

Annual Report 2021

SQRTPA | Scandinavian Quality Register for
Thyroid, Parathyroid and Adrenal Surgery

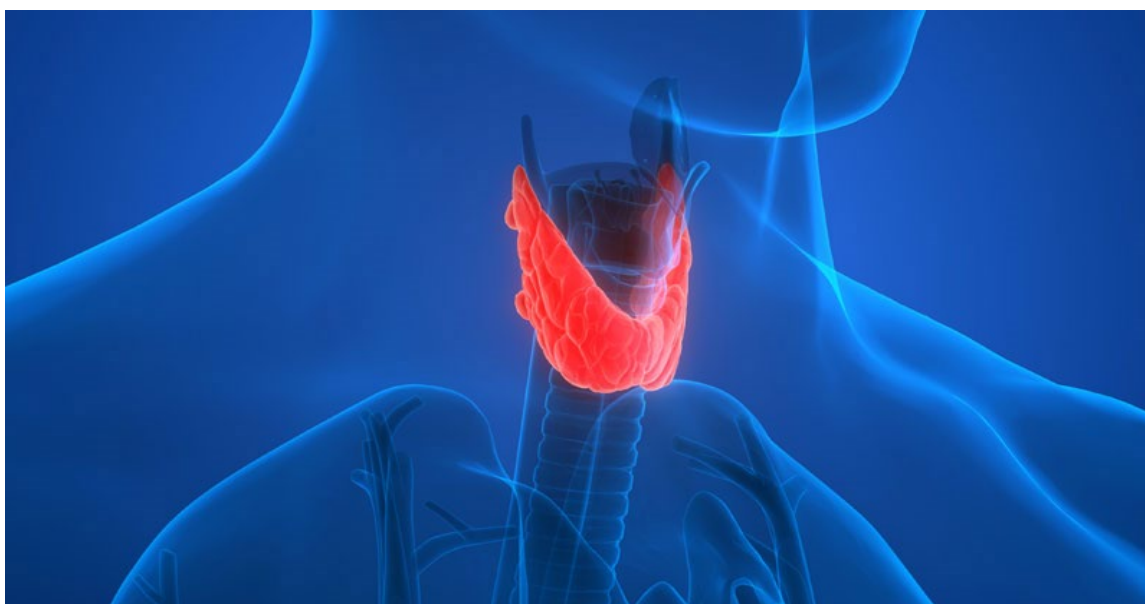


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Preface

1.1. Impact of the pandemic

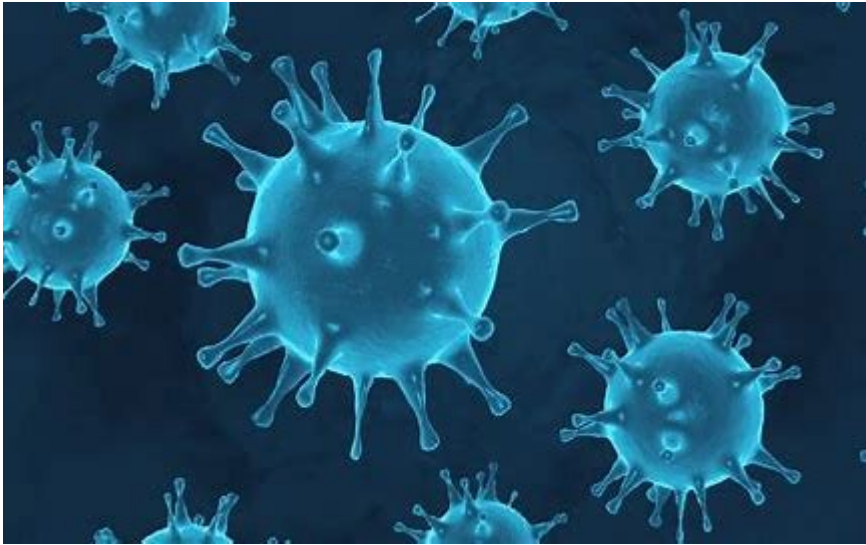
As in the 2020 annual report, it is impossible not to mention the ongoing corona virus pandemic first. In this year's annual report 2021, with data up to and including 2020, a separate review is performed of the impact of the Covid-19 pandemic on thyroid and parathyroid surgery. Clear impressions are:

1. Overall, fewer thyroid surgeries have been recorded in 2020 compared to 2019
2. The number of benign procedures in relation to malignant has decreased
3. Patients who underwent thyroid surgery due to a benign disease had to wait longer in 2020 compared to 2019
4. Patients with a malignant diagnosis had a shorter median waiting time in 2020 compared to 2019
5. The preoperative calcium values for surgery for PHPT increased significantly from 2.60 mmol/L in 2019 to 2.64 mmol/L in 2020, indicating that sicker patients had surgery during the pandemic

Overall, it can be said that during the pandemic, endocrine surgical healthcare has changed and shrunk overall, and the focus has adjusted from benign to malignant surgery. Paradoxically, waiting times for those with a malignant diagnosis have decreased.

As usual, data must be interpreted with caution. It could be that changes in the number of registrations are due to reduced coverage as personnel responsible for recording in the registry quite simply has not had time to do so because of the pandemic. In terms of waiting times and proportion of benign/malignant of recorded procedures, it is more difficult to explain it as a function of poorer coverage.

It is no secret that the biggest problem for Swedish healthcare is basically not poor quality but poor accessibility. Even before the pandemic, doctors responsible for patients in Swedish healthcare must prioritize daily. In many neighbouring countries, such as Denmark and Germany, waiting times are a non-issue. Particularly vulnerable in Swedish healthcare are patient groups whose diseases are non-acute and non-malignant, but who need the emergency hospital's resources. This is very much true for patients with thyroid and parathyroid diseases. Solving accessibility in the long term is probably the best quality improvement that can be made in Swedish healthcare in general, and especially for endocrine surgical patients. This is because we know that, for example, many people with a benign thyroid diagnosis on record, who may in the current system have to wait over a year before action is taken, in fact have a malignant disease.



1.2. Brand new adrenal module

In 2020/2021, a brand-new adrenal module was finally launched. In general, a simplification has taken place and the basic idea is that each procedure with accompanying variables is linked to the primary indication. For example, there is a module for primary hyperaldosteronism, one for pheochromocytoma, etc. Overall, there have been fewer variables, but on the other hand more relevant and targeted questions based on indication/diagnosis. After all, the old adrenal module was in principle developed from the incidental perspective.

1.3. A forward-looking view

SQRTPA is the nationwide Swedish quality register for endocrine surgical actions. We all hope that Sweden and the world can return to a more normal state in 2021/2022. This also applies to healthcare, and we hope that all those who are now in line for an endocrine surgical action can get help quickly. The whole point of a quality register and thereby also SQRTPA is improvement for all human beings suffering from disease.



Erik Nordenström
Registry manager
30 August 2021

2. Support and financing

SQRTPA is supported by the Swedish Association for Endocrine Surgery (SFEK), the Swedish Association for Otolaryngology, Head – Neck Surgery and the National Board of Health and Welfare. Funding is obtained from the Swedish State and Sweden's municipalities and regions (SKR) via the National Quality Register.



Sveriges
Kommuner
och Regioner



Socialstyrelsen



NATIONELLA KVALITETSREGISTER

Kunskap för bättre vård och omsorg

3. Office and organisation

SQRTPA is affiliated with Registry Centre South and is governed by a registry board that meets approximately 6 times a year. The registry manager has the primary responsibility for conduct. The registry platform is operated by the company AddPro and shared with the European Endocrine Surgery Registry EUROCRINE. SQRTPA's registry coordinator is Penny Lindegren. She is responsible for, e.g., qualifications, practical planning of user meetings, board meetings and audits. The office has its premises at Medicon Village in Lund.



SQRTPA's office is located in the Medicon Village area of Lund

4. Registry Board 2020-2021

Erik Nordenström	Lund	surgeon Registry manager
Anders Bergenfelz	Lund	surgeon Chairperson
Joakim Hennings	Östersund	surgeon member
Anna Koman	Stockholm	surgeon member
Göran Wallin	Örebro	surgeon member
Olov Norlén	Uppsala	surgeon member (mandate from SFEK)
Andreas Muth	Gothenburg	surgeon member
Daniel Nordanstig	Helsingborg	ENT surgeon (mandate from ENT association)
Henryk Domanski	Lund	cytologist co-opted
Jan Tennvall	Lund	oncologist co-opted
Penny Lindegren	RC South	Registry coordinator
Orestes Theodoridis	RC South	Registry statistician



5. Audit

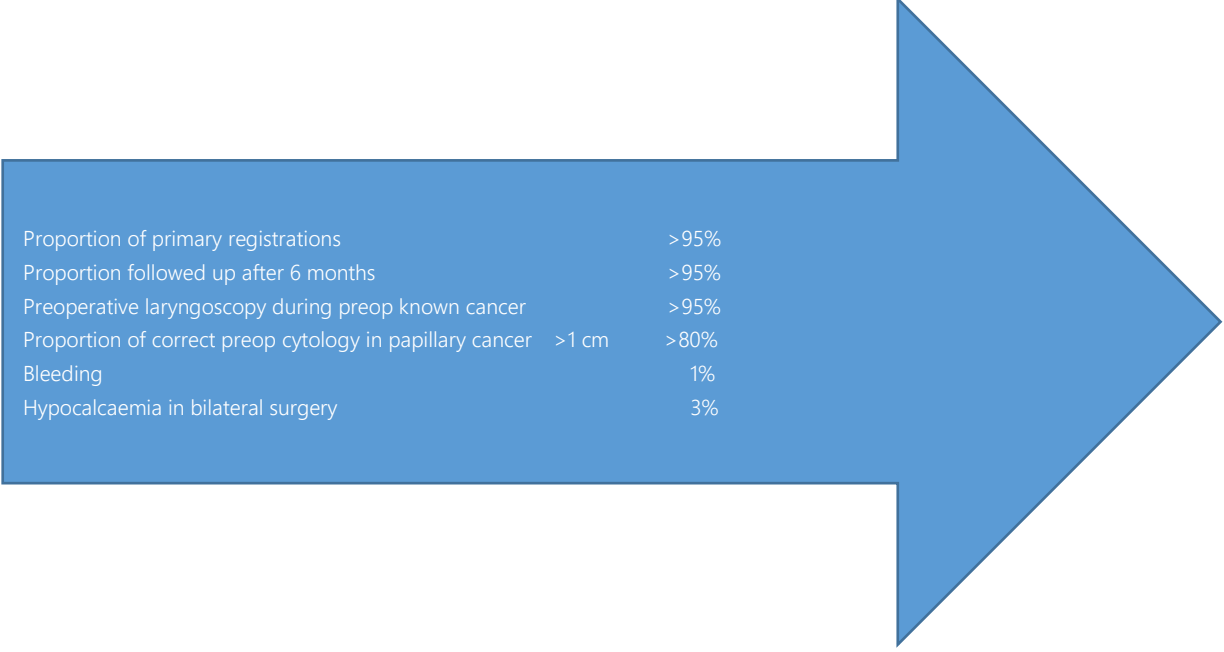
The fact that data can be trusted in a quality registry is absolutely crucial. If the data is incorrect, this affects the ability to conduct research and development based on data from the registry. In addition to the material being representative and covering the population well (coverage), it is important that recorded data is accurate and consistent with reality. Since the start of SQRTPA in 2004, the registry manager has been able to validate registry data through a special auditor. Each year, audits are carried out in 4-6 units. During the audit, 25 random cases are selected. The auditor reviews all the data recorded in the registry and then gets access to the data from medical records and can thus verify if what is in the registry corresponds to reality. In connection with auditing, procedures for the recording and following up patients are also discussed. In 2021, Ewa Lundgren retired as auditor and professor emeritus. Bo Wängberg, Gothenburg, was elected as the new auditor. Due to the pandemic, physical audits could not be carried out in 2020/2021. We expect to resume auditing in 2022.



Bo Wängberg; SQRTPA's new auditor



6. Quality indicators Thyroid surgery



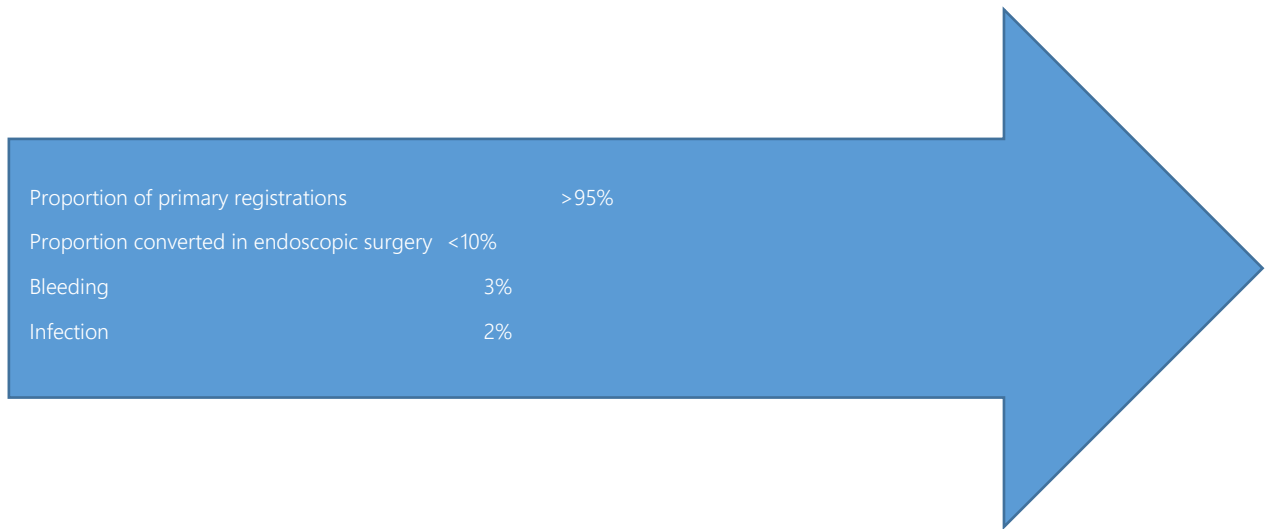
Proportion of primary registrations	>95%
Proportion followed up after 6 months	>95%
Preoperative laryngoscopy during preop known cancer	>95%
Proportion of correct preop cytology in papillary cancer >1 cm	>80%
Bleeding	1%
Hypocalcaemia in bilateral surgery	3%

7. Quality indicators surgery of sporadic PHPT



Proportion of primary registrations	>95%
Proportion followed up after 6 months	>95%
Normocalcaemic after 6 months	>95%

8. Quality Indicators Adrenal surgery



9. Connected units SQRTPA 2020

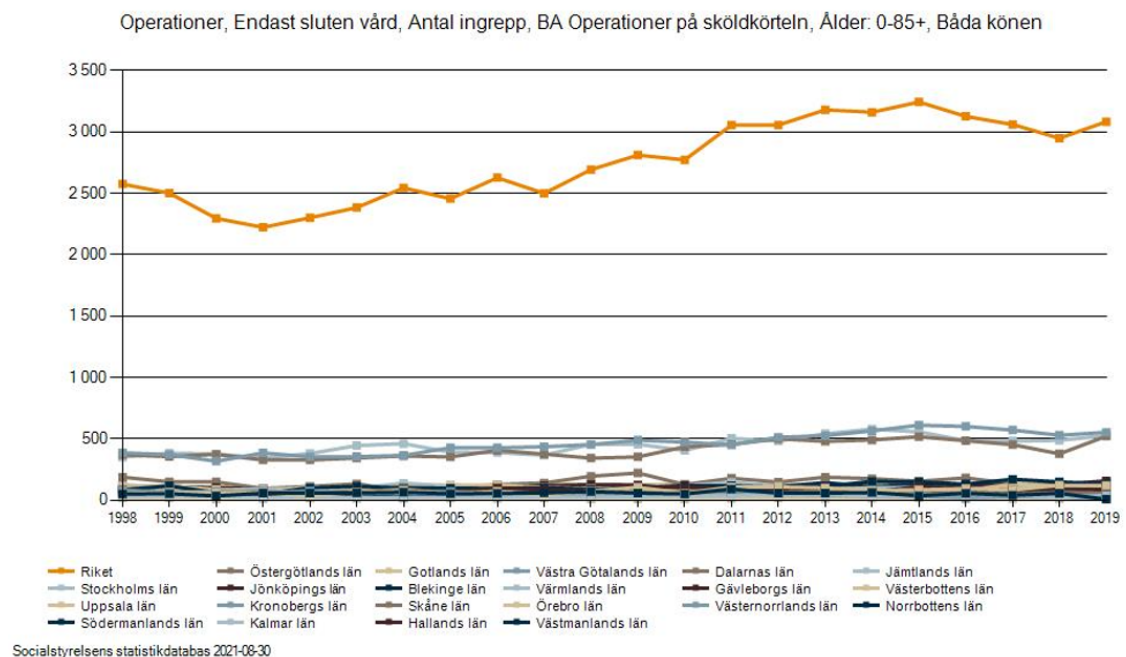
Surgical Clinic, Borås Hospital (Borås)
Highland Hospital Eksjö (Eksjö)
Surgical Clinic, Falu Hospital (Falun)
Surgical Clinic, County Hospital in Gävle (Gävle)
Surgical Clinic, Sahlgrenska University Hospital, Gothenburg (Sahlgrenska SUR)
Carlanderska Hospital, Gothenburg (Carlanderska)
Surgical Clinic, County Hospital in Halmstad (Halmstad SUR)
Ear-Nose-Throat Clinic, Halmstad (Halmstad ENT)
Ear-Nose-Throat Clinic, Helsingborg Hospital (Helsingborg ENT)
Surgical Clinic, County Hospital Ryhov, Jönköping (Jönköping)
Surgical Clinic, Blekinge Hospital, Karlskrona (Karlskrona SUR)
Ear-Nose-Throat Clinic, Blekinge Hospital, Karlskrona (Karlskrona ENT)
Surgical Clinic, Karlstad Hospital (Karlstad SUR)
Ear-Nose-Throat Clinic, County Hospital in Karlstad (Karlstad ENT)
Surgical Clinic, Kristianstad Hospital (Kristianstad)
Surgical Clinic, Kungälv Hospital (Kungälv)
Surgical Clinic, University Hospital in Linköping (Linköping)
Surgical Clinic, Ljungby Hospital (Ljungby)
Surgical Clinic, Sunderby Hospital (Luleå)
Skåne University Hospital, Lund (Lund SUR)
Surgical Clinic, Vrinnevi Hospital Norrköping (Norrköping)
Surgical Clinic, Skövde Hospital (Skövde SUR)
Ear-Nose-Throat Clinic, Skövde Hospital (Skövde ENT)
Endocrine Surgical Clinic, Karolinska University Hospital (Solna)
Surgical Clinic, County Hospital, Sundsvall (Sundsvall)
Surgical Clinic, Norra Älvsborg Hospital (Trollhättan)
Surgical Clinic, Norrland University Hospital, Umeå (Umeå)
Surgical Clinic, Academic Hospital Uppsala (Uppsala)
Surgical Clinic, Varberg Hospital (Varberg)
Surgical Clinic, Värnamo Hospital (Värnamo)

Surgical Clinic, Västervik Hospital (Västervik)
Surgical Clinic, Central Hospital in Västerås (Västerås)
Surgical Clinic, County Hospital in Växjö (Växjö)
Surgical Clinic, University Hospital in Örebro (Örebro SUR)
Ear-Nose-Throat Clinic, University Hospital in Örebro (Örebro ENT)
Surgical Clinic, County Hospital Östersund (Östersund)
Gastro Centre Skåne, Lund
Surgical Clinic, Nyköping

10. Surgery volumes

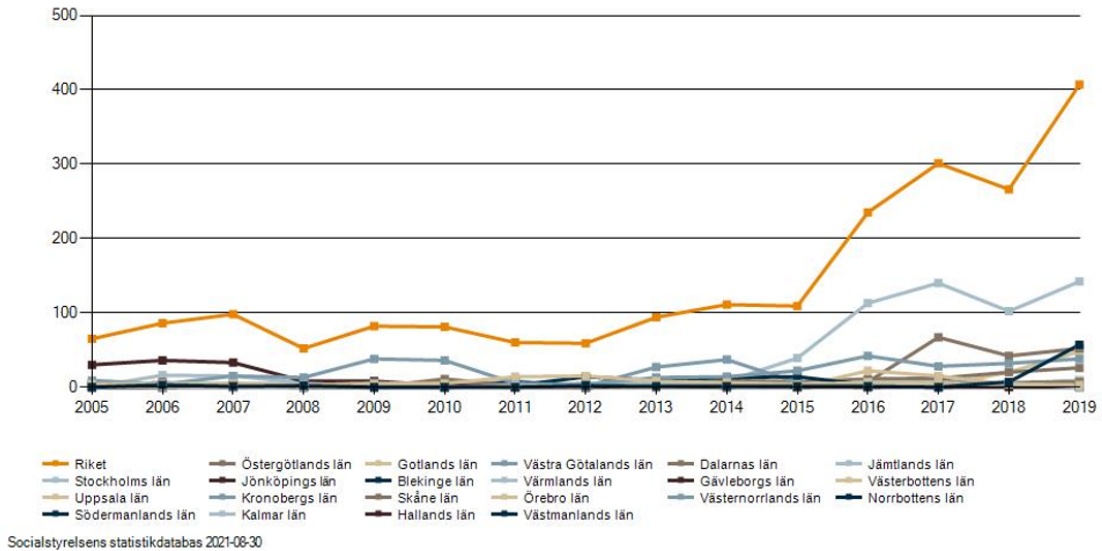
Accurately calculating surgery volumes for a country or unit for a given time period is not easy. The registry on which the data is based are living documents and are often changed in real time. In addition, surgeries in inpatient and outpatient wards are documented in separate registries with the National Board of Health and Welfare. Data from the National Board of Health and Welfare in this annual report are taken from 2021 unless otherwise stated. In the case of thyroid and parathyroid surgeries in inpatient wards, the number of procedures in Sweden annually is around 3000 and 1300 respectively, while adrenal surgeries for adrenal disease are about 200 annually. Regarding outpatient thyroid surgery, there is a sharp increase from approximately 100 cases in 2015 to about 400 cases in 2019. This group should be studied separately in the future.

