



SOReg
SCANDINAVIAN OBESITY
SURGERY REGISTRY

SOReg Norway-Sweden
Second joint report: 2017 - 2018

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Data for this report were extracted in October 2019

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Background

Scandinavian Obesity Surgery Registry (SOReg) was launched as a national registry in Sweden in 2007. The ambition from the start was to include all Scandinavian countries. However, due to legal issues mainly pertaining to transfer of patient data across borders this was found to be difficult. Therefore, Denmark established a national registry (not included in SOReg), but Norway was able to establish a SOReg-based register in 2014. In June 2015, SOReg Norway (SOReg-N) received status as a national quality register for bariatric surgery and since then the number of participating hospitals has gradually increased. By August 2019 all public hospitals and four out of seven private hospitals performing bariatric surgery in Norway are reporting to SOReg-N. In Sweden, all hospitals including all private units have been reporting to SOReg-S since 2013.

SOReg uses an IT-platform design by UCR (Uppsala Clinical Research Center, Sweden) and the data is stored on a UCR's server. An exact copy of SOReg is stored in Tromsø, Norway, where the same platform is used. An adaption to Norwegian system is done, including translation and connection to the Norwegian National Registry. Developments and changes to the register platform is made after agreements in a joint SOReg Committee with representatives from both countries.

Both the Swedish and Norwegian version of SOReg have previously published their reports for 2017 and 2018 which can be found on the registries' respective home pages. This report is the second joint report where we present and compare figures on the use of bariatric surgery in Sweden and Norway. We only present aggregated data on national levels. We also present a short overview of bariatric surgery performed in all the Nordic countries.

Reported procedures, financing and referral logistics in public and private units

The inclusion rate (number of procedures registered in SOReg/number of procedures performed in the country) is estimated to be at least 98% in Sweden for 2017 and 2018. In Norway, all hospitals did not participate in SOReg-N in 2017 and 2018 the inclusion rate is therefore lower: 72% for public hospitals in 2017 and 76% in 2018, while for private hospitals the ratio was 24% in 2017 and 31% in 2018 (Table 1).

The time from referral from physician to surgery seems to be shorter in Sweden than in Norway (Table 1). In Sweden, the legislation gives the patient the right to see a specialist within three months and also have a planned operation within the same time limit, i.e., uncomplicated cases should be operated within six months of referral. Although the same principles are present in the legislation for prioritizing patients in the two countries, no such time limit exists in Norway. Interpretation of these data should be made with caution, as there is an uncertainty on how the registration of referral date is performed in different centres.

Table 1. Number of procedures in public and private units and finance form in Norway and Sweden 2017 and 2018.

	Norway 2017	Norway 2018	Sweden 2017	Sweden 2018
Public hospitals				
Hospitals performing bariatric surgery (n)	15	15	32	30
Hospitals reporting to SOReg (n)	13	13	32	30
Operations reported to SOReg (n)	1561	1698	3301	3156
Calculated inclusion rate	72%	76%	98%	98%
Time from referral letter received to surgery (days). Mean (median) *	440 (350)	434 (336)	305 (224)	331 (241)
Missing data on time to surgery (n, %)	8 (0.5)	23 (1.4)	790 (23.9)	624 (19.8)
Private hospitals				
Hospitals performing bariatric surgery (n)	6	7	8	9
Hospitals reporting to SOReg (n)	4	4	8	9
Operations reported to SOReg (n)	210	169	2169	2089
Calculated inclusion rate	24%	31%	98%	98%
Finance form for operations in private hospitals				
Public financing (n, %)	1 (0.5)	15 (8.9)	1003 (46.2)	1013 (48.5)
Insurance (n, %)	0	0	3 (0.1)	4 (0.2)
Paid by patient (n, %)	209 (99.5)	154 (91.1)	1149 (53.0)	1058 (50.6)
Missing data on financing (n, %)	0	0	14 (0.6)	12 (0.6)

* Primary operations only. This is normally the number of days from the referral letter is received within specialized care to operating date.

