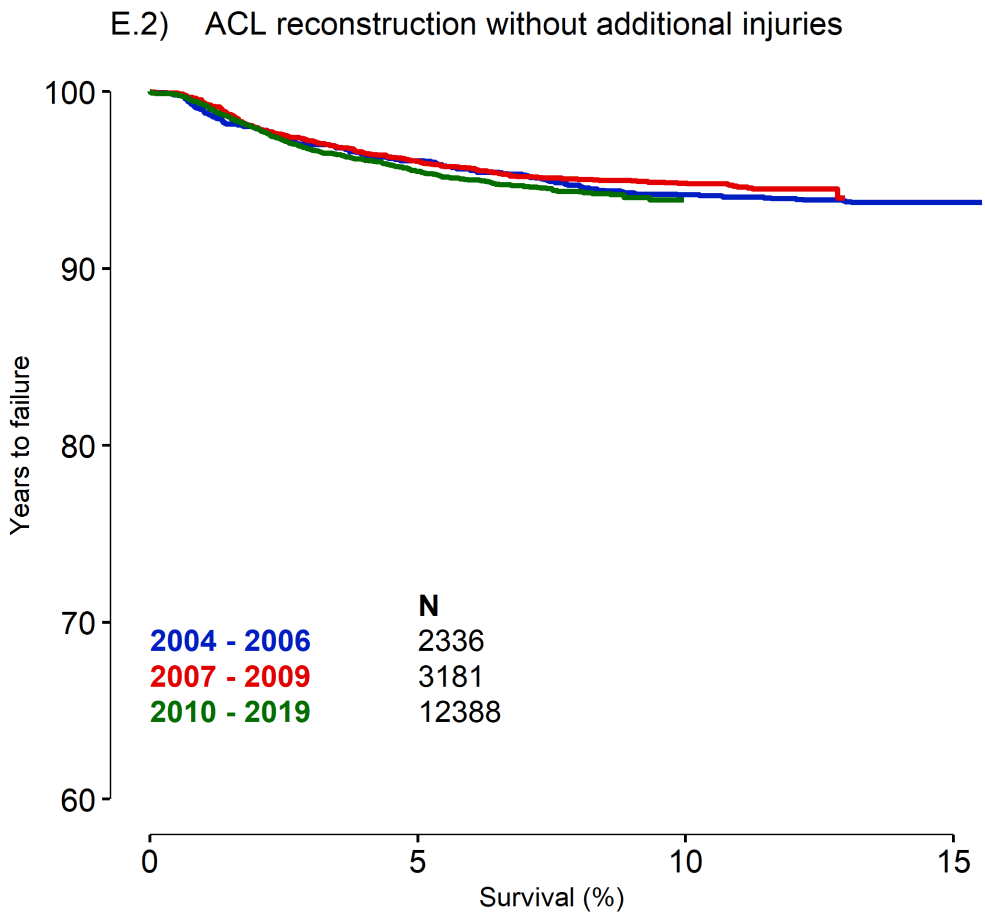
Irina Kvinnesland
IT-consultant

Stein Håkon Låstad Lygre
Biostatistician

Gard Kroken
Biostatistician

Survival of cruciate ligament operations 2004-2019





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

FIGURE E.3: KOOS with primary ACL reconstruction with additional injury

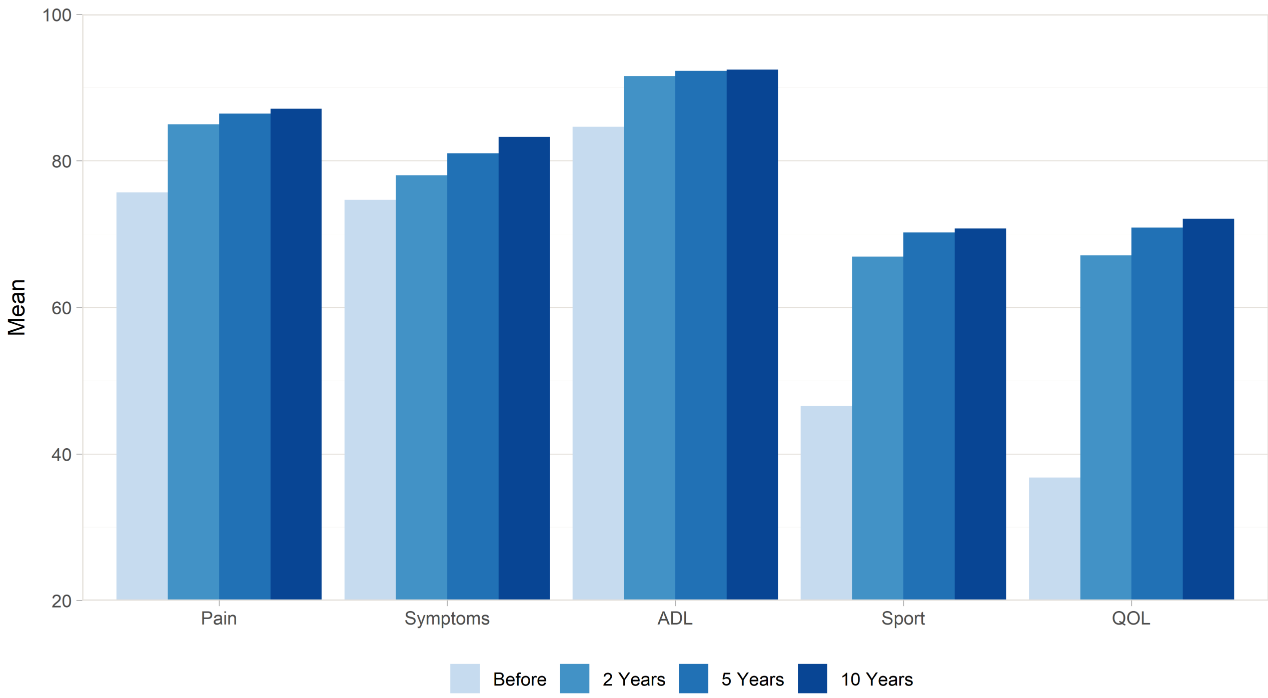


FIGURE E.4: KOOS with primary ACL reconstruction without additional injury

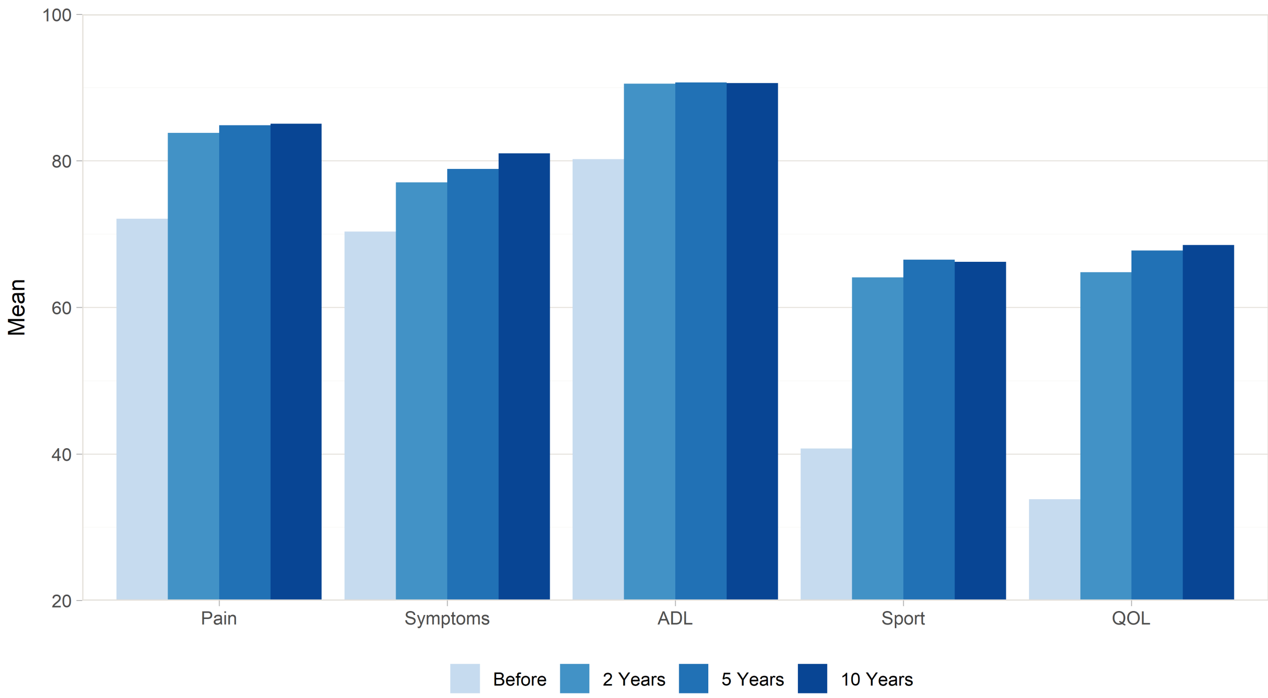


FIGURE E.5: Annual number of cruciate ligament primary reconstructions in 2019

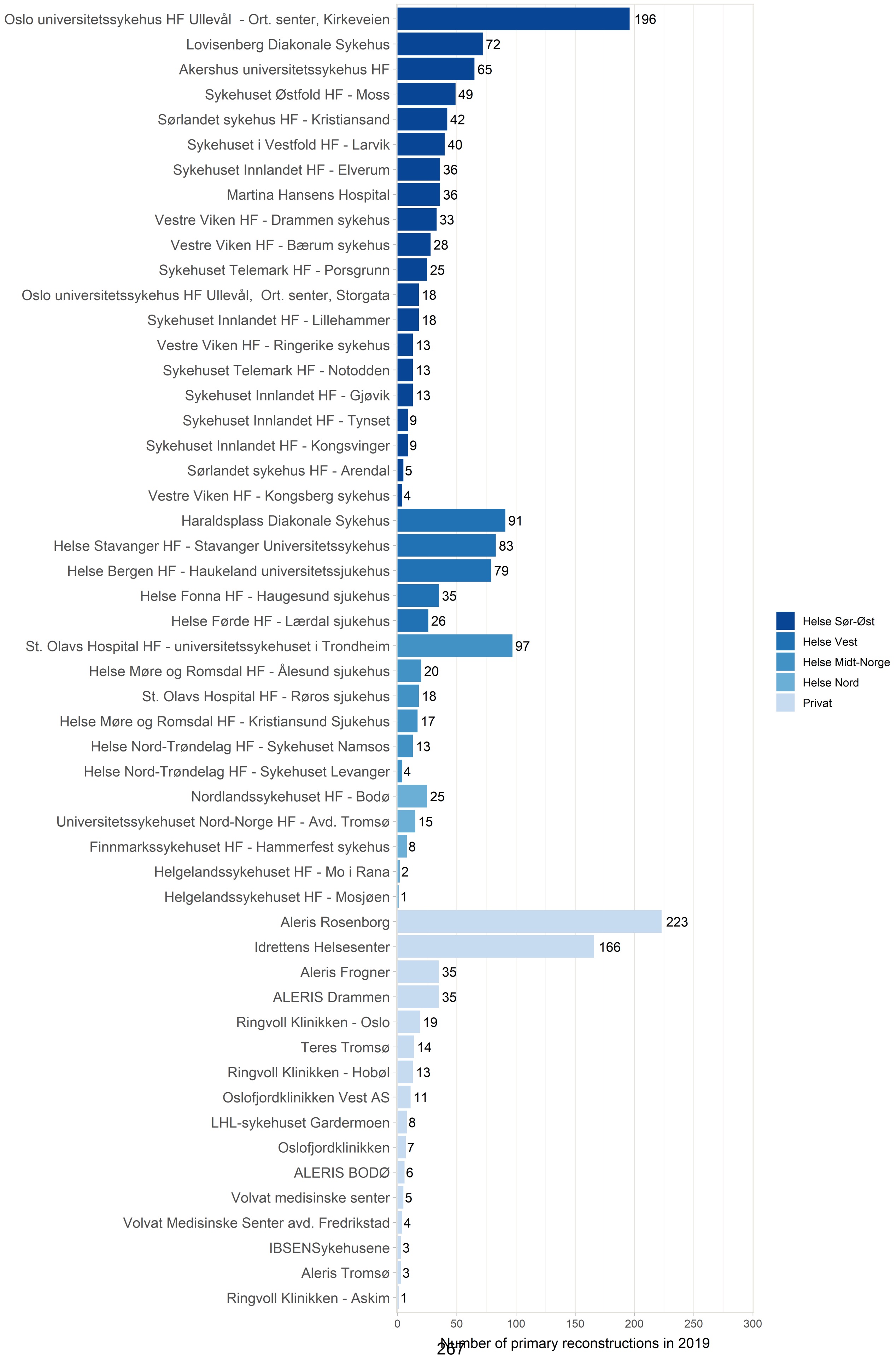
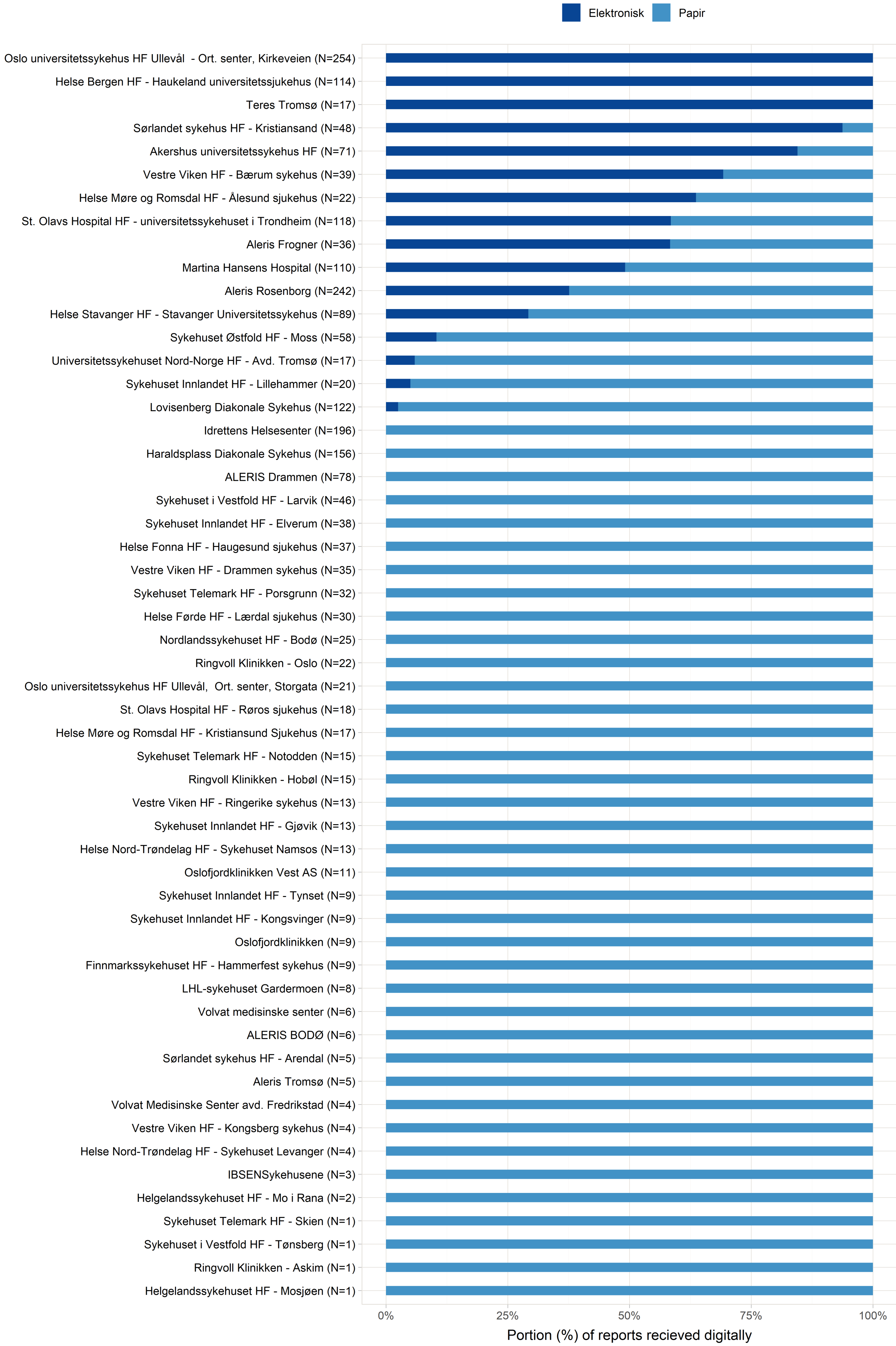


FIGURE E.6: Form registration by format in 2019



Cruciate Ligament

All categories of operations

Table 1: Annual numbers of operations

	Primary reconstruction		Revision reconstruction		Only other procedures		Total
2019	1 881	(83,8%)	145	(6,5%)	188	(8,4%)	**2 245**
2018	1 887	(81,5%)	207	(8,9%)	217	(9,4%)	**2 315**
2017	1 890	(82,3%)	217	(9,4%)	190	(8,3%)	**2 297**
2016	1 858	(81,7%)	203	(8,9%)	212	(9,3%)	**2 273**
2015	1 773	(82,1%)	225	(10,4%)	161	(7,5%)	**2 159**
2004-14	17 845	(86,3%)	1 650	(8,0%)	1 191	(5,8%)	**20 686**
Total	**27 134**	**(84,9%)**	**2 647**	**(8,3%)**	**2 159**	**(6,8%)**	**31 975**

Registration complete from 2005. 49,4% of the operations were performed on the right side. 44,6% of the operations were performed on females. 7,5% of the patients had a previous ACL/PCL-injury in the opposite knee. (10,3% was missing). Mean age was 28,3 years, 27,0 years for women and 29,5 years for men. Standard deviation of age was 10,6 years, 11,2 years for women and 9,9 years for men.
Median value for duration of primary ACL reconstruction was 72 minutes.

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

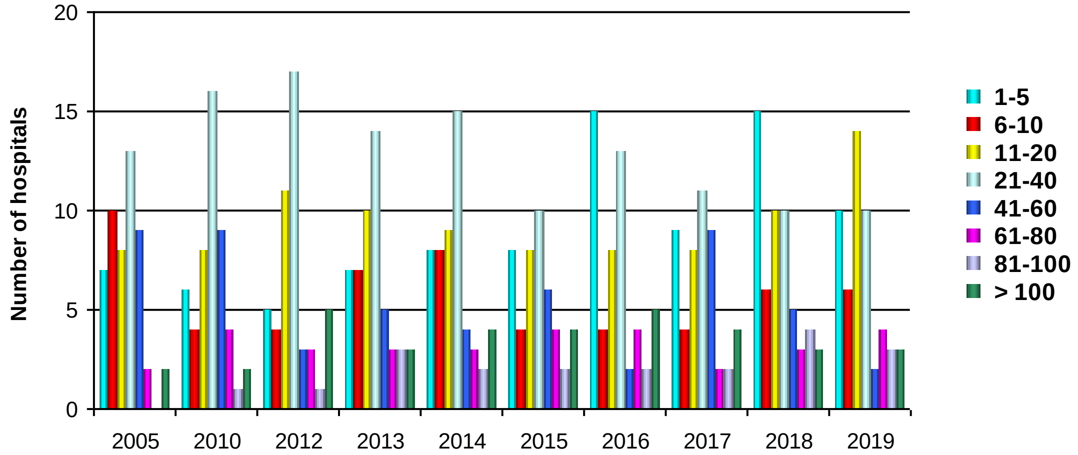


Figure 2: Distribution of hospitals by surgery volumes, revision reconstructions ACL

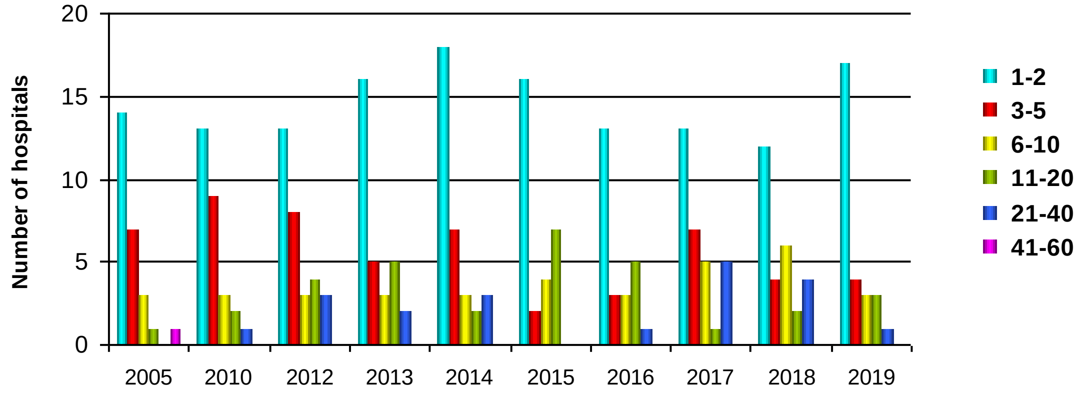
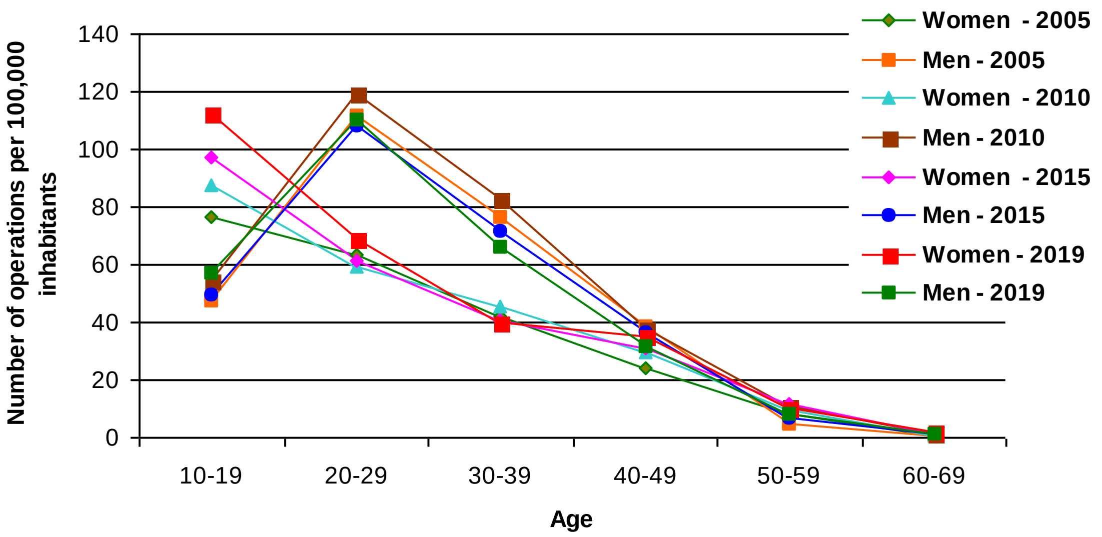


Figure 3: Incidence of primary reconstruction of cruciate ligament for 2005,2010,2015,2019



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
2019	827	30	32	50	3	4	50	19	8	109	2	0
2018	1 082	23	44	69	8	6	47	27	5	99	0	0
2017	1 088	24	32	54	12	5	57	26	3	25	6	0
2016	1 044	51	47	67	11	9	57	19	2	27	2	0
2015	1 017	65	43	63	7	4	51	31	5	31	5	0
2004-14	8 704	864	370	645	75	64	435	251	17	507	23	0
Total	**13 762**	**1 057**	**568**	**948**	**116**	**92**	**697**	**373**	**40**	**798**	**38**	**0**

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)
10 896	x					
430	x	x				
256		x				
245						x
240	x					x
93				x		
89	x		x			
86			x			
78	x			x		
29	x	x		x		
22	x			x		x
22					x	
21				x		x
16		x		x		
14	x	x				x
13		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 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)
682	x				
130			x		
95			x	x	
85				x	
55	x		x		
49		x			
35	x			x	
32					x
32	x		x	x	
30	x	x			
21	x				x
16			x		x
13	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
762	x							
218				x				
137							x	
82	x			x				
81			x					
65		x						
53	x		x					
50						x		
42				x	x			
31	x	x						
30			x	x				
27				x			x	
24							x	x
21	x		x	x				
20			x		x			
19	x						x	
19		x		x				
18				x			x	x
16					x			
13				x		x		
13			x	x	x			
11	x						x	x
11								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 ten or more.

