

# Gynaecology Healthcare Atlas

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Use of selected gynaecology health services  
during the period 2015–2017

January 2019



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|---------------------------|--|
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| Authors                   | Hanne Sigrun Byhring, Lise Balteskard, Janice Shu, Olav Helge Førde, Sivert Mathisen, Linda Leivseth, Arnfinn Hykkerud Steindal and Bård Uleberg |
| Professional contributors | Stine Andreasen and Yngvild Skåtun Hannestad   |
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# **Foreword from Northern Norway RHA**

## **Do we have to start talking about inequity?**

This is the seventh healthcare atlas that SKDE has produced. The knowledge gained from each of these atlases is significant, but perhaps equally important are the general characteristics of findings and trends that there is particular reason to draw attention to.

All the healthcare atlases found excessive variation that cannot be explained on medical grounds in the use of health services in some fields. This knowledge is important for at least two reasons. It is related to how we give individual patients with the same condition and the population as a whole access to services that provide an equitable chance of a good treatment outcome. On a more general level, it shows how the regional health authorities, on behalf of society, fulfil their responsibility to provide healthcare. This information will attract more and more attention. The question is whether we should start to use the word inequity in areas where there is particularly high variation without medical grounds. It is possible that the term variation contributes too much to ‘normalising’ differences and masking unwanted differences. This cannot be an intended effect.

The second thing I find reason to question is whether the way in which we organise the services has a bearing on which services are available to the population. In the gynaecology atlas, we see considerable differences in the use of the same procedure between specialists in private practice under public funding contracts and hospitals. What can cause this, considering that the medical practice recommendations are the same? Do we have to question whether the combination of the tariff system and the way in which services are organised results in an increase in the use of certain procedures whose indications are debated in the medical community? In principle, patients with the same diagnosis should receive the same diagnostic and treatment services regardless of where they receive these services. If the atlases indicate differences in practice that are not based on the patients’ condition, then this is an issue to which more attention must be paid, both in our professional follow-up and when the authorities stipulate the framework conditions for these activities.

The healthcare atlases give us knowledge of which techniques are used in certain fields, for example surgical procedures. It is a well-known fact that hospitals, like other enterprises, are different cultures - ‘this is how we do it here’. A case in point is that hysterectomies are still performed as open surgery despite the endoscopic technique being recommended and open surgery being less favourable for the patient. Can this situation continue? Should not the specialist communities be required to have staff that master the recommended technique and, as a rule, use that technique? What should we do with the knowledge that the population is being treated with techniques that are not in line with best practice?

It takes time to change professional practice and culture - sometimes too much time. The specialist associations do praiseworthy work in preparing guides based on the available knowledge. This strengthens the role of evidence-based medicine as a foundation for professional practice, while weakening the autonomy to choose for oneself, ‘this is how we do it here’. What we see is that even though the recommendations are drawn up by the specialists themselves, they are not implemented everywhere, and the implementation process takes time. Therefore, further initiatives are needed. An important topic in the most recent version of Norway’s national healthcare and hospital plan is organising hospitals and specialist communities into networks, and this step could lead to improvement. It would bring knowledge from different communities into the discussion and strengthen the preconditions for harmonisation of practices. This must be combined with clearer professional leadership and follow-up on the part of the regional health authorities when it comes to our attention that best practice is not followed.

Lars Vorland  
Managing Director  
Northern Norway RHA

# **Foreword from the Norwegian Society of Gynecology and Obstetrics**

The Norwegian Society of Gynecology and Obstetrics (NGF) is pleased that a gynaecology healthcare atlas is published. The Society has a longstanding tradition of drawing up professional guidelines in the form of guides. This work is a considerable voluntary effort carried out by the specialist community every five years. These guidelines are primarily used by the gynaecologists themselves, but also by others. However, these guidelines and the considerable engagement of Norwegian gynaecologists are no guarantee that the services we provide are equitable.

The Gynaecology Healthcare Atlas is an aid to identifying and understanding the content and distribution of the services that the specialist health service provides. In 2017, the Society contacted the Centre for Clinical Documentation and Evaluation (SKDE) to express our wish for a healthcare atlas to be prepared for our discipline. We are very pleased that SKDE took up our idea, and we have found it to be a professional organisation that has listened to our medical expertise.