Operations, only inpatient care, nr of procedures, BA operation on thyroid gland. Years 0-85 years, both genders



Operations, only specialized outpatient care, nr of procedures, BA operations on thyroid gland, age 0-85+, both genders

Operationer, Endast specialiserad öppen vård, Antal ingrepp, BA Operationer på sköldkörteln, Ålder: 0-85+, Båda könen

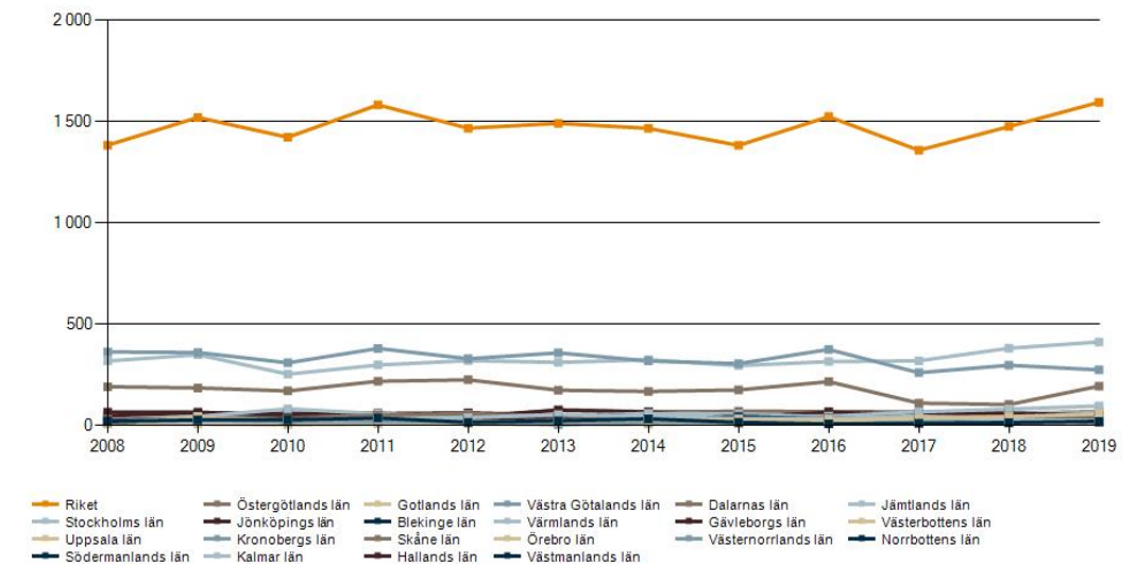


Socialstyrelsens statistikdatabas 2021-08-30

In 2019, there were approximately 400 thyroid surgeries in outpatient wards in Sweden. Source National Board of Health and Welfare's statistical database.

Operations, inpatient or/and specialized outpatient care, nr of procedures, BB operations on parathyroid glands. Ages 0-85 +, both genders

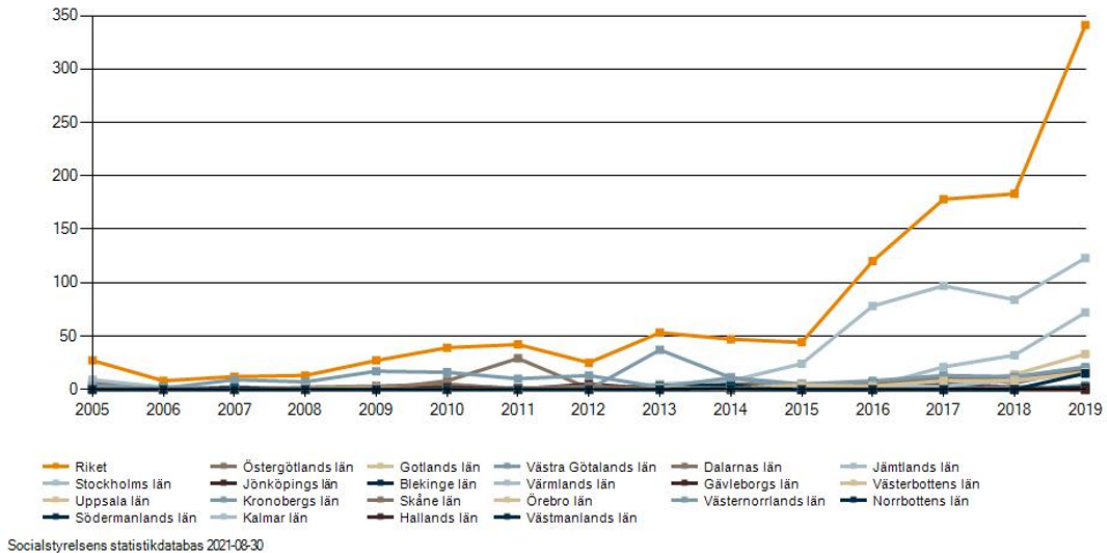
Operationer, Sluten och/eller specialiserad öppen vård, Antal patienter, BB Operationer på bisköldkörtlar, Ålder: 0-85+, Båda könen



Socialstyrelsens statistikdatabas 2021-08-30

Operations, only specialized outpatient care, nr of procedures, BB operations on parathyroid glands, Ages 0-85+years, both genders

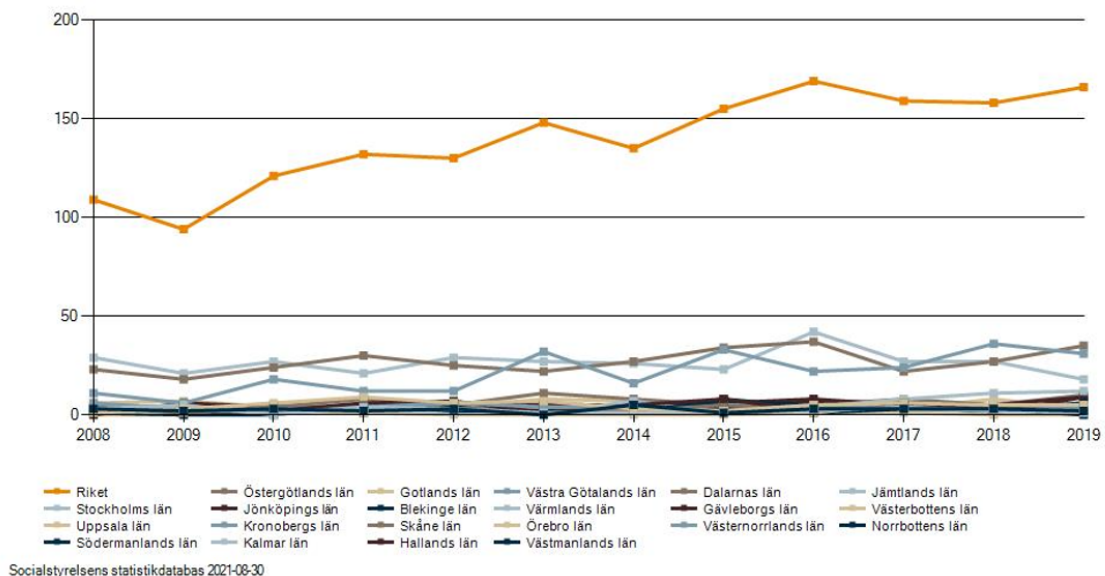
Operationer, Endast specialiserad öppen vård, Antal ingrepp, BB Operationer på bisköldkörtlar, Ålder: 0-85+, Båda könen



Surgeries for parathyroid disease have increased dramatically in outpatient wards since 2015. Approximately 1200 procedures were performed in inpatient wards and about 350 procedures were performed in an outpatient setting. Most parathyroid surgeries as outpatient surgery take place in Stockholm. Below are the number of laparoscopic adrenal surgeries. Source National Board of Health and Welfare's statistical database.

Operations, inpatient and/or specialized outpatient care, nr of patients, BCA31 Laparoscopic adrenalectomy, unilateral, Ages 0-85+, both genders

Operationer, Slutet och/eller specialiserad öppen vård, Antal patienter, BCA31 Laparoskopisk adrenalectomi, unilateral, Ålder: 0-85+, Båda könen



10.1. Number of procedures per unit registered in SQRTPA 2020

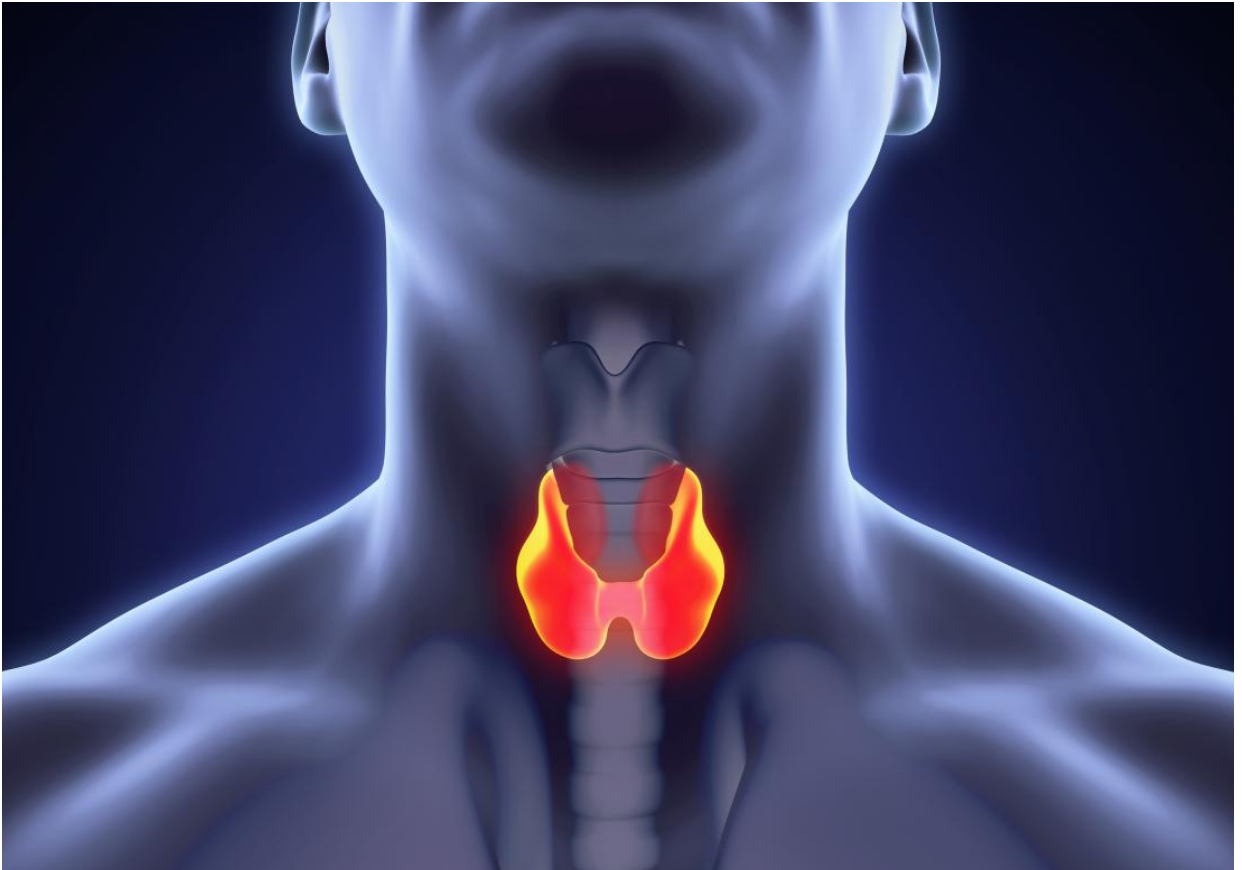
Unit	Thyroid	Primary HPT	Secondary HPT	Adrenalectomy
Borås SUR	18	1	0	0
Carlanderska	198	90	0	0
Eksjö SUR	34	12	0	0
Falun SUR	54	11	0	0
Gastro Centre Skåne	157	55	0	0
Gävle SUR	69	23	0	0
Gothenburg SUR	365	70	10	25
Halmstad SUR	36	27	0	0
Halmstad ENT	15	0	0	0
Helsingborg ENT	0	0	0	0
Jönköping SUR	34	20	1	0
Kalmar SUR	0	0	0	0
Karlskrona SUR	43	23	2	0
Karlskrona ENT	15	0	0	0
Karlstad SUR	20	34	0	0
Karlstad ENT	23	0	0	0
Kristianstad SUR	28	0	0	0
Kungälv SUR	15	7	0	0
Linköping SUR	95	23	2	11
Luleå SUR	52	6	0	0
Lund SUR	197	57	0	56
Norrköping SUR	27	16	0	0
Nyköping	67	8	0	0
Skövde SUR	0	0	0	0
Solna SUR	65	27	0	35
Sundsvall SUR	35	34	0	0
Trollhättan SUR	71	22	2	0
Umeå SUR	131	25	1	6
Uppsala SUR	109	32	0	13
Varberg SUR	22	7	0	0
Värnamo SUR	13	0	0	0
Västervik SUR	31	11	1	0
Västerås SUR	0	0	0	0
Västerås ENT	14	0	0	0
Växjö SUR	2	3	0	0
Örebro SUR	63	11	0	5
Örebro ENT	35	0	0	0
Östersund SUR	28	9	0	2
Total	2181	664	19	153

*In 2019, procedures were registered in
SQRTPA for:*

Thyroid: 2181

PHPT: 664

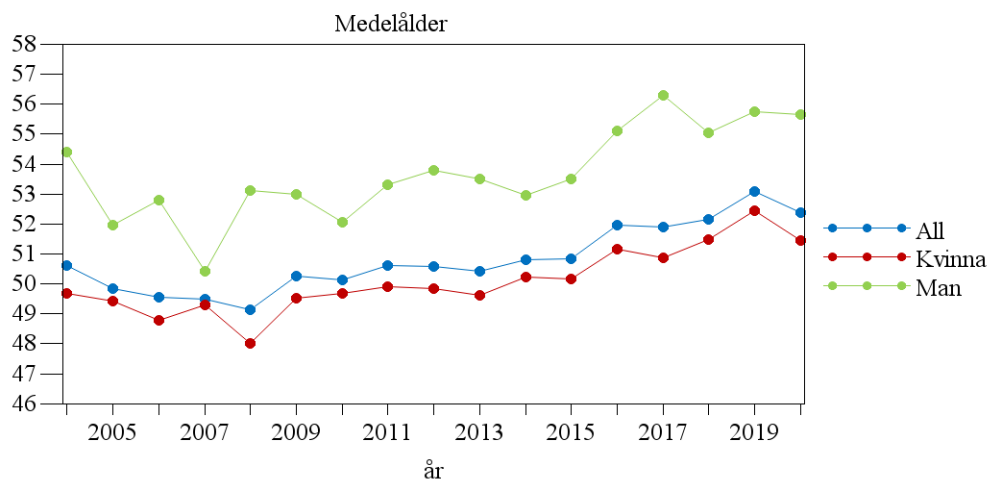
SHPT: 19



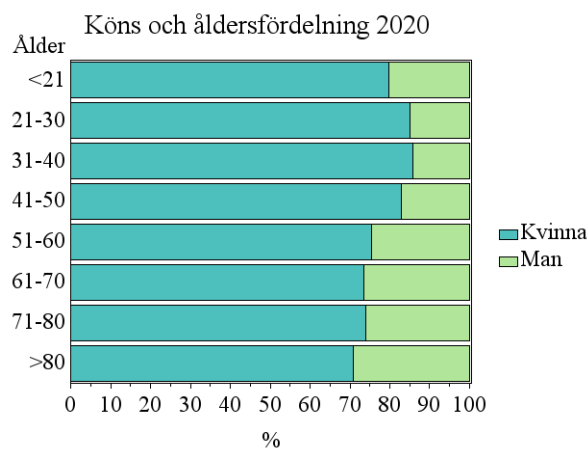
11. Thyroid surgery

11.1. AGE AND GENDER DISTRIBUTION

79% of all people who underwent thyroid surgery in 2020 were women and the average age was 53 years (0-91). In the older age groups, men represent a slightly higher proportion than 20%. For men, the average age is higher (56 years).



Average age of thyroid surgery SQRTPA 2004-2019

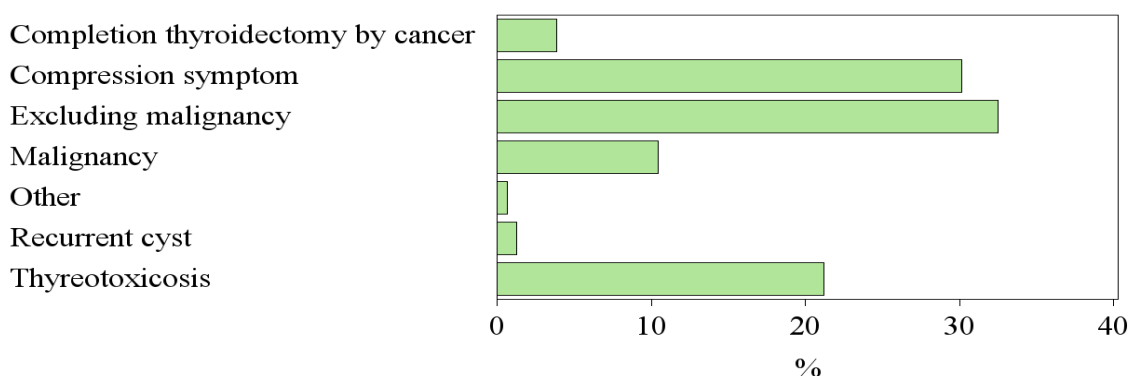


Gender and age distribution in thyroid surgery SQRTPA 2020

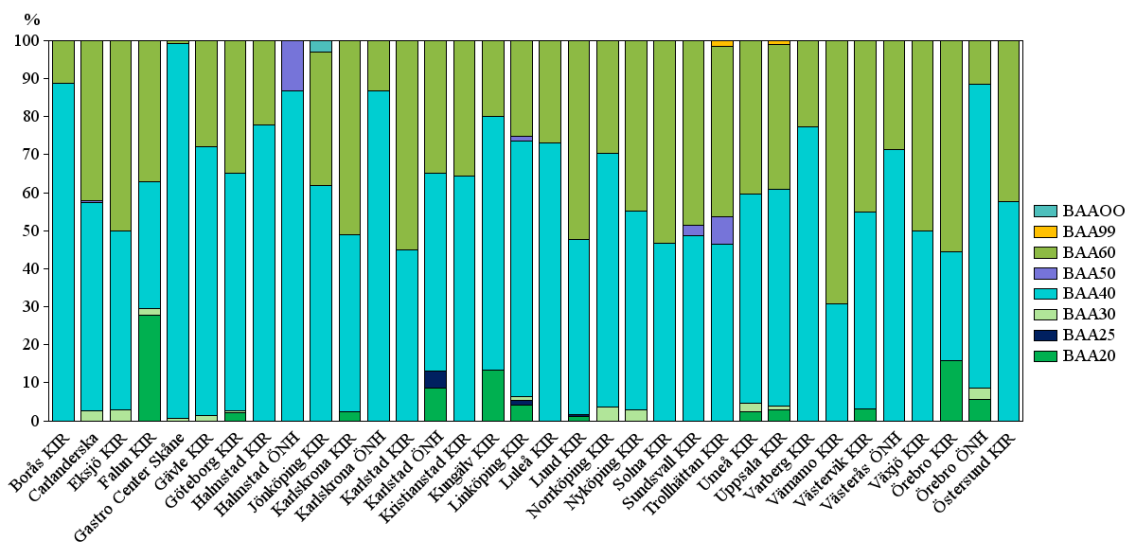
11.2. INDICATION AND TYPE OF SURGERY

In 2020, different types of tumour surgery were the most common indications for thyroid surgery (46.8%). In 10.4% of the surgeries, the cancer diagnosis is known prior to surgery and in 26% of the cases this concerns unclear tumours where the surgery is performed to obtain an accurate diagnosis. Pressure symptoms in benign goitre were performed in 30% and 21% of surgery patients due to hyperthyroidism. As seen in separate chapters, the proportion of malignant vs. benign has changed significantly in 2020 compared to 2019, most likely due to the pandemic. Hemithyroidectomy is the most common procedure (60%) followed by total thyroidectomy (36%). In some units, almost only hemithyroidectomy is performed.

Indikation för thyroideakirurgi 2020

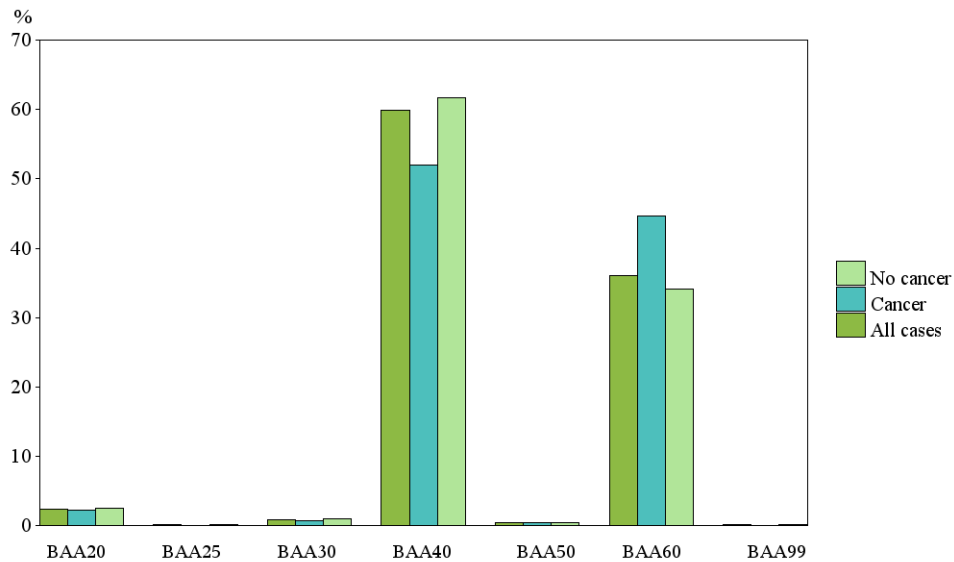


In 2020, different types of surgery due to tumour evaluation/cancer were the most common indication (46%) in thyroid surgery. The corresponding number in 2019 was just under 40%. SQRTPA 2020



Hemithyroidectomy (BAA40) and total thyroidectomy (BAA 60) are the most common types of surgery. SQRTPA 2020.

Examining the type of surgery used depending on malignant PAD after surgery reveals that in 45% of cases, total thyroidectomy is performed. This reflects the fact that many cancers are not diagnosed until after surgery and many patients therefore have to undergo two surgeries. In the case of benign end PAD, 34% have total thyroidectomy, i.e., in one setting.



Relationship between end PAD and surgery type. 52% of all cancer cases were surgically managed with hemithyroidectomy (BAA 40)

11.3. DIAGNOSIS AFTER SURGERY

Nodular goitre (43%), Graves' disease (15%) and papillary thyroid cancer (13%) were the most common diagnoses after thyroid surgery in 2020.