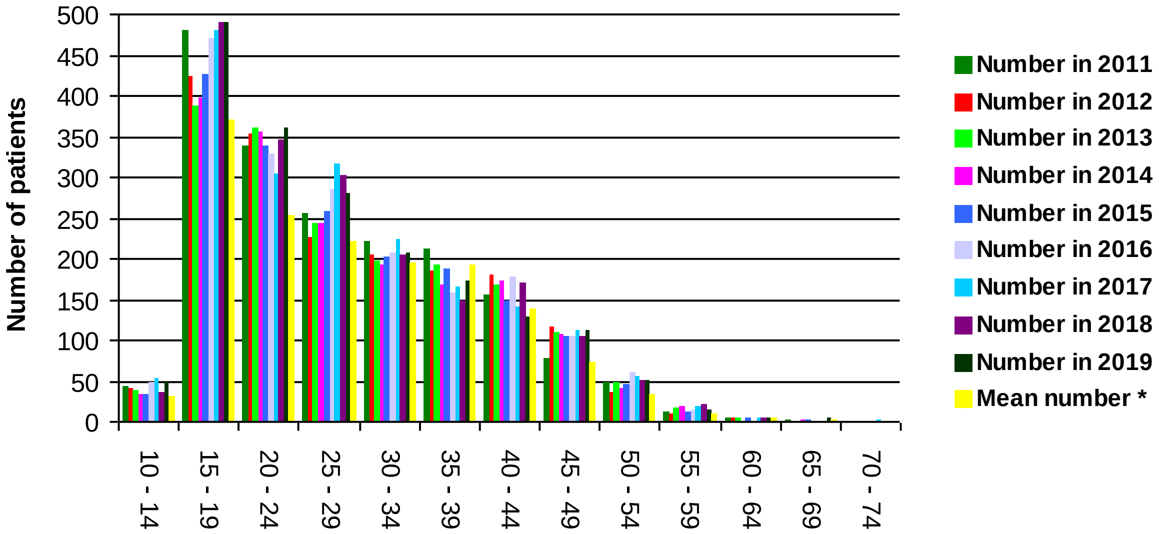
Intraoperative complications

Table 6: Intraoperative complications for all categories of surgeries

	Yes		No		Missing		Total
2019	43	(1,9%)	2 165	(96,4%)	36	(1,6%)	**2 245**
2018	46	(2,0%)	2 212	(95,6%)	57	(2,5%)	**2 315**
2017	64	(2,8%)	2 182	(95,0%)	50	(2,2%)	**2 297**
2016	51	(2,2%)	2 156	(94,9%)	65	(2,9%)	**2 273**
2015	63	(2,9%)	2 036	(94,3%)	60	(2,8%)	**2 159**
2004-14	630	(3,0%)	19 580	(94,7%)	476	(2,3%)	**20 686**
Total	**897**	**(2,8%)**	**30 331**	**(94,9%)**	**744**	**(2,3%)**	**31 975**

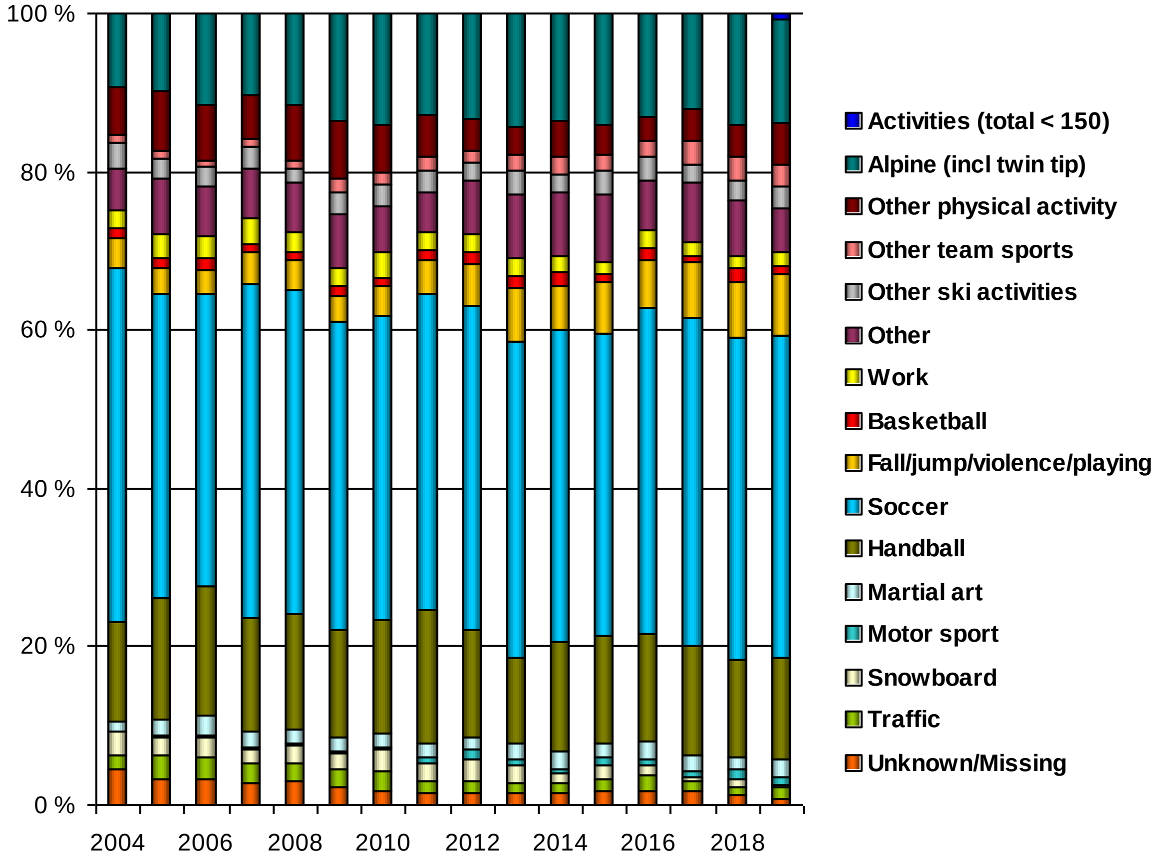
Primary reconstruction of cruciate ligament

Figure 4: Age by primary operation



* Mean number of primary operations for 2004 - 2010

Figure 5: Activity that lead to injury



Actual injury

Table 7: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2019	1 854	58	197	49	27	477	1 226
2018	1 861	58	227	56	23	506	1 188
2017	1 874	33	179	39	17	444	1 121
2016	1 832	47	189	52	20	416	1 060
2015	1 747	55	167	39	23	355	996
2004-14	17 664	465	1 289	300	200	4 255	8 860
Total	**26 832**	**716**	**2 248**	**535**	**310**	**6 453**	**14 451**

* 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
9 337	x						
9 243	x					x	
3 793	x					x	x
1 697	x						x
673	x		x				
604	x		x			x	
382	x		x			x	x
197	x		x				x
104	x			x			
97	x	x	x				
59	x			x	x		
52	x	x	x				x
31	x			x			x
31	x	x					
26	x				x		
26	x			x		x	
22	x	x		x	x		

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where ACL where the only injury. The table shows only combinations that have a number of 20 or more.

Table 9: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
124		x					
97	x	x	x				
52	x	x	x				x
39		x					x
37	x	x	x			x	
31	x	x					
29		x	x				
29	x	x	x			x	x
23	x	x				x	
22	x	x		x	x		
17	x	x				x	x
15		x				x	
14	x	x			x		
12	x	x		x	x		x
12		x	x				x
12	x	x		x	x	x	x
11	x	x		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 10 or more.

Choice of graft for injuries registered in primary reconstructions

Table 10: BPTB

	ACL	PCL	MCL	LCL	PLC
2019	1 316	0	1	0	0
2018	1 309	4	1	1	0
2017	1 131	0	0	0	0
2016	1 126	0	0	0	0
2015	975	1	0	0	0
2004-14	5 369	26	1	0	0
Total	**11 226**	**31**	**3**	**1**	**0**

Table 11: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2019	420	11	49	7	5
2018	428	6	32	6	2
2017	596	5	11	9	2
2016	592	23	23	15	5
2015	727	28	17	6	3
2004-14	12 157	274	151	29	23
Total	**14 920**	**347**	**283**	**72**	**40**

Table 12: ALLOGRAFT

	ACL	PCL	MCL	LCL	PLC
2019	4	34	0	9	11
2018	8	28	2	7	10
2017	3	15	5	1	5
2016	4	20	7	4	6
2015	5	21	6	6	12
2004-14	39	60	12	57	65
Total	**63**	**178**	**32**	**84**	**109**

Table 13: Suture

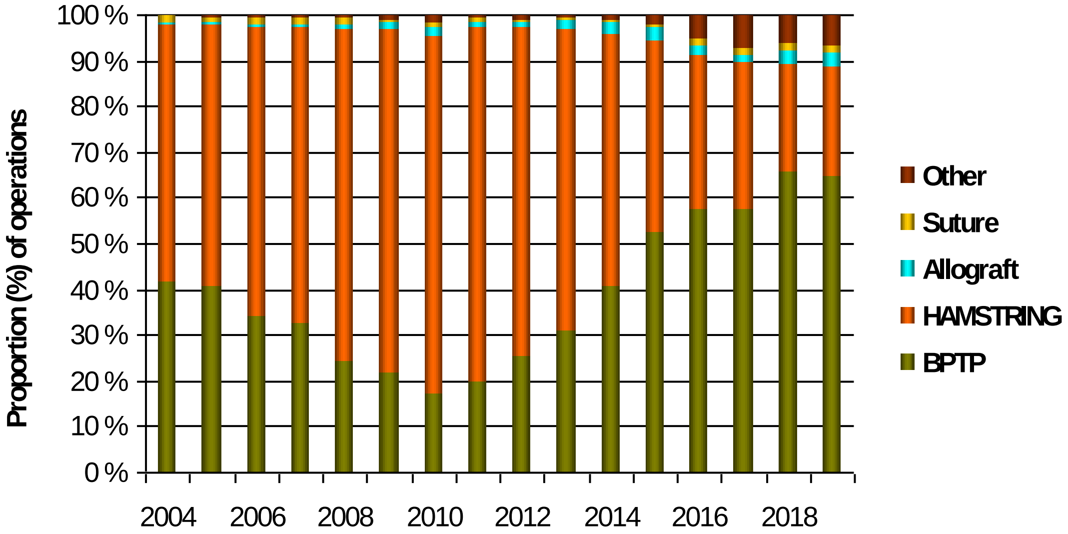
	ACL	PCL	MCL	LCL	PLC
2019	4	4	7	7	6
2018	4	6	10	4	6
2017	19	4	9	3	1
2016	10	1	6	4	4
2015	0	1	7	3	2
2004-14	4	8	85	59	47
Total	**41**	**24**	**124**	**80**	**66**

Table 14: Other

	ACL	PCL	MCL	LCL	PLC
2019	110	6	19	3	1
2018	111	8	4	1	0
2017	125	1	9	1	1
2016	99	0	4	0	1
2015	37	1	1	0	0
2004-14	75	35	7	8	5
Total	**557**	**51**	**44**	**13**	**8**

There are 21 forms where there are registered product for ACL and 23 forms for PCL but not checked for choice of graft.

Figure 6: Choice of graft for all injuries in primary reconstructions



Fixation

Table 15: Femur ACL (The 5 most common for the last 5 years)

Product	2004-14	2015	2016	2017	2018	2019	Total
Endobutton CL Ultra	5 570	521	438	402	281	249	**7 461**
SoftSilk	1 806	368	428	420	444	462	**3 928**
Endobutton CL BTB	275	261	309	228	216	321	**1 610**
Sheated Cannulated Int	68	70	126	174	212	167	**817**
ACL TightRope	146	50	49	75	87	92	**499**

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

Product	2004-14	2015	2016	2017	2018	2019	Total
SoftSilk	1 928	502	576	511	538	751	**4 806**
RCI Screw	3 651	224	230	231	183	169	**4 688**
Biosure HA Interferenc	1 586	207	178	140	81	80	**2 272**
Propel Cannulated	547	85	119	103	137	39	**1 030**
Sheated Cannulated Int	57	60	101	85	131	84	**518**

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

Product	2004-14	2015	2016	2017	2018	2019	Total
Endobutton CL Ultra	164	23	16	7	7	6	**223**
SoftSilk	35	17	18	4	21	27	**122**
RCI Screw	19	14	15	4	7	6	**65**
Peek Interference Scre	14	4	1		2	2	**23**
ACL TightRope	1		1	2	4	6	**14**

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

Product	2004-14	2015	2016	2017	2018	2019	Total
RCI Screw	205	20	17	2	23	18	**285**
AO Skrue	66	3	8	1	1	3	**82**
Biosure HA Interferenc	14	7	2	6	3	6	**38**
BIORCI Screw	1	8	2	1	1	1	**14**
BioComposite SwiveLo				2	4	5	**11**

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

Femur	Tibia	2004-14	2015	2016	2017	2018	2019	Total
SoftSilk	SoftSilk	1 626	296	359	335	369	399	**3 384**
Endobutton CL Ultra	RCI Screw	1 735	175	171	161	131	111	**2 484**
Endobutton CL Ultra	Biosure HA Interference screw	1 471	160	162	132	73	71	**2 069**
Endobutton CL BTB	SoftSilk	192	193	188	134	127	260	**1 094**
Sheated Cannulated Interference Screw	Sheated Cannulated Interference Screw	57	59	96	84	124	66	**486**

Meniscal lesion

Table 20: Actual treatment of meniscal lesion

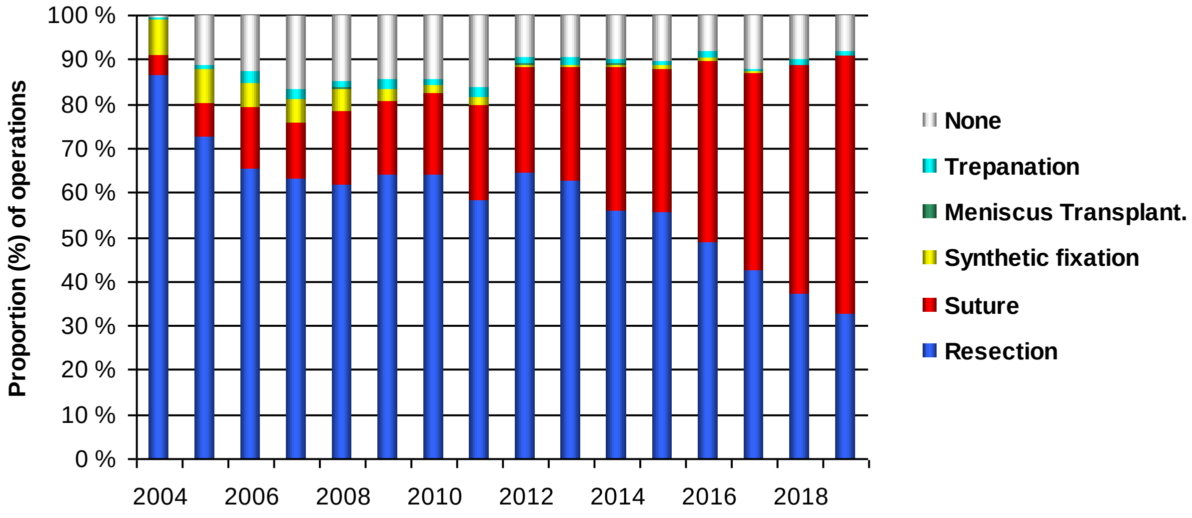
		Resection			Suture	Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
		OLD	Total	Partial						
2019	Lateral		1	230	352		1	3	61	**648**
2019	Medial		11	232	482	3	1	4	58	**791**
2018	Lateral		1	274	307			10	80	**672**
2018	Medial		8	249	428		1	10	62	**758**
2017	Lateral		2	312	255	1		4	81	**655**
2017	Medial		5	288	380	3	1	3	91	**771**
2016	Lateral		2	315	206	8	2	10	59	**602**
2016	Medial		9	319	335	6		8	45	**722**
2015	Lateral		3	342	144	3		7	68	**567**
2015	Medial		3	349	263	9		3	60	**687**
2004-14	Lateral	2 040	7	1 057	674	72	3	96	682	**4 631**
2004-14	Medial	2 371	25	1 185	1 332	247	4	81	629	**5 874**
Total		**4 411**	**77**	**5 152**	**5 158**	**352**	**13**	**239**	**1 976**	**17 378**

It became possible to register "Trepanation" and "None" from 01.01.2005. There have been forms where this has been an additional information. This information have been registered, but the registration is not complete before 2005.

In table 7: Actual injury has less. The reason for this is that we distinguish between the lateral and medial injury and some injuries are registreded in both groups.

The value in OLD Resection are the forms that are registered before the new forms were introduced in autumn 2011. Total and Partial Resection values are the new forms were introduced in autumn 2011.