It is my clear opinion as president of the Norwegian Society of Gynecology and Obstetrics that Norwegian gynaecologists want to practise good medicine. I am also convinced that they will be willing to change their course in areas where medical documentation shows a need to do so. It is our hope that this healthcare atlas will contribute to discussion, and perhaps disagreement, but first and foremost that it will result in improvements to gynaecological healthcare.

Nils-Halvdan Morken  
President  
Norwegian Society of Gynecology and Obstetrics

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# Summary

The Gynaecology Healthcare Atlas maps geographical variation in the use of a selection of specialist health services in the field of gynaecology during the period 2015–2017. Despite the fact that a guide produced by the Norwegian Society of Gynecology and Obstetrics has been available since the mid-90s, the findings of this healthcare atlas indicate that there are nevertheless variation, sometimes considerable variation, in practice in this field.

We find high and unwarranted geographical variation in diagnosis and assessment. The geographical variation is particularly high in the use of colposcopy and biopsies in connection with assessment for abnormal cells or cervical neoplasia. Most of the variation in the use of colposcopy is due to differences in the practice of specialists in private practice under public funding contracts. The results in this healthcare atlas confirm previous findings that indicate a high and geographically unevenly distributed overuse of colposcopy. However, the results indicate that women who experience post-menopausal bleeding receive equitable services when it comes to assessment to establish whether the cause of the bleeding is cancer, cervical neoplasia or something else.

There is also high and unwarranted geographical variation in the use of surgery in connection with spontaneous abortions and abortions on request. The variation is particularly high for the use of surgery in connection with abortions on request. Much of the variation is probably linked to differences in practice in terms of counselling, information and the extent to which the women's own treatment preferences are taken into consideration.

There is also high and unwarranted geographical variation in the use of surgical treatment of heavy and/or frequent menstruation, pelvic organ prolapse, urinary incontinence, and in the use of hysterectomy (removal of the uterus). These results give us a clear indication that there is great variation in treatment practices for a number of conditions.

Most of the procedures covered by the Gynaecology Healthcare Atlas show considerable geographical variation in the proportion of open surgery. These results suggest that we are in the middle of a process whereby open surgery is increasingly replaced by laparoscopic and vaginal procedures, but where development has not progressed at the same speed everywhere.

The Gynaecology Healthcare Atlas is primarily characterised by a high level of geographical variation that threatens the objective of equitable health services. The results indicate variation, sometimes considerable variation, in treatment practices for many of the forms of examination and treatment studied in this atlas. This variation highlights the discussion of over- and undertreatment in relation to several of these services, and the atlas should form a constructive basis for targeted work to reduce these variations in practice.



# Chapter 1

## Introduction

It is an overriding goal in Norway's health policy that the whole population should have equitable access to health services regardless of where they live. It is the responsibility of the regional health authorities to ensure an equitable distribution of health services. The purpose of the healthcare atlases is to investigate whether this key goal is achieved.

The Gynaecology Healthcare Atlas is the Centre for Clinical Documentation and Evaluation's (SKDE) seventh healthcare atlas. The board of the Norwegian Society of Gynecology and Obstetrics submitted a proposal for a healthcare atlas for the field of obstetrics and women's diseases already on 5 February 2017. For SKDE, there is no better background for a healthcare atlas than such a request from the relevant specialist community. This ensures the support of the specialist community during the work on the atlas, and contributes to it being read and used.

The Norwegian Society of Gynecology and Obstetrics was also the first specialist association to draw up an evidence-based guide for the discipline, which it did as early as in 1996. The guide has been updated several times, most recently in 2015. It is perhaps natural to assume that work on an association-based discipline guide would lead to discussions and consensus formation that would, over time, result in small variations in practice. The results presented in the Gynaecology Healthcare Atlas show that this is not necessarily the case.

Like most surgical disciplines, gynaecology has undergone significant change since the 1980s. Gentle pharmacological and minimally invasive methods have replaced much of the traditional surgical activity, meaning less pain, smaller incisions and scars, shorter hospital stays and shorter periods of convalescence for patients. Day surgery and outpatient procedures have replaced sometimes quite lengthy hospital stays. It can be challenging for gynaecologists who perform surgery to keep abreast of developments when new surgical techniques are introduced all the time, especially if their patient volume is small. It is to a certain extent inevitable that changes and new techniques are introduced gradually and at different paces, and this is a possible explanation for some of the variation documented in this healthcare atlas. In many cases, however, the observed variation is so high that there must be other reasons.