Primary diagnosis	Number	%
Nodular goitre T-96 M-71640	850	42.6
Graves' disease T-96 D-2193	296	14.8
Papillary cancer T-96 M-82603	261	13.1
Follicular adenoma T-96 M-83300	210	10.5
Follicular cancer T-96 M-83303	60	3.0
Lymphocytic thyroiditis Hashimoto T-96 M-45810	53	2.7
Thyroid normal T-96 M 00110	37	1.9
Hürtle cell (oxyphilic) adenoma T-96M-82900	31	1.6
Thyroid nothing malignant T-96 M 0945	29	1.5
Normal gland	22	1.1
Lymph node metastasis papillary cancer T-082 M-82606	16	0.8
Hürtle cell (oxyphilic) carcinoma T-96 M-82903	15	0.8
Medullary cancer T-9605 M-85103	15	0.8
Follicular tumour with uncertain malignant potential	14	0.7
Benign tumour UNS T-96 M-80000	13	0.7
Non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP)	12	0.6
Other diagnosis	12	0.6
Anaplastic cancer T-96 M-80123	5	0.3
Metastasis from malignant tumour UNS T-96 M-80006	5	0.3
Parathyroid adenoma (T-97 M-81400)	5	0.3
Well differentiated tumour of uncertain malignant potential (WDT-UMP)	5	0.3
C-cell hyperplasia T-9605 M-72000	4	0.2
Lymph node metastasis follicular cancer 1-082 M-83306	4	0.2
Chronic fibrotic thyroiditis Riedel T-96 M-45000	3	0.2
Lymph node metastasis medullary cancer T082 M-85106	3	0.2
Poorly differentiated thyroid cancer	3	0.2
Lymphoma T-96 M-95903	2	0.1
Metastasis from cancer UNS T-96 M-80106	2	0.1
Parathyroid hyperplasia (T-97 M 72000)	2	0.1
Acute thyroiditis T-96 M-41000	1	0.1
Hyalinising trabecular tumour	1	0.1
Malignant tumour UNS T-96 M-80003	1	0.1
Parathyroid normal	1	0.1
Subacute thyroiditis de Quervain T-96 M-44000	1	0.1
Total	1994	100

Hemithyroidectomy was the most common surgery type (60%), either confirmed or suspected cancer was the most common indication (46%) and nodular goitre (43%) was the most common PAD after thyroid surgery in 2019

11.4. QUALITY INDICATORS THYROID SURGERY

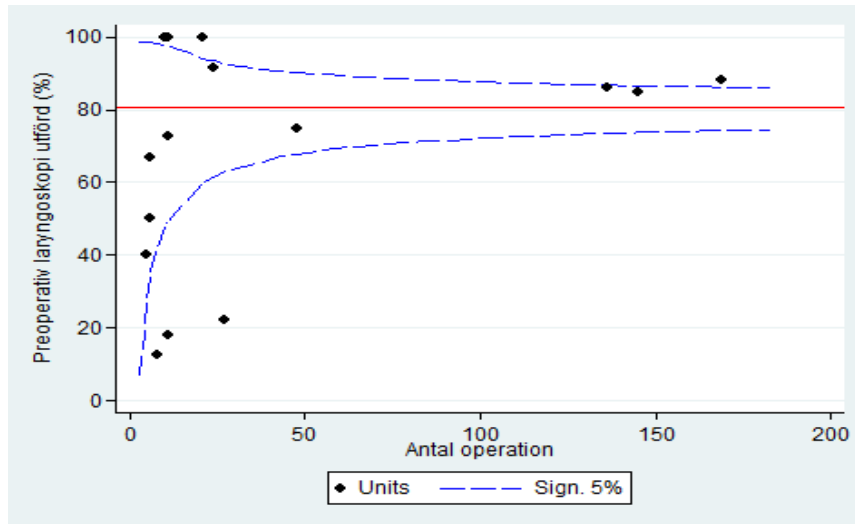
11.4.1 Proportion of primary registered thyroid surgeries in relation to the inpatient ward registry in 2019. Target 95%

Unit	SQRTPA Thyroid	Thyroid SoS	Coverage %
Borås SUR	18	15	100
Carlanderska	198	198	100
Eksjö SUR	34	35	97
Falun SUR	54	55	98
Gastro Centre Skåne	157	91	100
Gävle SUR	69	65	100
Gothenburg SUR	365	235	100
Halmstad SUR	36	36	100
Halmstad ENT	15	15	100
Helsingborg ENT	0	66	0
Jönköping SUR	34	34	100
Kalmar SUR	0	27	0
Karlskrona SUR	43	43	100
Karlskrona ENT	15	15	100
Karlstad SUR	20	14	100
Karlstad ENT	23	37	62
Kristianstad SUR	28	78	36
Kungälv SUR	15	14	100
Linköping SUR	95	78	100
Luleå SUR	52	0	100
Lund SUR	197	186	100
Norrköping SUR	27	27	100
Nyköping	67	69	100
Skövde SUR	0	38	0
Solna SUR	65	459	14
Sundsvall SUR	35	7	100
Trollhättan SUR	71	71	100
Umeå SUR	131	123	100
Uppsala SUR	109	78	100
Varberg SUR	22	22	100
Värnamo SUR	13	24	54
Västervik SUR	31	31	100
Västerås SUR	0	16	0
Västerås ENT	14	66	21
Växjö SUR	2	0	100
Örebro SUR	63	78	81
Örebro ENT	35	37	95
Östersund SUR	28	28	100
Total	2181	2511	87

11.4.2 Preoperatively performed laryngoscopy in known cancer. Data 2017–2020. Target 95%

Unit	Number of surgeries	Number of preoperative laryngoscopies	Preoperative laryngoscopy during preop known cancer%
Carlanderska	5	2	40.0
Gastro Centre Skåne	4	4	100.0
Borås SUR	11	8	72.7
Eksjö SUR	3	0	0.0
Lund SUR	169	149	88.2
Östersund SUR	24	22	91.7
Falun SUR	3	3	100.0
Gävle SUR	2	0	0.0
Gothenburg SUR	136	117	86.0
Halmstad SUR	4	0	0.0
Jönköping SUR	6	4	66.7
Solna SUR	145	123	84.8
Karlskrona SUR	4	4	100.0
Kristianstad SUR	3	3	100.0
Linköping SUR	11	2	18.2
Luleå SUR	4	4	100.0
Norrköping SUR	1	1	100.0
Nyköping SUR	6	3	50.0
Sundsvall SUR	4	4	100.0
Trollhättan SUR	21	21	100.0
Uppsala SUR	48	36	75.0
Varberg SUR	8	1	12.5
Västervik SUR	4	4	100.0
Västerås SUR	1	1	100.0
Örebro SUR	3	1	33.3
Umeå SUR	27	6	22.2
Karlstad ENT	11	11	100.0
Örebro ENT	10	10	100.0
Västerås ENT	4	4	100.0
Total	682	548	80.4

11.4.3



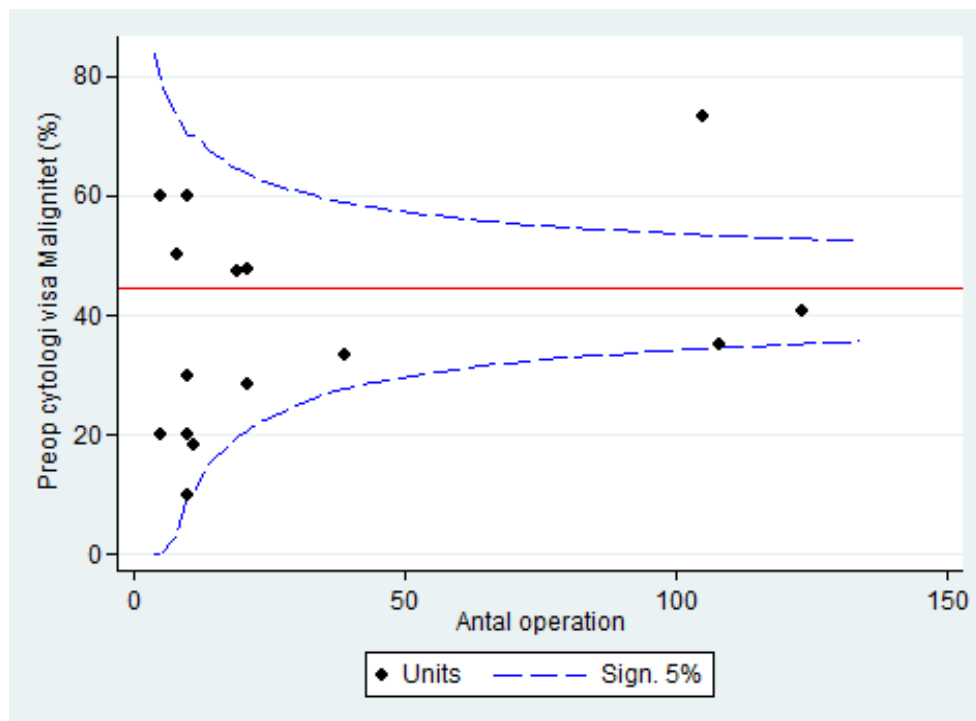
Funnel plot showing the ratio of the number of thyroid cancer surgeries to the proportion where preoperative laryngoscopy was used.

11.4.4 Proportion of patients with preoperative malignant cytology where PAD revealed papillary thyroid cancer >10 mm. Data 2017–2020. Target 80%

Unit	Number of surgeries	Cytology performed %	Cytology reveals malignancy %
Borås SUR	19	78.9	15.8
Carlanderska	5	80.0	60.0
Eksjö SUR	4	75.0	0.0
Falun SUR	11	90.9	9.1
Gastro Centre Skåne	8	87.5	0.0
Gävle SUR	6	83.3	0.0
Gothenburg SUR	98	91.8	48.0
Halmstad SUR	4	100.0	0.0
Helsingborg ENT	1	100.0	0.0
Jönköping SUR	7	85.7	14.3
Kalmar SUR	1	100.0	0.0
Karlskrona SUR	2	100.0	0.0
Karlskrona ENT	2	100.0	0.0
Karlstad ENT	10	100.0	40.0
Kristianstad SUR	5	60.0	20.0
Kungälv SUR	3	100.0	0.0
Linköping SUR	7	57.1	28.6
Luleå SUR	17	88.2	11.8
Lund SUR	115	87.8	44.3

Unit	Number of surgeries	Cytology performed %	Cytology reveals malignancy %
Norrköping SUR	4	75.0	0.0
Nyköping SUR	3	100.0	33.3
Solna SUR	69	98.6	73.9
Sundsvall SUR	13	92.3	23.1
Trollhättan SUR	10	90.0	50.0
Umeå SUR	26	92.3	26.9
Uppsala SUR	12	100.0	75.0
Varberg SUR	8	100.0	75.0
Västervik SUR	4	100.0	25.0
Västerås ENT	8	75.0	0.0
Växjö SUR	1	100.0	0.0
Örebro SUR	2	100.0	50.0
Örebro ENT	13	53.8	0.0
Östersund SUR	17	88.2	47.1
Total	516	89.1	40.1

11.4.5



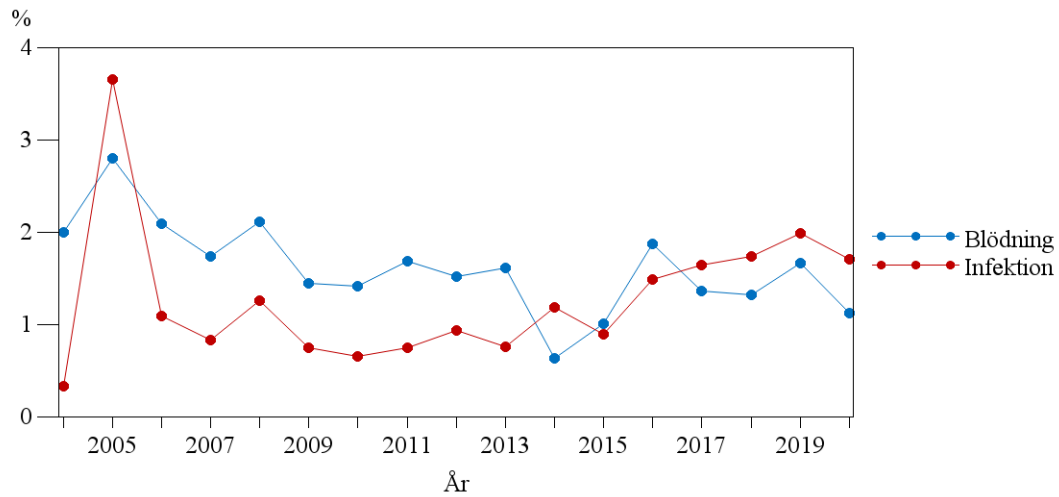
Funnel plot showing the proportion of patients who had a malignant diagnosis prior to surgery where PAD after surgery revealed papillary thyroid cancer >10 mm. Data 2016-2019

Bleeding after thyroid surgery. Data 2017–2020. Target 1%

Unit	Number of surgeries	Number of bleedings	Bleeding %
Carlanderska	704	11	1.6
Gastro Centre Skåne	279	4	1.4
Borås SUR	201	7	3.5
Eksjö SUR	141	5	3.5
Lund SUR	1056	9	0.9
Östersund SUR	164	2	1.2
Falun SUR	201	3	1.5
Gävle SUR	320	4	1.3
Gothenburg SUR	1387	29	2.1
Halmstad SUR	145	2	1.4
Jönköping SUR	184	0	0.0
Solna SUR	955	8	0.8
Kalmar SUR	89	0	0.0
Karlskrona SUR	173	4	2.3
Karlstad SUR	128	1	0.8
Kristianstad SUR	270	2	0.7
Kungälv SUR	76	0	0.0
Linköping SUR	195	1	0.5
Luleå SUR	199	3	1.5
Norrköping SUR	190	1	0.5
Nyköping SUR	147	1	0.7
Sundsvall SUR	196	2	1.0
Trollhättan SUR	302	3	1.0
Uppsala SUR	487	5	1.0
Varberg SUR	232	2	0.9
Värnamo SUR	57	0	0.0
Västervik SUR	145	3	2.1
Västerås SUR	197	4	2.0
Växjö SUR	48	1	2.1
Örebro SUR	239	3	1.3
Umeå SUR	416	5	1.2
Karlstad ENT	174	1	0.6
Halmstad ENT	48	4	8.3
Helsingborg ENT	29	0	0.0
Karlskrona ENT	91	3	3.3
Örebro ENT	226	5	2.2

Unit	Number of surgeries	Number of bleedings	Bleeding %
Västerås ENT	166	2	1.2
Total	10257	140	1.4

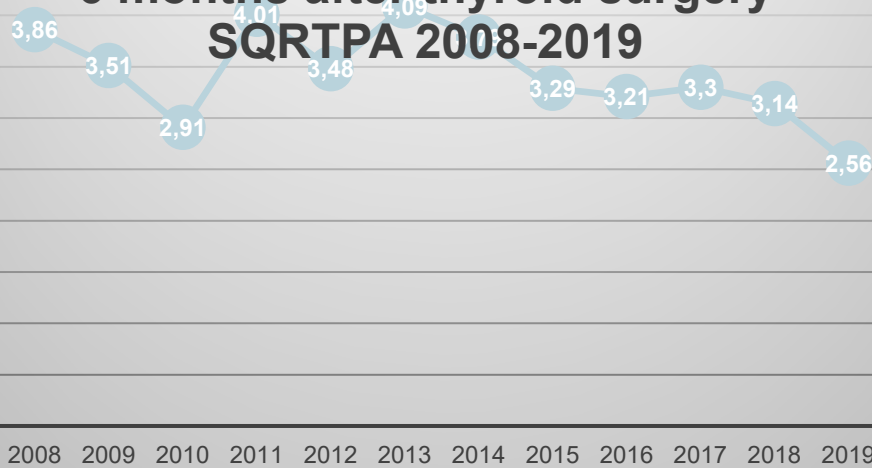
11.4.6



In 2020, the bleeding rate after thyroid surgery was 1.1% and the rate of infections was 1.7%

*In 2021 in Sweden, after thyroid surgery,
1.1% suffered from bleeding, 1.7% from infection and
after 6 weeks, 2.9% had unilateral vocal cord paralysis
and after 6 months 2.7% had unilateral vocal cord*

Unilateral vocal cord paralysis 6 months after thyroid surgery SQRTPA 2008-2019



Unit	Number of surgeries	Number of recurrence paresis at 6w	Recurrence of paresis after 6 months %
Carlanderska	704	9	1.3
Gastro Centre Skåne	279	1	0.4
Borås SUR	201	7	3.5
Eksjö SUR	141	3	2.1
Lund SUR	1056	31	2.9
Östersund SUR	164	1	0.6
Falun SUR	201	6	3.0
Gävle SUR	320	13	4.1
Gothenburg SUR	1387	74	5.3
Halmstad SUR	145	0	0.0
Jönköping SUR	184	11	6.0
Solna SUR	955	18	1.9
Kalmar SUR	89	1	1.1
Karlskrona SUR	173	3	1.7
Karlstad SUR	128	2	1.6
Kristianstad SUR	270	3	1.1
Kungälv SUR	76	1	1.3
Linköping SUR	195	1	0.5
Luleå SUR	199	11	5.5

Unit	Number of surgeries	Number of recurrence paresis at 6w	Recurrence of paresis after 6 months %
Norrköping SUR	190	1	0.5
Nyköping SUR	147	4	2.7
Sundsvall SUR	196	3	1.5
Trollhättan SUR	302	9	3.0
Uppsala SUR	487	3	0.6
Varberg SUR	232	3	1.3
Värnamo SUR	57	1	1.8
Västervik SUR	145	3	2.1
Västerås SUR	197	6	3.0
Växjö SUR	48	0	0.0
Örebro SUR	239	5	2.1
Umeå SUR	416	10	2.4
Karlstad ENT	174	2	1.1
Halmstad ENT	48	1	2.1
Helsingborg ENT	29	1	3.4
Karlskrona ENT	91	1	1.1
Örebro ENT	226	12	5.3
Västerås ENT	166	1	0.6
Total	10257	262	2.6

11.4.7 Hypocalcaemia after bilateral thyroid surgery. Target 3% Data 2017–2020. NB! Data after 6 months are not reported as validation studies have shown that under-reporting occurs

Unit	Number of surgeries	Hypocalcaemia upon discharge %	Hypocalcaemia after 6 weeks %
Borås SUR	68	27.9	11.8
Carlanderska	327	11.9	4.3
Eksjö SUR	71	1.4	4.2
Falun SUR	88	27.3	15.9
Gastro Centre Skåne	2	0.0	0.0
Gävle SUR	109	25.7	11.9
Gothenburg SUR	532	18.8	10.0
Halmstad SUR	47	4.3	10.6
Halmstad ENT	2	50.0	0.0
Helsingborg ENT	4	0.0	0.0

Unit	Number of surgeries	Hypocalcaemia upon discharge %	Hypocalcaemia after 6 weeks %
Jönköping SUR	70	18.6	18.6
Kalmar SUR	33	9.1	6.1
Karlskrona SUR	86	20.9	3.5
Karlskrona ENT	21	14.3	4.8
Karlstad SUR	90	8.9	7.8
Karlstad ENT	38	2.6	0.0
Kristianstad SUR	82	4.9	1.2
Kungälv SUR	20	25.0	5.0
Linköping SUR	57	28.1	7.0
Luleå SUR	59	5.1	3.4
Lund SUR	458	12.4	8.3
Norrköping SUR	69	17.4	8.7
Nyköping SUR	66	10.6	13.6
Solna SUR	435	14.9	8.0
Sundsvall SUR	97	21.6	11.3
Trollhättan SUR	110	10.0	5.5
Umeå SUR	158	25.3	16.5
Uppsala SUR	220	25.9	9.1
Varberg SUR	50	4.0	0.0
Värnamo SUR	27	0.0	0.0
Västervik SUR	82	17.1	11.0
Västerås SUR	99	14.1	7.1
Västerås ENT	20	15.0	5.0
Växjö SUR	16	0.0	6.3
Örebro SUR	143	3.5	7.7
Örebro ENT	42	14.3	9.5
Östersund SUR	57	14.0	5.3
Total	3955	15.4	8.4

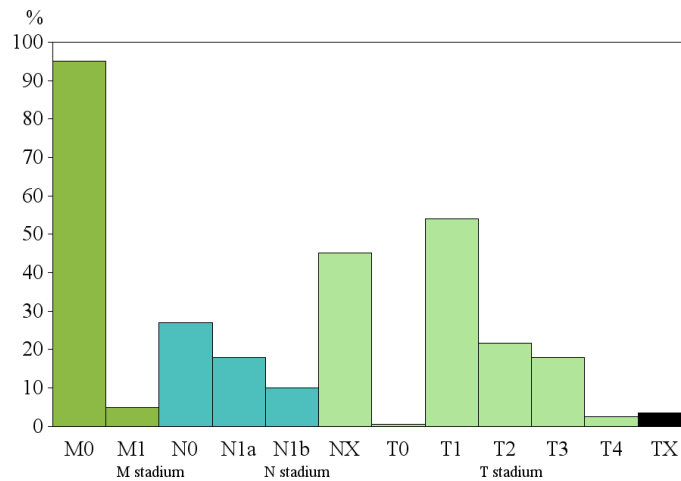
11.5. SURGICAL TREATMENT OF THYROID CANCER

In 2020, 436 operations were registered where PAD showed cancer. 72% were women and the average age was 53 (11-89). Papillary cancer accounted for almost 72% of all cancer cases. Just over half of the cancer tumours were small tumours (T1).