Figure 7: Treatment of meniscal lesions in primary reconstructions



Meniscal fixation

Table 21: Synthetic

Product	2004-07	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Contour Meniscus arrow	109	25	8	1										**143**
FAST-FIX				1	6	3		1		4	1			**16**
Meniscal Dart	17	2												**19**
Meniscal Dart Stick	12	6	5		1									**24**
Meniscus arrow	25		2	1	2		1							**31**
TRUESPAN Meniscal Repair System PEEK 12													1	**1**
Unknown	11	3	2		11	4	4	7	10	9				**61**
Total	**174**	**36**	**17**	**3**	**20**	**7**	**5**	**8**	**10**	**13**	**1**		**1**	**295**

Table 22: Suture

Product	2004-07	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
2-0 ORTHOCORD w/Double-Armed Meniscal Needles												1	30	**31**
BioComposite SwiveLock C w Fiber Tape											9	7	9	**25**
ENDOBUTTON (BOX OF 1) STR												1	15	**16**
Endobutton CL Ultra													4	**4**
FAST-FIX	134	99	118	126	192	208	203	280	320	406	457	535	595	**3 673**
MENISCAL CINCH													7	**7**
Meniscal Dart Stick				1								1		**2**
Meniscus arrow				3	4									**7**
PDS II (polydioxanone) sutur											8			**8**
Rapidloc	62	8	2				2							**74**
SUTURE WASHER STER. BOX OF 1												4	9	**13**
SutureButton													12	**12**
SutureTape													1	**1**
TIGHTROPE ABS BUTTON ROUND 11MM CONCAVE													2	**2**
TRUESPAN Meniscal Repair System PEEK 12													21	**21**
Unknown	3	1	3	3	48	40	43	49	54	65	23	12	1	**345**
Total	**199**	**108**	**123**	**133**	**244**	**248**	**248**	**329**	**374**	**471**	**497**	**561**	**706**	**4 241**

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
2019	43,4%	38,7%	15,1%	2,2%	0,6%
2018	44,4%	37,9%	13,5%	2,7%	1,5%
2017	44,0%	36,2%	15,7%	2,5%	1,6%
2016	37,5%	44,4%	14,3%	3,1%	0,7%
2015	31,4%	43,6%	19,0%	5,7%	0,3%
2004-14	35,5%	42,4%	16,2%	4,5%	1,3%

Table 24: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2019	5,3%	0,7%	88,6%	0,3%	5,2%
2018	6,3%	1,3%	84,6%	0,5%	7,3%
2017	6,9%	1,1%	81,6%	0,3%	10,0%
2016	9,3%	2,0%	76,9%		11,9%
2015	12,3%	3,6%	80,1%		3,9%
2004-14	12,0%	3,2%	62,6%	1,2%	21,0%

Cartilage injuries registered in primary reconstructions

Figure 8: All Cartilage injuries (total)

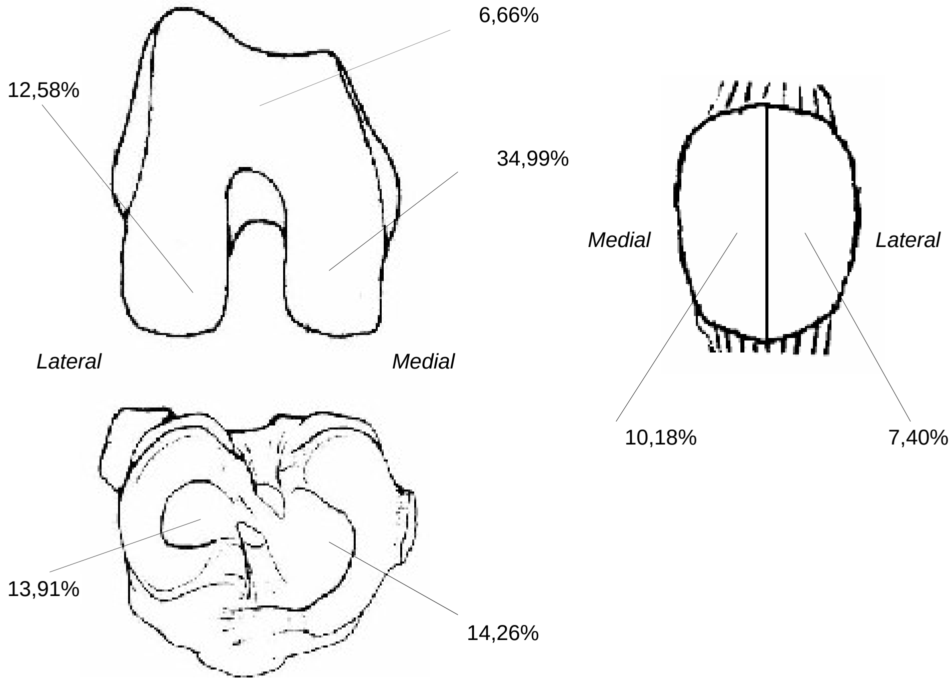
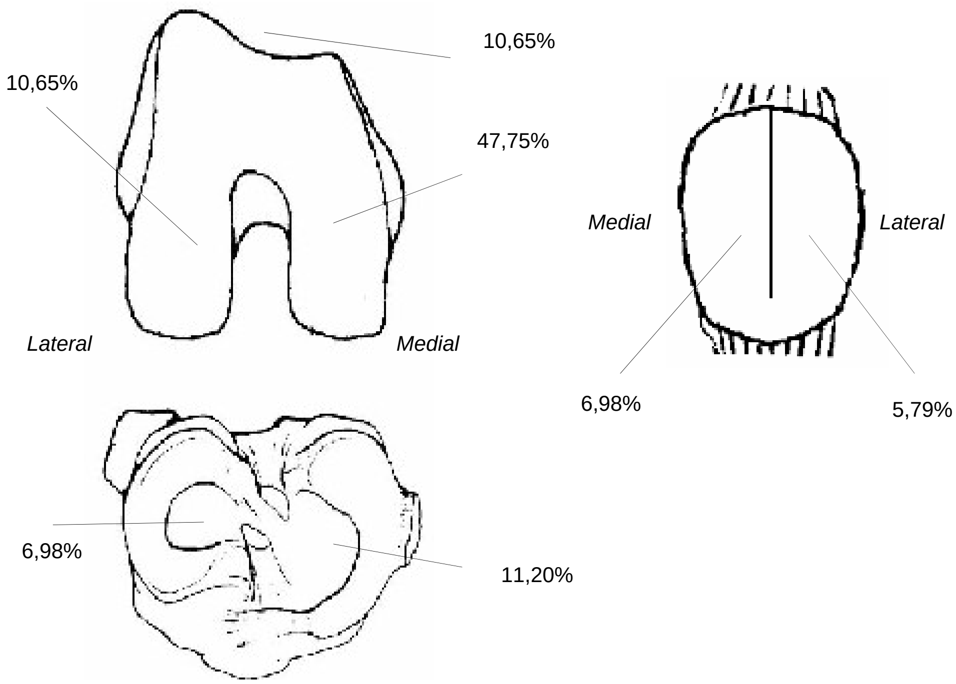


Figure 9: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 25: Outpatient surgery

	Yes		No		Missing		Total
2019	1 372	(72,9%)	502	(26,7%)	7	(0,4%)	**1 881**
2018	1 390	(73,7%)	491	(26,0%)	6	(0,3%)	**1 887**
2017	1 430	(75,7%)	456	(24,1%)	4	(0,2%)	**1 890**
2016	1 327	(71,4%)	521	(28,0%)	10	(0,5%)	**1 858**
2015	1 244	(70,2%)	516	(29,1%)	13	(0,7%)	**1 773**
2004-14	9 315	(52,2%)	8 439	(47,3%)	91	(0,5%)	**17 845**
Total	**16 078**	**(59,3%)**	**10 925**	**(40,3%)**	**131**	**(0,5%)**	**27 134**

Intraoperative complications

Table 26: Intraoperative complications

	Yes		No		Missing		Total
2019	35	(1,9%)	1 816	(96,5%)	29	(1,5%)	**1 881**
2018	43	(2,3%)	1 803	(95,5%)	41	(2,2%)	**1 887**
2017	50	(2,6%)	1 803	(95,4%)	36	(1,9%)	**1 890**
2016	43	(2,3%)	1 763	(94,9%)	52	(2,8%)	**1 858**
2015	55	(3,1%)	1 673	(94,4%)	45	(2,5%)	**1 773**
2004-14	570	(3,2%)	16 897	(94,7%)	378	(2,1%)	**17 845**
Total	**796**	**(2,9%)**	**25 755**	**(94,9%)**	**581**	**(2,1%)**	**27 134**

Systemic antibiotic prophylaxis

Table 27: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2019	1 876	(99,7%)	4	(0,2%)	1	(0,1%)	**1 881**
2018	1 875	(99,4%)	8	(0,4%)	4	(0,2%)	**1 887**
2017	1 885	(99,7%)	2	(0,1%)	3	(0,2%)	**1 890**
2016	1 856	(99,9%)	0	(0,0%)	2	(0,1%)	**1 858**
2015	1 768	(99,7%)	1	(0,1%)	4	(0,2%)	**1 773**
2004-14	17 698	(99,2%)	101	(0,6%)	46	(0,3%)	**17 845**
Total	**26 958**	**(99,4%)**	**116**	**(0,4%)**	**60**	**(0,2%)**	**27 134**

Table 28: Drug

	2004-14	2015	2016	2017	2018	2019
Benzylpenicillin (Penicillin G)	0,02%			0,05%		
Cefaleksin (Keflex, Cefalexin)	0,02%					
Cefalotin (Keflin)	90,78%	94,85%	97,04%	92,68%	68,21%	19,40%
Cefazolin (Cephazolin)				4,03%	28,91%	69,67%
Cefotaksim (Claforan)	0,02%					
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1,57%		0,05%			0,48%
Ciprofloksasin (Ciproxin)	0,01%					
Dikloksacillin (Diclocil, Dicillin)	3,13%	0,06%	0,16%	0,16%		0,05%
Doksysyklin (Vibramycin, Dumoxin, Doxylin)	0,01%					
Erytromycin (Ery-max, Abboticin)	0,02%					
Gentamicin (Garamycin, Gensumycin)	0,01%		0,16%	0,16%		
Klindamycin (Dalacin, Clindamycin)	2,49%	1,30%	1,99%	2,49%	2,24%	2,08%
Kloksacillin (Ekvacillin)	1,68%	3,11%	0,32%	0,21%		7,84%
Linkomycin (Lincocin)	0,01%					0,05%
Oxacillin (Unspecified)	0,03%					
Piperacillin\Tazobactam (Tazocin)					0,05%	
Tobramycin (Nebcina, Nebcin, Tobi)	0,01%					
Missing	0,21%	0,68%	0,27%	0,21%	0,59%	0,43%

Thrombosis prophylaxis

Table 29: Thrombosis prophylaxis

	Yes		No		Missing		Total
2019	1 231	(65,4%)	645	(34,3%)	5	(0,3%)	**1 881**
2018	1 436	(76,1%)	449	(23,8%)	2	(0,1%)	**1 887**
2017	1 481	(78,4%)	406	(21,5%)	3	(0,2%)	**1 890**
2016	1 522	(81,9%)	328	(17,7%)	8	(0,4%)	**1 858**
2015	1 530	(86,3%)	239	(13,5%)	4	(0,2%)	**1 773**
2005-14	13 821	(81,1%)	3 008	(17,6%)	247	(1,4%)	**17 076**
Total	**21 021**	**(79,7%)**	**5 075**	**(19,2%)**	**269**	**(1,0%)**	**26 365**

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

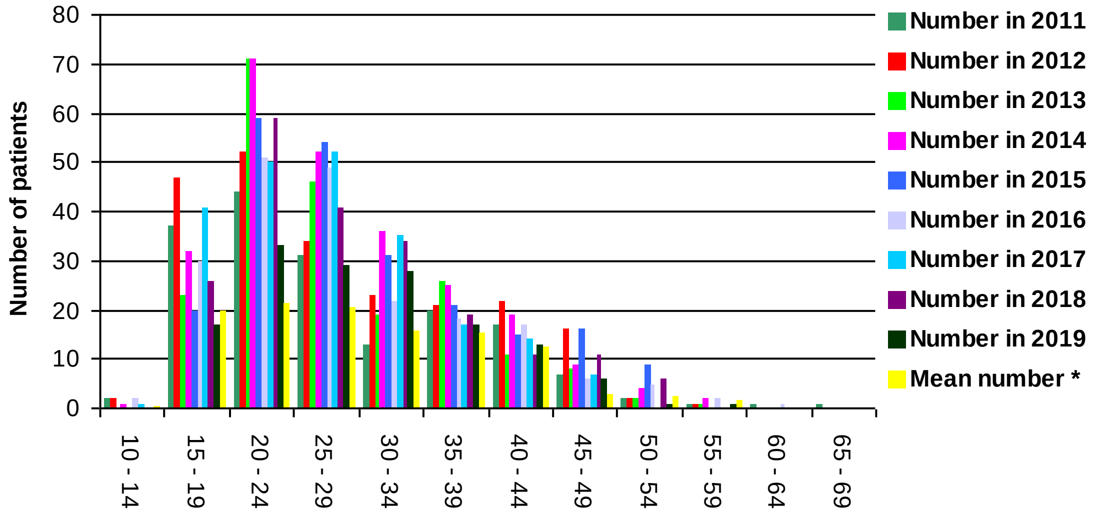
	One drug		Two drugs		Total
2019	1 152	(93,6%)	79	(6,4%)	**1 231**
2018	1 410	(98,2%)	26	(1,8%)	**1 436**
2017	1 472	(99,4%)	9	(0,6%)	**1 481**
2016	1 504	(98,8%)	18	(1,2%)	**1 522**
2015	1 521	(99,4%)	9	(0,6%)	**1 530**
2005-14	13 730	(99,3%)	91	(0,7%)	**13 821**
Total	**20 789**	**(98,9%)**	**232**	**(1,1%)**	**21 021**

Table 31: Drug

	2004-14	2015	2016	2017	2018	2019
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)	0,01%		0,07%			0,24%
Apixiban (Eliquis)					0,14%	0,24%
Dabigatranetixalat (Re-Novate, Pradaxa)	0,01%				0,07%	
Dalteparin (Fragmin)	61,02%	58,69%	60,78%	59,35%	57,94%	53,05%
Dekstran (Macrodex, Dextran)	0,09%	0,20%	0,07%	0,07%		0,08%
Enoksaparin (Klexane)	35,06%	39,87%	37,25%	39,30%	39,48%	38,99%
Heparin (Heparin)	0,01%					
Rivaroksaban (Xarelto)	0,05%	0,07%	0,07%	0,07%	0,07%	0,16%
Ticagrelor (Brilique)					0,07%	
Warfarin (Marevan)	0,02%		0,20%	0,07%		
Ximelagatran (Exanta, Malagatran)	0,22%					
Unknown	0,01%					
No drugs	2,64%					
Missing	0,21%	0,59%	0,39%	0,54%	0,42%	0,81%
Two drugs	0,66%	0,59%	1,18%	0,61%	1,81%	6,42%

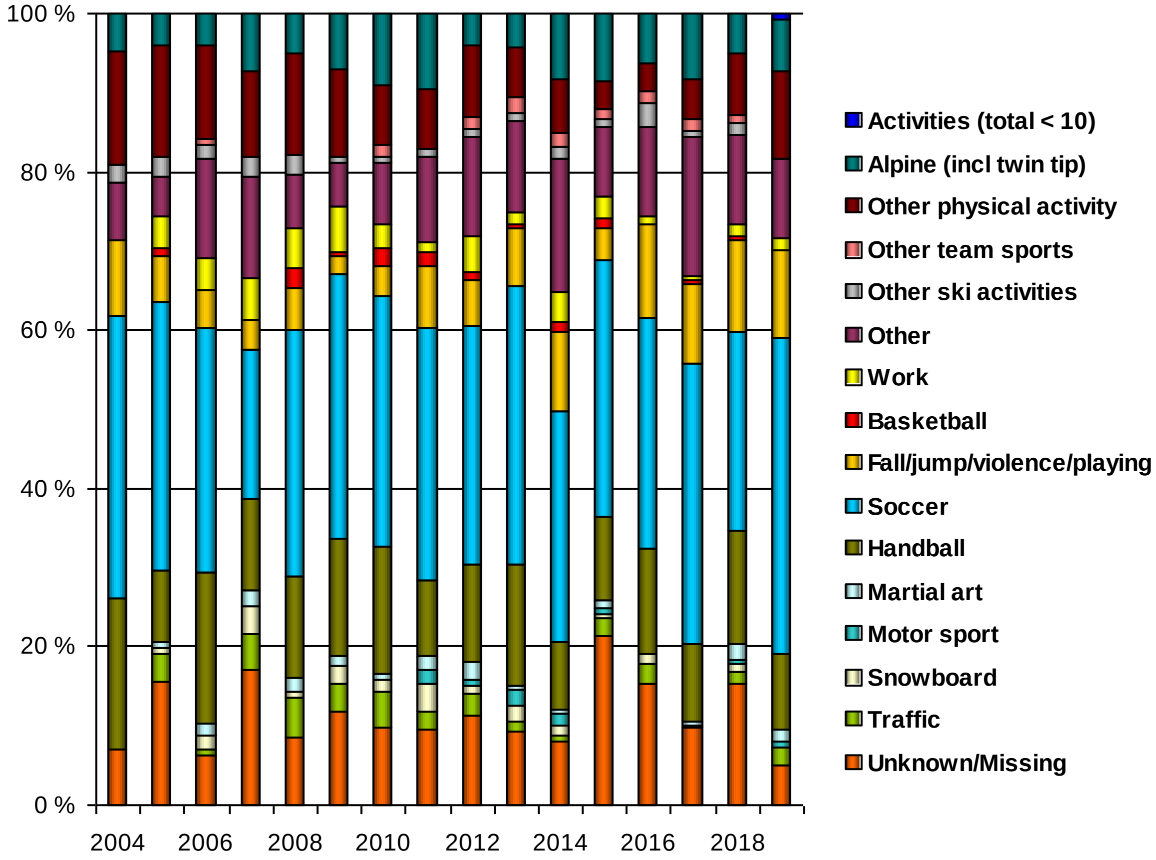
Revision reconstruction

Figure 10: Age by primary operation



* Mean number of primary operations for 2004 - 2010

Figure 11: Activity that lead to injury



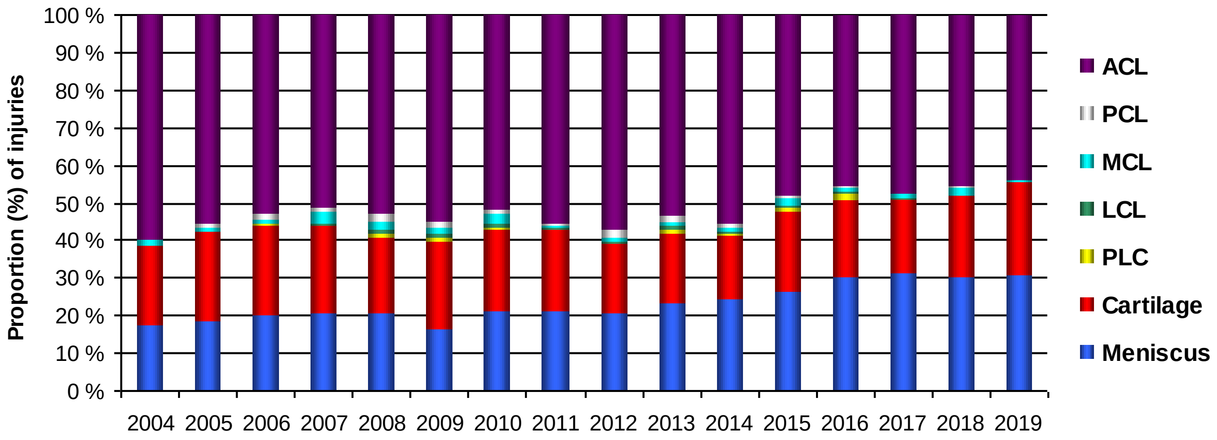
Actual injury

Table 32: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2019	138		3			65	97
2018	198	3	8	1	1	90	131
2017	207	1	5	1	1	80	136
2016	155	2	3	3	4	71	103
2015	165	3	7	2	3	73	91
2004-14	1 499	37	41	16	15	571	576
Total	**2 362**	**46**	**67**	**23**	**24**	**950**	**1 134**

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

Figure 12: Actual injury



Additional injuries

Table 33: ACL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
924	x						
529	x					x	
476	x					x	x
339	x						x
18	x		x				
8	x		x				x

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where ACL where the only injury. The total number will be identical to the total number of registered ACL injuries. The table shows only combinations that have a number of more than 5.

Table 34: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
12		x					
7		x					x
4	x	x	x				x
4	x	x					x
3	x	x					

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where PCL where the only injury. The total number will be identical to the total number of registered PCL injuries. The table shows only combinations that have a number of more than 2.

Reason for revision reconstruction

Table 35: Reason for revision reconstruction

	Cause 1	Cause 2	Cause 3	Cause 4	Cause 5	Cause 6	Other	Total
2019	2	5	2	60	66	10		135
2018	3	8	3	91	91	5		196
2017	3	7	1	106	97	8		214
2016	4	9	5	110	78	4	1	207
2015	6	12	3	116	81	1	1	219
2004-14	21	57	12	565	540	20	33	1 228
Total	**39**	**98**	**26**	**1 048**	**953**	**48**	**35**	**2 247**

Cause 1: Infection
Cause 2: Fixation failure
Cause 3: Untreated ligamentinjury
Cause:4: Graft failure
Cause 5: New trauma
Cause 6: Pain

Choice of graft for injuries registered in revision reconstructions

Table 36: BPTB

	ACL	PCL	MCL	LCL	PLC
2019	55	0	0	0	0
2018	92	0	0	0	0
2017	108	0	0	0	0
2016	87	0	0	0	0
2015	92	0	0	0	0
2004-14	664	2	0	0	0
Total	**1 098**	**2**	**0**	**0**	**0**

Table 37: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2019	38	0	0	0	0
2018	40	0	2	0	0
2017	39	1	1	0	1
2016	38	1	0	1	1
2015	50	1	0	1	1
2004-14	650	6	16	2	0
Total	**855**	**9**	**19**	**4**	**0**

Table 38: ALLOGRAFT

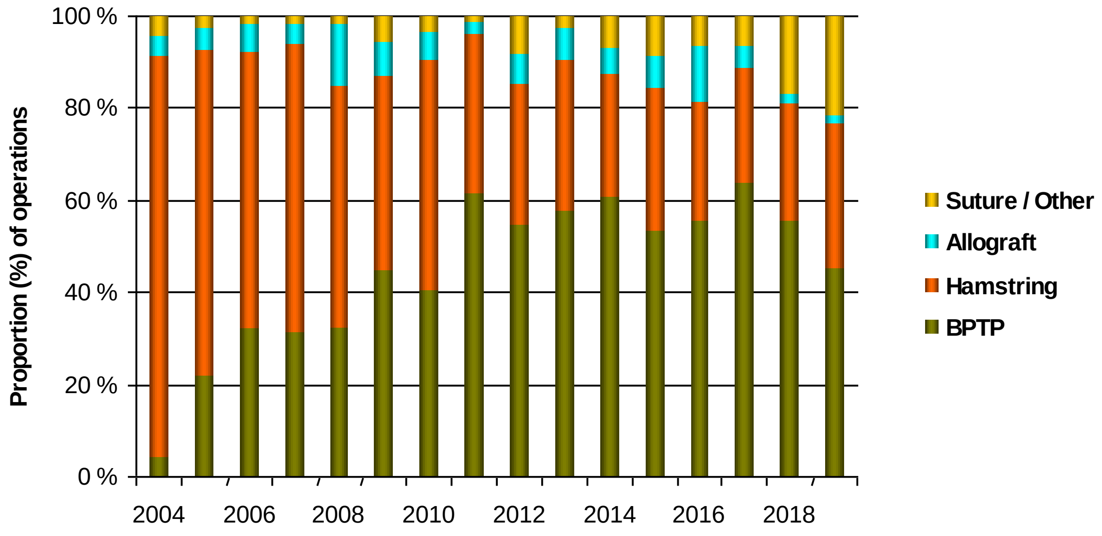
	ACL	PCL	MCL	LCL	PLC
2019	2	0	0	0	0
2018	3	0	0	0	0
2017	6	0	2	0	0
2016	12	1	1	2	3
2015	7	2	3	0	0
2004-14	46	22	6	8	11
Total	**76**	**25**	**12**	**10**	**14**

Table 39: Suture / Other

	ACL	PCL	MCL	LCL	PLC
2019	25	0	1	0	0
2018	26	1	1	0	0
2017	11	0	0	0	0
2016	10	0	0	0	0
2015	15	0	0	0	0
2004-14	50	4	3	1	1
Total	**137**	**5**	**5**	**1**	**1**

There were 1 forms where it was registered product for ACL but not checked for choice of graft. It was registered direct suture for two cases (PLC, MCL).