In recent years, the Norwegian health system has focused more on issues relating to geographical variation and over- and undertreatment. One result of this focus is the Norwegian Medical Association's *Gjør kloke valg!* campaign, which is a Norwegian version of the *Choosing Wisely* campaign. The high level of geographical variation documented in the present healthcare atlas highlights the discussion of over- and undertreatment in relation to several of these services. The atlas should form a constructive basis for targeted work to reduce these variations in practice, for example through continued work on the Society's guide and the *Gjør kloke valg!* campaign.



# **Chapter 2**

## **Method**

### **2.1 Data**

#### **2.1.1 The Norwegian Patient Registry (NPR)**

The description of the use of specialist health services is based on data from the Norwegian Patient Registry (NPR). NPR has disclosed indirectly identifiable personal health data for the years 2013–2017 to SKDE pursuant to the provisions of the Personal Health Data Filing System Act Section 20 under a licence from the Norwegian Data Protection Authority dated 6 April 2016. Since 20 July 2018, the basis for the processing of data has been the General Data Protection Regulation Article 6(1) letter (e) and Article 9(2) letter (j). This healthcare atlas uses data from NPR to describe publicly funded activity at public hospitals and specialists in private practice under public funding contracts. SKDE has sole responsibility for the interpretation and presentation of the disclosed data. NPR has no responsibility for analyses or interpretations based on the data.

#### **2.1.2 Control and payment of reimbursements to health service providers (KUHR)**

The description of the activities of regular GPs and emergency primary healthcare services is based on data from the settlement system for control and payment of reimbursements to health service providers (KUHR). Aggregate data for the number of consultations where an endometrial biopsy was performed have been disclosed to SKDE (Chapter 3.2).

#### **2.1.3 Norwegian Registry of Pregnancy Termination**

The analysis of the choice of technique for abortions on request is based on data from the Norwegian Registry of Pregnancy Termination (Chapter 4.3). Aggregate data for all abortions on request performed on women aged 16 years or older using the medical or surgical method have been disclosed to SKDE. All terminations must be reported to the Registry of Pregnancy Termination.

### 2.1.4 Statistics Norway (SSB)

Population figures for municipalities (Table 07459) and city districts (Table 10826) are taken from Statistics Norway's StatBank. In the analyses, the population figures are used as the denominator for the number of persons or events per 10,000 population, and for age standardisation purposes.

## 2.2 Definition of sample data from NPR

The Gynaecology Healthcare Atlas includes publicly funded specialist health service activities in the years 2015–2017 for women aged 16 years or older. Most of the analyses are based on activity data from NPR for public hospitals and specialists in private practice under public funding contracts. The number of examinations, treatments, procedures or contacts with the specialist health service is counted regardless of level of care. The hysterectomy analysis also includes data from the specialist health service for 2013 and 2014. Health services paid for in full by the patient or other private parties (for example an insurance company or employer) are not reported to NPR, and are therefore not included in our analyses.

Samples are usually defined on the basis of a set of relevant diagnosis codes (ICD-10) in combination with clinical judgement. These selected diagnosis codes are used to identify the procedure codes (NCSP/NCMP/NCRP) used in connection with the conditions in question. Then we do the same in the opposite direction, and look at which diagnosis codes are found in combination with the most commonly used procedure codes. This method is used in order to try to identify as similar patient samples as possible, even though coding practices may vary between treatment providers, or different procedures are used to treat the same condition. When we find unexpected combinations of diagnosis and procedure codes, a discretionary assessment on a case-to-case basis determines whether they can be included in the sample in question or whether it could be a case of miscoding. We also contact specialists in the different disciplines to quality-assure our coding proposals and discuss possible explanations for what may appear to be 'illogical' coding. This clinical contact is invaluable in terms of the quality of our patient samples.

Specialists in private practice under public funding contracts do not always register procedure codes, but normally use tariff codes from *Normaltariff for avtalespesialister* (The Norwegian Medical Association's normal tariff for specialists in private practice under public funding contracts). These tariff codes contain information about some procedures performed. When a tariff code is registered, it is assumed that a procedure corresponding to the tariff code has been performed.

This healthcare atlas presents the *number of contacts with the specialist health service* for which at least one of the relevant diagnosis codes, procedure codes and/or tariff codes has been registered. For assisted reproduction, we present the *number of women* who have had at least one contact with the specialist health service for which at least one of the relevant procedure codes has been registered.