Unit	Number of thyroid cancers
Borås SUR	6
Carlanderska	22
Falun SUR	8
Gastro Centre Skåne	31
Gävle SUR	12
Gothenburg SUR	97
Halmstad ENT	1
Jönköping SUR	3
Karlskrona SUR	5
Karlskrona ENT	2
Karlstad SUR	1
Karlstad ENT	5
Kristianstad SUR	3
Kungälv SUR	4
Linköping SUR	22
Luleå SUR	13
Lund SUR	70
Nyköping SUR	7
Solna SUR	16
Sundsvall SUR	6
Trollhättan SUR	20
Umeå SUR	32
Uppsala SUR	2
Västerås ENT	6
Örebro SUR	9
Örebro ENT	9
Östersund SUR	11
Total	436

Histology thyroid cancer	Number	%
Papillary cancer T-96 M-82603	312	71.6
Follicular cancer T-96 M-83303	62	14.2
Lymph node metastasis papillary cancer T-082 M-82606	16	3.7
Medullary cancer T-9605 M-85103	15	3.4
Anaplastic cancer T-96 M-80123	5	1.1
Metastasis from malignant tumour UNS T-96 M-80006	5	1.1
Lymph node metastasis follicular cancer 1-082 M-83306	4	0.9
Hürtle cell (oxyphilic) carcinoma T-96 M-82903	3	0.7
Lymph node metastasis medullary cancer T082 M-85106	3	0.7
Poorly differentiated thyroid cancer	3	0.7
Lymphoma T-96 M-95903	2	0.5
Metastasis from cancer UNS T-96 M-80106	2	0.5
Hürtle cell (oxyphilic) adenoma T-96M-82900	1	0.2
Malignant tumour UNS T-96 M-80003	1	0.2
Non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP)	1	0.2
Well differentiated tumour of uncertain malignant potential (WDT-UMP)	1	0.2
Total	436	100.0

Thyroideacancer TNM stadium



Distribution of small and large tumours and lymph node metastases in 436 cancer cases recorded in SQRTPA 2020

Unit	Number of thyroid cancer cases in 2020	Indication Malignancy %	Indication exclusively from malignancy %	Benign indication %
Borås SUR	6	33	50	17
Carlanderska	22	14	9	77
Falun SUR	8	13	63	25
Gastro Centre Skåne	31	6	81	13
Gävle SUR	12	25	42	33
Gothenburg SUR	97	46	36	18
Halmstad SUR	3	0	100	0
Halmstad ENT	1	0	100	0
Jönköping SUR	3	33	67	0
Karlskrona SUR	5	0	80	20
Karlskrona ENT	2	0	100	0
Karlstad SUR	1	100	0	0
Karlstad ENT	5	60	20	20
Kristianstad SUR	3	0	0	100
Kungälv SUR	4	0	75	25
Linköping SUR	22	32	36	32
Luleå SUR	13	23	46	31
Lund SUR	70	56	37	7
Norrköping SUR	4	0	25	75
Nyköping SUR	7	43	57	0
Solna SUR	16	50	31	19
Sundsvall SUR	6	33	50	17
Trollhättan SUR	20	35	50	15
Umeå SUR	32	16	72	13
Uppsala SUR	2	50	50	0
Varberg SUR	3	0	67	33
Västervik SUR	2	0	100	0
Västerås ENT	6	33	33	33
Växjö SUR	1	0	100	0
Örebro SUR	9	22	44	33
Örebro ENT	9	33	44	22
Östersund SUR	11	82	0	18
Total	436	35	44	21

Out of all cancer cases operated on in 2020, 21% had a completely benign indication. The majority of these had a small tumour but also tumours of type T3 and T4 were present in this group.

For 216 of the procedures, concomitant lymph node surgery was performed. 11 units performed 5 or fewer lymph node surgeries in 2020.

Unit	Number of lymph node surgeries
Borås SUR	1
Carlanderska	6
Falun SUR	3
Gävle SUR	4
Gothenburg SUR	63
Halmstad SUR	3
Jönköping SUR	1
Karlstad SUR	1
Karlstad ENT	6
Kungälv SUR	1
Linköping SUR	20
Luleå SUR	6
Lund SUR	28
Nyköping SUR	1
Solna SUR	6
Sundsvall SUR	1
Trollhättan SUR	8
Umeå SUR	7
Uppsala SUR	13
Varberg SUR	2
Västervik SUR	10
Västerås ENT	4
Örebro SUR	7
Örebro ENT	6
Östersund SUR	8
Total	216

11.6. EU TIRADS

In addition to clinical examination and functional tests, modern thyroid evaluations always have ultrasound examinations of the thyroid gland performed. When assessing nodules, ultrasound is the most important examination. Based on the ultrasound examination, it is determined whether to proceed and take a cell sample (fine needle puncture). After a national meeting in Malmö in 2019 with representatives of various associations with an interest in thyroid disease (radiologists, cytologists, endocrinologists, surgeons, ENT doctors, oncologists, etc.), it was decided to use an established classification system (EU TIRADS) in assessing thyroid nodules in Sweden and in SQRTPA. The system classifies nodules on a scale of 1-5:

EU TIRADS Classification

- **EU-TIRADS 1:** no nodule
- **EU-TIRADS 2:** benign
- **EU-TIRADS 3:** low risk (oval, smooth margin, iso / hyperechoic, no high risk features)
- **EU-TIRADS 4:** intermediate risk (oval, smooth margin, mildly hypoechoic, no high risk features)
- **EU-TIRADS 5:** any high risk features (non-oval, irregular margin, microcalcifications, marked hypoechogenicity)

From each class there are calculations of the risk of malignancy when assessing a nodule in the thyroid gland and studies have shown the following distribution:

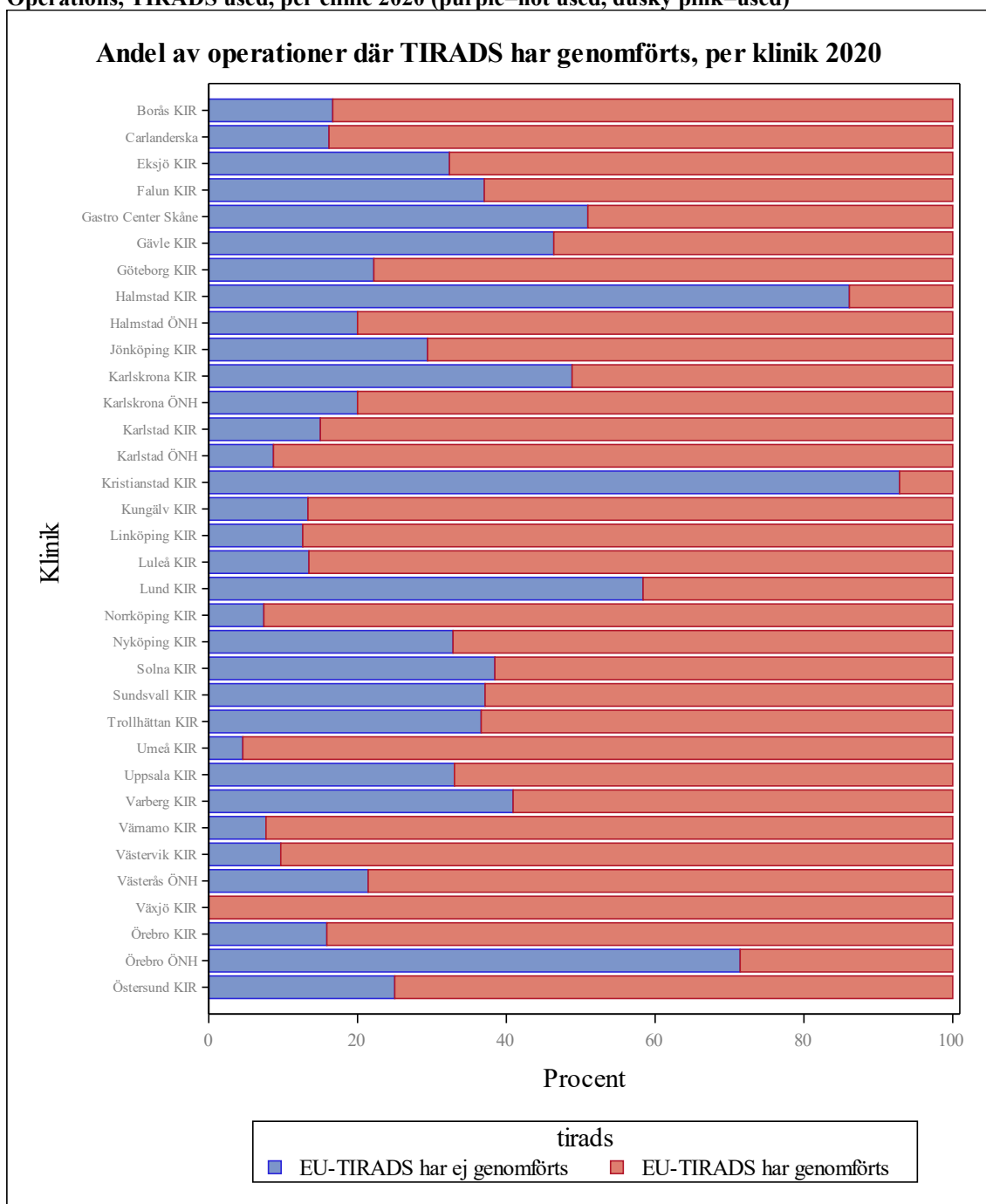
Risk of malignancy

- **EU-TIRADS 1:** n/a
- **EU-TIRADS 2:** 0%
- **EU-TIRADS 3:** low risk (2–4%)
- **EU-TIRADS 4:** intermediate risk (6–17%)
- **EU-TIRADS 5:** high risk (26–87%)

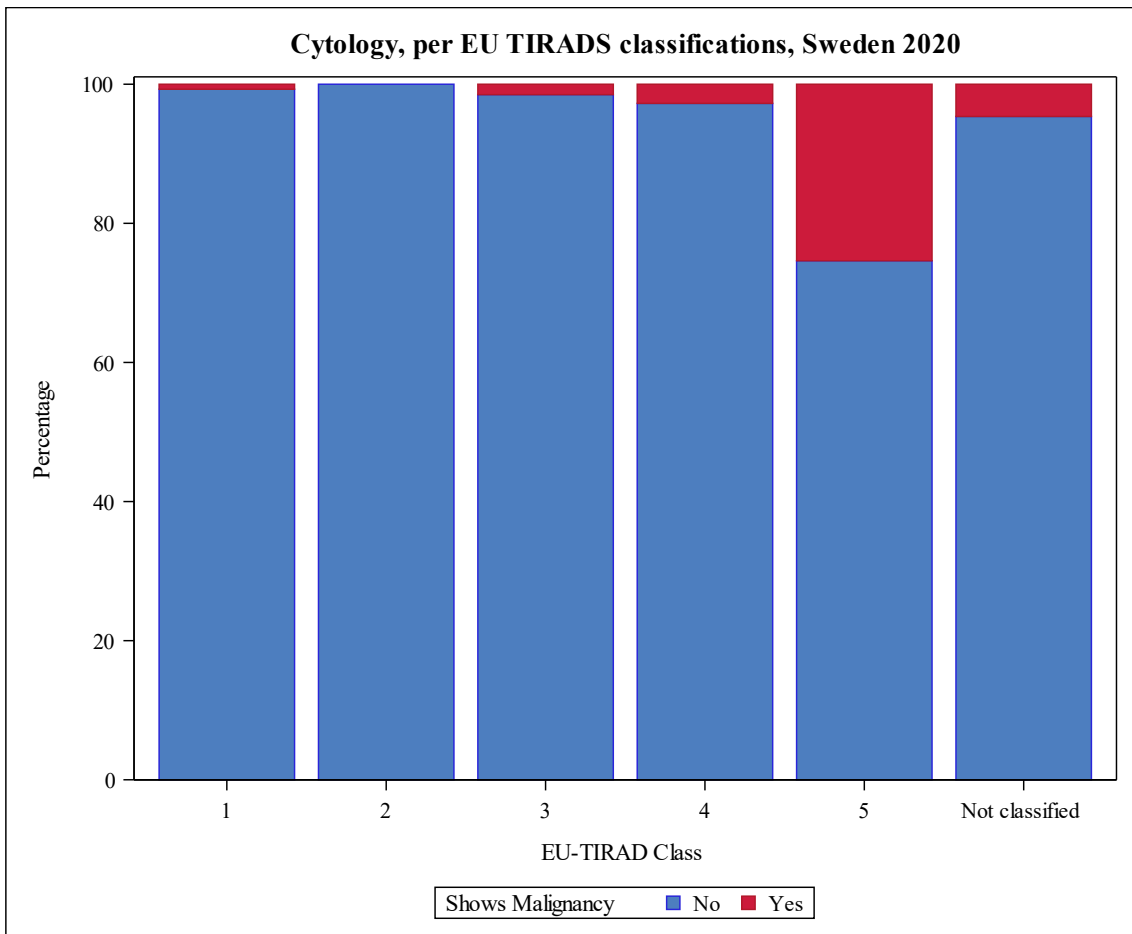
This year's annual report includes an initial summary of how often the TIRADS system is used in Sweden and how each class (1-5) correlates to malignant PAD.



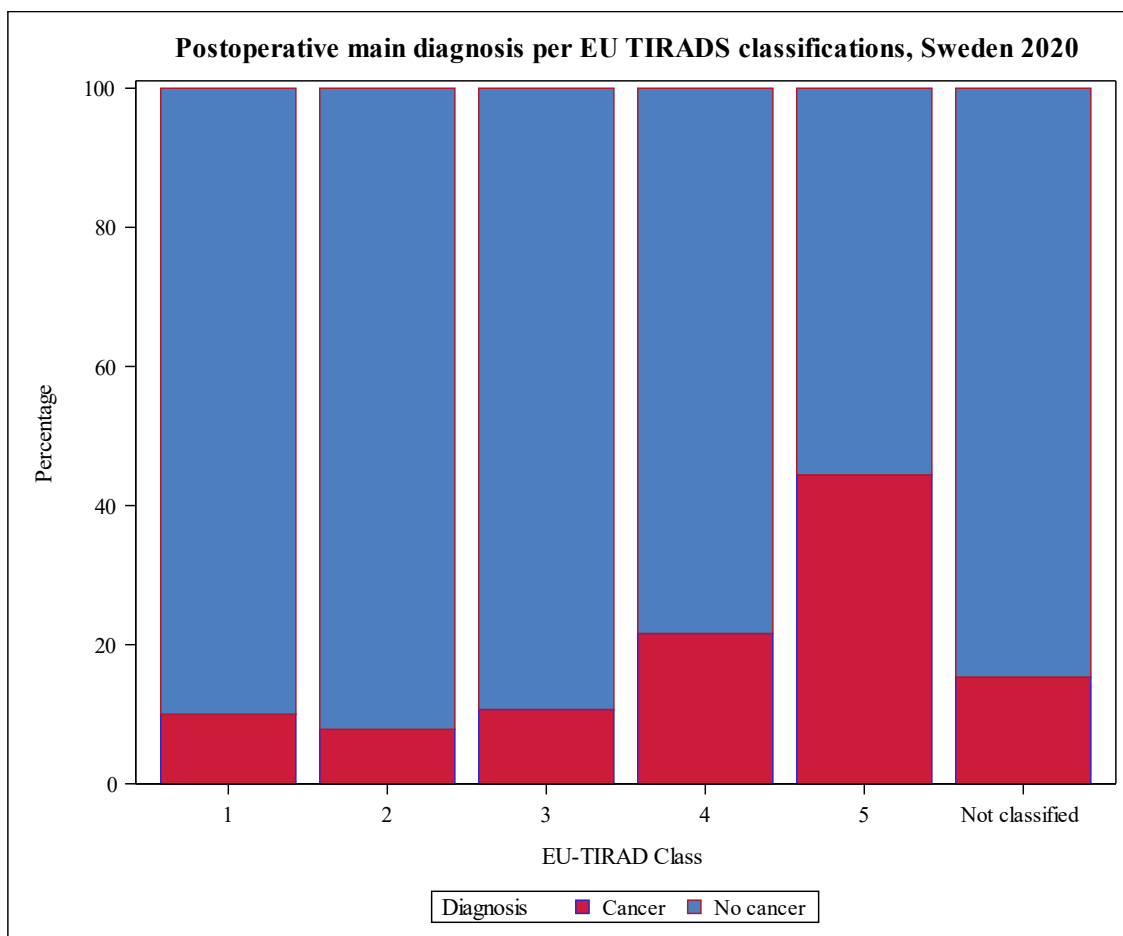
Operations, TIRADS used, per clinic 2020 (purple=not used, dusky pink=used)



It can be seen that in total, the TIRADS system has been used in 69% of cases that have since been operated on and are registered in SQRTPA. The figure above shows that there are very large differences between the units. Whether this is due to a correct difference in the TIRADS classification used or if it is registration error/bias cannot of course be determined.



If you study TIRADS classes and correlate to malignant cytology i.e., Bethesda 6, you will see that in all TIRADS groups 3, 4 and 5 there were nodules that were cytologically assessed as malignant.



If you look instead at the end PAD, it is noted that there are patients with malignant PAD in all TIRADS groups. However, it should be borne in mind that the group "cancer" also includes microcancers.

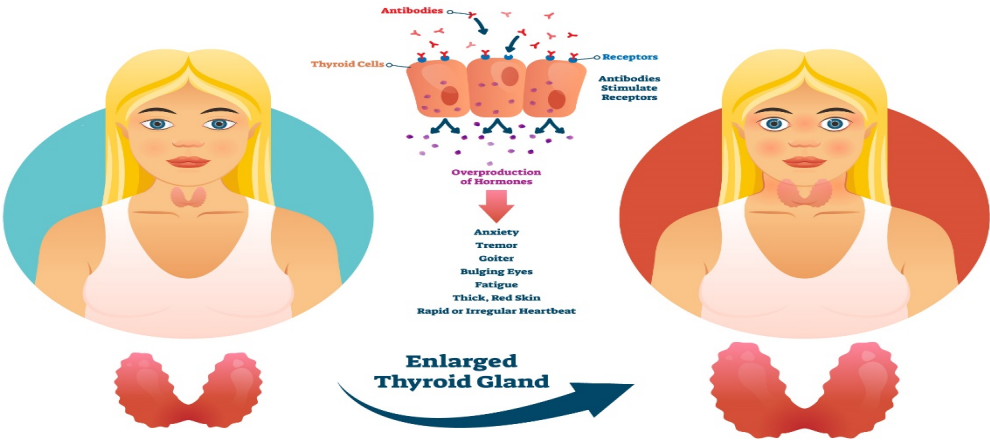
Overall, the EU TIRADS has become standard in Sweden in a short period of time and was used in 2020 in about 70% of the cases. The accuracy of TIRADS 5 is just under 55%, i.e. 55% had cancer in the end PAD.

11.7. SURGICAL TREATMENT OF GRAVES' DISEASE

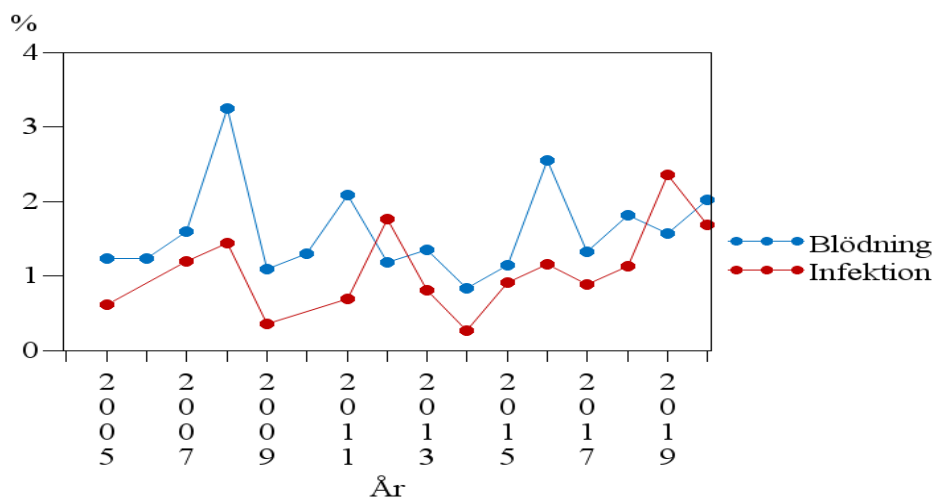
In Graves' disease, the thyroid gland becomes overactive and the patient suffers from palpitations, agitation, anxiety and sometimes eye problems. Most often, treatment with thyreostatics is initiated, but approximately 25% of patients with Graves' disease will at some point be subjected to surgical treatment.

In 2020, 296 patients with Graves' disease were registered in SQRTPA. The average age was 39 years (15-82). 14% of the patients were parathyroid transplanted during surgery. 94% of the patients underwent total thyroidectomy. Postoperatively, 2% suffered bleeding and 1.7% infection. During the inpatient period, 1.5% required intravenous calcium treatment. Unilateral vocal cord paralysis occurred after 6 weeks in 1.7% and after 6 months in 1.3%. 20% were medicated after 6 weeks with calcium and/or vitamin D and 10% still had ongoing calcium treatment and/or vitamin D after 6 months due to hypoparathyroidism.

GRAVES' DISEASE



Unit	Surgeries for Graves' disease 2020
Carlanderska	54
Eksjö SUR	4
Falun SUR	16
Gävle SUR	6
Gothenburg SUR	54
Halmstad SUR	2
Jönköping SUR	7
Karlskrona SUR	17
Karlstad SUR	8
Kristianstad SUR	4
Kungälv SUR	2
Linköping SUR	3
Luleå SUR	3
Lund SUR	25
Norrköping SUR	5
Nyköping SUR	14
Solna SUR	21
Sundsvall SUR	9
Trollhättan SUR	11
Umeå SUR	7
Uppsala SUR	2
Varberg SUR	1
Värnamo SUR	2
Västervik SUR	7
Örebro SUR	12
Total	296



The frequency of postoperative bleeding and after infection with surgical treatment of Graves' disease in Sweden.

Data SQRTPA 2004-2020.

In 2020, SQRTPA recorded 296 procedures for Graves' disease. 2% suffered from bleeding, 1.7% from infection and just under 4% had unilateral vocal cord paralysis after 6 weeks. After 6 months, 10% were medicated with calcium and or vitamin D as a sign of parathyroid failure after surgery.

11.8. Thyroid surgery and Covid

The corona pandemic has affected the whole of society and healthcare. The annual report of SQRTPA included an effort to map the impact on thyroid surgery. The data below shows that there has been a strong impact. We have compared the panorama in terms of volumes, indication, waiting times and PAD i.e. final diagnosis.