Figure 13: Choice of graft for all injuries in revision reconstruction



Fixation

Table 40: Femur ACL (The 5 most common for the last 5 years)

Product	2004-14	2015	2016	2017	2018	2019	Total
SoftSilk	334	44	48	50	42	32	**550**
Endobutton CL Ultra	286	49	36	37	37	28	**473**
Endobutton CL BTB	50	17	15	10	14	7	**113**
Sheated Cannulated Int	24	13	16	22	20	6	**101**
Peek Interference Scre	12	8	1	9	3	4	**37**

Table 41: Femur PCL (The 5 most common for the last 5 years)

Product	2004-14	2015	2016	2017	2018	2019	Total
Endobutton CL Ultra	12	1					**13**
RCI Screw	11		1				**12**
SoftSilk	4	1	2	1			**8**
EndoButton CL	2						**2**
Propel Cannulated	2						**2**

Table 42: Tibia ACL (The 5 most common for the last 5 years)

Product	2004-14	2015	2016	2017	2018	2019	Total
SoftSilk	302	39	48	51	44	40	**524**
RCI Screw	297	11	15	16	20	16	**375**
Biosure HA Interferenc	128	40	24	17	25	6	**240**
Sheated Cannulated Int	23	11	11	8	9		**62**
Biosure PK	17	6	9	4	6	8	**50**

Table 43: Tibia PCL (The 5 most common for the last 5 years)

Product	2004-14	2015	2016	2017	2018	2019	Total
RCI Screw	21	1	2	1			**25**
AO Skrue	5		2				**7**
Propel Cannulated	3						**3**
Biosure HA Interferenc	1	1					**2**
Tightrope ABS	2						**2**

Table 44: Femur and tibia ACL (The 5 most common for the last 5 years)

Femur	Tibia	2004-14	2015	2016	2017	2018	2019	Total
SoftSilk	SoftSilk	276	33	43	43	30	28	**453**
Endobutton CL Ultra	Biosure HA Interference screw	85	31	21	14	21	5	**177**
Endobutton CL Ultra	RCI Screw	104	8	7	9	13	12	**153**
Sheated Cannulated Interference Screw	Sheated Cannulated Interference Screw	22	11	11	8	7		**59**
Peek Interference Screw	Peek Interference Screw	11	8	1	7	3	4	**34**

Meniscal lesion

Table 45: Actual treatment of meniscal lesion

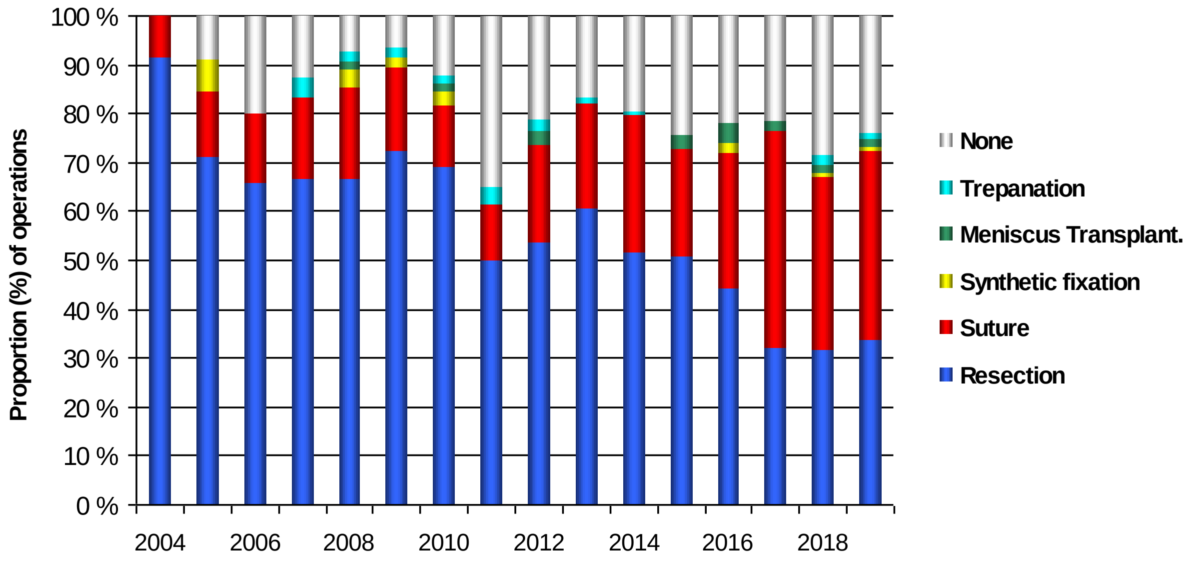
		Resection				Synthetic	Meniscus			
		OLD	Total	Partial	Suture	fixation	Transplant.	Trepanation	None	Total
2019	Lateral			14	22		1	1	11	**49**
2019	Medial		1	24	23	1	1		17	**67**
2018	Lateral			22	31			2	14	**69**
2018	Medial			30	28	1	3	1	33	**96**
2017	Lateral		1	22	30				14	**67**
2017	Medial			29	42		3		21	**95**
2016	Lateral			20	22	1	1		11	**55**
2016	Medial		2	36	14	2	4		18	**76**
2015	Lateral			19	8				16	**43**
2015	Medial			39	17		3		12	**71**
2004-14	Lateral	85	1	74	37	4	2	7	51	**261**
2004-14	Medial	149	4	107	87	4	2	5	66	**424**
Total		**234**	**9**	**436**	**361**	**13**	**20**	**16**	**284**	**1 373**

It became possible to register "Trepanation" and "None" from 01.01.2005. There have been forms where this has been an additional information. This information have been registered, but the registration is not complete before 2005.

In table 32: Actual injury has less. The reason for this is that we distinguish between the lateral and medial injury and some injuries are registreded in both groups.

The value in OLD Resection are the forms that are registered before the new forms were introduced in autumn 2011. Total and Partial Resection values are the new forms were introduced in autumn 2011.

Figure 14: Treatment of meniscal lesions in revision reconstructions



Meniscal fixation

Table 46: Synthetic

Product	2004-07	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Contour Meniscus arrow	2	1												**3**
FAST-FIX												1	1	**2**
Meniscus arrow	1													**1**
Unknown			1							3				**4**
Total	**3**	**1**	**1**							**3**		**1**	**1**	**10**

Table 47: Suture

Product	2004-07	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
BioComposite SwiveLock C w Fiber Tape											2		2	**4**
FAST-FIX	13	6	5	4	5	14	16	19	16	15	42	32	26	**213**
Meniscus arrow				1										**1**
PDS II (polydioxanone) sutur											1	1		**2**
Rapidloc	4													**4**
SUTURE WASHER STER. BOX OF 1												1	1	**2**
SutureButton													1	**1**
TRUESPAN Meniscal Repair System PEEK 12													1	**1**
Unknown			1		4	1	5	6	9	13	1	2	2	**44**
Total	**17**	**6**	**6**	**5**	**9**	**15**	**21**	**25**	**25**	**28**	**46**	**36**	**33**	**272**

Cartilage lesion all localizations

Table 48: ICRS Grade

Definitjon av ICRS Grade:

1. Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks.
2. Abnormal: Lesions extending down to <50% of cartilage depth.
3. Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer.
4. Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.

	Code 1	Code 2	Code 3	Code 4	Missing
2019	28,4%	48,3%	14,9%	6,0%	2,5%
2018	42,4%	39,0%	11,5%	3,0%	4,1%
2017	43,9%	35,2%	13,3%	4,1%	3,6%
2016	33,3%	40,4%	18,2%	7,6%	0,5%
2015	29,7%	42,3%	22,9%	4,0%	1,1%
2004-14	20,0%	51,7%	22,4%	4,6%	1,3%

Table 49: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2019	5,5%		88,1%	1,0%	5,5%
2018	5,3%	1,9%	82,3%	0,8%	9,8%
2017	7,7%	1,0%	75,5%	1,5%	14,3%
2016	8,6%	2,0%	85,9%		3,5%
2015	16,0%	0,6%	76,0%	1,7%	5,7%
2004-14	8,0%	2,5%	70,1%	1,2%	18,2%

Cartilage injuries registered in revision reconstructions

Figure 15: All Cartilage injuries (total)

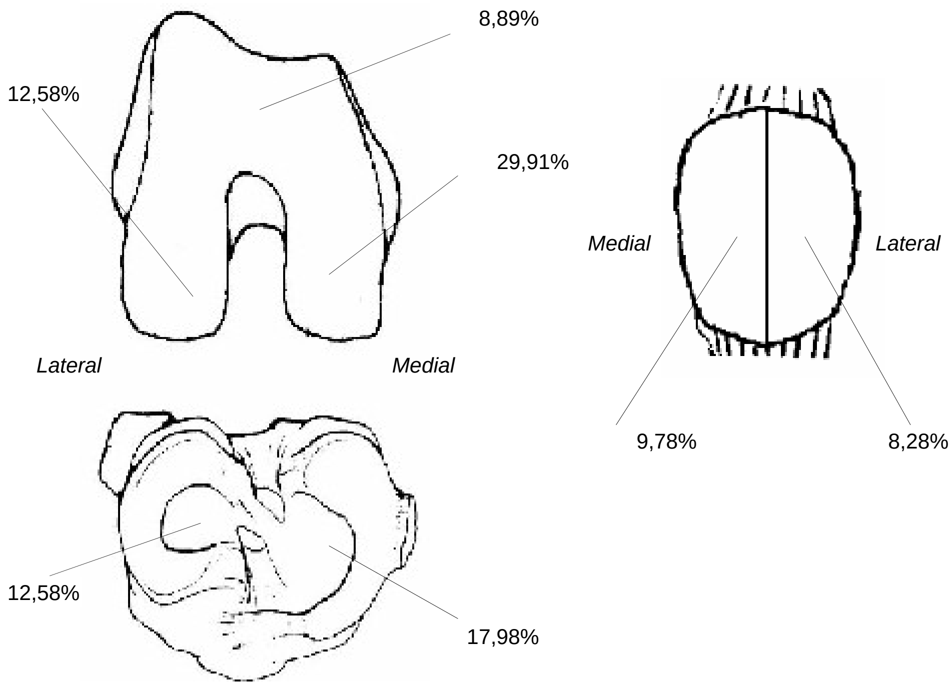


Figure 16: All Cartilage injuries with area greater than 2 cm² (total)

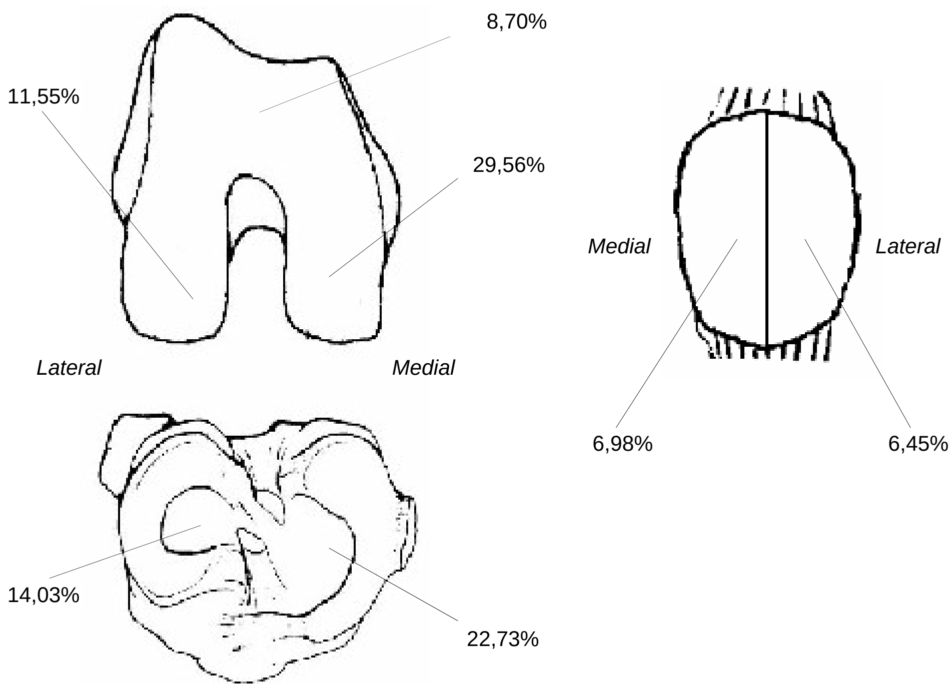
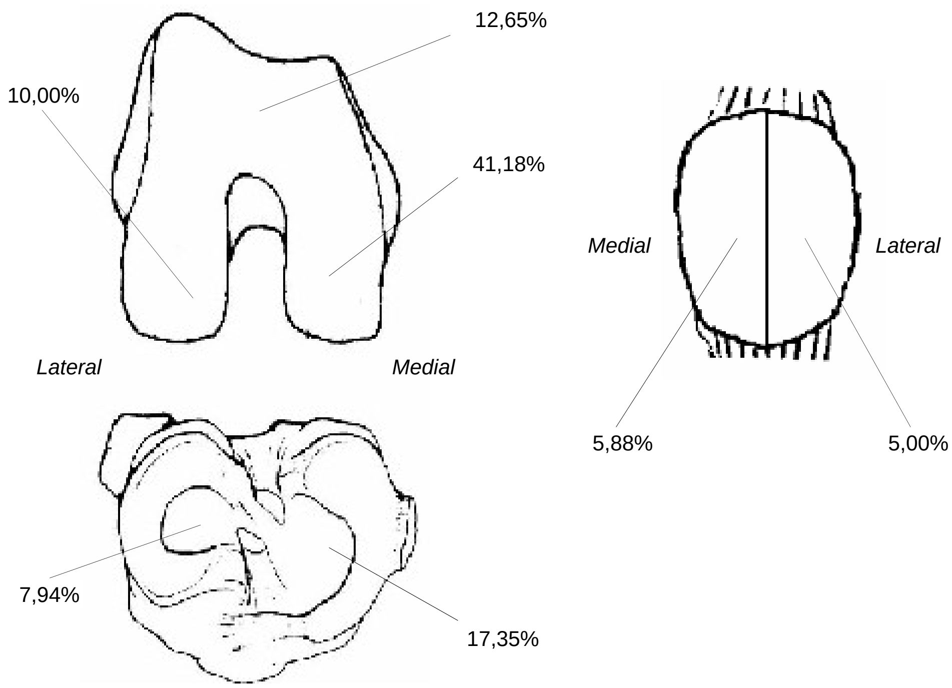


Figure 17: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 50: Outpatient surgery

	Yes		No		Missing		Total
2019	70	(48,3%)	73	(50,3%)	2	(1,4%)	**145**
2018	113	(54,6%)	92	(44,4%)	2	(1,0%)	**207**
2017	95	(43,8%)	119	(54,8%)	3	(1,4%)	**217**
2016	93	(45,8%)	109	(53,7%)	1	(0,5%)	**203**
2015	118	(52,4%)	101	(44,9%)	6	(2,7%)	**225**
2004-14	696	(42,2%)	942	(57,1%)	12	(0,7%)	**1 650**
Total	**1 185**	**(44,8%)**	**1 436**	**(54,3%)**	**26**	**(1,0%)**	**2 647**

Intraoperative complications

Table 51 : Intraoperative complications

	Yes		No		Missing		Total
2019	3	(2,1%)	140	(96,6%)	2	(1,4%)	**145**
2018	3	(1,4%)	195	(94,2%)	9	(4,3%)	**207**
2017	13	(6,0%)	197	(90,8%)	7	(3,2%)	**217**
2016	7	(3,4%)	192	(94,6%)	4	(2,0%)	**203**
2015	8	(3,6%)	207	(92,0%)	10	(4,4%)	**225**
2004-14	55	(3,3%)	1 542	(93,5%)	53	(3,2%)	**1 650**
Total	**89**	**(3,4%)**	**2 473**	**(93,4%)**	**85**	**(3,2%)**	**2 647**

Systemic antibiotic prophylaxis

Table 52: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2019	142	(97,9%)	2	(1,4%)	1	(0,7%)	**145**
2018	204	(98,6%)	3	(1,4%)			**207**
2017	213	(98,2%)	3	(1,4%)	1	(0,5%)	**217**
2016	194	(95,6%)	6	(3,0%)	3	(1,5%)	**203**
2015	221	(98,2%)	3	(1,3%)	1	(0,4%)	**225**
2004-14	1 627	(98,6%)	18	(1,1%)	5	(0,3%)	**1 650**
Total	**2 601**	**(98,3%)**	**35**	**(1,3%)**	**11**	**(0,4%)**	**2 647**

Table 53: Drug

	2004-14	2015	2016	2017	2018	2019
Benzylpenicillin (Penicillin G)	0,06%					
Cefalotin (Keflin)	91,95%	92,76%	98,45%	92,96%	68,63%	16,90%
Cefazolin (Cephazolin)				3,76%	29,41%	78,17%
Ceftriakson (Rocefalin)	0,06%					
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	0,55%					
Ciprofloksasin (Ciproxin)	0,06%					
Dikloksacillin (Diclocil, Dicillin)	1,78%					
Gentamicin (Garamycin, Gensumycin)	0,06%					
Imipenem (Tienam)					0,49%	
Klindamycin (Dalacin, Clindamycin)	2,77%	3,17%	1,55%	2,35%	1,47%	2,11%
Kloksacillin (Ekvacillin)	2,15%	2,26%		0,47%		2,82%
Oxacillin (Unspecified)	0,06%					
Vankomycin (Vancomycin, Vancocin)	0,06%					
Missing	0,43%	1,81%		0,47%		

Thrombosis prophylaxis

Table 54: Thrombosis prophylaxis

	Yes		No		Missing		Total
2019	95	(65,5%)	49	(33,8%)	1	(0,7%)	**145**
2018	149	(72,0%)	57	(27,5%)	1	(0,5%)	**207**
2017	164	(75,6%)	51	(23,5%)	2	(0,9%)	**217**
2016	141	(69,5%)	58	(28,6%)	4	(2,0%)	**203**
2015	177	(78,7%)	47	(20,9%)	1	(0,4%)	**225**
2005-14	1 298	(81,0%)	288	(18,0%)	19	(1,2%)	**1 605**
Total	**2 024**	**(77,8%)**	**550**	**(21,1%)**	**28**	**(1,1%)**	**2 602**

There are 2 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.
There are 9 forms with two drugs and 2015 forms with one drug.