In some cases, the combination of procedure codes for a contact may be such that it falls within more than one category. For example, a procedure could have one procedure code for a laparoscopic procedure and one for open surgery. In such cases, the contact is categorised in accordance with conditional logic to ensure that each contact is only counted once. In the analyses of surgical treatment of gynaecological conditions (Chapter 5), all procedures with at

## 2.2. Definition of sample data from NPR

least one procedure code for open surgery are counted as open surgeries, and all procedures with a procedure code for hysterectomy are counted as hysterectomies.

### 2.2.1 Age limits

The Gynaecology Healthcare Atlas includes women aged between 16 and 105 years. However, some samples are limited to women for whom a health service is considered relevant based on age.

Relevant age ranges:

- 16–105 years (all women)
- 16–55 years (women of childbearing age)
- 25–55 years (women of childbearing age eligible for sterilisation)
- 50–105 years (postmenopausal women)

There is a five-year overlap between the groups ‘women of childbearing age’ and ‘postmenopausal women’ because the age at which women go through menopause and are no longer fertile varies considerably from woman to woman. Table 2.1 presents the age limits for the different samples.

**Table 2.1:** Age ranges, total numbers and numbers excluded on account of their age being outside the defined age range for each sample. Average per year for the period 2015–2017.

| Sample   | Age (years) | Measure        | Total (n) <sup>a</sup> | Excl. (n) |
|--|-------------|----------------|------------------------|-----------|
| <b>Diagnosis and assessment<sup>b</sup></b>            |             |                |                        |           |
| Postmenopausal bleeding                                | 50–105      | Outp. contacts | 9,638                  | 471       |
| Endometrial diagnosis                                  | 16–105      | Examinations   | 19,865                 | –         |
| Colposcopy and cervical biopsy                         | 16–105      | Examinations   | 99,013                 | –         |
| <b>Reproductive health</b>                             |             |                |                        |           |
| Surgical treatment, spontaneous abortion               | 16–55       | Procedures     | 884                    | 0         |
| Surgical treatment, abortion on request                | 16–55       | Procedures     | 12,550                 | 0         |
| Assisted conception                                    | 16–55       | Persons        | 3,793                  | 0         |
| <b>Surgical treatment of gynaecological conditions</b> |             |                |                        |           |
| Endometriosis  | 16–55       | Procedures     | 1,203                  | 17        |
| Uterine myomas   | 16–105      | Procedures     | 2,093                  | –         |
| Excessive and/or frequent menstruation                 | 16–55       | Procedures     | 2,802                  | 37        |
| Hysterectomy   | 16–105      | Procedures     | 3,510                  | –         |
| <b>Surgical treatment of prolapse and incontinence</b> |             |                |                        |           |
| Pelvic organ prolapse                                  | 16–105      | Procedures     | 4,059                  | –         |
| Urinary incontinence                                   | 16–105      | Procedures     | 2,614                  | –         |

<sup>a</sup> Includes only activities registered with a valid municipality number for the patient’s residence.

<sup>b</sup> These figures are not comparable with the figures presented in Chapter 3.1 because of inadequate reporting of data by specialists in private practice under public funding contracts in Nordland county in 2017 (see Chapter 2.6.3).

## 2.2.2 Lacking or incomplete reporting to NPR

Specialists in private practice under public funding contracts sometimes fail to report all of their activities to NPR. Technical problems and other reasons could result in all or some of their activities not being included in the national basic data. In other cases, the specialist has been ill, has been on leave or has for some other reason treated fewer patients than normal. SKDE has no information about the proportion of activities not reported to NPR. However, the majority of specialists in private practice under public funding contracts report all their activities to NPR every year.

Cases of relatively high variation between years within the same hospital referral area could be because public funding contracts for specialists in private practice are entered into or terminated, or caused by failure to report activities to NPR. In 2017, there was a marked drop in activities reported to NPR by three specialists in private practice under public funding contracts practising in Bodø (see Table 2.2). Figures from other data sources (KUHR/HELFO) show only a marginal reduction in the number of reimbursement claim forms submitted during the same period, which indicates that a significant proportion of these specialists' activities in 2017 was not reported to NPR. We have therefore chosen to exclude activity figures for the use of specialists in private practice under public funding contracts in Nordland hospital referral area for 2017 and instead based the results on an average for the years 2015 and 2016.