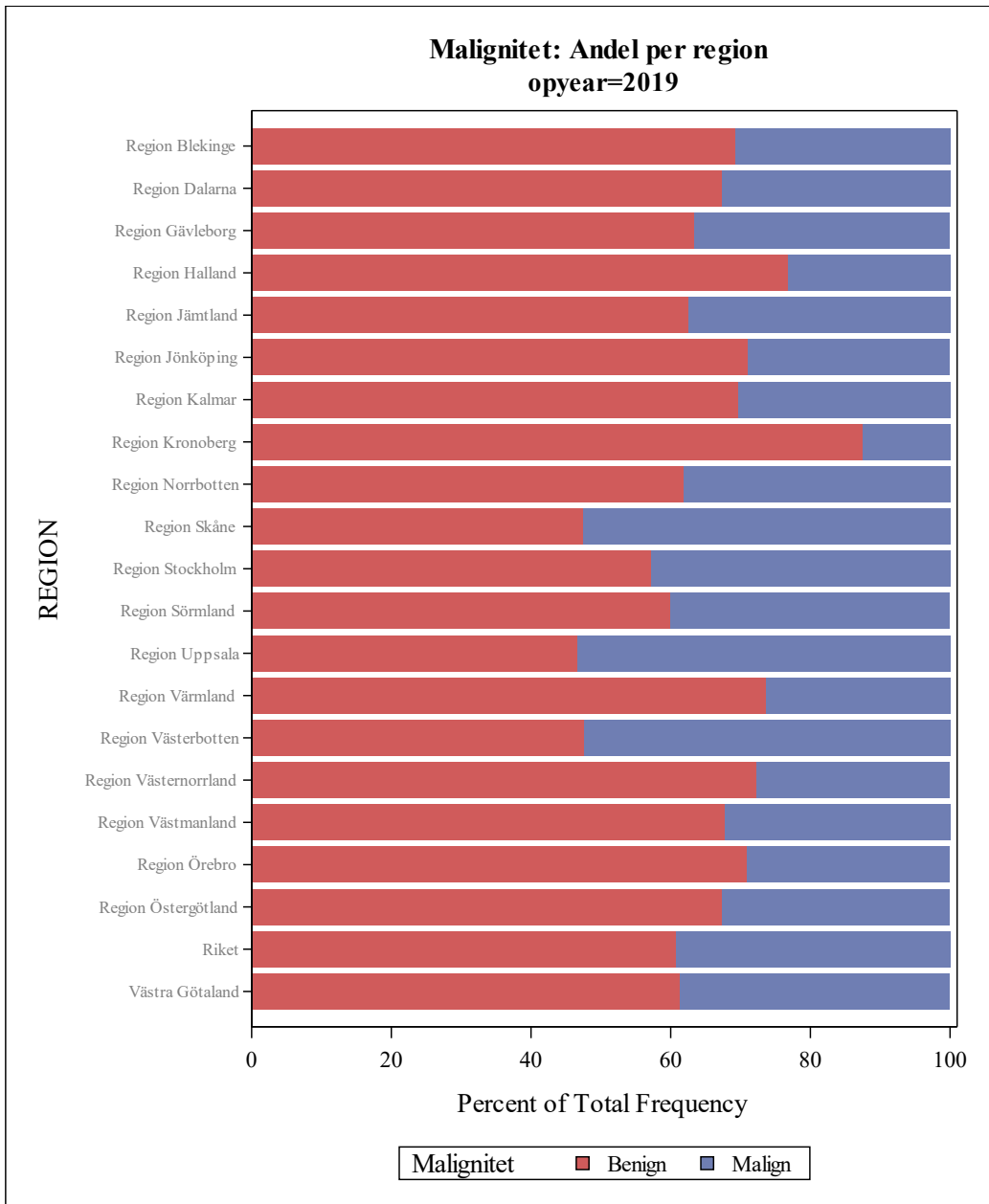
Region and unit	Thyroid surgeries 2019	Thyroid surgeries 2020
State	2631	2181
Region Blekinge	79	58
Region Dalarna	53	54
Region Gävleborg	82	69

Region and unit	Thyroid surgeries 2019	Thyroid surgeries 2020
Region Halland	142	73
Region Jämtland	48	28
Region Jönköping	91	81
Region Kalmar	56	31
Region Kronoberg	8	2
Region Norrbotten	55	52
Region Skåne	506	382
Region Stockholm	14	65
Region Sörmland	80	67
Region Uppsala	118	109
Region Värmland	91	43
Region Västerbotten	108	131
Region Västernorrland	47	35
Region Västmanland	100	14
Region Örebro	97	98
Region Östergötland	141	122
Västra Götaland	715	667
Borås SUR	35	18
Carlanderska	210	198
Eksjö SUR	34	34
Falun SUR	53	54
Gastro Centre Skåne	106	157
Gävle SUR	82	69
Gothenburg SUR	382	365
Halmstad SUR	33	36
Halmstad ENT	16	15
Helsingborg ENT	13	.
Jönköping SUR	45	34
Kalmar SUR	17	.
Karlskrona SUR	55	43
Karlskrona ENT	24	15
Karlstad SUR	40	20
Karlstad ENT	51	23
Kristianstad SUR	96	28
Kungälv SUR	13	15
Linköping SUR	70	95
Luleå SUR	55	52
Lund SUR	291	197
Norrköping SUR	71	27
Nyköping SUR	80	67
Solna SUR	14	65

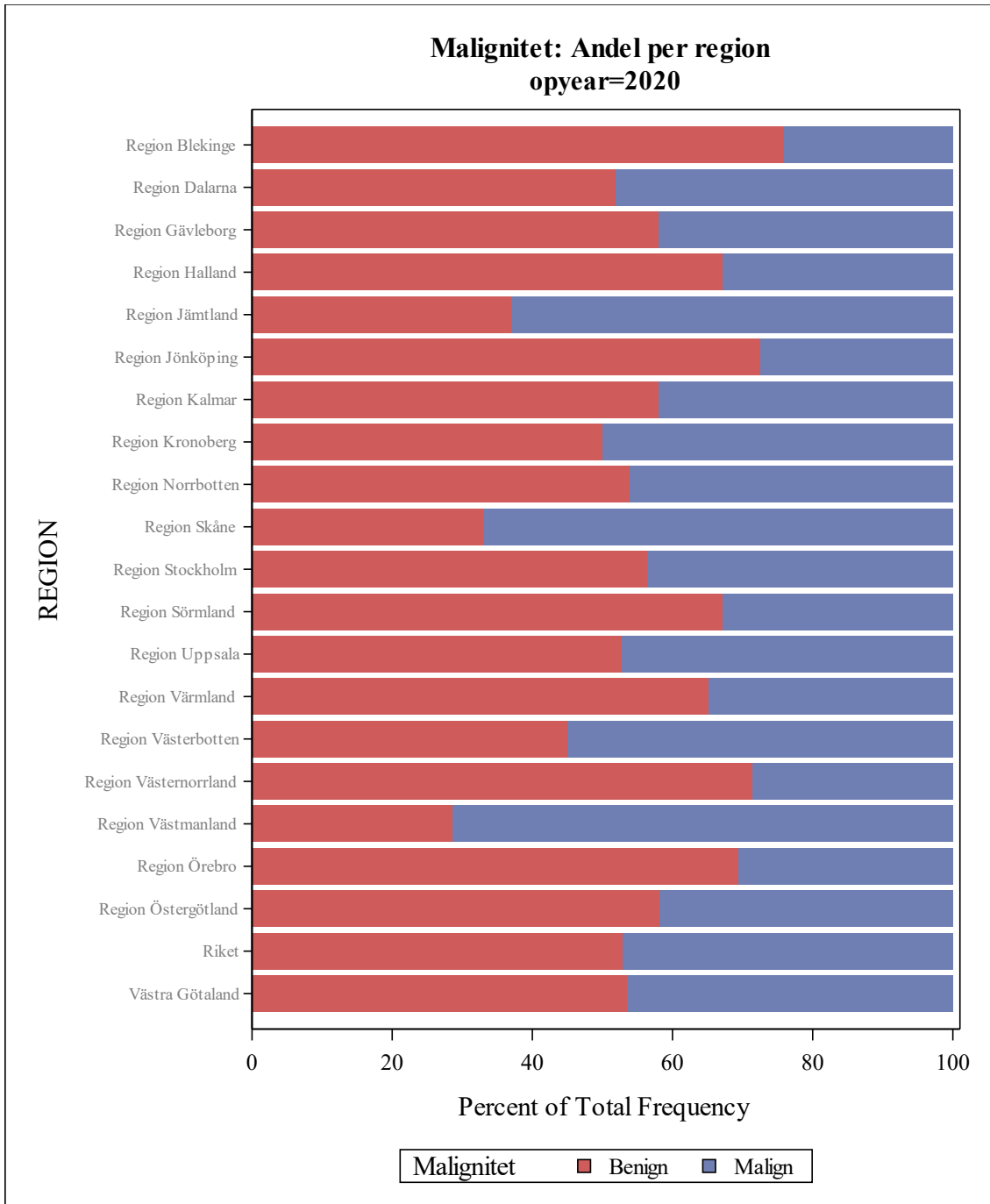
Region and unit	Thyroid surgeries 2019	Thyroid surgeries 2020
Sundsvall SUR	47	35
Trollhättan SUR	75	71
Umeå SUR	108	131
Uppsala SUR	118	109
Varberg SUR	93	22
Värnamo SUR	12	13
Västervik SUR	39	31
Västerås SUR	48	.
Västerås ENT	52	14
Växjö SUR	8	2
Örebro SUR	53	63
Örebro ENT	44	35
Östersund SUR	48	28

The table above compares the number of registered thyroid surgeries across the country, each region and in each unit in 2019 vs. 2020. The trend is that there were fewer operations in total in 2020, i.e. during the pandemic, compared to 2019. For each unit and region, there are possible sources of error. For example, the coverage in the Stockholm region in both 2019 and 2020 was very poor.

Malignancy per region, op year=2019, dusky pink= benign, purple= malignant

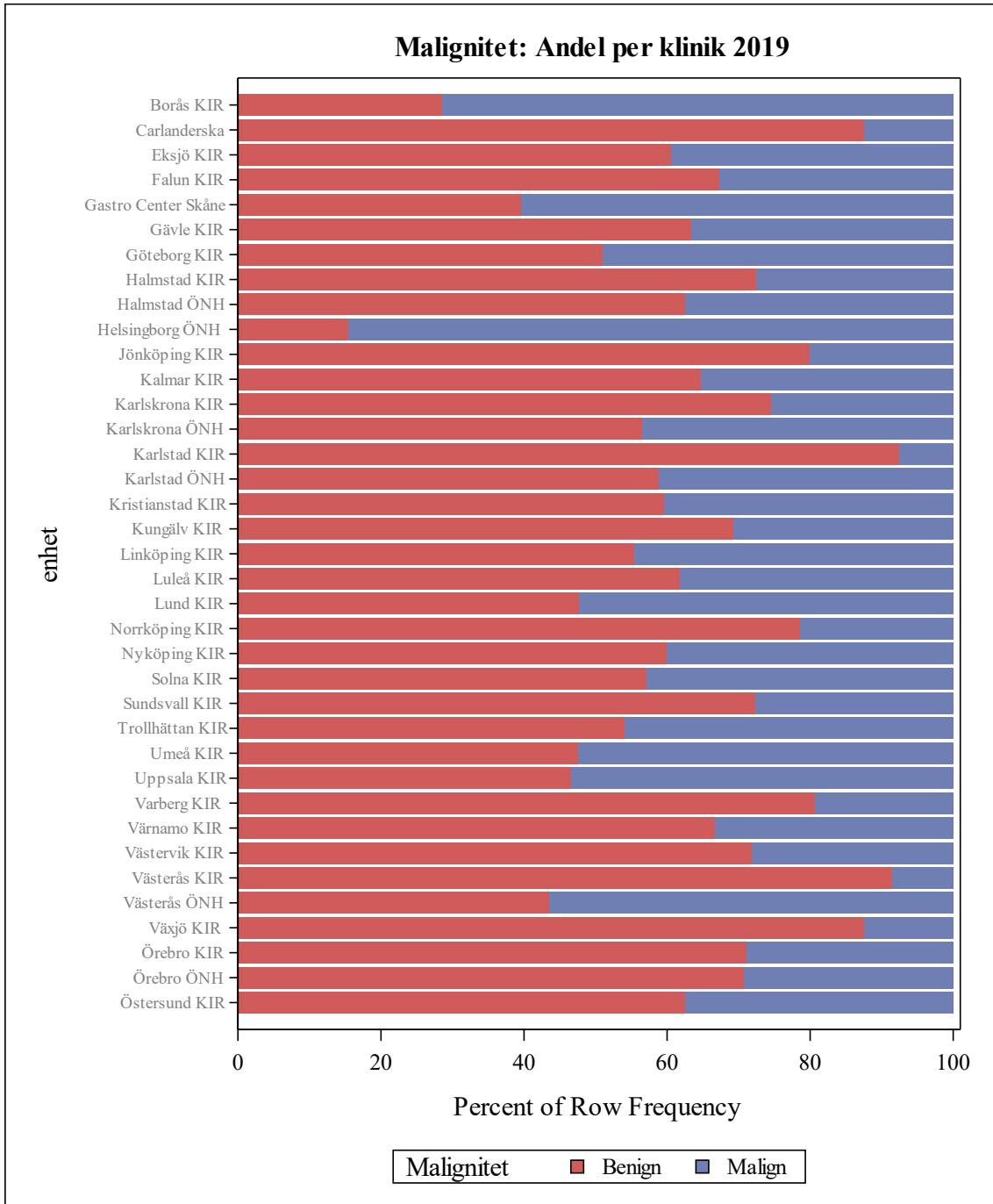


Malignancy per region, op year=2020, dusky pink= benign , purple=malignant

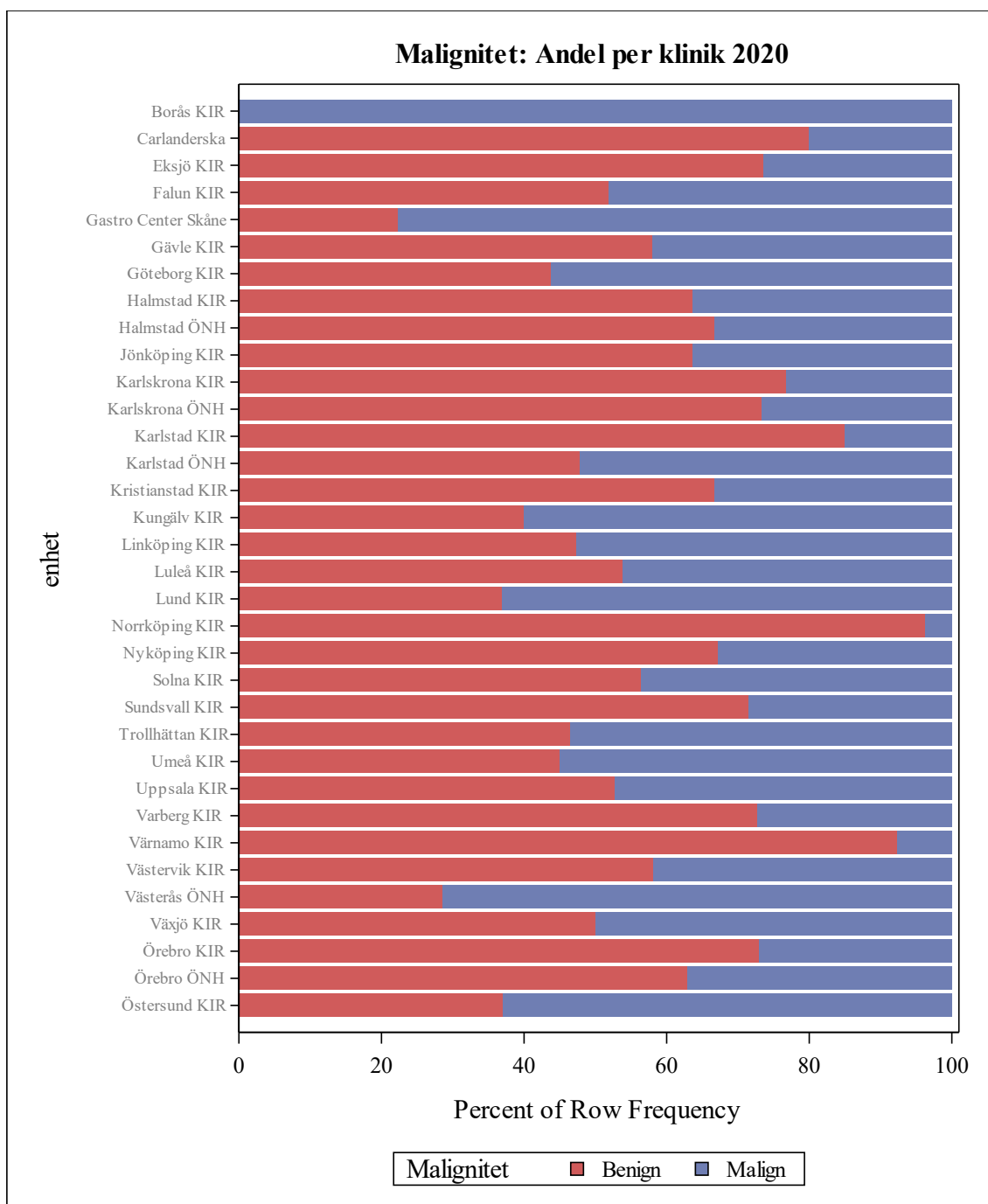


The graphics above describe the relationship between malignant indication and benign indication in the year prior to the pandemic (2019) and during the pandemic (2020). It is clear that patients with a benign indication have been turned away during the pandemic. It is also striking that there are major differences between the regions in terms of turning them away. In Västmanland, for example, very few patients with benign indication have had surgery during the pandemic, while in Blekinge, for example, it does not appear to have been affected. Malignant indication in the graphics: Cancer, exclusion of cancer and additional surgery of established cancer.

Malignancy per clinic 2019, dusky pink= benign, purple=malignant



Malignancy per clinic 2020, dusky pink= benign, purple=malignant



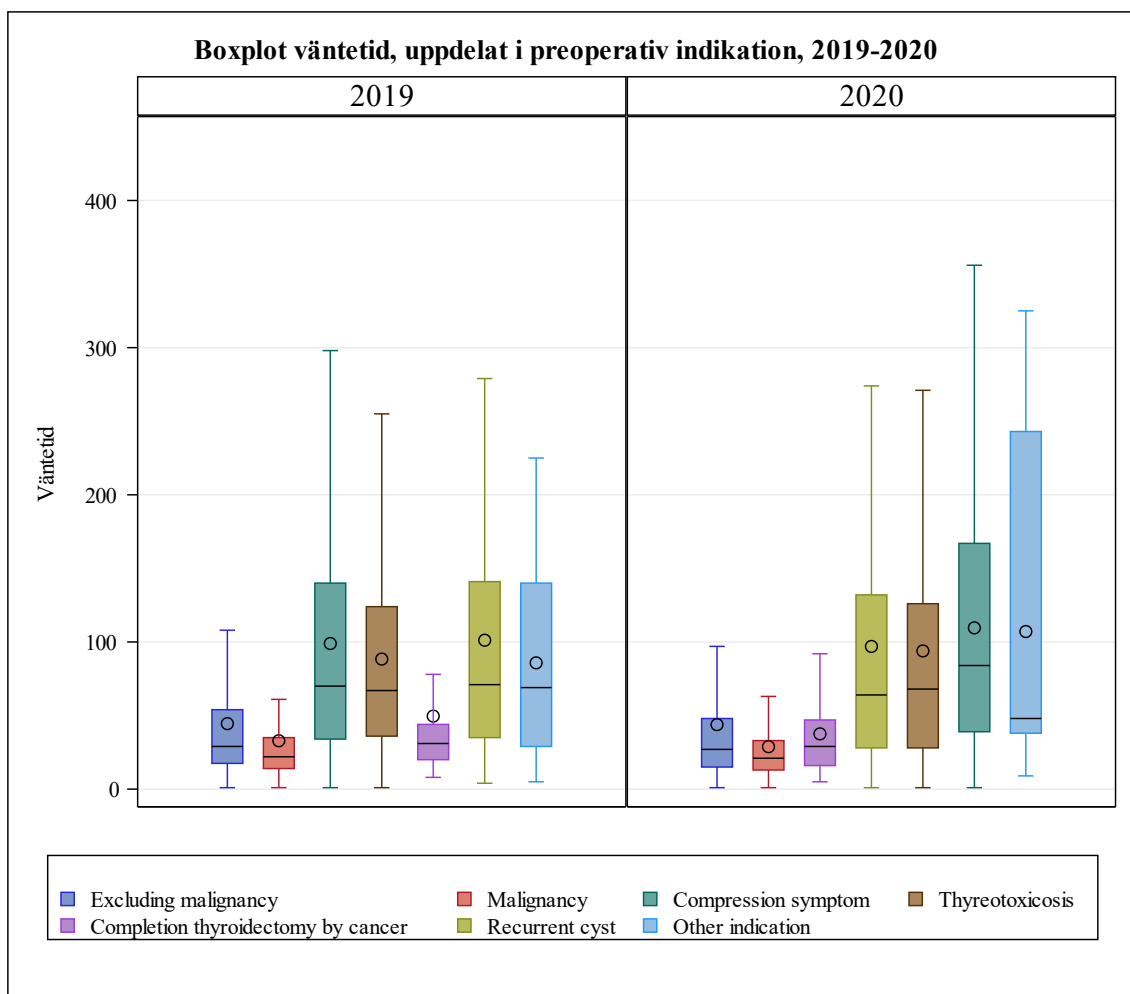
The tables above compare the indication for surgery prior to the pandemic and during the pandemic. When interpreting the data, it must be noted that there is a case mix that can explain both distribution but also no changes during the pandemic. There is a clear trend in the state that patients with benign indication have not received care and the units handling both benign and malignant surgery will display the difference the most.

Bethesda	Cytology preoperative according to Bethesda system	2019 %	2020 %
1	Non-diagnostic or unsatisfactory	7.2	6.5
2	Benign	44.4	36.9
3	Atypia of undetermined significance or follicular lesion of undetermined significance	17.5	18.8
4	Follicular neoplasm or suspicious follicular neoplasm	17.5	23
5	Suspicious for malignancy	5.7	6.3
6	Malignant	7.6	8.3

The table above shows the distribution of fine needle puncture cytology prior to thyroid surgery the year prior to the pandemic and during the pandemic. The most evident difference is that the proportion with completely benign cytology decreased during the pandemic.