Table 55: Drug

	2004-14	2015	2016	2017	2018	2019
Apixiban (Eliquis)	0,08%					
Dalteparin (Fragmin)	65,41%	55,93%	60,28%	68,90%	62,42%	72,63%
Dekstran (Macrodex, Dextran)	0,15%					
Enoksaparin (Klexane)	32,36%	42,94%	38,30%	29,27%	36,24%	26,32%
Rivaroksaban (Xarelto)	0,08%					
Warfarin (Marevan)		0,56%				
Ximelagatran (Exanta, Malagatran)	0,23%					
No drugs	1,08%					
Missing	0,23%		0,71%	1,22%	0,67%	1,05%
Two drugs	0,15%	0,56%	0,71%	0,61%	0,67%	

PROM (Patient Reported Outcome Measures)

Table 56: Number of issued and answered patient questionnaires

	2 years *			5 years *			10 years *			Total		
	Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)	
2019	1 861	976	(52,4%)	1 698	872	(51,4%)	1 797	1 012	(56,3%)	**5 356**	**2 860**	(53,4%)
2018	1 863	1 021	(54,8%)	1 722	913	(53,0%)	1 646	831	(50,5%)	**5 231**	**2 765**	(52,9%)
2017	1 766	1 002	(56,7%)	1 745	943	(54,0%)	1 603	889	(55,5%)	**5 114**	**2 834**	(55,4%)
2016	1 719	1 034	(60,2%)	1 818	1 009	(55,5%)	1 426	811	(56,9%)	**4 963**	**2 854**	(57,5%)
2015	1 749	1 058	(60,5%)	1 717	964	(56,1%)	1 515	935	(61,7%)	**4 981**	**2 957**	(59,4%)
2014	1 749	1 035	(59,2%)	1 823	1 053	(57,8%)	899	554	(61,6%)	**4 471**	**2 642**	(59,1%)
2013	1 851	1 163	(62,8%)	1 688	989	(58,6%)				**3 539**	**2 152**	(60,8%)
2012	1 917	1 215	(63,4%)	1 800	960	(53,3%)				**3 717**	**2 175**	(58,5%)
2011	1 669	1 095	(65,6%)	1 303	717	(55,0%)				**2 972**	**1 812**	(61,0%)
2010	1 864	1 232	(66,1%)	1 694	1 126	(66,5%)				**3 558**	**2 358**	(66,3%)
2009	1 632	1 131	(69,3%)	762	527	(69,2%)				**2 394**	**1 658**	(69,3%)
2008	1 452	914	(62,9%)							**1 452**	**914**	(62,9%)
2007	1 351	723	(53,5%)							**1 351**	**723**	(53,5%)
2006	896	549	(61,3%)							**896**	**549**	(61,3%)
Total	23 339	14 148	(60,6%)	17 770	10 073	(56,7%)	8 886	5 032	(56,6%)	**49 995**	**29 253**	(58,5%)

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

Completeness analysis for the Cruciate Ligament Register, 2017-2018

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

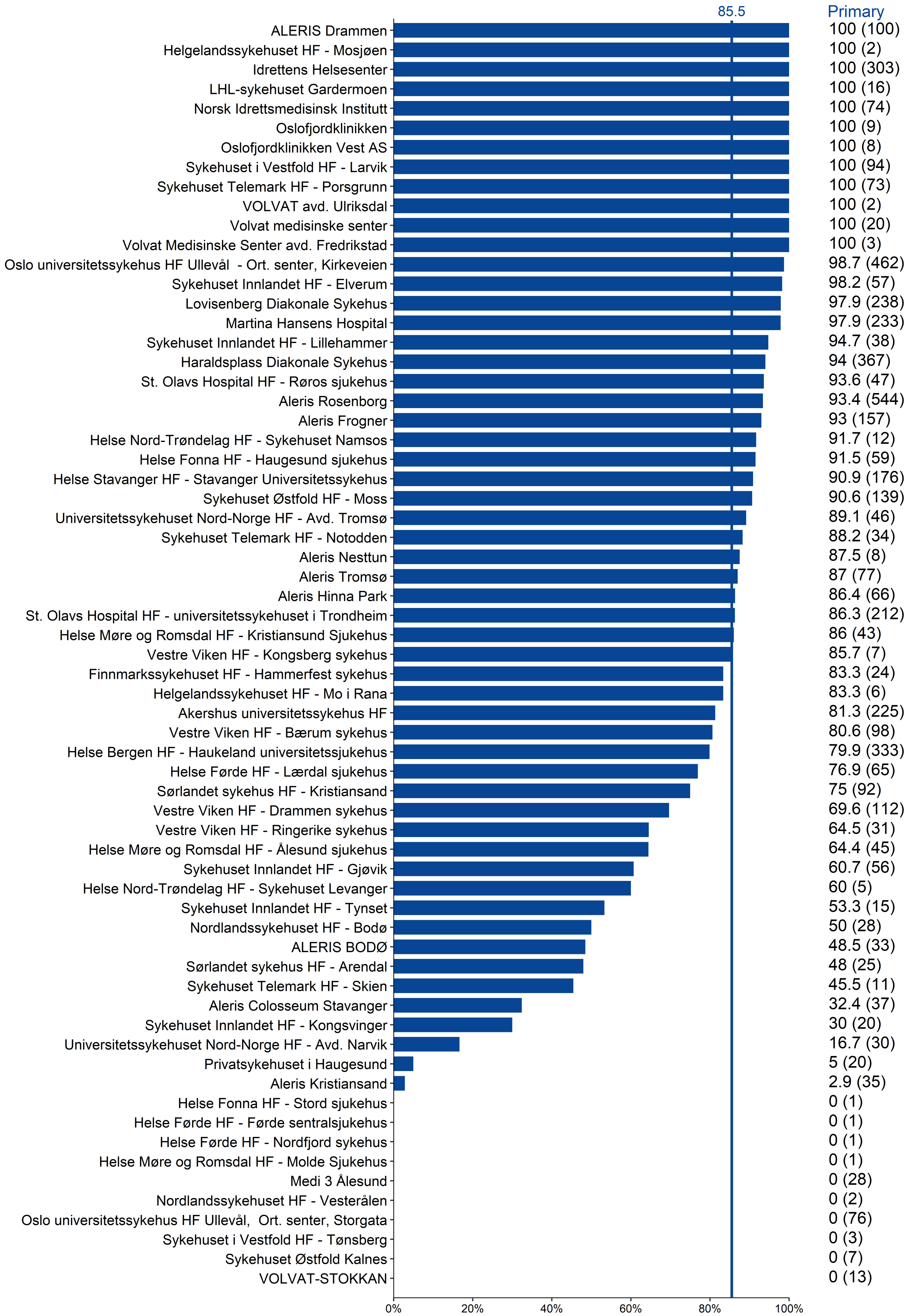
Formulae for completeness rates:

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

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

In 2017-2018, 5205 cruciate ligament operations were reported to one or both of the registers. 85.5% of these were reported to the Cruciate Ligament Register, while 75.5% 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 primary cruciate ligament operations 2017-2018



Vertical line shows the national averages. The numbers in brackets gives the number of operations registered at both NAR and NPR.

CONTENTS

Norwegian Paediatric Hip Register

PAEDIATRIC HIP REGISTER: ANNUAL REPORT

The Paediatric Hip Register now contains data on almost 1500 children and 300 young adults, including 274 added in 2019. We have worked hard to increase reporting from all hospitals. Last year's autumn meeting was a good opportunity to meet Norway's orthopaedic surgeons and remind them to send in reports. At the NRL stand, many people were assisted to register as users of the electronic reporting form, and we saw that there were many more users following the meeting.

Good data depend on high reporting rates, and we will continue to work to improve reporting in 2020. The data on the number of patients reported from each hospital tells us that we have patients from all health regions, but some hospitals appear to have a low reporting rate.
For 2019, we see that scopic and open surgery for young adult hips has had a significant increase in the number of patients reported; the total figure is 137 patients. We are very pleased to note that the hard work led by Jone Segadal to design a new electronic form has already resulted in such good reporting. Our first goal is to find out the number of patients operated in comparison with reporting to the Norwegian Patient Register (NPR). In addition, data on age and gender of the patients, as well as the grade of osteoarthritis, will be compared to results of joint preservation surgery.
PROM data will be collected for all patients. PROMs for young adults are EQ-5D and iHOT-12. There are already Norwegian versions of these ready for use. For children under 18 we will use Barnehofte, translated from Swedish and PROMIS 25-ped, translated from English. The Centre for Patient Reported Data has been of great help in translating Barnehofte. The Norwegian Institute of Public Health has translated PROMIS 25-ped. This work has now been completed and cognitive interviews have been conducted, which means that these data can be collected from autumn 2020.

Quality indicators of importance in improving treatment are symptom duration prior to diagnosis of epiphysis of the hip and Calvé-Legg-Perthes' disease. National guidelines approved by the Norwegian Paediatric Orthopaedic Association state that all children with hip pain should have a pelvic x-ray within six weeks. When we examine the figures for the two disorders, we see that more than 50% have symptoms long before diagnosis, and this applies especially to CLP. We are interested in reducing these figures, as we know the importance of early diagnosis for long-term results, especially for epiphysiolysis. In 2020 we will therefore make an active effort to raise awareness in primary health care about children with hip pain and the importance of x-rays for diagnosis.

At the October meeting of the Advisory Committee, some new representatives were elected. The members are now Hanne Rasmussen, Helse Nord, Ketil Holen, Helse Midt, Dag Rune Pedersen, Helse Vest, Stefan Hunstock, Helse Sør-Øst. Ola Wiig, Helse Sør-Øst continues as Chair of the Committee and Trude Gundersen, Helse Vest continues as General Manager.

We would like to thank all the orthopaedic surgeons who have provided patient data to the register, and hope for even better reporting in 2020.

Bergen, June 2020

Trude Gundersen

Trude Gundersen
Chief Physician/Associate Professor
Head of Paediatric Hip Register

FIGURE F.1: Number of treated patients in the Pediatric Hip Register

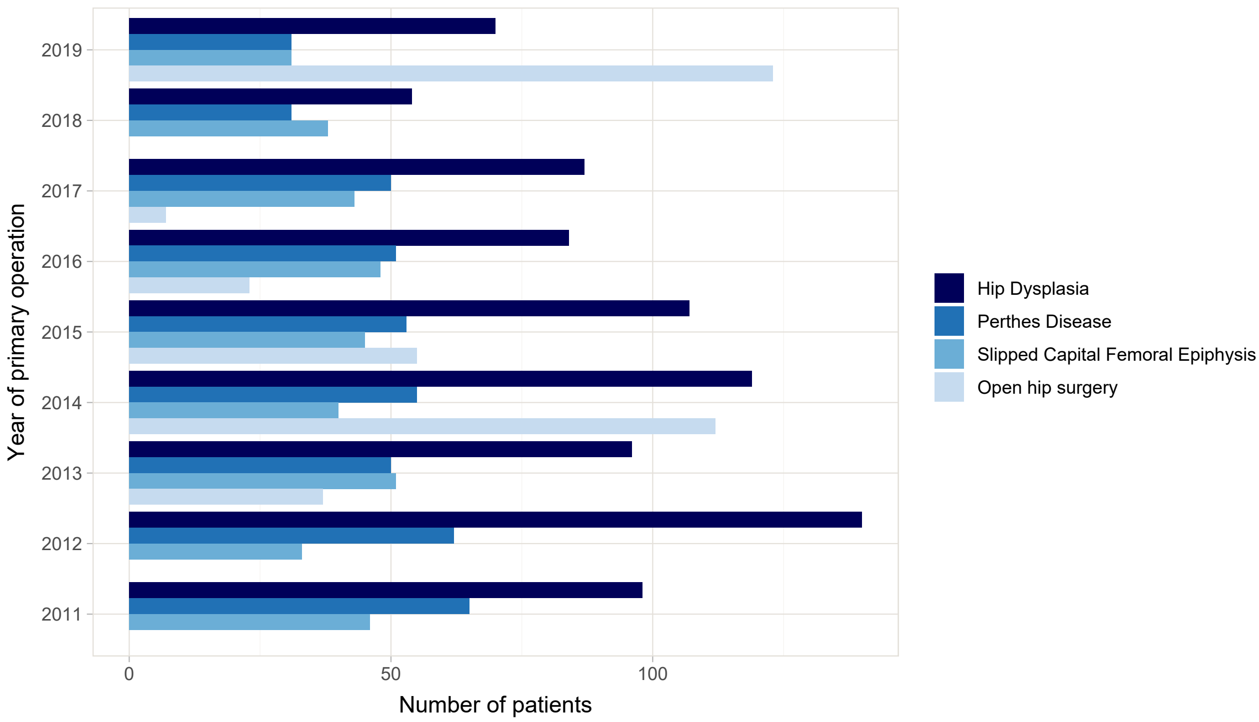
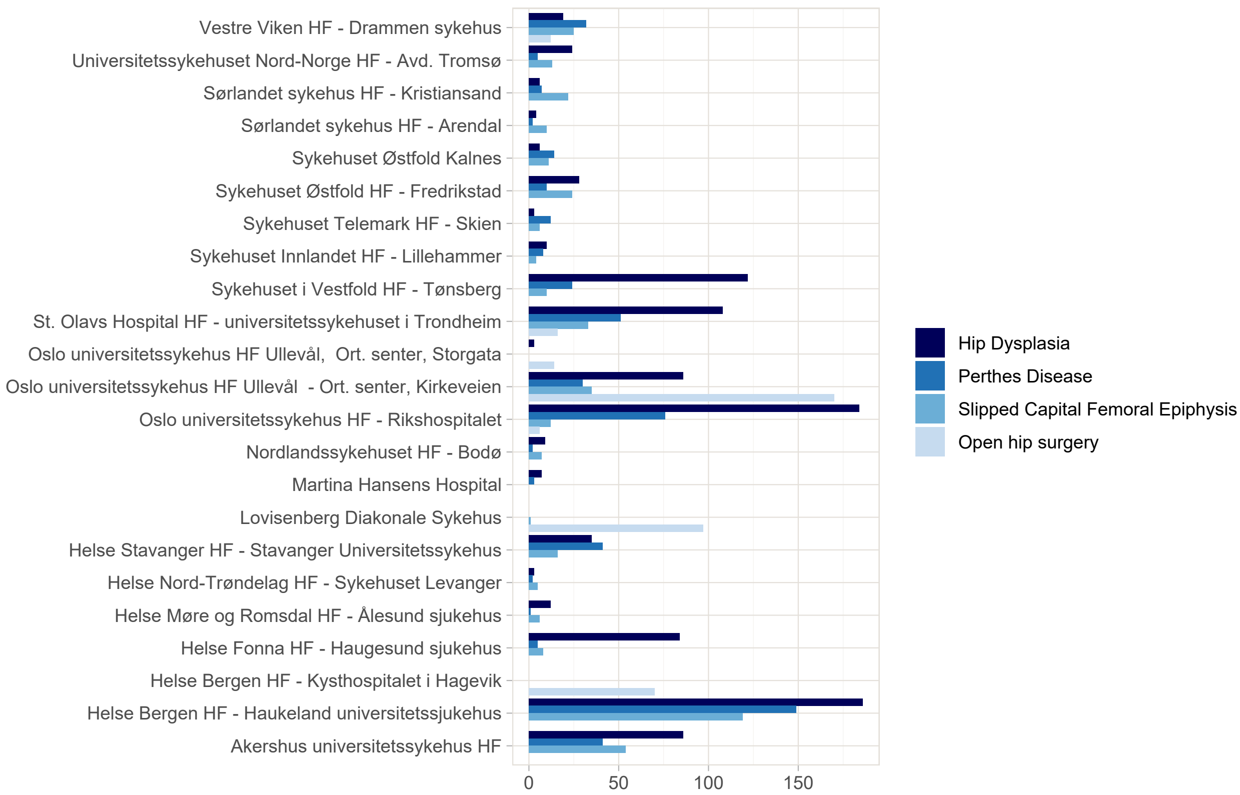


FIGURE F.2: Number of operations by diagnosis at each operating hospital*



*Only hospitals with more than 10 operations in total are included

PAEDIATRIC HIP DISEASE

Hip Dysplasia

Table 1: HD - New cases per year

Year diagnosed	Unilateral	Bilateral	Missing	Total
2019	26	12	0	**38**
2018	26	8	0	**34**
2017	42	12	0	**54**
2016	37	17	0	**54**
2015	40	16	0	**56**
2014	62	26	1	**89**
2013	57	19	0	**76**
2012	79	30	0	**109**
2011	68	19	0	**87**
2010	95	19	0	**114**
Unknown	18	5	8	**31**
Total	**550**	**183**	**9**	**742**

Table 2: HD - Earlier treatment

Year treated	None	Abd. orthosis	Other	Missing	Total
2019	38	23	7	2	**70**
2018	23	20	8	3	**54**
2017	36	33	15	3	**87**
2016	31	37	9	6	**83**
2015	39	25	15	28	**107**
2014	38	40	14	27	**119**
2013	30	16	9	41	**96**
2012	6	6	0	128	**140**
2011	1	1	0	96	**98**
2010	2	3	0	121	**126**
Total	**244**	**204**	**77**	**455**	**980**

More than one form for patient per side is possible.

Table 3: HD - Hip status

Year treated	Normally located	Subluxated	Dislocated	Missing	Total
2019	43	13	12	2	**70**
2018	39	12	2	1	**54**
2017	51	16	19	1	**87**
2016	43	11	21	8	**83**
2015	55	26	17	9	**107**
2014	67	15	35	2	**119**
2013	50	19	18	9	**96**
2012	70	21	35	14	**140**
2011	56	14	23	5	**98**
2010	64	24	29	9	**126**
Total	**538**	**171**	**211**	**60**	**980**

More than one form for patient per side is possible

Table 4: HD - Acetabular index

Year diagnosed	< 30°	< 40°	>= 40°	Missing	Total
2019	2	12	22	2	**38**
2018	5	15	7	7	**34**
2017	9	21	14	10	**54**
2016	7	16	22	9	**54**
2015	3	20	25	8	**56**
2014	13	33	29	14	**89**
2013	10	29	22	15	**76**
2012	16	39	41	13	**109**
2011	16	35	28	8	**87**
2010	33	39	27	15	**114**
Unknown	3	6	3	19	**31**
Total	**117**	**265**	**240**	**120**	**742**

Mean number used for both hips for bilateral HD,

Table 5: HD - Femoral osteotomy

Treatment year	Varus osteotomy	Rotational osteotomy	Shortening	Total
2019	4	2	1	**7**
2017	5	3	2	**10**
2016	7	5	0	**12**
2015	5	3	2	**10**
2014	1	0	0	**1**
2013	5	4	3	**12**
2012	2	2	0	**4**
2011	3	2	1	**6**
2010	1	3	1	**5**
Total	**33**	**24**	**10**	**67**

Table 6: HD - Pelvic osteotomy

Treatment year	Salter	Dega	Other	Total
2019	4	4	0	**8**
2018	1	9	0	**10**
2017	3	12	1	**16**
2016	2	8	2	**12**
2015	5	6	3	**14**
2014	8	2	0	**10**
2013	7	0	0	**7**
2012	3	0	0	**3**
2011	1	1	3	**5**
2010	1	1	0	**2**
Total	**35**	**43**	**9**	**87**

Slipped Capital Femoral Epiphysis (SCFE)

Table 7: SCFE - New cases per year

Year diagnosed	Unilateral	Bilateral	Total
2019	10	5	**15**
2018	17	3	**20**
2017	24	9	**33**
2016	23	8	**31**
2015	23	7	**30**
2014	24	3	**27**
2013	17	18	**35**
2012	18	5	**23**
2011	29	10	**39**
2010	22	6	**28**
Unknown	14	12	**26**
Total	**221**	**86**	**307**

Table 8: SCFE - Classification

Year diagnosed	Acute	Chronic	Acute on chronic	Stable (Able to bear weight)	Unstable (Unable to ambulate)
2019	2	9	4	11	3
2018	3	13	3	12	7
2017	4	20	5	23	9
2016	6	17	6	20	10
2015	5	21	2	24	4
2014	1	18	6	13	11
2013	4	20	5	25	5
2012	4	8	5	8	6
2011	7	16	7	23	4
2010	4	15	3	18	7
Unknown	1	9	0	9	0
Total	**41**	**166**	**46**	**186**	**66**

Table 9: ECF - Symptoms duration

Year diagnosed	< 4 weeks	4 - 8 weeks	9 - 26 weeks	27-52 weeks	> 52 weeks	Total
2019	1	5	3	2	2	**13**
2018	1	1	0	0	0	**2**
2017	2	3	1	1	0	**7**
2016	0	1	0	0	0	**1**
2015	1	1	2	0	0	**4**
2014	0	2	1	0	1	**4**
2013	1	2	3	3	0	**9**
2012	3	4	1	1	0	**9**
2011	5	2	6	4	3	**20**
2010	3	8	8	2	0	**21**
Unknown	1	0	0	0	0	**1**
Total	**18**	**29**	**25**	**13**	**6**	**91**

Table 10: SCFE - Degree of slip

Year diagnosed	< 30°	30 - 50°	> 50°	Total
2019	9	5	1	**15**
2018	13	3	5	**21**
2017	13	7	8	**28**
2016	13	10	7	**30**
2015	15	9	4	**28**
2014	8	7	9	**24**
2013	17	11	4	**32**
2012	6	4	5	**15**
2011	11	10	6	**27**
2010	16	4	7	**27**
Unknown	5	1	2	**8**
Total	**126**	**71**	**58**	**255**

Table 11: SCFE - Primary operation

Year treated	Screw osteosynthesis	Femoral osteotomy	Pin osteosynthesis	Total
2019	22	2	2	**26**
2018	28	0	2	**30**
2017	32	1	3	**36**
2016	31	0	5	**36**
2015	22	1	10	**33**
2014	30	1	4	**35**
2013	36	0	12	**48**
2012	14	0	9	**23**
2011	26	1	15	**42**
2010	25	1	13	**39**
Total	**266**	**7**	**75**	**348**

Perthes disease

Table 12: Perthes - Number of new cases per year

Year diagnosed	Unilateral	Bilateral	Total
2019	23	0	**23**
2018	17	4	**21**
2017	29	5	**34**
2016	27	2	**29**
2015	28	7	**35**
2014	37	1	**38**
2013	44	3	**47**
2012	43	5	**48**
2011	30	4	**34**
2010	62	12	**74**
Unknown	40	5	**45**
Total	**380**	**48**	**428**

Table 13: Perthes - Catterall classification

Year diagnosed	I/II	III/IV	Missing	Total
2019	7	15	1	**23**
2018	7	16	0	**23**
2017	10	20	4	**34**
2016	6	18	5	**29**
2015	10	22	4	**36**
2014	7	25	6	**38**
2013	12	27	8	**47**
2012	16	26	6	**48**
2011	11	22	1	**34**
2010	22	44	8	**74**
Unknown	1	17	33	**51**
Total	**109**	**252**	**76**	**437**

I/II = < 50 % caput necrosis III/IV = < 50 % caput necrosis

Table 14: CLP - Symptoms duration (in months)

Year diagnosed	< 1 mth	1 - 10 mth	11 -30 mth	31-50 mth	> 50 mth	Total
2019	2	18	2	1	0	**23**
2018	0	16	0	2	0	**18**
2017	0	28	3	0	0	**31**
2016	0	21	2	0	0	**23**
2015	0	27	4	0	0	**31**
2014	0	29	5	1	0	**35**
2013	0	24	9	2	0	**35**
2012	2	23	10	1	0	**36**
2011	1	25	5	1	1	**33**
2010	1	45	11	0	1	**58**
Unknown	0	3	7	0	0	**10**
Total	**6**	**259**	**58**	**8**	**2**	**333**

Table 15: Perthes - Treatment

Year treated	None/ physiotherapy	Abduction orthosis	Femoral osteotomy	Pelvic osteotomy	Total
2019	16	0	11	0	**27**
2018	22	0	6	1	**29**
2017	35	0	8	2	**45**
2016	22	0	21	1	**44**
2015	30	0	12	2	**44**
2014	37	2	11	0	**50**
2013	35	0	14	0	**49**
2012	38	0	4	4	**46**
2011	34	0	15	1	**50**
2010	46	0	10	0	**56**
Total	**315**	**2**	**112**	**11**	**440**

Table 16: Perthes - Plates

Year treated	Prebent plate	Angel plate	Special plate
2019	1	2	8
2018	0	2	4
2017	0	1	7
2016	2	2	14
2015	1	2	8
2014	0	0	10
2013	2	1	10
2012	1	0	8
2011	0	0	19
2010	1	7	3
Total	**8**	**17**	**91**

Adult hips *

Table 17: AH - Annual numbers of all operations

Year	Primary operation		Reoperation		Total
2019	100	(81,3%)	23	(18,7%)	**123**

Table 18: AH - Annual numbers of intervention types

Year	Open procedure		Scopy		Total
2019	57	(46,3%)	66	(53,7%)	**123**

Table 19: AH - Annual numbers of all operations in the different age groups

Year	10-20		21-30		31-40		41-50		> 50		Total
	Women	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	
2019	27	8	19	26	21	10	6	4	2	0	**123**

* Registration started in 2019

Completeness analysis for the Norwegian Pediatric Hip Register, 2017-2018

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 2017-2018. A report and analysis have been prepared by the Norwegian Patient Register (NPR) in cooperation with the NPHR. A report on the implementation and results will be published at www.helsedirektoratet.no.