Most operations are publically financed in both countries. In Sweden, about half of the operations performed in private units are publically financed, while in Norway this is rare although the waiting time for bariatric surgery is longer. Operations financed by private insurance is non-existing in Norway and rare in Sweden. Relevant for the interpretation of data is that registrations from public and private hospitals are not complete in Norway.

Bariatric centres, number and type of operations

In 2018, 63 operations per 100.000 inhabitants were performed in Sweden and 56 per 100.000 in Norway. In both countries, an unknown number of patients (estimated to be low) are operated abroad and not included in these estimates. Based on figures from the bariatric societies in the Nordic countries, the number of procedures per 100.000 inhabitants were three times higher in Sweden and Norway than in Finland and Denmark (17-18/100.000), while lower than Iceland (103/100.000) in 2018. The number of centres performing bariatric surgery per inhabitant seems comparable between Sweden and Norway (Table 2).

The use of the most common surgical procedures are presented in Table 2. For the last two decades, Roux-en-y Gastric Bypass (RYGBP) has been the dominating procedure in Sweden. Although there has been an increase in Sleeve Gastrectomy (SG) in Sweden during the last 4-5 years, RYGBP is still the most common procedure (51.1% in 2018). In Norway, the percentage of SG was higher from the start and seems stable around 50%. As not all hospitals in Norway reported to SOReg in 2017 and 2018, there might be a skewness in data as variations in the dominating procedure may differ between hospitals. In Denmark and Finland, RYGBP constitutes 60 to 70% of all reported bariatric surgery while SG is somewhat more common in Iceland, however, the total number of procedures (n=332) is low.

Other procedures such as the duodenal switch and one anastomosis gastric bypass (OAGB) are only performed in small numbers in both countries although OAGB has risen to 5,5% among primary procedures performed in Norway in 2018. The annual percentage of revisional surgery is low, about 3-4% in both countries. Other uncommon procedures performed include reversal to normal anatomy, initiated but not fulfilled operations, gastric plication, single anastomosis duodeno-ileal switch (SADI), gastric banding and Aspire.

Table 2. Bariatric centres and number and types of operations registred in Norway and Sweden 2017-2018.

	Norway 2017	Norway 2018	Sweden 2017	Sweden 2018
Total number of centers (n)	21	22	40	39
Reporting centers (n)	17	17	40	39
Reported number of primary procedures (n)	1724	1804	5470	5243
- Roux-en-y Gastric Bypass (n, %)	794 (46.1)	827 (45.8)	2982 (54.5)	2682 (51.1)
- Sleeve Gastrectomy (n, %)	874 (50.1)	872 (48.3)	2357 (43.1)	2393 (45.6)
- One-anastomosis Gastric Bypass (n, %)	53 (3.1)	100 (5.5)	0	12 (0.2)
- Duodenal switch (n, %)	0	0	51 (0.9)	45 (0.9)
- Other procedures (n, %)	3 (0.2)	5 (0.3)	182 (3.3)	112 (2.1)
Reported number of revisional procedures (n, % of total number of procedures)	47 (2.5)	63 (3.4)	190 (3.5)	223 (4.3)

Demographics

In both countries, the majority of patients are women (Table 3). This concurs with reports from most countries worldwide as well as the fifth IFSO Global Registry Report in 2019. The SOReg definition of an obesity-related disorder is continuous pharmacological treatment (CPAP in sleep apnea) for the respective diagnoses. Norwegian patients seem to be slightly older and with a higher BMI than Swedish patients, and all diseases seem to have a little higher prevalence in the Norwegian population, except for depression. The percentage of patients with diabetes are rather low in both countries compared to most international reports. In a joint study on the two present SOReg-cohorts and the Dutch Audit for Treatment of Obesity (DATO), diabetes was present in 21.9% of the Dutch patients at baseline [1].

Table 3. Preoperative characteristics of patients operated with bariatric surgery in Norway and Sweden 2017 - 2018.