Waiting times for different indications for thyroid surgery 2019					
Indication	N Obs	Mean	Median	Minimum	Maximum
Supplemental cancer surgery	70	49.6142857	31.0000000	8.0000000	356.0000000
Benign goitre with pressure symptoms	822	98.9416058	70.0000000	1.0000000	364.0000000
Exclusion of cancer	632	44.5000000	29.0000000	1.0000000	348.0000000
Cancer	183	32.8743169	22.0000000	1.0000000	283.0000000
Other indications	26	85.8076923	69.0000000	5.0000000	225.0000000
Recurrent cyst	27	101.1851852	71.0000000	4.0000000	344.0000000
Thyrotoxicosis (hyperthyroidism)	493	88.3793103	67.0000000	1.0000000	356.0000000
Waiting times for different indications for thyroid surgery 2020					
Indication	N Obs	Mean	Median	Minimum	Maximum
Supplemental cancer surgery	75	37.5466667	29.0000000	5.0000000	131.0000000
Benign goitre with pressure symptoms	558	109.5788530	84.0000000	1.0000000	360.0000000
Exclusion of cancer	643	43.8211509	27.0000000	1.0000000	334.0000000
Cancer	179	28.8491620	21.0000000	1.0000000	217.0000000
Other indications	11	107.0909091	48.0000000	9.0000000	325.0000000
Recurrent cyst	27	96.9629630	64.0000000	1.0000000	339.0000000
Thyrotoxicosis (hyperthyroidism)	408	93.9142157	68.0000000	1.0000000	363.0000000

Waiting times i.e. time from surgery decision to surgery date have been compared for 2019 and 2020. The big difference concerns patients with benign goitre where waiting times have increased from an average of 70 days in the state to 84 days



Waiting times i.e. time from decision to perform thyroid surgery throughout the state in 2019 vs. 2020. Waiting times for cancer patients have not deteriorated during the pandemic

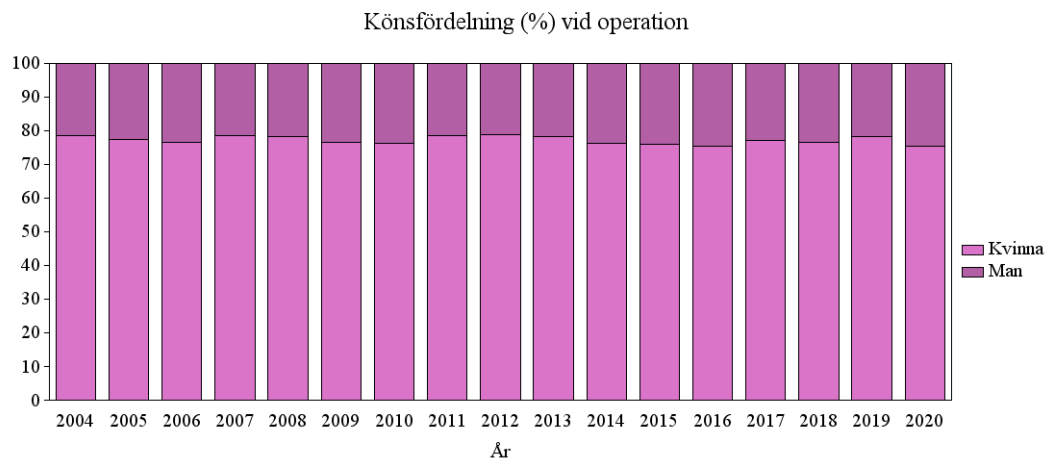
PAD after thyroid surgery State	Surgery year	Number	%
Follicular adenoma	2019	216	4.4888
Follicular adenoma	2020	210	4.3641
Graves' disease	2019	382	7.9385
Graves' disease	2020	296	6.1513
Nodular goitre	2019	1213	25.2078
Nodular goitre	2020	850	17.6642
Papillary thyroid cancer	2019	315	6.5461
Papillary thyroid cancer	2020	261	5.4239

The table above shows the most common main PAD after thyroid surgery prior to the pandemic and during the pandemic (2020). Most clearly, the proportion with benign PAD (nodular goitre) decreased during the pandemic.

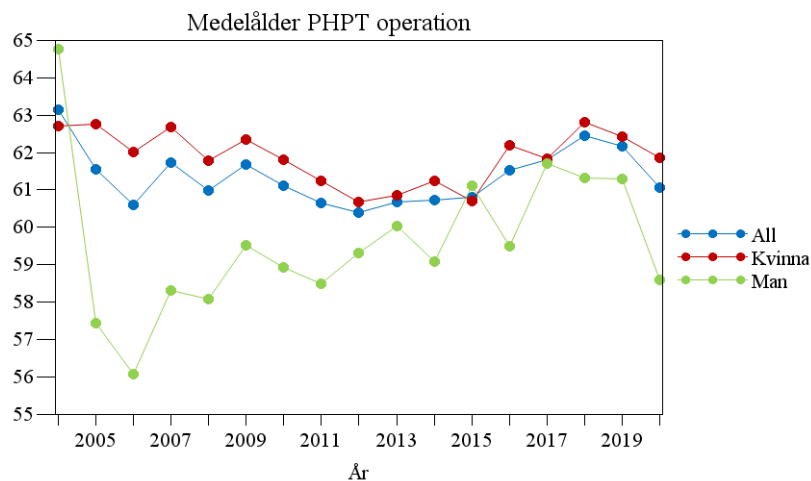
12. Surgical treatment of primary hyperparathyroidism

12.1. VOLUME and AGE AND GENDER DISTRIBUTION

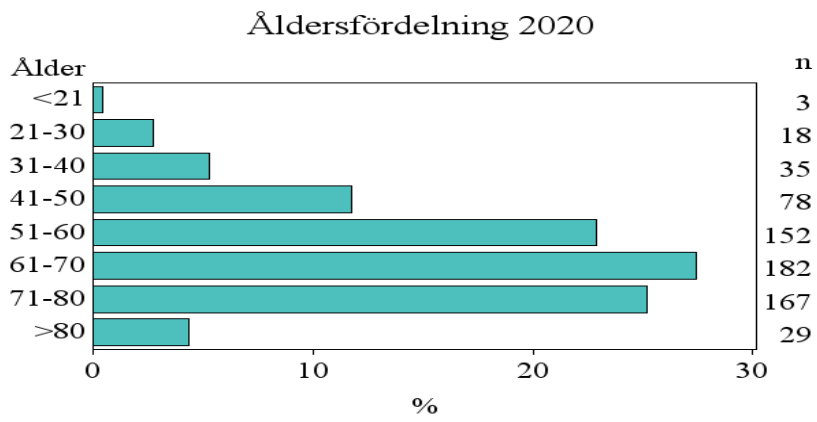
In 2020, 664 operations for primary hyperparathyroidism (PHPT) were recorded. 75% of those operated were women and the average age was 61 (12-87). 1.6% were reported to have some form of hereditary syndrome as the cause of their PHPT, of which MEN 1 was most common (1.1%).



Gender distribution PHPT surgery Sweden. Data SQRTPA 2004-2020.



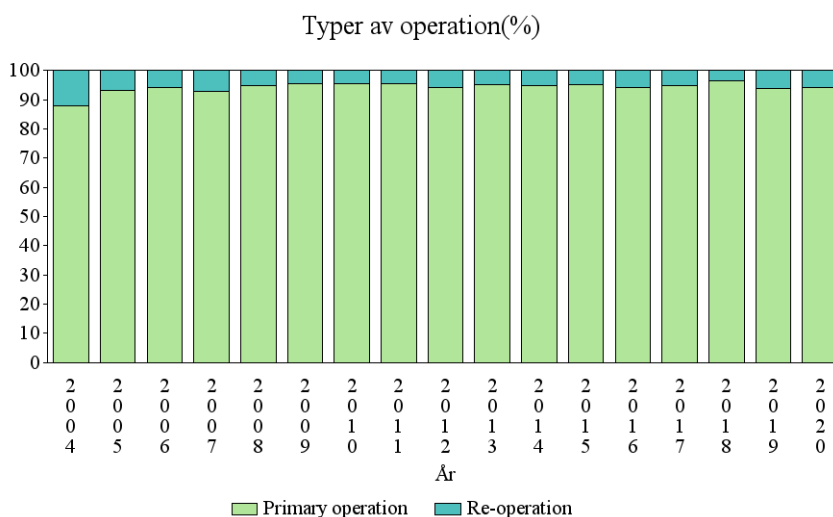
Average age at PHPT surgery. Data SQRTPA 2004-2020.



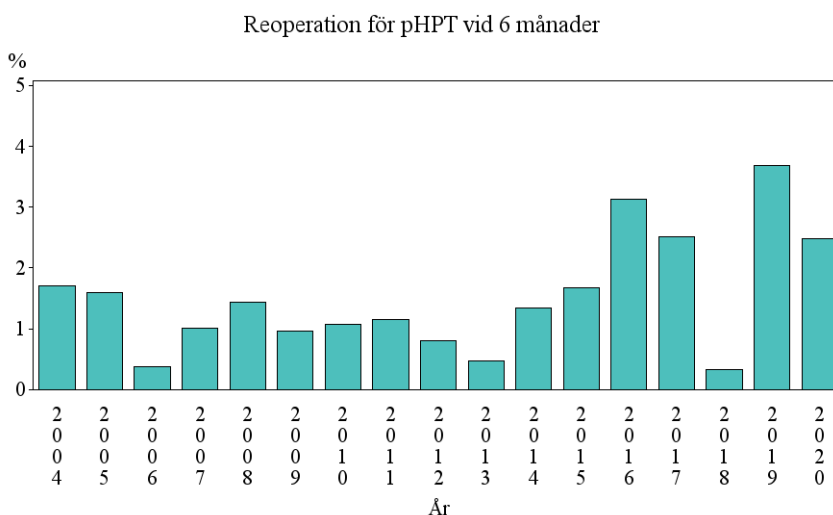
Age distribution PHPT surgery in Sweden 2020

12.2. Reoperation rate, calcium values and symptoms

In 2020, reoperations accounted for 6% of all PHPT operations. The preoperative calcium values that have been reducing for several years have turned upwards and continued to decline in 2020, averaging 2.64 mmol/L. One might suspect that this is a corona effect. I.e., only sicker patients with PHPT have turned up for surgery in 2020. 88% of PHPT patients who had surgery in 2020 were reported to have symptoms from their disease and of all who had surgery, 24% reported suffering from fatigue and 17% of osteopenia/osteoporosis.

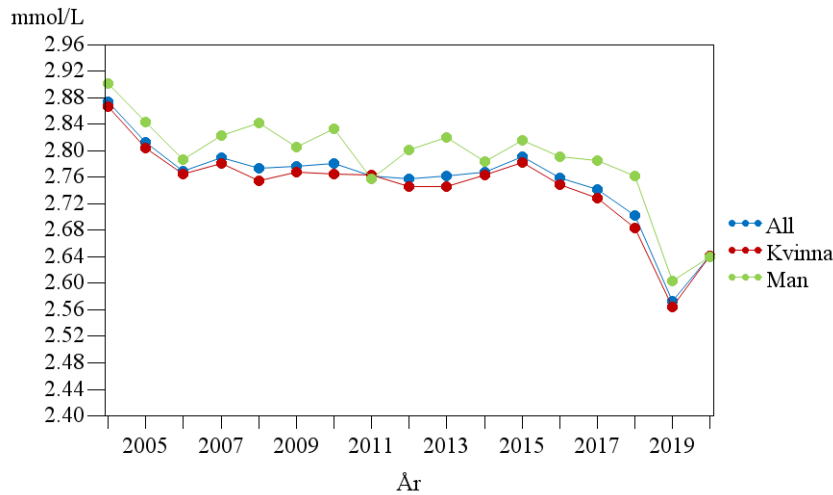


In 2020, the proportion of reoperations accounted for approximately 6% of all PHPT operations. SQRTPA 2004-2020



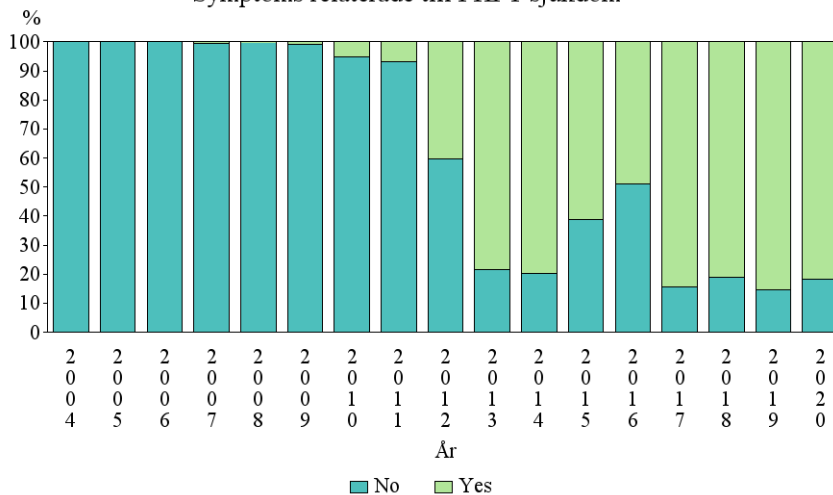
Within 6 months, just over 2% of patients who have undergone PHPT surgery have had to have a reoperation.

Preoperativa kalkvärden



Calcium values prior to PHPT surgery continue to decrease. Data SQRTPA 2004-2019

Symptoms relaterade till PHPT sjukdom

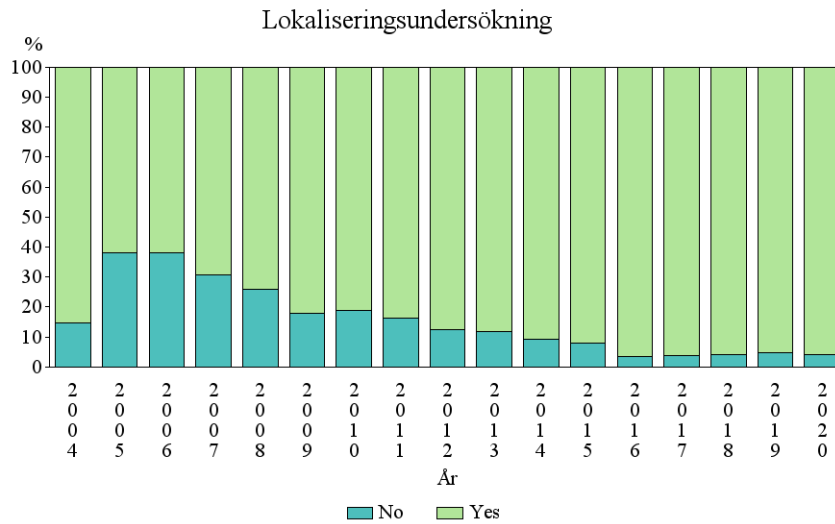


Just over 85% of patients operated for PHPT in 2020 were reported to have symptoms of their disease.

12.3. Localisation of parathyroid gland before surgery

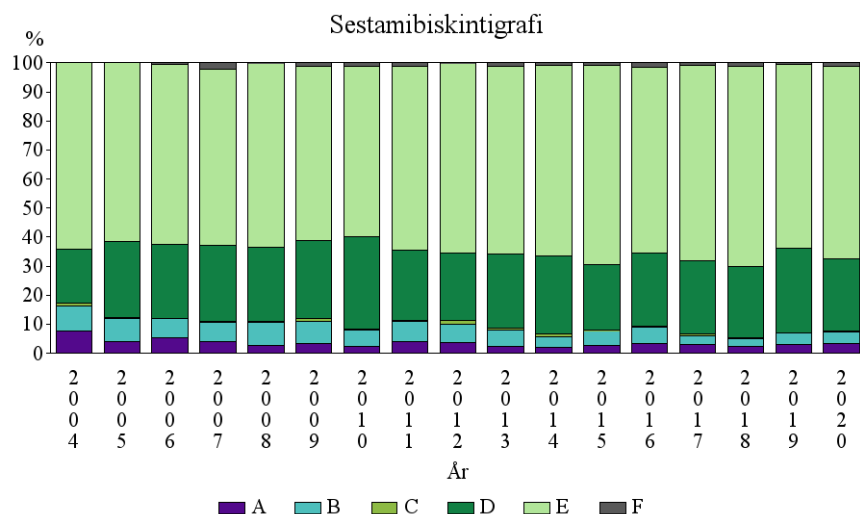
At the classic PHPT operation, a bilateral neck exploration was made and all 4 glands were identified and the diseased gland(s) were extirpated. Nowadays, 95% of patients undergo some form of localisation examination prior to surgery. In 91% of cases ultrasound is used and in 88% of cases sestamibi scintigraphy was used. Assessing the outcome of the localisation examinations can be difficult because some selection is now taking place. For example, so-called unlocalised disease is less often operated in smaller units. This means that data on the correct prediction of the number of sick glands must be interpreted very carefully. However, the trend is at the national level that sestamibi scintigraphy can predict the localisation to a somewhat higher degree of an adenoma

(63% correct localisation of an adenoma) compared to ultrasound (60% accurate localisation of an adenoma). Over time, investigations have not improved to predict a glandular disease, but on the other hand, patients with milder disease are now undergoing surgery, which can affect the difficulty of detecting diseased glands.



Almost no PHPT operations are now performed without prior attempts at localisation.





A=Correct position of one pathologic gland, but multiglandular disease not predicted

B=False prediction of multiglandular disease in solitary adenoma

C=False preop. localisation of solitary adenoma (FP)

D=Negative/inconclusive preop. examination

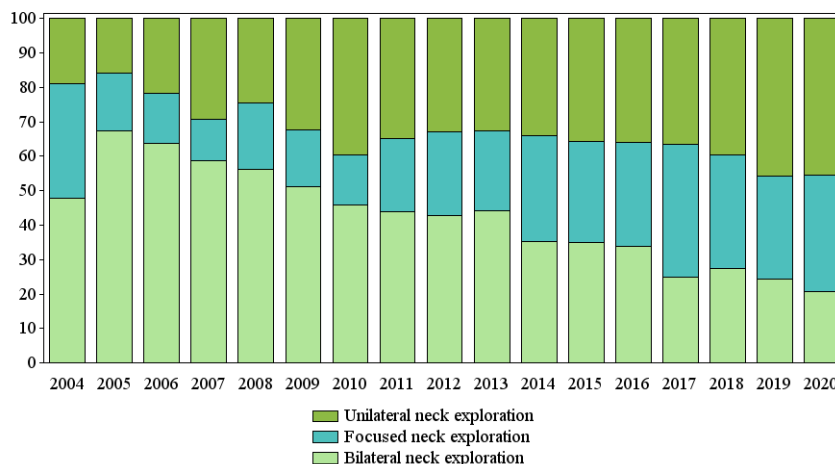
E=True preop. localisation of solitary adenoma (TP)

F=True preop. prediction of multiglandular disease

12.4. Operation type and use of intraoperative PTH measurement

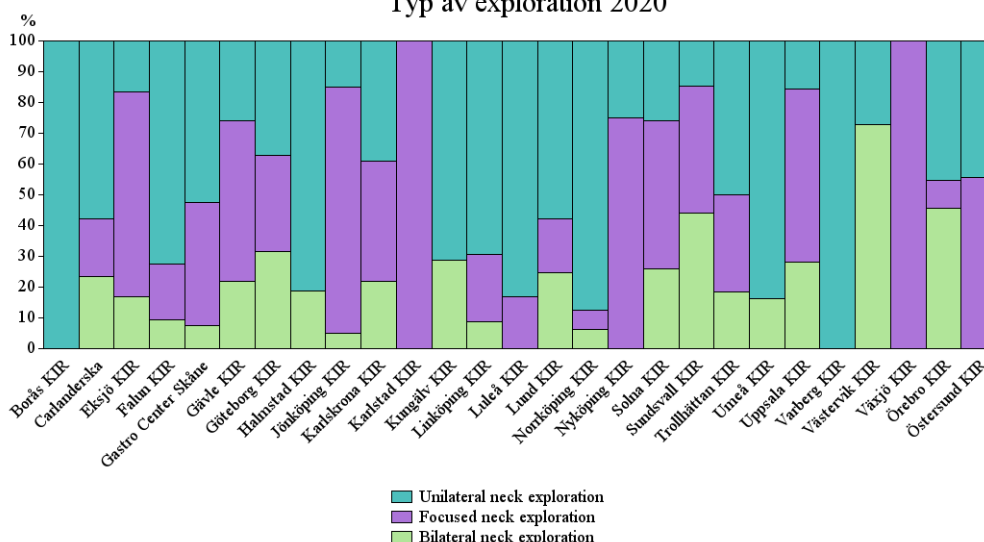
Fewer than 20% of operations were performed as planned bilateral neck exploration. A further 6% had bilateral neck exploration surgery after the procedure was first started as a focused or unilateral operation. 77% of the operations were performed as a unilateral exploration i.e. antigen focused or unilateral neck exploration. In only 14% of cases a bilateral neck exploration was planned. As seen below, there are differences between hospitals, but here too data should be interpreted cautiously as case mix may influence the choice of surgical method. If a centre has, e.g., more unlocalised patients, the frequency of bilateral neck explorations will reasonably increase. In 11% of operations, thyroid surgery was performed simultaneously, and the most common procedure (9%) performed at the same time as PHPT surgery was hemithyroidectomy. In 63% of procedures, intraoperative PTH measurements were used and calculated on all operations where PTH was used intraoperatively, and they revealed a correct reduction consistent with recovery in 95% of cases.

Typ av halseexploration(%)



Surgical technique in surgery for PHPT in Sweden. Bilateral neck exploration is now uncommon in primary surgery Data SQRTPA 2004-2020

Typ av exploration 2020

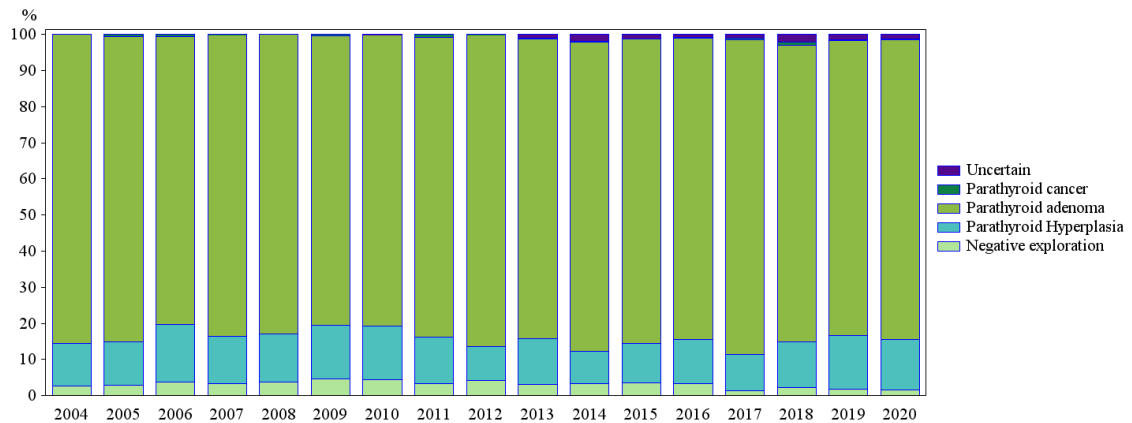


Surgical technique in surgery for PHPT divided into hospitals. Data SQRTPA 2020

12.5. Diagnosis and proportion recovered

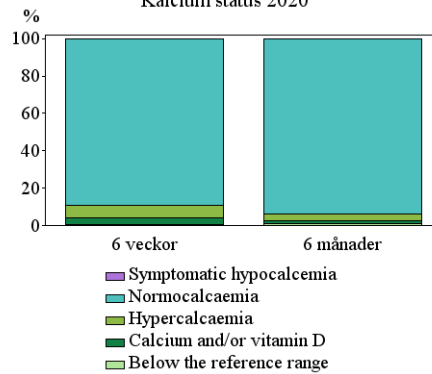
In 2020, after surgery for PHPT, 82% were reported to have an adenoma, 14% hyperplasia, 0.16% cancer and 1.5% negative explorations. If you look over time, the proportion of negative explorations has possibly decreased slightly. In 2020, six weeks after PHPT surgery, 89% were reported to have a normal calcium values (normocalcaemia). 6.5% had persistently high calcium and 4% were treated with calcium and/or vitamin D 6 weeks after surgery. After 6 months, 3% still had excessive calcium values and 1% were treated with calcium and/or vitamin D.