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

Operation	Code	Description
CLP	NEK 59	Angulation, rotation or displacement osteotomy of pelvis
	NFK 49	Epiphysiodesis of femur
	NFK 59	Angulation, rotation or displacement osteotomy of femur
	TNF 31	Prefabricated orthosis of hip joint or thigh
	TNF 32	Splint of malleable material on hip or thigh
	TNF 33	Circular plaster cast on hip or thigh
HD	NEK 59	Angulation, rotation or displacement osteotomy of pelvis
	NFH 00	Closed reduction of dislocation of hip joint
	NFH 02	Open reduction of dislocation of hip joint
	NFK 59	Angulation, rotation or displacement osteotomy of femur
	NFL 39	Myotomy or tenotomy of hip or thigh
	TNE 34	Large plaster dressing on pelvis
	TNF 32	Splint of malleable material on hip or thigh
	TNF 33	Circular plaster cast on hip or thigh
	TNF 34	Large plaster dressing on hip or thigh
SCFE	NEK 59	Angulation, rotation or displacement osteotomy of pelvis
	NFJ 40	Osteosynthesis of fracture of femur using wire, cerclage or pin
	NFJ 70	Osteosynthesis of fracture of femur using screws
	NFK 49	Epiphysiodesis of femur
	NFK 59	Angulation, rotation or displacement osteotomy of femur

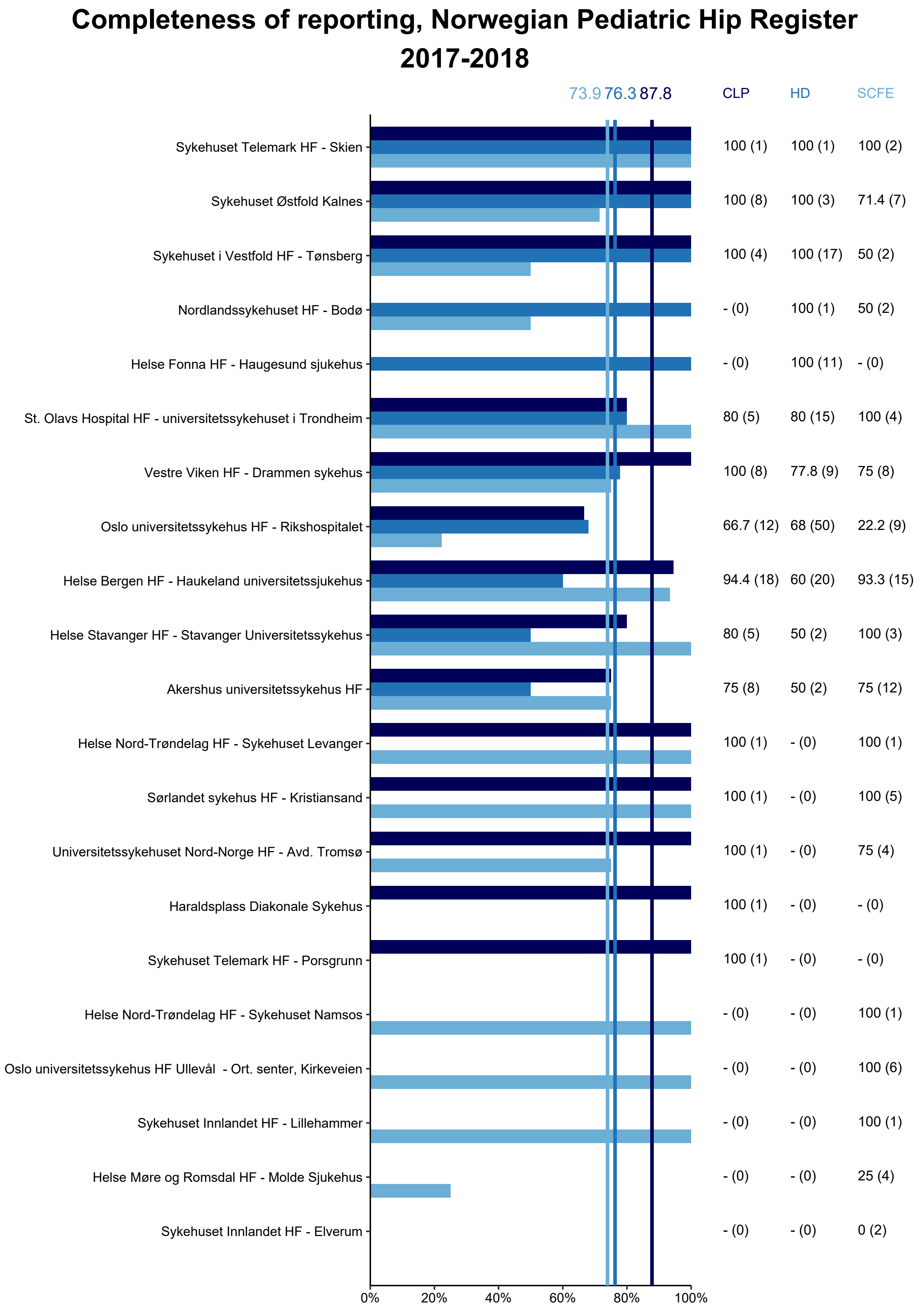
Formler for dekningsgrad (DG)

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

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

Information in the NPHR showed a high degree of agreement with the information in the NPR. Completeness for Perthes disease was 88 %, for Hip dysplasia 76 % and Slipped Capital Femoral Epiphysis 74 %. However, there are considerable variations in completeness between hospitals. Many of the hospitals have completeness under 80 %, which we consider very low. One explanation for low completeness rates in NPHR may be patients not giving consent to registration of the data. The differences between rates for primary CLP, HD and SCFE show that this cannot be the only cause and that hospitals must improve their reporting of primary hip fracture surgery with the correct diagnostic and procedure codes.

The following pages show the hospital-based completeness analysis for the Norwegian Pediatric Hip Register. We urge hospitals with low completeness to review their coding practices and routines in reporting to the registers.



Dark blue bars and first number to the right of the bars gives completensess of reporting for CLP. Medium blue bars and second number to the right of the bars gives completensess of reporting for HD. Light blue bars and third number to the right of the bars gives completensess of reporting for SCFE. The numbers in paranthesis gives the number of operations registered at both NPHR and NPR. Vertical lines shows the national averages.

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Doctoral thesis (49 stk)

Norwegian Arthroplasty Register (28 stk)

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Oral presentations/Abstracts/Posters 2019-2020 (53 stk)

Norwegian Arthroplasty Register (32 stk)

Furnes O. Hvilken dokumentasjon har vi tilgjengelig? Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Dale H, Børsheim S, Kristensen T, Fenstad AM, Gjertsen JE, Hallan G, Lie SA, Furnes O. Perioperativ, kort- og langtids mortalitet relatert til fiksasjonsmåte ved primær total hofteprotese. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

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Norwegian Hip Fracture Register (8 stk)

Kristensen T, Dybvik E, Dale H, Furnes O, Engesæter LB, Gjertsen JE. Sementerte hemiproteser med rett, anatomisk eller kileformet design eller usementert hemiprotese ved lårhalsbrudd? Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Boutera A, Dybvik E, Gjertsen JE. Betyr utskrivelsesdag fra sykehus noe for mortaliteten etter hoftebrudd? Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

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Gjertsen JE. The Norwegian National Hip Fracture Registry. 20th EFORT Congress; 2019 5.-9. juni; Lisboa, Portugal

Leer-Salvesen S, Gjertsen JE, Kristensen T, Furnes O, Dybvik E, Engesæter LB. Does time to surgery influence mortality after hip fracture? An observational study of 48,970 patients reported to the Norwegian hip fracture register. 20th EFORT Congress; 2019 5.-9. juni; Lisboa, Portugal

Boutera A, Dybvik E, Gjertsen JE. Is there a weekend effect after hip fracture surgery at Norwegian hospitals? Results from 74,410 patients in the Norwegian Hip Fracture Register. 8th ISAR Congress. 2019 1.-3. juni; Leiden, Nederland

Kristensen TB, Kristoffersen M, Dybvik E, Dale H, Engesæter LB, Furne O, Gjertsen JE. Cemented or uncemented hemiarthroplasty for femoral neck fractures? Mortality, reoperations, and patient reported outcome after 30,178 operations reported to the Norwegian Hip Fracture Register 2005-2017. 8th ISAR Congress. 2019 1.-3. juni; Leiden, Nederland

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Norwegian Cruciate Ligament Register (4 stk)

Sailer M, Årøen A, Skråmm I, Fenstad AM. Bruk av lokal antibiotika ved rekonstruksjon av fremre korsbånd i Norge. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Straume-Næsheim T, Persson A, Årøen A. Patellaintabilitetsregister- noe å bruke tid og ressurser på? Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

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Moatshe G, Martin K, Persson A, Fenstad AM, Engebretsen L, Visnes H. The effect of surgical center volume on outcome following anterior cruciate ligament reconstruction. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Clinical trials related to the Norwegian National Advisory Unit on Arthroplasty (9 stk)

Brekke S, Fenstad AM, Indrekvam K, Badawy M. Resultater etter acetabulær takplastikk med caputgraft ved Kysthospitalet i Hagevik i perioden 1999-2015. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Gifstad T, Fenstad AM, Foss OA. Proteseoperasjon etter gjennomført artroseskole. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Hansen VB, Ahmad N, Hellum C, Austevoll I, Otsuki B, Ikeda N, Shimizu T, Strömquist F, Sigmundsson FG, Furnes O, Röhrl SM. Indication and treatment of adult kyphoscoliosis (Intraks study)-study protocol. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Øilo M, Høl PJ, Gjerdet NR, Furnes O, Hallan G. Bruddmekanisk analyse av hofteprotesefraktur, retrieval-analyse. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Djuv A, Fosse L, Paulsen A, Gjertsen JE. Retrospektiv pilotstudie for komplikasjoner ved ustabile trokantære frakturer operert med margnagle eller protese. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Ludvigsen T, Vetti N, Kristoffersen PM, Toppe MK, Krukhaug Y, Gudmundsdottir RS, Matre K, Dybvik E, Fevang J. Er det korrelasjon mellom funksjonelt resultat og radiologiske målinger hos pasienter operert for distal radiusfraktur? Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Jonsson BA, Gjertsen JE, Stokke T, Haugan K, Furnes O, Hallan G. Migrasjon av corail stamme med og uten krage. En RSA- studie med 61 pasienter fulgt i 2 år. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Høl PJ, Ellison P, Wolf S, Rogg K, Furnes O, Hallan G. Mekanismer for aseptisk løsning av sementert spectron EF hoftestamme med reflection kopp- En retrievalstudie. Høstmøtet i Norsk Ortopedisk Forening; 2019 23.-25.oktober; Oslo

Ludvigsen T, Fevang JM, Matre K, Gudmundsdottir RS, Krukhaug Y, Dybvik E. Surgical treatment of wrist fractures – External fixation or volar locked plateing? A randomized controlled trial. 20th EFORT Congress; 2019 5.-9. juni; Lisboa, Portugal

Opertation forms (in Norwegian only)
Data from these forms is the basis of this report.

Nasjonalt Register for Leddproteser
Ortopedisk klinikk, Helse Bergen HF
Haukeland universitetssjukehus, Postboks 1400
Møllendalsbakken 11, 5021 BERGEN
Tlf 55973742/55973743

F.nr. (11 sifre)..
Navn:...
(Skriv tydelig ev. pasientklistrelapp – **spesifiser sykehus**.)

Sykehus:...

HOFTEPROTESER

Alle totale hofteproteseoperasjoner og hemiproteser på annen indikasjon enn fraktur/fraktursekvele registreres her (hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema). Alle reoperasjoner skal registreres: skifte/fjerning av protesedeler, kantplastikk, bløtdelsdebridement, og operasjoner for protesenær fraktur eller gluteal svikt.

TIDLIGERE OPERASJON I AKTUELLE HOFTE (ev. flere kryss)
☐0 Nei
☐1 Osteosyntese for fraktur i prox. femurende
☐2 Hemiprotese pga. fraktur
☐3 Osteotomi
☐4 Artrodese
☐5 Totalprotese(r)
☐6 Annen operasjon ……………………………………………….

AKTUELLE OPERASJON (ett kryss)
☐1 Primæroperasjon (også hvis hemiprotese tidligere)
☐2 Reoperasjon (totalprotese tidligere)
☐3 Primær hemiprotese for annen indikasjon enn fraktur/fraktursekvele

OPERASJONSDATO (dd.mm.åå) |__|__| |__|__| |__|__|

AKTUELLE SIDE (ett kryss) (Bilateral opr.= 2 skjema)
☐1 Høyre ☐2 Venstre

ÅRSAK TIL AKTUELLE OPERASJON (KRYSS AV ENTEN I A ELLER B)

A. Primæroper. pga (ev. flere kryss)
☐1 Idiopatisk coxartrose
☐2 Rheumatoid artritt
☐3 Sekvele etter frakt. colli. fem.
☐4 Sekv. dysplasi
☐5 Sekv. dysplasi med total luksasjon
☐6 Sekv. Perthes
☐7 Sekv. epifysiolyse
☐8 Mb. Bechterew
☐9 Akutt fraktura colli femoris
☐10 Annet…………………………………
(f.eks caputnekrose, tidl. artrodese o.l)

B. Reoper. pga (ev. flere kryss)
☐1 Løs acetabularkomponent
☐2 Løs femurkomponent
☐3 Luksasjon
☐4 Dyp infeksjon
☐5 Fraktur i acetabulum
☐6 Fraktur av femur
Vancouverklassifikasjon, se bakside.
☐A ☐B1 ☐B2 ☐ B3 ☐C
☐7 Smerter
☐8 Osteolyse i acetab. uten løsning
☐9 Osteolyse i femur uten løsning
☐10 Implantatfraktur femurdel
☐11 Implantatfraktur caput
☐12 Implantatfraktur kopp
☐13 Implantatfraktur liner
☐14 Implantatfraktur annet: ....
....
☐15 Gluteal svikt
☐16 Annet……………………………….
(f.eks Girdlestone etter tidl. infisert protese)

REOPERASJONSTYPE (ev. flere kryss)
☐1 Bytte av femurkomponent
☐2 Bytte av acetabularkomponent
☐3 Bytte av hele protesen
☐4 Fjernet protese og satt inn sementspacer
☐5 Fjernet sementspacer og satt inn ny protese
☐6 Fjernet protese (Girdlestone eller fjerning av sementspacer)
Angi hvilke deler som ble fjernet…………………………………………………
☐7 Bytte av plastforing
☐8 Bytte av caput
☐9 Bløtdelsdebridement
☐10 Ny protese etter Girdlestone
☐11 Resutur av muskel
☐12 Transposisjon av muskel
☐13 Osteosyntese for fraktur
☐14 Konvertering til hemiprotese
☐15 Andre operasjoner ………………………………………………………………

TILGANG (ett kryss)
☐1 Fremre (Mellom sartorius og tensor)
☐2 Anterolateral (Mellom glut. medius og tensor)
☐3 Direkte lateral (Transgluteal)
☐4 Bakre (Bak gluteus medius)
☐5 Annen ………………………………………………………………………………

MINIINVASIV KIRURGI (MIS)	☐0 Nei	☐1 Ja
LEIE	☐0 Sideleie	☐1 Rygg
TROCHANTEROSTEOTOMI	☐0 Nei	☐1 Ja

BENTRANSPLANTASJON (ev. flere kryss)
Acetabulum ☐0 Nei ☐1 Ja ☐2 Benpakking
Femur ☐0 Nei ☐1 Ja ☐2 Benpakking a.m. Ling/Gie

BENTAP VED REVISJON (Paprosky's klassifikasjon se baksiden)

Acetabulum	☐1 I	☐2 IIA	☐3 IIB	☐4 IIC	☐5 IIIA	☐6 IIIB
Femur	☐1 I	☐2 II	☐3 IIIA	☐4 IIIB	☐5 IV	

PROTESEKOMPONENTER (Bruk klistrelapp på baksiden, eller skriv REF.NR.)

Acetabulum
Navn/Type ……………………………………………………………………………………
ev. REF.NR. … ………………………………………………………………………
☐ Med hydroksylapatitt ☐ Uten hydroksylapatitt
☐1 Sement med antibiotika – Navn ………………………………………………………
☐2 Sement uten antibiotika – Navn ………………………………………………………
☐3 Usementert

Femur (+ ev. trokanterdel)
Navn/Type ……………………………………………………………………………………
ev. REF.NR. .. ………………………………………………………………………
☐ Med hydroksylapatitt ☐ Uten hydroksylapatitt
☐1 Sement med antibiotika – Navn ………………………………………………………
☐2 Sement uten antibiotika – Navn ………………………………………………………
☐3 Usementert

Caput (+ ev. halsdel)
☐1 Fastsittende caput
☐2 Separat caput - Navn/Type ……………………………………………………………
ev. REF. NR. .. ……………………………………………………………………
Diameter …………………………………………………………………………………

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

	Navn	*Dosering*	*Varighet i timer*
Medikament 1	…………………………	…………………………	……….timer
Medikament 2	…………………………	…………………………	……….timer
Medikament 3	…………………………	…………………………	……….timer

TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja: Første dose ☐1 Preoperativt ☐2 Postoperativt
Medikament 1…………………..Dosering opr.dag…………………………………
Dosering videre….……Varighet.……………..døgn
Medikament 2………………….. Dosering…………..……Varighet.…………..……døgn

FAST TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: ……………………………………………………………………………

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament: ………………………………….. Dosering………………

OPERASJONSSTUE
☐1 "Green house"
☐2 Operasjonsstue med laminær luftstrøm
☐3 Vanlig operasjonsstue

OPERASJONSTID (hud til hud) ………………………..min

PEROPERATIV KOMPLIKASJON
☐0 Nei
☐1 Ja,hvilke(n) ………………………………………………………………………………

ASA KLASSE (se baksiden for definisjon)
☐1 Frisk
☐2 Asymptomatisk tilstand som gir økt risiko
☐3 Symptomatisk sykdom
☐4 Livstruende sykdom
☐5 Moribund

Lege ………………………………………………………………………………………
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

2025016 Bergen Grafisk AS 04.2016

RETTLEDNING TIL HOFTEPROTESER

Registreringen gjelder innsetting, skifting og fjerning av totalproteser i hofteledd, samt kantplastikk, bløtdelsrevisjon for infisert protese og hemiproteser på annen indikasjon enn fraktur/fraktursekvele. Hemiprotese for fraktur/ fraktursekvele registreres på Hoftebruddskjema. Ett skjema fylles ut for hver operasjon. Fødselsnummer (11sifre) og sykehusnavn må påføres. Aktuelle ruter markeres med kryss. På eget Samtykkeskjema skal pasienten gi samtykke til rapportering til Leddregisteret.

AKTUELLE OPERASJON

Primæroperasjoner: Første totalproteseoperasjon, og første hemiprotese hvis denne settes inn på annen indikasjon enn fraktur. Hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema.

Reoperasjon (totalprotese tidligere): Fjerning av protesedeler (f.eks. Girdlestone) må registreres. Kantplastikk (f. eks. PLAD), bløtdelsrevisjoner for infeksjon, osteosyntese, resutur av muskel og muskeltransposisjon registreres selv om protesedeler ikke skiftes.

ÅRSAK TIL AKTUELLE OPERASJON

Kryss av under A ved primæroperasjoner og under B ved reoperasjoner. I B må du krysse av for alle årsakene til reoperasjon, eller forklare med fritekst.

REOPERASJONSTYPE

Fjerning av protesedeler (f.eks. Girdlestone) må registreres. Kantplastikk (f. eks. PLAD), bløtdelsrevisjoner for infeksjon, osteosyntese, resutur av muskel og muskeltransposisjon registreres selv om protesedeler ikke skiftes.

BENTRANSPLANTASJON Benpropp som sementstopper regnes ikke som bentransplantat. Vi skiller mellom benpakking og transplantasjon.

PROTESEKOMPONENTER: Acetabulum - Femur - Caput - Trokanterdel og hals hvis disse er separate deler

Bruk klistrelappene som følger med protesen. Lim disse på baksiden av skjema. Alternativt, skriv inn protesenavn + REF.NR., materiale, overflatebelegg og design. Sementnavn må anføres (bruk klistrelapp).

KOMPLIKASJONER Også operasjoner hvor pasienter dør på operasjonsbordet eller rett etter operasjon skal meldes. Ved stor blødning, angi mengde**.**

ASA-KLASSE (ASA=American Society of Anesthesiologists)

ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.

ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon) eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.

ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt (f.eks moderat angina pectoris og mild astma).

ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks hjertesvikt og astma).

ASA-klasse 5: Moribund/døende pasient.

MINIINVASIV KIRURGI (MIS = Minimally Invasive Surgery**)** når det er brukt spesialinstrument laget for MIS.

ANTIBIOTIKAPROFYLAKSE Før på antibiotikum som er benyttet i forbindelse med operasjonen, f.eks.: Medikament 1: Keflin 2g x 4, med varighet 4,5 timer.