	Norway 2017-18	Sweden 2017-18
Age (years), mean (SD)	42.6 (11.0)	40.9 (11.4)
Gender (m/f), (% females)	830 / 2808 (77.2)	2323 / 8390 (78.3)
Preoperative weight (kg), mean (SD)	123.0 (21.3)	116.6 (22.0)
Length (cm), mean (SD)	170.0 (8.8)	168.5 (9.0)
BMI (kg/m ² , SD)	42.5 (5.7)	40.9 (6.0)
Patients with any comorbidity (n, %)	2460 (67.6)	5850 (54.6)
Sleep apnea (n, %)	645 (17.7)	1017 (9.5)
Hypertension (n, %)	1050 (28.9)	2525 (23.6)
Diabetes (n, %)	497 (13.7)	1277 (11.9)
Dyslipidemia (n, %)	493 (13.6)	944 (8.8)
Dyspepsia (n, %)	613 (16.9)	1083 (10.1)
Musculoskeletal pain (n, %)	1331 (36.7)	1793 (16.7)
Depression (n, %)	479 (13.2)	1831 (17.1)

Perioperative results

Laparoscopic approach is dominating in both countries with very low conversion rates (Table 4). Perioperative findings, complication rates and postoperative hospital stay are similar and few patients experience severe complications such as reoperations. The 30 day mortality rate was 0,03 in both countries.

Table 4. Surgery and complication data from Norway and Sweden 2017 - 2018.

	Norway 2017-18	Sweden 2017-18
Laparoscopic approach (n, %)	3621 (98.2)	10637 (99.3)
Conversions (n, %)	3 (0.1)	14 (0.1)
Operative time (min), mean (SD)	58 (29.2)	56.8 (31.5)
Postoperative hospital stay (days), mean (SD)	1.8 (2.3)	1.5 (4.7)
Any postoperative complication (n, %)	190 (5.2)	720 (6.7)
Leakage (n, %)	25 (0.7)	84 (0.8)
Bleeding (n, %)	51 (1.4)	115 (1.1)
Intraabdominal infection (n, %)	9 (0.3)	73 (0.7)
Reoperations within 30-days (n, %)	83 (2.3)	321 (3.0)
30 days postoperative mortality (n, %)	1 (0.03)	3 (0.03)

Summary

There are many similarities between Norway and Sweden when it comes to health care. As the indications for bariatric surgery are identical, it is no surprise that we see many similarities between the two countries in this report.

We do find, however, that in general the Norwegian patients seem to be slightly older, heavier, and have a higher prevalence of obesity-related disorders, except for depression.

The majority of operations are publically funded in both countries. We see more publically funded operations being performed in private units in Sweden than in Norway, where this is rare. In both countries waiting time is long, however, differences are probably explained by legislation issues.

The laparoscopic approach dominates. Sleeve gastrectomy and Roux-en-Y gastric bypass are the dominant procedures in both countries. The overall number of bariatric procedures per 100,000 inhabitants (56/100.000 (N) – 63/100,000 (S)) is about three times higher than in Denmark and

Finland, but lower than Iceland. Both the conversion rate and prevalence of severe complications, such as reoperations within 30-days, are low. The 30-day mortality rate (0.03%) is among the lowest reported in international literature.

To assure high quality data in a registry is of paramount importance. Both registries are using the same system for auditing which include checking the database for strange and unusual data combinations and control of data between medical record and SOReg on randomly chosen patients. In Norway the first audit has been completed and showed >90% correct data on clinical variables. In Sweden the third complete audit during 2017-2018 showed >97% correct data.

A lower inclusion rate in Norway than in Sweden may to some extent influence the Norwegian data. From September 2019 a new regulation opening up for omitting written informed consent (“opt-out”), and imposing on health care workers to report data to national quality registries in Norway may increase the future inclusion rate to SOReg-N.

The similarities in demographics and results, combined with a similar auditing system gives a good foundation for future projects on quality assurance and research based on joint registry data.

Reference:

[1] Poelmeijer YQM, Liem RSL, Vage V, Mala T, Sundbom M, Ottosson J, et al. Perioperative Outcomes of Primary Bariatric Surgery in North-Western Europe: a Pooled Multinational Registry Analysis. *Obes Surg.* 2018.

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