Huvuddiagnos (PAD)



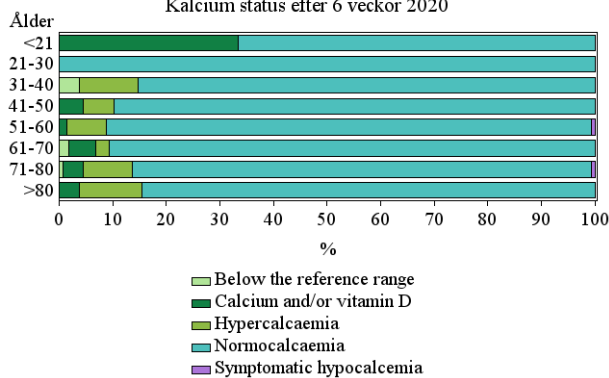
Results after PHPT surgery in Sweden. In 2020, in 1.5% of the cases no sick gland could be found, this is a very low figure. SQRTPA 2004-2020

Kalcium status 2020



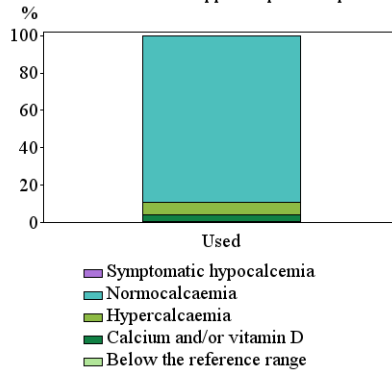
Outcome after PHPT surgery in Sweden in 2019. 6.5% had not recovered at the 6 week check-up

Kalcium status efter 6 veckor 2020

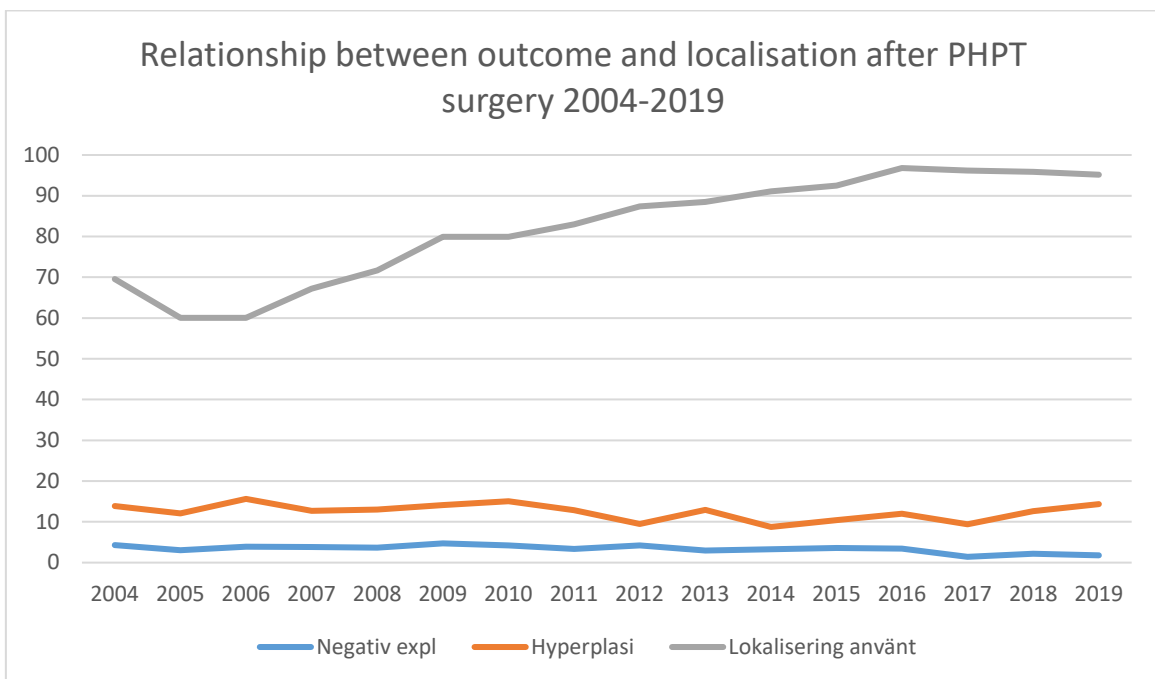


The proportion of not recovered (hypercalcaemia after 6 weeks) PHPT operated patients is higher in the lower and higher age ranges. SQRTPA 2020

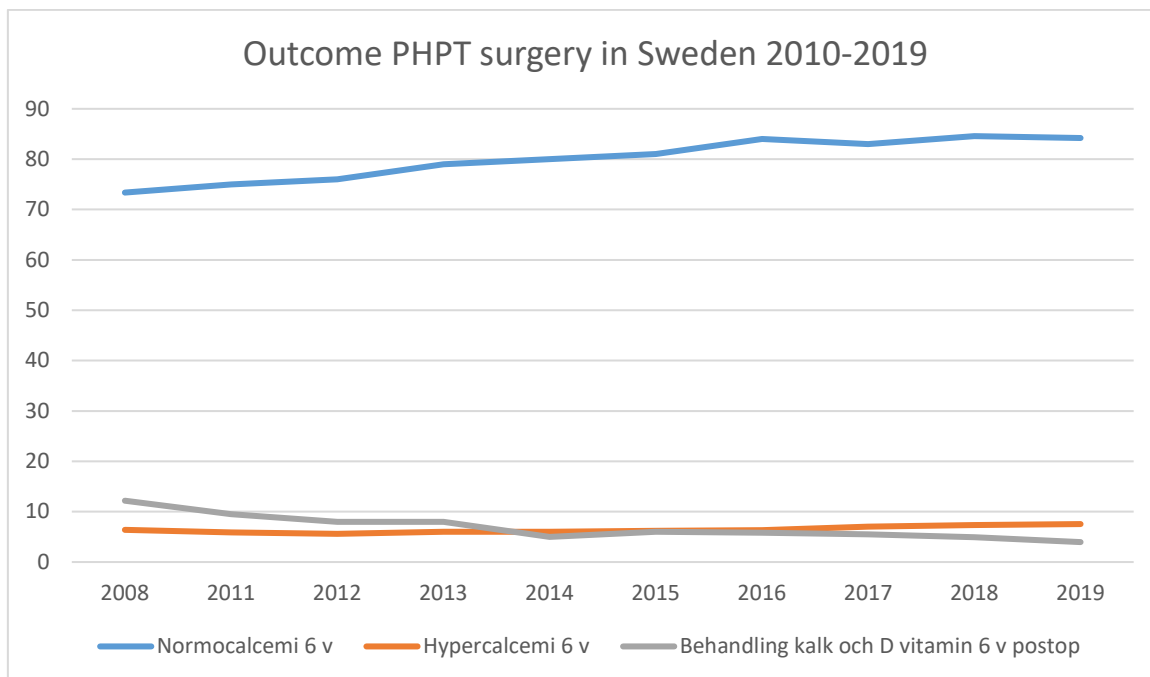
Kalcium status efter 6 veckor uppdelat på intraoperativt PTH 2020



The use of intraoperative PTH measurements reduces the risk of hypocalcaemia after 6 weeks.



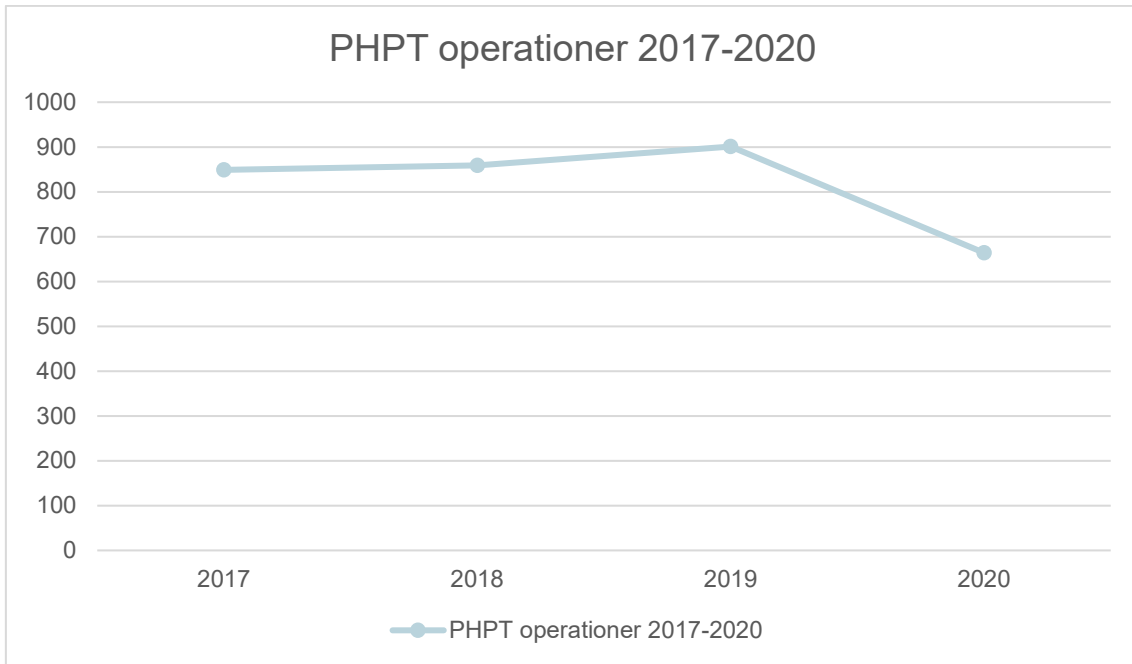
Relationship between outcome and localisation use at PHPT surgery.



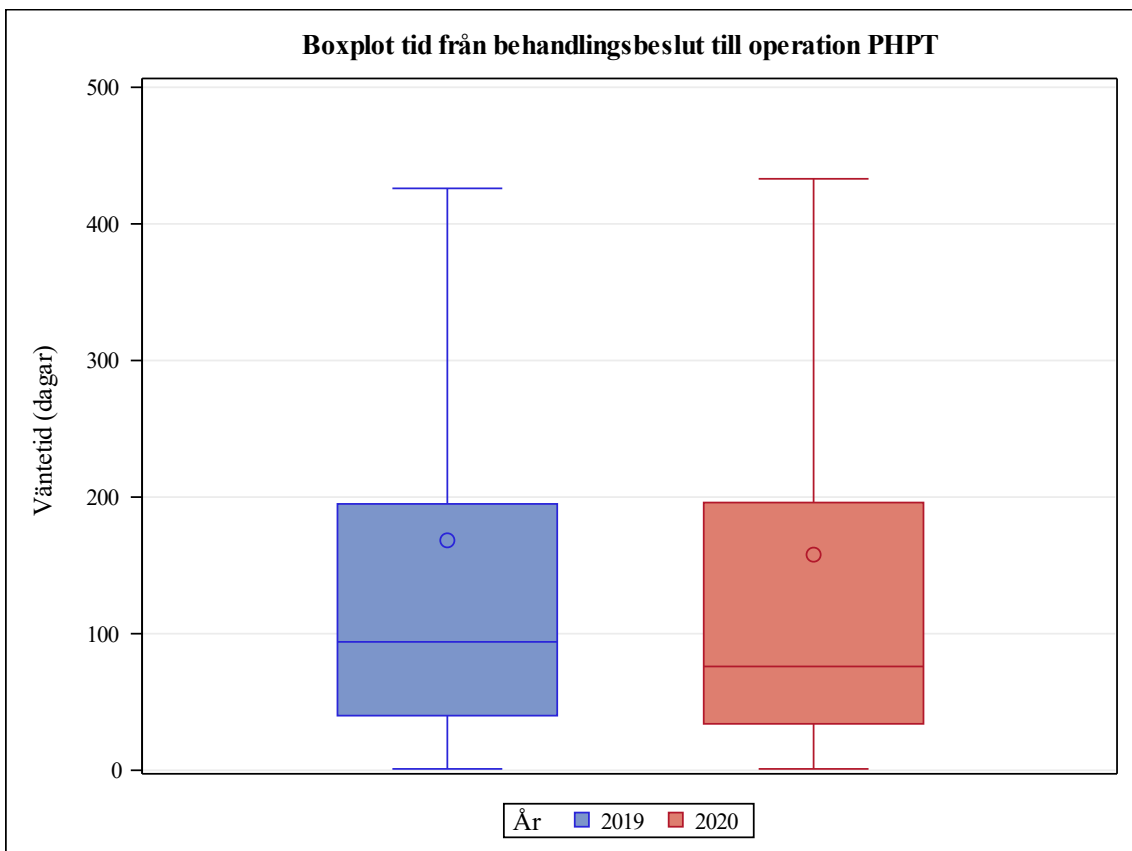
While the proportion of localisations has increased, the proportion of hypocalcaemia has decreased, but the frequency of hypercalcaemia i.e. not recovered has not changed.

12.6. PHPT and Covid

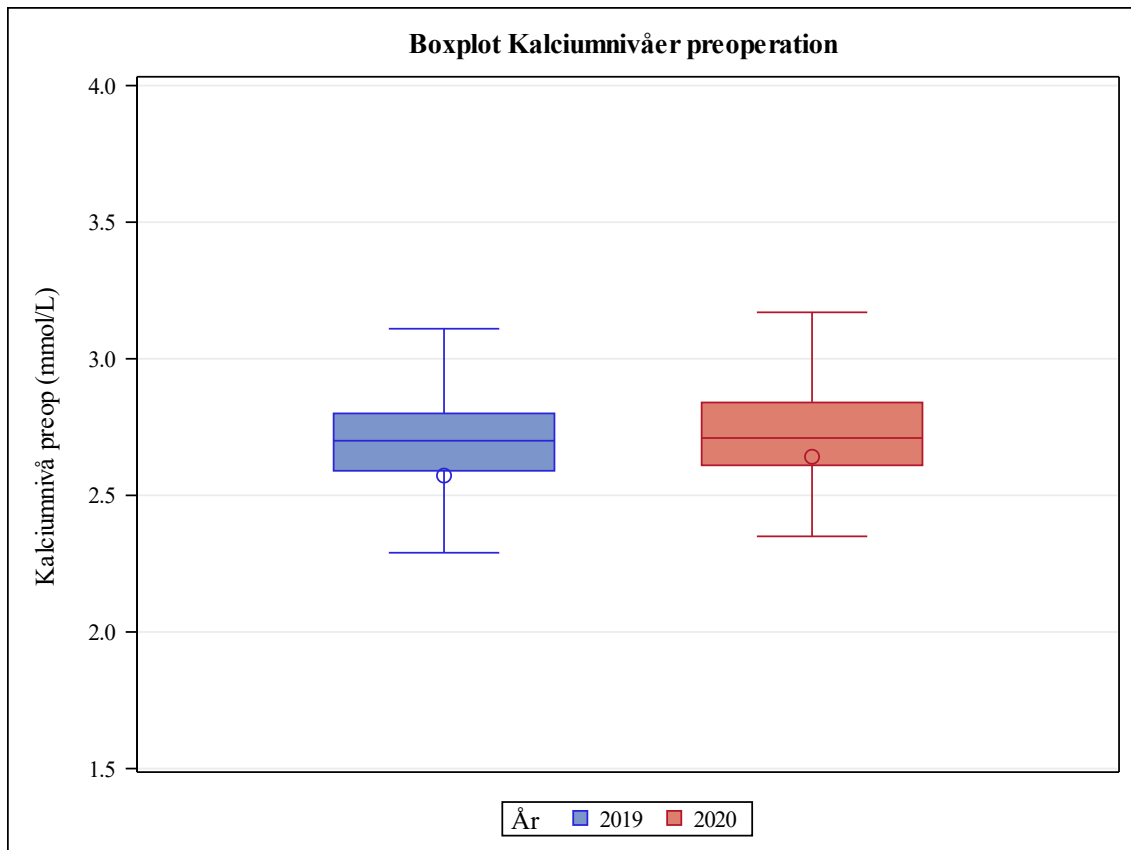
In an attempt to analyse the effect of the pandemic on PHPT, volumes, waiting times for surgery and preoperative calcium levels have been studied. Overall, an image emerges where the total volume of PHPT surgery in 2020 decreased sharply compared to 2019. The waiting time from treatment decisions to surgery has decreased from an average of 94 days in 2019 to 76 in 2020. The interpretation is that only very sick patients have turned up during the pandemic. The same applies to preoperative calcium values, which have increased from an average of 2.60 mmol/L in 2019 to 2.64 mmol/L in 2020. This is also interpreted as sicker patients have been treated while patients with milder illness have simply not received any care during the pandemic.



The number of registered PHPT operations fell dramatically in the first year of the pandemic compared to the previous year. SQRTPA 2021.



The waiting time for PHPT surgery has *decreased* during the pandemic. SQRTPA 2021



Preoperative calcium levels prior to PHPT surgery decreased compared to the previous year in the first year of the pandemic. SQRTPA 2021

12.7. Complications after PHPT surgery

The rate of infection in 2019 was 1% and bleeding 0.3% after PHPT surgery. After 6 weeks, 0.3% had a unilateral recurrence paresis. No bilateral paresis was recorded. As mentioned, 5% needed treatment with calcium and/or vitamin D 6 weeks after surgery.

In 2020, SQRTPA recorded 664 procedures due to PHPT. The analyses indicate that during the pandemic, far fewer people have had surgery and those who have been treated have been sicker and the waiting time for surgery has been shorter. Patients with PHPT are most likely to be among those who have not received adequate care during the pandemic

12.8. QUALITY INDICATORS surgery for sporadic PHPT

12.8.1 Percentage of primary registered parathyroid surgeries in relation to the inpatient registry. Target 95%

Unit	PHPT SQRTPA	PHPT SoS	Coverage
Borås SUR	1	2	50
Carlanderska	90	90	100
Eksjö SUR	12	12	100
Falun SUR	11	12	92
Gastro Centre Skåne	55	43	100
Gävle SUR	23	23	100
Gothenburg SUR	70	82	85
Halmstad SUR	27	32	84
Jönköping SUR	20	20	100
Karlskrona SUR	23	28	82
Karlstad SUR	34	17	100
Kristianstad SUR	0	36	0
Kungälv SUR	7	0	100
Linköping SUR	23	27	85
Luleå SUR	6	0	100
Lund SUR	57	60	95
Norrköping SUR	16	8	100
Nyköping SUR	8	0	100
Solna SUR	27	280	10
Sundsvall SUR	34	0	100
Trollhättan SUR	22	24	92
Umeå SUR	25	25	100
Uppsala SUR	32	28	100
Varberg SUR	7	7	100
Värnamo SUR	0	0	100
Västervik SUR	11	11	100
Växjö SUR	3	0	100
Örebro SUR	11	17	65
Östersund SUR	9	8	100
National	664	892	74

12.9. QUALITY INDICATORS surgery for sporadic PHPT

12.9.1 Percentage of followed-up patients after surgery for sporadic PHPT. Data 2017-2020. Target 95%

Unit	Number of ops with complication at 6 weeks	Number of followed-up after 6 months	Percentage followed up after 6 months %
Lund SUR	8	0	0.0
Kristianstad SUR	4	0	0.0
Uppsala SUR	10	0	0.0
Halmstad SUR	15	0	0.0
Falun SUR	2	0	0.0
Västerås SUR	3	0	0.0
Solna SUR	58	4	6.9
Luleå SUR	8	0	0.0
Gothenburg SUR	25	13	52.0
Umeå SUR	1	0	0.0
Trollhättan SUR	6	5	83.3
Jönköping SUR	4	3	75.0
Karlstad SUR	8	0	0.0
Sundsvall SUR	7	3	42.9
Östersund SUR	4	0	0.0
Gävle SUR	3	0	0.0
Kungälv SUR	9	0	0.0
Örebro SUR	2	0	0.0
Borås SUR	9	2	22.2
Varberg SUR	1	0	0.0
Karlskrona SUR	8	3	37.5
Västervik SUR	5	0	0.0
Linköping SUR	2	1	50.0
Carlanderska	15	3	20.0
Eksjö SUR	8	8	100.0
Norrköping SUR	6	0	0.0
Kalmar SUR	7	6	85.7
Nyköping SUR	2	0	0.0
Gastro Centre Skåne	1	0	0.0
National	241	51	21.2

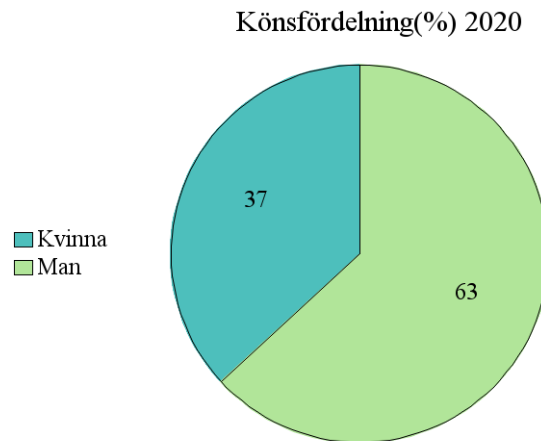
12.10. QUALITY INDICATORS surgery for sporadic PHPT

12.10.1 Proportion of patients with normocalcaemia 6 months after surgery for sporadic PHPT Data 2016-2019. Target 95%

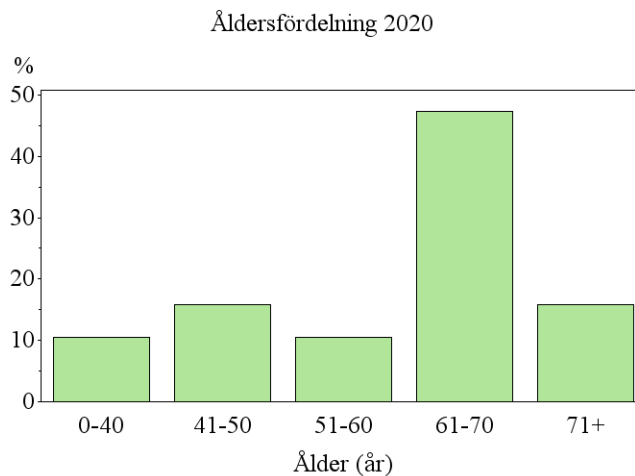
Unit	Number of surgeries	Number normocalcaemic	Normocalcaemic after 6 months %
Borås SUR	39	25	64.1
Carlanderska	197	178	90.4
Eksjö SUR	37	30	81.1
Falun SUR	61	58	95.1
Gastro Centre Skåne	66	56	84.8
Gävle SUR	57	55	96.5
Gothenburg SUR	274	249	90.9
Halmstad SUR	90	64	71.1
Jönköping SUR	49	40	81.6
Kalmar SUR	68	63	92.6
Karlskrona SUR	66	56	84.8
Karlstad SUR	136	126	92.6
Kristianstad SUR	40	35	87.5
Kungälv SUR	45	36	80.0
Linköping SUR	12	4	33.3
Luleå SUR	26	18	69.2
Lund SUR	139	105	75.5
Norrköping SUR	70	64	91.4
Nyköping SUR	15	13	86.7
Solna SUR	298	234	78.5
Sundsvall SUR	38	30	78.9
Trollhättan SUR	102	78	76.5
Umeå SUR	11	9	81.8
Uppsala SUR	120	44	36.7
Varberg SUR	38	2	5.3
Västervik SUR	50	41	82.0
Västerås SUR	17	12	70.6
Växjö SUR	23	22	95.7
Örebro SUR	28	22	78.6
Östersund SUR	42	29	69.0
National	2254	1798	79.8

13. Surgical treatment of secondary hyperparathyroidism

19 patients were registered for SHPT surgery in SQRTPA 2020. 63% were male and the average age was 60 years (38-74). The proportion of patients not on dialysis at surgery has increased and the majority (63%) have surgery with subtotal parathyroidectomy. On average, 3 glands were extirpated during the surgery. 0% contracted infection and 5% suffered postoperative bleeding requiring reoperation. One patient suffered unilateral nerve paralysis after surgery.