TROMBOSEPROFYLAKSE

Medikament, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere. Det skal også oppgis om pasienten står fast på tromboseprofylakse (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER Her føres det på om en benytter blødningsreduserende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

BEINTAP VED REVISJON

Femur (Paprosky`s klassifikasjon)

Type I: Minimalt tap av metafysært ben og intakt diafyse.

Type II: Stort tap av metafysært ben, men intakt diafyse.

Type IIIA: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Over 4 cm intakt corticalis i isthmusområdet.

Type IIIB: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Under 4 cm intakt corticalis i isthmusområdet.

Type IV: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Bred isthmus med liten mulighet for cortical støtte.

Acetabulum (Paprosky`s klassifikasjon)

Type I: Hemisfærisk acetabulum uten kantdefekter. Intakt bakre og fremre kolonne. Defekter i forankringshull som ikke ødelegger subchondral benplate.

Type IIA: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kolonne, men med lite metafysært ben igjen.

Type IIB: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kolonne, men med lite metafysært ben igjen og noe manglende støtte superiort.

Type IIC: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kollonne, men med defekt i medial vegg.

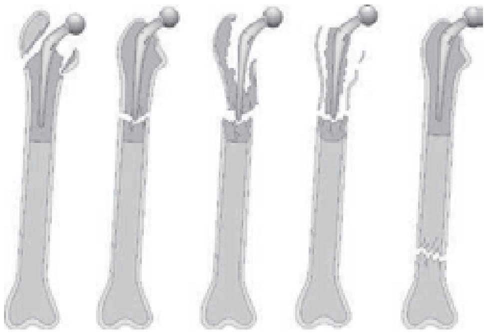
Type IIIA: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl.10 til 2.

Type IIIB: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl. 9 til 5.

Kopi beholdes til pasientjournalen, originalen sendes Haukeland universitetssjukehus.

PROTESENÆR FRAKTUR

Vancouverklassifikasjon



Type A Type B1 Type B2 Type B3 Type C

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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 <u>ett</u> 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 ☐6 Håndledd
☐2 Ankel ☐7 Fingre (angi ledd) ....
☐3 Tær (angi ledd) .... ☐8 Annet ....
☐4 Skulder ☐9 Rygg (angi nivå).......................
☐5 Albue

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)
Proximal ☐0 Nei ☐1 Ja ☐2 Benpakking ☐3 Kjegler (cones)
Distalt ☐0 Nei ☐1 Ja ☐2 Benpakking ☐3 Kjegler (cones)

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

	Navn	*Dosering*	*Varighet i timer*
Medikament 1	....		...........timer
Medikament 2	....		...........timer

TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja: Første dose ☐1 Preoperativt ☐2 Postoperativt
Medikament 1.......................Dosering opr.dag.......................................
Dosering videre............Varighet...........døgn
Medikament 2...................... Dosering....................Varighet...........døgn

FAST TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: ....

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament: .... Dosering............

DREN ☐0 Nei ☐1 Ja. Antatt varighet ....døgn

OPERASJONSTID (hud til hud) ....minutter

BLODTOMHET ☐0 Nei ☐1 Ja **BLODTOMHETSTID**.................. minutter
BLODTOMHET UNDER SEMENTERING ☐0 Nei ☐1 Ja

PEROPERATIV KOMPLIKASJON
☐0 Nei ☐1 Ja,hvilke(n): ....

MINI INVASIV KIRURGI (MIS) ☐0 Nei ☐1 Ja
COMPUTERNAVIGERING (CAOS) ☐0 Nei ☐1 Ja Type:......................
PASIENTTILPASSEDE INSTRUMENTER ☐0 Nei ☐1 Ja Type:......................

ASA KLASSE (se baksiden for definisjon)
☐1 Frisk
☐2 Asymptomatisk tilstand som gir økt risiko
☐3 Symptomatisk sykdom
☐4 Livstruende sykdom
☐5 Moribund

PROTESE KNE (Bruk klistrelapper på baksiden, eller spesifiser nøyaktig)

PROTESETYPE
☐1 Totalprot. m/patella . ☐4 Patellofemoralledd prot.
☐2 Totalprot. u/patella ☐5 Bi-compartmental ☐6 Hengslet protese
☐3 Unicondylær prot ☐ Medial ☐ Lateral ☐7 Annet ....

FEMURKOMPONENT
Navn/Type/Str / evt. Katalognr...
ev. katalognummer ....
Sentral stamme ☐0 Nei ☐1 Ja, ev. lengde ....mm
Sementert stamme ☐0 Nei ☐1 Ja
Metallforing (Wedge) ☐0 Nei ☐1 Ja
Stabilisering ☐0 Nei ☐1 Ja, bakre ☐2 Ja, annen
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

TIBIAKOMPONENT (metallplatå)
Navn/Type/Str / ev. katalognummer ....
Forlenget sentral stamme ☐0 Nei ☐1 Ja, ev. lengde ....mm
Sementert stamme ☐0 Nei ☐1 Ja
Metallforing (Wedge) ☐0 Nei ☐1 Ja
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

TIBIAKOMPONENT (plastkomponent)
Navn/Type/Str / ev. katalognummer...
Tykkelse .... mm
Stabilisering ☐0 Nei ☐1 Ja, bakre ☐2 Ja, annen

PATELLAKOMPONENT
Navn/Type/Str / ev. katalognummer..
Metallrygg ☐0 Nei ☐1 Ja
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

KORSBÅND
Intakt fremre korsbånd før operasjon ☐0 Nei ☐1 Ja
Intakt fremre korsbånd etter operasjon ☐0 Nei ☐1 Ja
Intakt bakre korsbånd før operasjon ☐0 Nei ☐1 Ja
Intakt bakre korsbånd etter operasjon ☐0 Nei ☐1 Ja

PROTESE ANDRE LEDD (Bruk klistrelapper på baksiden, eller spesifiser nøyaktig)

PROTESETYPE
☐1 Totalprotese ☐2 Hemiprotese ☐3 Enkomponentprotese ☐4 Annet .....

PROKSIMAL KOMPONENT
Navn/Type/Str / ev. katalognummer...
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

DISTAL KOMPONENT
Navn/Type/Str / ev. katalognummer...
☐1 Sement med antibiotika – Navn ....
☐2 Sement uten antibiotika – Navn ....
☐3 Usementert

INTERMEDIÆR KOMPONENT (f.eks. caput humeri)
Navn/Type/Str/Diameter / ev. katalognummer..

Lege ....
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

RETTLEDNING KNEPROTESER og andre leddproteser

Registreringen gjelder innsetting, skifting eller fjerning av protese i kne, skuldre og andre ledd med unntak av hofter som har eget skjema. Ett skjema fylles ut for hver operasjon. Pasientens fødselsnummer (11 sifre) og sykehus må være påført. Aktuelle ruter markeres med kryss.
På eget Samtykkeskjema skal pasienten gi samtykke til rapportering til Leddregisteret.

Kommentarer til de enkelte punktene

AKTUELLE OPERASJON
Primæroperasjon: Dette er første totalproteseoperasjon.
Kryss av enten i A eller i B. Kryss av for alle årsakene til operasjonen. Bløtdelsrevisjon for infeksjon skal registreres selv om protesedeler ikke skiftes.

REOPERASJONSTYPE
Fjerning av protesedeler må spesifiseres og føres opp, også fjerning ved infeksjon.

BENTRANSPLANTASJON
Påsmøring av benvev rundt protesen regnes ikke som bentransplantat.

ANTIBIOTIKAPROFYLAKSE
Medikament, dose og varighet av profylaksen skal angis f.eks. slik: Medikament: Keflin, Dosering: 2g x 4, med varighet 4,5 timer.

TROMBOSEPROFYLAKSE
Medikament, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere. Det skal også oppgis om pasienten står fast på tromboseprofylakse (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

PEROPERATIV KOMPLIKASJON
Dersom det foreligger komplikasjon i form av stor blødning, må mengden angis.
Dersom pasienten dør under eller like etter operasjonen, ønsker vi likevel melding om operasjonen.

ASA-KLASSE (ASA=American Society of Anesthesiologists)
ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.
ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks. hypertensjon) eller med kost (f.eks. diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.
ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt (f.eks. moderat angina pectoris og mild astma).
ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks. hjertesvikt og astma).
ASA-klasse 5: Moribund/døende pasient

PROTESETYPE
Dersom det er gjort revisjon av totalprotese uten patellakomponent og REOPERASJONSTYPE er **innsetting av patellakomponent,** skal det krysses av for pkt. 1: Totalprotese med patellakomponent (dvs. protesen har nå blitt en totalprotese med patellakomponent). Ved revisjon av unicondylær protese til totalprotese brukes enten pkt. 1 eller 2.

PROTESEKOMPONENTER
Her anføres kommersielle navn, materiale, størrelse og design. Alternativt kan en føre opp protesenavn og katalognummer eller benytte klistrelapp som følger med de fleste protesene. **Denne kan limes på baksiden av skjemaet (vennligst ikke plasser klistrelapper på markeringskryss, som brukes ved scanning av skjema).**
Navnet på sementen som evt. brukes må anføres, f.eks. Palacos R+G. (Bruk helst klistrelapp)
Under femurkomponent skal evt. påsatt **femurstamme** anføres med lengde.
Med **metallforing** under femur- og tibiakomponent menes bruk av en eller flere separate metallkiler (wedges) som erstatning for manglende benstøtte.
Stabilisering er bruk av proteser med stabilisering som kompensasjon for sviktende båndapparat.
Forlenget sentral stamme under tibiakomponent (metallplatå) skal bare anføres ved bruk av en lengre påsatt stamme enn standardkomponenten.

ANDRE LEDD. PROTESETYPE
Ved bruk av hemiprotese med bare en komponent, f.eks. resurfacing i skulder, skrives dette på DISTAL KOMPONENT. Enkomponent-protese i finger/tå, skrives på PROKSIMAL KOMPONENT.

COMPUTERNAVIGERING (CAOS = Computer Aided Orthopaedic Surgery**)**
Angi firmanavn på computersystem.

MINIINVASIV KIRURGI (MIS = Minimally Invasive Surgery**)**
Her menes at kirurgen har brukt kort snitt og at det er brukt spesialinstrument laget for MIS.

PASIENTTILPASSEDE INSTRUMENTER
Her menes kutteblokker eller instrumenter som lages etter MR eller CT bilder tatt av pasienten før operasjonen. Oppgi navn på systemet.

Kopi beholdes til pasientjournalen, originalen sendes Haukeland universitetssjukehus.

Kontaktpersoner vedrørende registreringsskjema er
Seksjonsoverlege Ove Furnes, tlf. 55 97 56 90.
Overlege Randi Hole, kontaktperson (skulder), tlf. 55 97 56 79.
Overlege Yngvar Krukhaug, kontaktperson (albue/hånd), tlf. 55 97 56 88.
Ortopedisk klinikk, Haukeland universitetssjukehus. Besøksadresse: Møllendalsbakken 11.
Sekretærer i Nasjonalt Register for Leddproteser, Ortopedisk klinikk, Helse Bergen:
Randi Furnes, tlf. 55 97 37 42.
Epost: nrl@helse-bergen.no Internett: http://nrlweb.ihelse.net/
Skjema revidert i januar 2018.

NASJONALT HOFTEBRUDDREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11
5021 BERGEN
Tlf: 55976452

F.nr. (11 sifre)..

Navn:...

(Skriv tydelig ev. pasientklistrelapp – **spesifiser sykehus**.)

Sykehus:..

HOFTEBRUDD

PRIMÆRE OPERASJONER PÅ BRUDD I PROKSIMALE FEMURENDE og ALLE REOPERASJONER, inkludert lukket reponering av hemiproteser. Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese brukes kun hofteproteseskjema. Alle produktklistrelapper settes i merket felt på baksiden av skjemaet.

AKTUELLE OPERASJON
☐1 Primæroperasjon ☐2 Reoperasjon

SIDE (ett kryss) (Bilateral opr.= 2 skjema)
☐1 Høyre ☐2 Venstre

OPR TIDSPUNKT (dd.mm.åå) |__|__| |__|__| |__|__| kl |__|__|

BRUDD TIDSPUNKT (dd.mm.åå) |__|__| |__|__| |__|__| kl |__|__|
Dersom det er usikkerhet om bruddtidspunkt, fyll ut neste punkt.

TID FRA BRUDD TIL OPERASJON I TIMER
☐1 0-6 ☐2 >6-12 ☐3 >12-24 ☐4 >24-48 ☐5 >48

KOGNITIV SVIKT
☐0 Nei ☐1 Ja (Se test på baksiden) ☐2 Usikker

ASA-KLASSE (se bakside av skjema for definisjon)
☐1 Frisk
☐2 Asymptomatisk tilstand som gir økt risiko
☐3 Symptomatisk sykdom
☐4 Livstruende sykdom
☐5 Moribund

TYPE PRIMÆRBRUDD (ÅRSAK TIL PRIMÆROPERASJON) (Kun ett kryss)
Se baksiden for klassifikasjon

☐1 Lårhalsbrudd udislokert	(Garden 1 og 2)
☐2 Lårhalsbrudd dislokert	(Garden 3 og 4)
☐3 Lateralt lårhalsbrudd	
☐4 Pertrokantært tofragment	(AO klassifikasjon A1)
☐5 Pertrokantært flerfragment	(AO klassifikasjon A2)
☐9 Intertrokantært	(AO klassifikasjon A3)
☐6 Subtrokantært	
☐7 Annet, spesifiser..	

TYPE PRIMÆROPERASJON (Kun ett kryss)
(Fylles ut bare ved primæroperasjon - eget skjema for totalproteser)
(Fest produktklistrelapp på baksiden eller spesifiser nøyaktig produkt)
☐1 To skruer eller pinner
☐2 Tre skruer eller pinner
☐3 Bipolar hemiprotese
☐4 Unipolar hemiprotese
☐5 Glideskrue og plate
☐6 Glideskrue og plate med trokantær støtteplate
☐7 Vinkelplate
☐8 Kort margnagle uten distal sperre
☐9 Kort margnagle med distal sperre
☐10 Lang margnagle uten distal sperre
☐11 Lang margnagle med distal sperre
☐12 Annet, spesifiser...

Navn / størrelse og katalognummer..

ÅRSAK TIL REOPERASJON (Flere enn ett kryss kan brukes)
☐1 Osteosyntesesvikt/havari
☐2 Ikke tilhelet brudd (non-union/pseudartrose)
☐3 Caputnekrose (segmentalt kollaps)
☐4 Lokal smerte pga prominerende osteosyntesemateriale
☐5 Brudd tilhelet med feilstilling
☐6 Sårinfeksjon – overfladisk
☐7 Sårinfeksjon – dyp
☐8 Hematom
☐9 Luksasjon av hemiprotese
☐10 Osteosyntesematerialet skåret gjennom caput
☐11 Nytt brudd rundt implantat
☐12 Løsning av hemiprotese
☐13 Annet, spesifiser...

TYPE REOPERASJON (Flere enn ett kryss kan brukes)
(Fest produktklistrelapp på baksiden eller spesifiser nøyaktig produkt)
☐1 Fjerning av implantat (Brukes når dette er eneste prosedyre)
☐2 Girdlestone (= fjerning av implantat og caput)
☐3 Bipolar hemiprotese
☐4 Unipolar hemiprotese
☐5 Re-osteosyntese
☐6 Debridement for infeksjon
☐7 Lukket reposisjon av luksert hemiprotese
☐8 Åpen reposisjon av luksert hemiprotese
☐9 Annet, spesifiser...

Navn / størrelse og katalognummer..

FIKSASJON AV HEMIPROTESE
(For totalprotese sendes eget skjema til hofteproteseregisteret)
☐1 Usementert ☐1 med HA ☐2 uten HA
☐2 Sement med antibiotika Navn..
☐3 Sement uten antibiotika Navn..

PATOLOGISK BRUDD (Annen patologi enn osteoporose)
☐0 Nei ☐1 Ja, type...

TILGANG TIL HOFTELEDDET VED HEMIPROTESE (Kun ett kryss)
☐1 Fremre (mellom sartorius og tensor)
☐2 Anterolateral (mellom gluteus medius og tensor)
☐3 Direkte lateral (transgluteal)
☐4 Bakre (bak gluteus medius)
☐5 Annet, spesifiser...

ANESTESITYPE
☐1 Narkose ☐2 Spinal ☐3 Annet, spesifiser..

PEROPERATIVE KOMPLIKASJONER
☐0 Nei ☐1 Ja, hvilke(n)..

OPERASJONSTID (hud til hud).......................minutter.

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

Navn	Dosering	Varighet i timer
Medikament 1..		................timer
Medikament 2..		................timer
Medikament 3..		................timer

TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja: Første dose ☐1 Preoperativt ☐2 Postoperativt

Medikament 1 .... Dosering opr.dag..
Dosering videre .... Varighet ...... døgn

Medikament 2 .... Dosering .... Varighet ...... døgn

FAST TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: ....

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament : .... Dosering ....

OPERATØRERFARING
Har en av operatørene mer enn 3 års erfaring i hoftebruddkirurgi? ☐0 Nei ☐1 Ja

Lege...
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

202 038 Bergen Grafisk as - 01.2016

RETTLEDNING

Registreringen gjelder alle operasjoner for hoftebrudd (lårhals, pertrokantære og subtrokantære) og alle reoperasjoner, også reposisjoner, på pasienter som er primæroperert og reoperert for hoftebrudd. **Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese sendes bare skjema til hofteproteseregisteret.**
Ett skjema fylles ut for hver operasjon. Originalen sendes Haukeland universitetssjukehus og kopien lagres i pasientens journal. Pasientens fødselsnummer (11 sifre) og sykehuset må være påført. Aktuelle ruter markeres med kryss. Pasienten skal på eget skjema gi samtykke til registrering i Nasjonalt hoftebruddregister.

Kommentarer til enkelte punkt:
OPERASJONS- OG BRUDDTIDSPUNKT
Operasjonstidspunkt (dato og klokkeslett) må føres opp på alle primæroperasjoner. Det er også sterkt ønskelig at dato og klokkeslett for *bruddtidspunkt* føres opp. Dette bl.a. for å se om tid til operasjon har effekt på prognose. (Hvis en ikke kjenner klokkeslettet for bruddtidspunkt lar en feltet stå åpent. En må da prøve å angi omtrentlig tidsrom fra brudd til operasjon på neste punkt).
Ved reoperasjon er ikke klokkeslett nødvendig.

KOGNITIV SVIKT
Kognitiv svikt kan eventuelt testes ved å be pasienten tegne klokken når den er 10 over 11. En pasient med kognitiv svikt vil ha problemer med denne oppgaven.

ASA-KLASSE (ASA=American Society of Anesthesiologists)
ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.
ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon)
eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.
ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt
(f.eks moderat angina pectoris og mild astma).
ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks hjertesvikt og astma).
ASA-klasse 5: Moribund/døende pasient

GARDENS KLASSIFISERING AV LÅRHALSBRUDD
Garden 1: Ikke komplett brudd av lårhalsen (såkalt innkilt)
Garden 2: Komplett lårhalsbrudd uten dislokasjon
Garden 3: Komplett lårhalsbrudd med delvis dislokasjon. Fragmentene er fortsatt i kontakt, men det er feilstilling av lårhalsens trabekler.
Caputfragmentet ligger uanatomisk i acetabulum.
Garden 4: Komplett lårhalsbrudd med full dislokasjon. Caputfragmentet er fritt og ligger korrekt i acetabulum slik at trabeklene er normalt orientert.

AO KLASSIFIKASJON AV TROKANTÆRE BRUDD

A1: Pertrokantært tofragment brudd A2: Pertrokantært flerfragment brudd A3: Intertrokantært brudd Subtrokantært brudd*

*Subtrokantært brudd: Bruddsentrum er mellom nedre kant av trokanter minor og 5 cm distalt for denne.

REOPERASJONSÅRSAK
Dyp infeksjon defineres som infeksjon som involverer fascie, protese, ledd eller periprotetisk vev.

IMPLANTAT
Implantattype må angis entydig. Produktklistrelapp er ønskelig for å angi katalognummer for osteosyntesematerialet eller protesen som er brukt.

PEROPERATIVE KOMPLIKASJONER
Vi ønsker også å få meldt dødsfall på operasjonsbordet og peroperativ transfusjonstrengende blødning.

ANTIBIOTIKAPROFYLAKSE
Her føres det på hvilket antibiotikum som er blitt benyttet i forbindelse med operasjonen. Det anføres dose, antall doser og profylaksens varighet. F.eks. Medkament 1: Keflin 2g x 4, med varighet 4,5 timer.

TROMBOSEPROFYLAKSE
Medikament, dose og antatt varighet av profylaksen skal angis separat for oprerasjonsdagen og senere. Det skal også oppgis om pasienten står fast på tromboseprofylakse (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

Kontaktpersoner vedrørende registreringsskjema er:
Overlege Jan-Erik Gjertsen, Ortopedisk klinikk, Haukeland universitetssjukehus. Tlf. 55 97 56 86 (email: jan-erik.gjertsen@helse-bergen.no)
Prosjektkoordinator Nasjonalt Hoftebruddregister: Lise B. Kvamsdal. Tlf. 55 97 64 52 (email: nrl@helse-bergen.no)
Internett: http://nrlweb.ihelse.net/

PRODUKTKLISTRELAPPER:

NASJONALT HOFTEBRUDDREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

PASIENTSPØRRESKJEMA NASJONALT HOFTEBRUDDREGISTER

1. Dato for utfylling av skjema: |__|__| |__|__| |__|__|

2. Spørreskjemaet er besvart av:

☐ [1] Meg selv

eller ved hjelp av….(kryss av i ruten som gjelder)

☐ [2] Slektning (ektefelle, barn)
☐ [3] God venn eller annen nærstående
☐ [4] Annen privat person
☐ [5] Hjemmesykepleier/hjemmehjelp
☐ [6] Annen person, angi hvem:___________________________

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Møllendalsbakken 11
5021 BERGEN

I de neste 5 spørsmålene ønsker vi å vite hvordan livssituasjonen din var <u>FØR</u> du fikk hofte/lårhalsbruddet som du ble operert for.