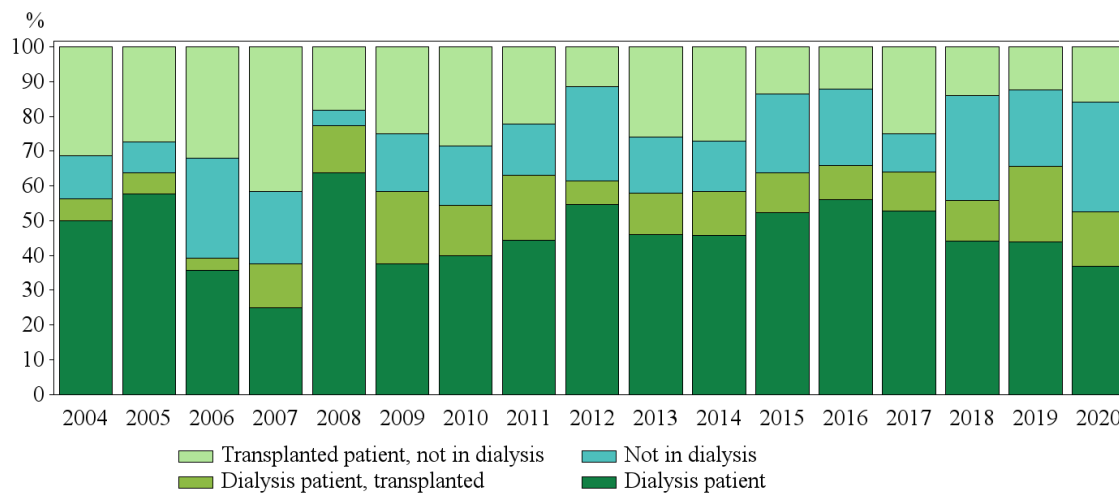


Gender distribution SHPT operation SQRTPA 2020

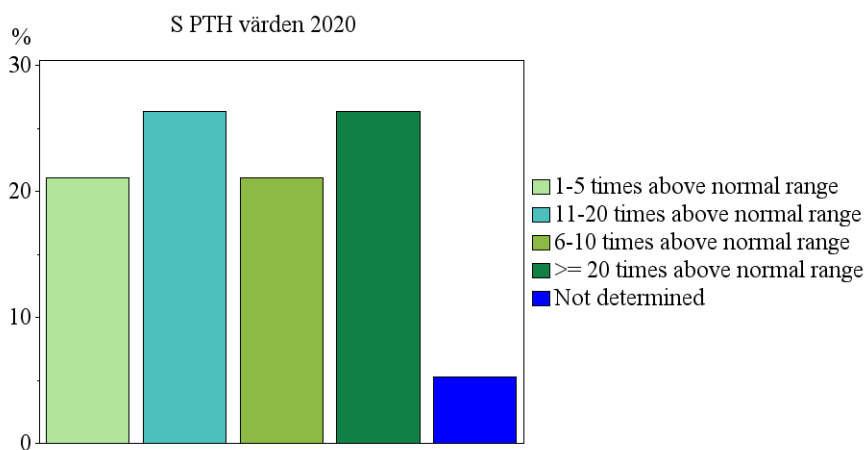


Age distribution SHPT surgery SQRTPA 2020

Typ av njurbehandling

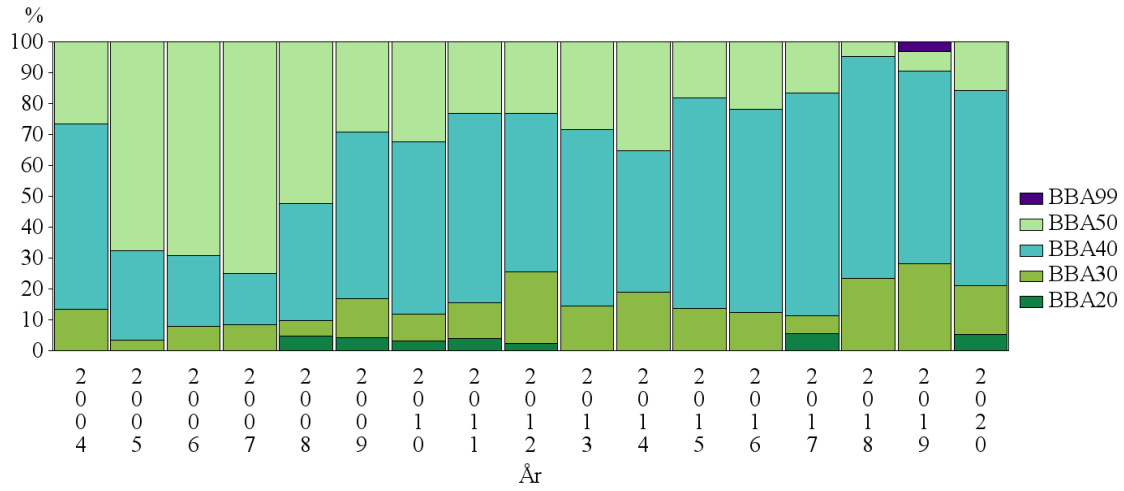


Type of renal treatment in patients undergoing SHPT surgery. Data SQRTPA 2004-2020



PTH values at time of SHPT operation. Data SQRTPA 2020

Parathyroid operation



Type of operation for SHPT. Subtotal parathyroidectomy is now by far the most common operation Data SQRTPA 2004-2020

BBA20=Exploration of parathyroid gland, BBA20

BBA30=Extirpation of parathyroid gland, BBA30

BBA40=Subtotal parathyroidectomy, BBA40

BBA50=Parathyroidectomy, BBA50

BBA99=Other operation on parathyroid gland, BBA99

14. Surgical treatment of adrenal disease

14.1. VOLUMES

In 2020, SQRTPA recorded 153 adrenal surgeries. In principle, adrenal surgery is performed in university hospitals. The number of registered interventions has increased compared to 2019, which could be a pandemic effect.

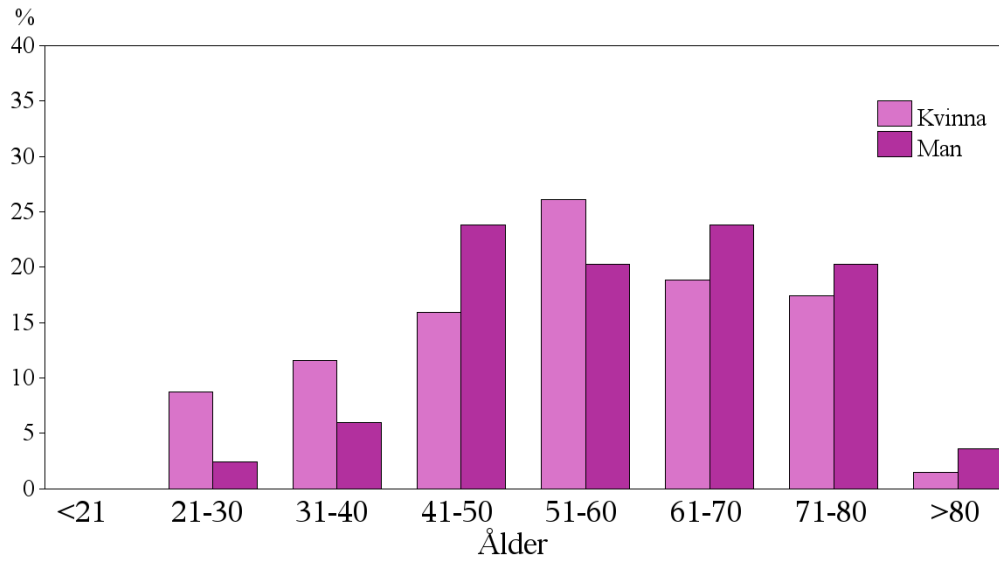
Unit	Number	%
Gothenburg SUR	25	16.34
Linköping SUR	11	7.19
Lund SUR	56	36.60
Solna SUR	35	22.88
Umeå SUR	6	3.92
Uppsala SUR	13	8.50
Örebro SUR	5	3.27
Östersund SUR	2	1.31
Total	153	100.00

14.2. AGE AND GENDER

The gender balance is in principle even and the men who undergo adrenal surgery are older than the women.



Binjurekirurgi: Åldersfördelning n=153



Age distribution of patients undergoing adrenal surgery. Data SQRTPA 2020.

14.3. DETECTION AND HORMONE PRODUCTION

58% of patients undergoing adrenal surgery have been detected due to adrenal related symptoms, of which aldosterone overproduction is the most common type. Of all the operated adrenal glands, just under 30% are non-hormone producing.

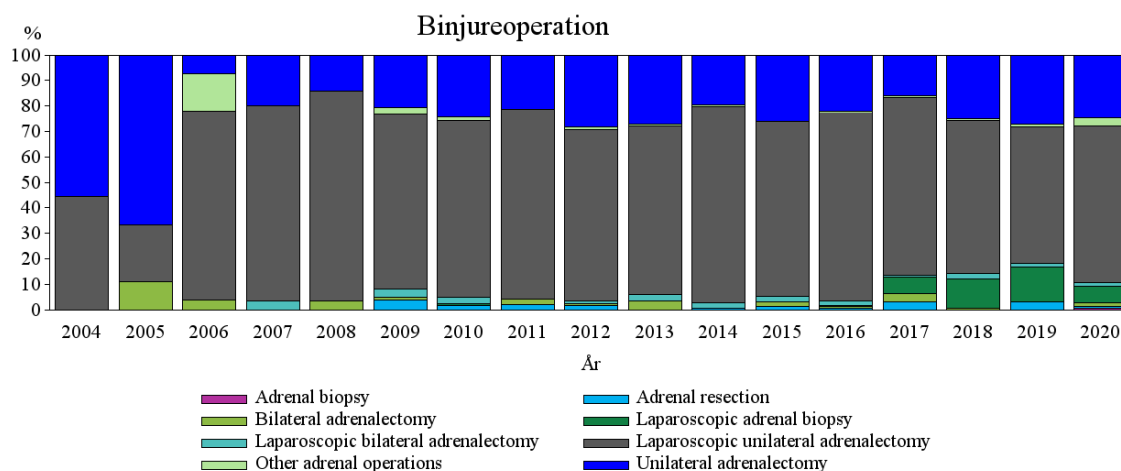
Typer av diagnos 2020



Hormone production	Number	%
Aldosterone	39	29
Catecholamines	24	18
Catecholamines, Cortisol	2	1
Cortisol	17	13
Cortisol, Other	1	1
Cortisol, Subclinical Cushing	2	1
None	43	32
Other	2	1
Subclinical Cushing	4	3
Total	134	100

14.4. TYPE OF SURGERY AND COMPLICATIONS

Laparoscopic unilateral adrenalectomy is the most common operation (79%), and endoscopic posterior technique is now most common. When starting with minimally invasive surgery, 4% is converted to open technology. 18% of operations are carried out using open technology. 3% are reoperations and 1% suffer postoperative bleeding.



Type of surgical technique in adrenal surgery in Sweden. Data SQRTPA 2004-2020

Surgical technique	Number	%
Laparotomy	25	17
Posterior endoscopic	44	29
Thoracoabdominal approach	1	1
Transabdominal endoscopic	41	27

Surgical technique	Number	%
Transabdominal robot assisted	40	26
Total	151	100

Type of surgical technique for adrenal surgery in Sweden 2020. Data SQRTPA

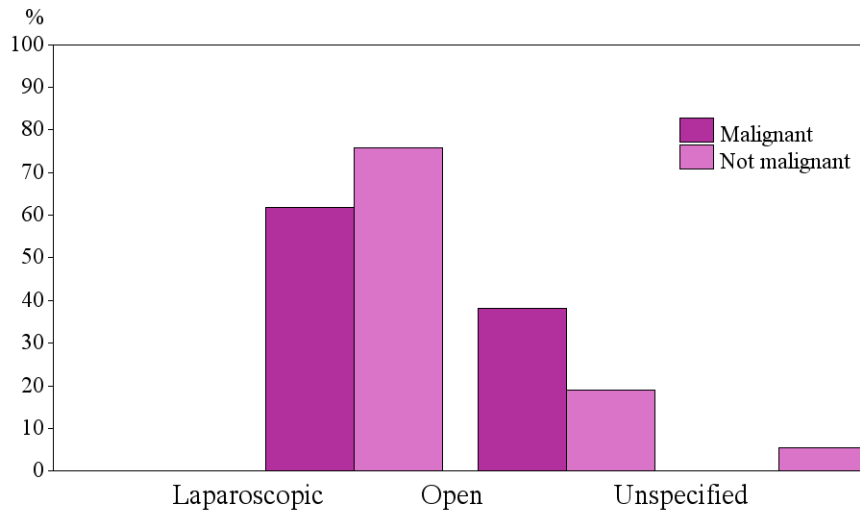
14.5. INDICATION, PAD AND SURGICAL TECHNOLOGY

Adrenal adenoma was the most common PAD (44%). In 15% of cases, PAD was malignant (note phaeochromocytoma is counted as benign PAD here). If you study the relationship between malignant PAD and surgical technique, you will see that the majority of malignant tumours are operated using laparoscopic technique (62%).

PAD adrenal surgery in 2020	Number	%
Adrenal cortical adenoma M83700	56	44
Adrenal cortical cancer M83703	4	3
Adrenal cortical hyperplasia	6	5
Adrenal cyst	3	2
Adrenal medullary hyperplasia	2	2
E Schwannoma M95600	1	1
Ganglioneuroma M94900	1	1
Malignant phaeochromocytoma M87003	2	2
Metastasis to the adrenal gland	15	12
Myelolipoma M88700	4	3
Other diagnosis	6	5
Phaeochromocytoma M87003	26	21
Total	126	100

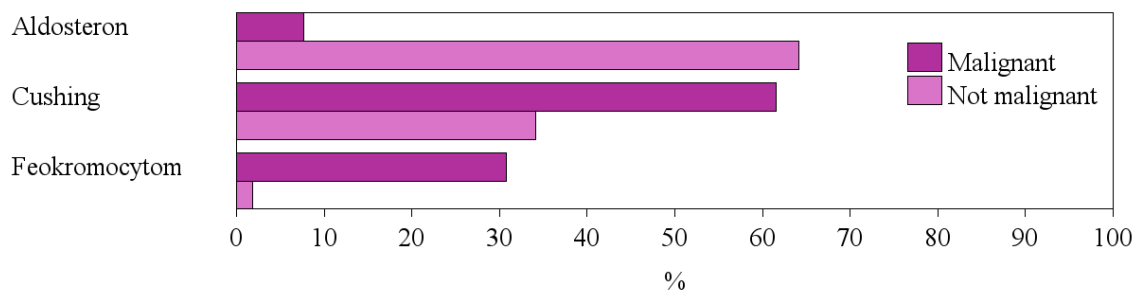
PAD after adrenal surgery in Sweden in 2020. Various forms of malignant PAD occurred in 15% of cases.

Binjurekirurgi: Operationstyper och malign n=96



Surgical technique and PAD in adrenal surgery in Sweden 2020. Even in malignant PAD (phaeochromocytoma is not included), the majority (62%) are operated using laparoscopic technique. SQRTPA 2021

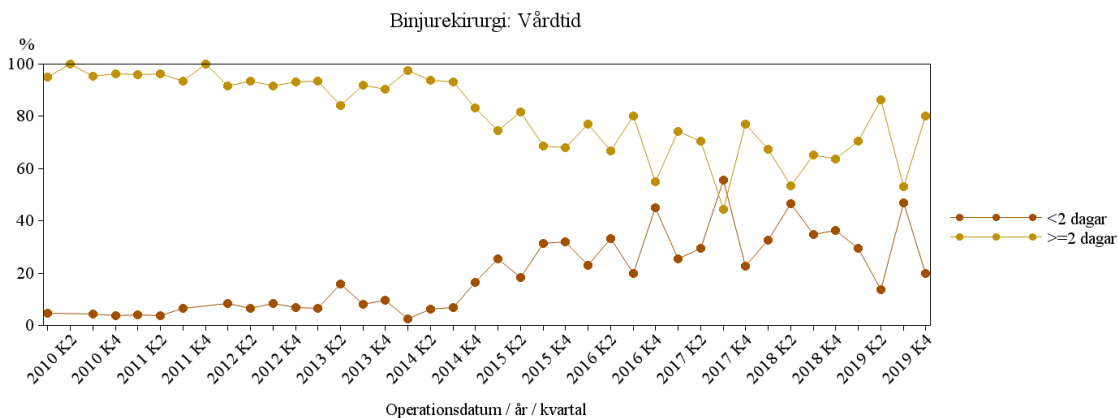
Binjurekirurgi: indikation för operaton och malign n=330



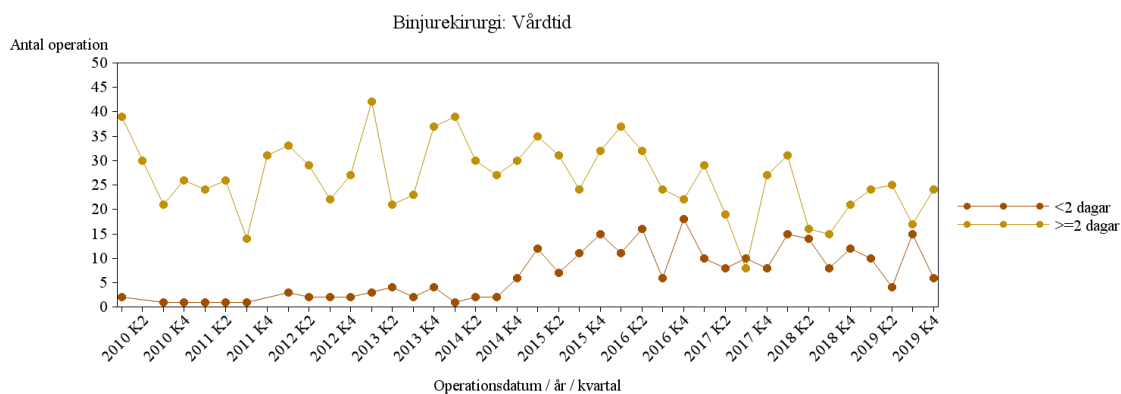
Cortisol overproduction is the most common disorder in malignant PAD. SQRTPA 2017-2020.

14.6. INPATIENT PERIOD

Nowadays, fewer and fewer patients are staying in hospital for 2 or more days. Since 2014, the proportion of people staying in hospital for less than 2 days has increased dramatically and now constitutes more than 30%.



Adrenal surgeries and inpatient period. K= quarter. Since 2014, the proportion of patients staying in hospital for less than 2 days has increased.



Number of adrenal surgeries and inpatient period. Inpatient periods have gradually decreased since 2014. Data SQRTPA 2016-2019.

14.7. QUALITY INDICATORS adrenal surgery

14.7.1 Proportion of primary registered operations. Target >95%

Unit	SQRTPA Adrenal surgeries 2019	SoS Adrenal surgeries 2019	Coverage %
Gothenburg SUR	25	25	100
Linköping SUR	11	14	79
Lund SUR	56	60	93
Solna SUR	35	35	100
Umeå SUR	6	6	6
Uppsala SUR	13	40	33
Örebro SUR	5	7	71
Östersund	2	2	100
National	153	189	80

14.8. QUALITY INDICATORS adrenal surgery

14.8.1 Proportion of converted with laparoscopic surgery Target <10% Data 2017-2020

Unit	Number of surgeries	Number converted	converted %
Eksjö SUR	1	0	0.0
Lund SUR	173	14	8.1
Östersund SUR	3	0	0.0
Gothenburg SUR	141	1	0.7
Solna SUR	60	2	3.3
Linköping SUR	31	0	0.0
Uppsala SUR	69	1	1.4
Västervik SUR	1	0	0.0
Örebro SUR	20	0	0.0
Umeå SUR	47	1	2.1
National	546	19	3.5

14.9. QUALITY INDICATORS adrenal surgery

14.9.1 Proportion of postoperative bleeding after adrenal surgery. Target 3% Data 2017-2020

Unit	Number of surgeries	Number of bleedings	bleeding %
Eksjö SUR	1	0	0.0
Lund SUR	173	2	1.2
Östersund SUR	3	0	0.0
Gothenburg SUR	141	2	1.4
Solna SUR	60	0	0.0
Linköping SUR	31	0	0.0
Uppsala SUR	69	2	2.9
Västervik SUR	1	0	0.0
Örebro SUR	20	0	0.0
Umeå SUR	47	2	4.3
National	546	8	1.5

14.10. QUALITY INDICATORS adrenal surgery

14.10.1 Proportion of postoperative infections after adrenal surgery. Target 2% Data 2017-2020

Unit	Number of surgeries	Number of infections	infection %
Eksjö SUR	1	0	0.0
Lund SUR	173	0	0.0
Östersund SUR	3	1	33.3
Gothenburg SUR	141	4	2.8
Solna SUR	60	2	3.3
Linköping SUR	31	0	0.0
Uppsala SUR	69	3	4.3
Västervik SUR	1	0	0.0
Örebro SUR	20	2	10.0
Umeå SUR	47	2	4.3
National	546	14	2.6

The most common surgical technique in adrenal surgery in 2020 was the minimally invasive posterior technique.

15. Literature

15.1. Scientific publications

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