3. Hvordan opplevde du gangevnen din?

- ☐ 1 Jeg hadde ingen problemer med å gå omkring
- ☐ 2 Jeg hadde litt problemer med å gå omkring
- ☐ 3 Jeg var sengeliggende

4. Hvordan klarte du personlig stell?

- ☐ 1 Jeg hadde ingen problemer med personlig stell
- ☐ 2 Jeg hadde litt problemer med å vaske meg eller kle meg
- ☐ 3 Jeg klarte ikke å vaske meg eller kle meg

5. Hvordan klarte du dine vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- og fritidsaktiviteter)?

- ☐ 1 Jeg hadde ingen problemer med å utføre mine vanlige gjøremål
- ☐ 2 Jeg hadde litt problemer med å utføre mine vanlige gjøremål
- ☐ 3 Jeg var ute av stand til å utføre mine vanlige gjøremål

6. Smerter eller ubehag?

- ☐ 1 Jeg hadde verken smerte eller ubehag
- ☐ 2 Jeg hadde moderat smerte eller ubehag
- ☐ 3 Jeg hadde sterk smerte eller ubehag

7. Angst eller depresjon?

- ☐ 1 Jeg var verken engstelig eller deprimert
- ☐ 2 Jeg var noe engstelig eller deprimert
- ☐ 3 Jeg var svært engstelig eller deprimert

NASJONALT HOFTEBRUDDREGISTER
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Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

I de 5 neste spørsmålene ønsker vi å vite hvordan livssituasjonen din er NÅ:

8. Hvordan opplever du gangevnen din?

- ☐ 1 Jeg har ingen problemer med å gå omkring
- ☐ 2 Jeg har litt problemer med å gå omkring
- ☐ 3 Jeg er sengeliggende

9. Hvordan klarer du personlig stell?

- ☐ 1 Jeg har ingen problemer med personlig stell
- ☐ 2 Jeg har litt problemer med å vaske meg eller kle meg
- ☐ 3 Jeg klarer ikke å vaske meg eller kle meg

10. Hvordan klarer du dine vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- og fritidsaktiviteter)?

- ☐ 1 Jeg har ingen problemer med å utføre mine vanlige gjøremål
- ☐ 2 Jeg har litt problemer med å utføre mine vanlige gjøremål
- ☐ 3 Jeg er ute av stand til å utføre mine vanlige gjøremål

11. Smerter eller ubehag?

- ☐ 1 Jeg har verken smerte eller ubehag
- ☐ 2 Jeg har moderat smerte eller ubehag
- ☐ 3 Jeg har sterk smerte eller ubehag

12. Angst eller depresjon?

- ☐ 1 Jeg er verken engstelig eller deprimert
- ☐ 2 Jeg er noe engstelig eller deprimert
- ☐ 3 Jeg er svært engstelig eller deprimert

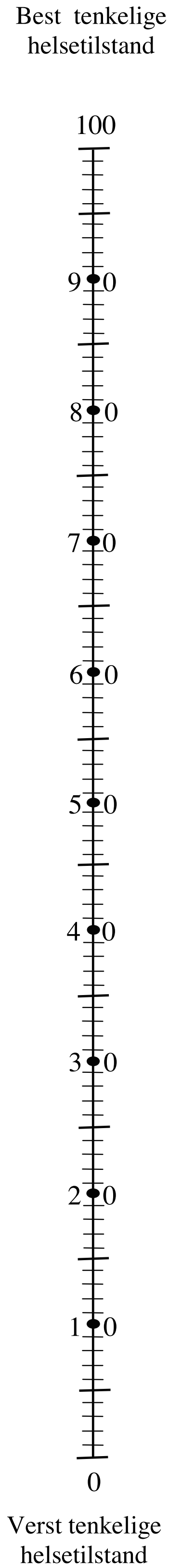
NASJONALT HOFTEBRUDDREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

13. Din helsetilstand i dag.

For å hjelpe folk til å si hvor god eller dårlig en helsetilstand er, har vi laget en skala (omtrent som et termometer) hvor den beste tilstanden du kan tenke deg er merket 100 og den verste tilstanden du kan tenke deg er merket 0.

Vi vil gjerne at du viser på denne skalaen hvor god eller dårlig helsetilstanden din er i dag, etter din oppfatning. Vær vennlig å gjøre dette ved å trekke en linje fra boksen nedenfor til det punktet på skalaen som viser hvor god eller dårlig din helsetilstand er i dag.

Din egen helsetilstand i dag



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Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

SMERTE

14. Sett ett kryss på den streken som du synes tilsvarer din gjennomsnittlige smerteopplevelse fra den opererte hoften den siste måneden:

Ingen smerte | Maksimal smerte

IıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııI

lett | moderat | middels | sterk | uutholdelig

TILFREDSHET

15. Sett ett kryss på den streken som du synes tilsvarer hvor fornøyd du er med operasjonsresultatet:

Fornøyd | Misfornøyd

IıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııIıııııııııI

svært fornøyd | fornøyd | middels fornøyd | misfornøyd | svært misfornøyd

NASJONALT HOFTEBRUDDREGISTER
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16. Har du besvær fra den andre hoften?

☐ 1 Ja ☐ 2 Nei

17. Er det andre årsaker til at du har problemer med å gå? (For eksempel smerter fra andre ledd, ryggsmerter, hjerte-karsykdom eller andre sykdommer som påvirker gangevnen din)

☐ 1 Ja ☐ 2 Nei

18. Har du hatt nye operasjoner i den samme hoften som ble operert for hoftebrudd?

☐ 1 Ja ☐ 2 Nei

Takk for at du tok deg tid til å svare på spørsmålene. Dine svar er svært nyttige for oss. Vennligst send spørreskjemaet i retur til oss i den ferdig frankerte svarkonvolutten.

NASJONALT KORSBÅNDSREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11, 5021 BERGEN
Tlf: 55 97 64 54

F.nr. (11 sifre)..

Navn...

Sykehus...

(Skriv tydelig evt. pasientklistrelapp – **spesifiser sykehus**.)

KORSBÅND

KORSBÅNDSOPERASJONER OG ALLE REOPERASJONER på pasienter som tidligere er korsbåndsoperert.

Alle klistrelapper (med unntak av pasientklistrelapp) settes i merket felt på baksiden av skjemaet.

(Bilateral operasjon = 2 skjema)

AKTUELLE SIDE (ett kryss) ☐^{0} Høyre ☐^{1} Venstre

MOTSATT KNE ☐^{0} Normalt ☐^{1} Tidligere ACL/PCL-skade

TIDLIGERE OPERASJON I SAMME KNE
☐^{0} Nei ☐^{1} Ja

SKADEDATO FOR AKTUELL SKADE (mm.åå) |__|__| |__|__|

AKTIVITET SOM FØRTE TIL AKTUELLE SKADE
☐^{0} Fotball
☐^{1} Håndball
☐^{2} Snowboard
☐^{3} Alpint (inkl. twin tip)
☐^{4} Annen skiaktivitet
☐^{5} Kampsport
☐^{6} Basketball
☐^{98} Annet....................................
☐^{7} Annen lagidrett
☐^{8} Motor- og bilsport
☐^{9} Annen fysisk aktivitet
☐^{10} Arbeid
☐^{11} Trafikk
☐^{12} Fall/hopp/vold/lek

AKTUELLE SKADE (Registrer **alle** skader – også de som ikke opereres)
☐ ACL ☐ MCL ☐ PLC ☐ Med. menisk
☐ PCL ☐ LCL ☐ Brusk ☐ Lat. menisk
☐ Annet...

YTTERLIGERE SKADER (evt. flere kryss) ☐ Nei, hvis ja spesifiser under

	Hvilken: ....
☐ Karskade	
☐ Nerveskade	☐ ^{0}N. tibialis ☐ ^{1} N. peroneus
☐ Fraktur	☐ ^{0}Femur ☐ ^{1}Tibia ☐ ^{2}Fibula ☐ ^{3}Patella ☐ ^{4}Usikker
☐ Ruptur i ekstensorapparatet	☐ ^{0}Quadricepssenen ☐ ^{1}Patellarsenen

OPERASJONSDATO (dd.mm.åå) |__|__| |__|__| |__|__|

AKTUELLE OPERASJON (ett kryss)
☐^{0} Primær rekonstruksjon av korsbånd
☐^{1} Revisjonskirurgi, 1. seanse
☐^{2} Revisjonskirurgi, 2. seanse
☐^{3} Annen knekirurgi (Ved kryss her skal andre prosedyrer fylles ut)

ÅRSAK TIL REVISJONSREKONSTRUKSJON (evt. flere kryss)
☐ Infeksjon
☐ Fiksasjonssvikt
☐ Ubehandlede andre ligamentskader
☐ Annet ....
☐ Graftsvikt
☐ Nytt traume
☐ Smerte

ANDRE PROSEDYRER (evt. flere kryss) ☐ Nei, hvis ja spesifiser under
☐ Meniskoperasjon
☐ Synovektomi
☐ Mobilisering i narkose
☐ Fjerning av implantat
☐ Benreseksjon (Notch plastikk)
☐ Osteotomi
☐ Annet ....
☐ Osteosyntese
☐ Bruskoperasjon
☐ Artroskopisk debridement
☐ Operasjon pga infeksjon
☐ Bentransplantasjon
☐ Artrodese

GRAFTVALG

	ACL	PCL	MCL	LCL	PLC
☐ BPTB					
☐ Hamstring					
☐ Allograft					
☐ Direkte sutur					
☐ Annet					

GRAFTDIAMETER (oppgi største diameter på graftet) .. ..mm

Ved bruk av double bundle-teknikk: AM:.........mm PL:.........mm

TILGANG FOR FEMURKANAL
☐^{1} Anteromedial ☐^{2}Transtibial ☐^{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 (cm^2) ≤2	>2	ICRS Grade* 1 2 3 4	Artrose Ja	Nei	Behandlings-kode** 1 2 3 4	Spesifiser annet
Patella MF	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	....
Patella LF	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	....
Trochlea fem.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	....
Med.fem. cond.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	....
Med. tib. plat.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	....
Lat.fem. cond.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	....
Lat. tib. plat.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	....

***ICRS Grade:** 1 Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks; 2 Abnormal: Lesions extending down to <50% of cartilage depth; 3 Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer; 4 Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.

****Behandlingskoder**: 1 Debridement; 2 Mikrofraktur; 3 Ingen behandling; 4 Annet.

DAGKIRURGISK OPERASJON ☐^{0} Nei ☐^{1} Ja

PEROPERATIVE KOMPLIKASJONER ☐^{0} Nei ☐^{1} Ja,
hvilke(n) ....

OPERASJONSTID (hud til hud)......................min

SYSTEMISK ANTIBIOTIKA
☐^{0} Nei ☐^{1} Ja ☐^{1} Profylakse ☐^{2} Behandling

Medikament 1 .... Dosering ………….. Varighet ………timer

Eventuelt i kombinasjon med medikament 2 ....

TROMBOSEPROFYLAKSE
☐^{0} Nei ☐^{1} Ja: Første dose ☐^{1} Preoperativt ☐^{2} Postoperativt

Medikament 1 .... Dosering opr.dag.......................................

Dosering videre .... Varighet …… døgn

Medikament 2 ....

Anbefalt total varighet av tromboseprofylakse...

NSAIDs
☐^{0} Nei ☐^{1} Ja, hvilken type...
Anbefalt total varighet av NSAIDs-behandling...

HØYDE ....cm

VEKT ....kg

RØYK ☐^{0} Nei ☐^{1} Av og til ☐^{2} Daglig

SNUS ☐^{0} Nei ☐^{1} Av og til ☐^{2} Daglig

Lege:...
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

202 5007 Bergen Grafisk AS - 10.2017

RETTLEDNING

- Registreringen gjelder ALLE fremre og bakre korsbåndsoperasjoner.
- Registreringen gjelder ALLE kneoperasjoner på pasienter som tidligere er korsbåndsoperert.
- Ett skjema fylles ut for hvert kne som blir operert.
- Aktuelle ruter markeres med kryss. Stiplet linje fylles ut der dette er aktuelt.
- Pasienten skal på eget skjema gi samtykke til registrering.

KOMMENTARER TIL DE ENKELTE PUNKTENE

FORKORTELSER SOM ER BRUKT PÅ SKJEMAET

- ACL: Fremre korsbånd
- PCL: Bakre korsbånd
- MCL: Mediale kollateralligament
- LCL: Laterale kollateralligament
- PLC: Popliteus kompleks/bicepssene kompleks
- BPTB; Patellarsene autograft
- AM: Anteromediale bunt av ACL
- PL: Posterolaterale bunt av ACL

SKADEDATO Skriv inn skadedatoen så eksakt som mulig.
Ved ny skade av tidligere operert korsbånd, skriv inn den nye skadedatoen.

FIKSASJON Angi hvilken fiksasjonstype som er brukt ved å feste klistrelapp på baksiden.
Husk å skille mellom femur og tibia for graftfiksasjon, og mellom medial og lateral side for meniskfiksasjon.

PEROPERATIVE KOMPLIKASJONER
Ved en ruptur/kontaminering av høstet graft e.l. skal det opprinnelige graftet anføres her.
Andre peroperative komplikasjoner skal også fylles inn her.

SYSTEMISK ANTIBIOTIKA
Her føres det på hvilket antibiotikum som er blitt benyttet i forbindelse med operasjonen. Det anføres dose, antall doser og profylaksens varighet. F.eks. Medikament 1: Keflin 2g x 4, med varighet 12 timer.

TROMBOSEPROFYLAKSE
Type, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere.

Kopi beholdes i pasientjournalen, originalen sendes til Nasjonalt Korsbåndsregister.

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

BARNEHOFTESYKDOM

F.nr. (11 sifre): ....

Navn: ....

Sykehus: ....

(Skriv tydelig eller bruk pasientklistrelapp. Husk sykehus!)

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 ☐< 30º ☐30-50º ☐> 50º *(Glidningsvinkel i sideplan)*

OPERASJON ☐Primæroperasjon ☐Reoperasjon ☐Profylaktisk

PRIMÆROPERASJONSTYPE Fiksasjon in-situ: ☐N ☐J Peroperativ reposisjon: ☐N ☐J

Kirurgisk hofte-dislokasjon: ☐N ☐J Collumosteotomi: ☐N ☐J

Femurosteotomi: ☐N ☐J Spesifiser: ....

Skrueosteosyntese: ☐N ☐J Antall skruer: .... Fabrikat: ....

Pinnefiksasjon: ☐N ☐J Antall pinner: .... Diameter: .... mm

Platefiksasjon: ☐N ☐J Spesifiser: ....

Annen operasjon: ☐N ☐J Spesifiser: ....

REOPERASJONSTYPE ☐Reosteosyntese ☐Bløtdelsrevisjon ☐Fjerne ostemat.

☐Annen, spesifiser: ....

REOPERASJONSÅRSAK ☐Feilplass. av osteosynt. ☐Osteosyntesesvikt ☐Infeksjon

☐Blødning ☐Annen: ....

KNIVTID FOR OPERATIV BEHANDLING: .... min.

Ved operativ behandling (artroskopisk eller åpen) for impingement etter SCFE:
fyll ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

Dato: .... Lege: ....

Legen som har fylt ut skjemaet (Navnet registreres ikke i databasen)

CALVÉ-LEGG-PERTHES

BEHANDLINGSDATO ..../.......... 20......... **SIDE** ☐Hø ☐Ve *(Ett kryss. Bilateral = 2 skjema)*

FØRSTE GANG DIAGNOSTISERT ..../......... 20......... *(Fylles ut første gang det sendes inn skjema)*

SYMPTOMVARIGHET .... mnd **HALTING** ☐N ☐J

SMERTE ☐Ingen ☐Lett ☐Betydelig **CATTERALL** ☐I / II ☐III / IV

BEHANDLING ☐Ingen (fysioterapi) ☐Abduksjonsortose

FEMUROSTEOTOMI ☐Varisering ☐Valgisering ☐Rotasjon

PLATE ☐Forbøyd plate ☐Vinkelplate ☐Spesialplate, fabrikat: ....

SKRUER ☐Vanlige skruer ☐Vinkelstabile skruer

BEKKENOSTEOTOMI ☐Salter ☐Dega ☐Takplastikk

☐Annen, spesifiser: ....

ANNEN OPERATIV BEHANDLING ☐Trochanter transposisjon ☐Trochanter apofysiodese

☐Annen, spesifiser: ....

REOPERASJONSTYPE ☐Reosteosyntese ☐Bløtdelsrevisjon ☐Fjerne ostemat.

☐Annen: ....

REOPERASJONSÅRSAK ☐Osteosyntesesvikt ☐Blødning ☐Infeksjon

☐Pseudartrose ☐Annen: ....

KNIVTID FOR OPERATIV BEHANDLING: .... min.

Ved artroskopi eller hoftedislokasjon for sequele etter CLP:
fyll ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

BEHANDLINGSDATO ..../......... 20....... **SIDE** ☐Hø ☐Ve *(Ett kryss. Bilateral = 2 skjema)*

OPERASJON ☐Primæroperasjon ☐Reoperasjon ☐Kun diagnostisk uten intervensjon

SYMPTOMVARIGHET .... mnd

TIDLIGERE HOFTELIDELSE ☐N ☐J ☐SCFE ☐CLP ☐DDH

☐Andre: ....

DIAGNOSE ☐Cam impingement ☐Pincer impingement ☐Kombinert impingement

☐Annen: ....

PREOPERATIVE FUNN Impingement test Høyre: ☐Neg. ☐Pos. Venstre: ☐Neg. ☐Pos.

Halting: ☐N ☐J Rtg Alfavinkel sideplan: Hø .... Ve .... frontplan: Hø .... Ve ....

CE-vinkel Hø .... Ve .... Cross-over tegn Hø: ☐Neg. ☐Pos. Ve: ☐Neg. ☐Pos.

Spina ischiadica projisert medialt for linea terminales? Hø: ☐N ☐J Ve: ☐N ☐J

Bruskhøyde *(mm i øvre vektbærende del av leddet i AP projeksjon)*: ☐<2 ☐2-3 ☐>3

MR funn: ☐Labrumskade ☐Paralabral cyste ☐Subchondral cyste

Effekt av lokalbedøvelse i leddet: ☐N ☐J ☐Ikke aktuelt

KIRURGISK TILGANG ☐Artroskopisk ☐Kirurgisk dislokasjon ☐Konvertering til åpen tilgang

Tilgang ved åpen kirurgi: ☐Lateral ☐Annen: ....

Fiksasjonsmetode ved trochanter osteotomi: ....

Portaler: ☐Anterior ☐Anterolateral ☐Posterolateral ☐Distal anterior ☐Proximal anterior

☐Perifere kompartment først ☐Sentrale kompartment først

PEROPERATIVE FUNN

Labrum: ☐Normal ☐Degen. forandret ☐Forbenet ☐Partiell ruptur ☐Gjennomgående ruptur

Bruskskade acetabulum: ☐N ☐J Grad: ☐0 ☐1 ☐2 ☐3 ☐4 Lokalisasjon: ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

Bruskskade caput femoris: ☐N ☐J Areal: .... mm² Dybde (ICRS): ☐1 ☐2 ☐3 ☐4

Lokalisasjon: ☐1 ☐2 ☐3 ☐4 ☐5 ☐6

Ligamentum teres skade: ☐N ☐J ☐Partiell ruptur ☐Total ruptur

Frie legemer: ☐N ☐J ☐Perifert ☐Sentralt

Os acetabuli: ☐N ☐J ☐Som forbening av labrum ☐Som del av leddflaten Synovitt: ☐N ☐J

KIRURGISK BEHANDLING Labrumruptur: ☐Debridement ☐Sutur. Antall ankre: ....

Type ankre: .... ☐Labrumrekonstruksjon, spesifiser: ....
(Klistrelapp på baksiden)

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.

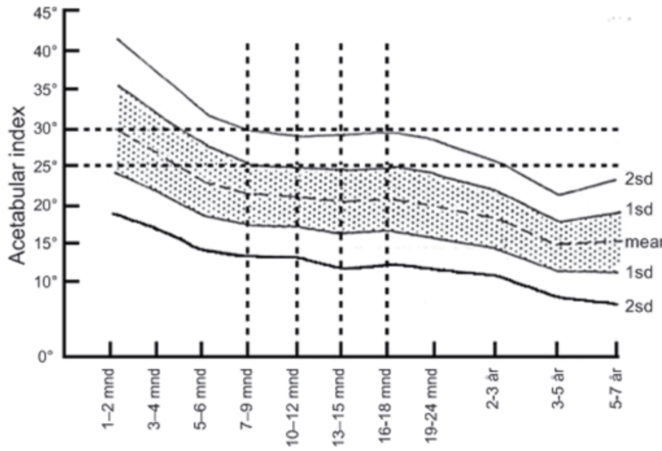
Reoperasjonsårsak, spesifiser: ....

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

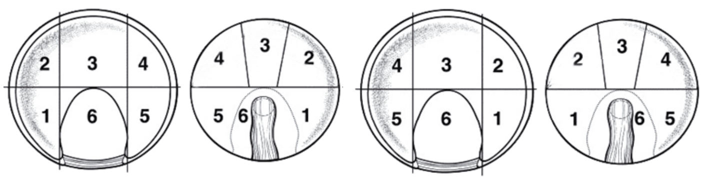
Alle pasienter (uavhengig av alder) som gjennomgår åpen eller artroskopisk hofteoperasjon, unntatt fraktur-, protese- og tumor-operasjoner, skal registreres.

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.

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Versjon 20130301