**Table 2.2:** Total number of contacts and patients (for women aged 16 years or older) in data reported to NPR in the period 2014–2017 by three specialists in private practice under public funding contracts practising in Bodø.

| Year | Patients | Contacts |
|------|----------|----------|
| 2014 | 5,625    | 7,861    |
| 2015 | 5,753    | 8,247    |
| 2016 | 5,319    | 7,039    |
| 2017 | 1,250    | 1,479    |

**Table 2.3:** Number of gynaecologists in private practice under public funding contracts in the different health regions 2015–2017 and whether their reporting to NPR is inadequate.

| Health region            | Year | Number of private practitioners in region (n) | Private practitioners with inadequate reporting to NPR (n) |
|--------------------------|------|---|--|
| Northern Norway RHA      | 2015 | 7   | 1  |
|                          | 2016 | 7   | 0  |
|                          | 2017 | 6   | 2  |
| Central Norway RHA       | 2015 | 7   | 2  |
|                          | 2016 | 7   | 1  |
|                          | 2017 | 6   | 0  |
| Western Norway RHA       | 2015 | 16  | 1  |
|                          | 2016 | 16  | 0  |
|                          | 2017 | 16  | 0  |
| South-Eastern Norway RHA | 2015 | 58  | 4  |
|                          | 2016 | 62  | 1  |
|                          | 2017 | 65  | 2  |

Table 2.3 provides an overview of how many gynaecologists in private practice under public

## 2.2. Definition of sample data from NPR

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funding contracts reported to NPR for each year of the period, and of how many of them only reported some of their activities. Table 2.3 shows inadequate reporting also from two out of seven specialists in private practice under public funding contracts with the Central Norway Regional Health Authority in 2015. However, we find no variation between years on the same scale as was found for Nordland hospital referral area from 2016 to 2017 in the number of contacts with specialists in private practice under public funding contracts in the hospital referral areas in question. We have therefore chosen not to adjust for this.

In addition to the specialists in private practice under public funding contracts, there are many gynaecologists in private practice who do not have public funding contracts. The Norwegian Medical Association (Taraldset 2018) states that out of their 134 members registered with gynaecologist in private practice as their principal occupation in 2017, about 40, or approximately 30%, had no public funding contract. Another 34 members, of whom 20 had no public funding contract, were registered with gynaecologist in private practice as a secondary position. This means that the activities presented in this healthcare atlas do not provide a complete picture of the activities of gynaecologists in private practice.

Data for which key information is lacking are not included in the analyses. It is sometimes a problem, particularly in connection with data from specialists in private practice under public funding contracts, that the patient's municipality number is missing. Without information about the patient's place of residence, an activity cannot be linked to a hospital referral area. Table 2.4 presents information about contacts with specialists in private practice under public funding contracts for the three samples where specialists in private practice under public funding contracts accounted for a significant proportion of activities.<sup>1</sup> The number of contacts excluded because the municipality number was missing is so low that it will not have any material effect on the interpretation of the results.

An overview of activities reported to NPR by gynaecologists in private practice under public funding contracts during the period 2015–2017 is provided in Chapter 2.6.3.

**Table 2.4:** Contacts excluded because the municipality number was missing

| Sample                         | Year | Contacts<br>n | Excl.<br>n | Max. excl. <sup>a</sup><br>proportion (n) | Max. excl. <sup>b</sup><br>n (proportion) |
|--------------------------------|------|---------------|------------|---|---|
| Colposcopy and cervical biopsy | 2015 | 87,471        | 441        | 9% (11)                                   | 38 (3%)                                   |
|                                | 2016 | 87,026        | 205        | 4% (73)                                   | 73 (4%)                                   |
|                                | 2017 | 83,114        | 99         | 4% (40)                                   | 40 (4%)                                   |
| Endometrial diagnosis          | 2015 | 11,397        | 72         | 9% (1)                                    | 20 (8%)                                   |
|                                | 2016 | 11,135        | 19         | 7% (3)                                    | 4 (2%)                                    |
|                                | 2017 | 10,651        | 48         | 8% (12)                                   | 16 (7%)                                   |
| Postmenopausal bleeding        | 2015 | 4,325         | 30         | 10% (7)                                   | 7 (10%)                                   |
|                                | 2016 | 4,321         | 5          | 4% (1)                                    | 2 (2%)                                    |
|                                | 2017 | 4,272         | 21         | 11% (5)                                   | 8 (7%)                                    |

<sup>a</sup> The highest proportion (number) of contacts excluded for a single practice.

<sup>b</sup> The highest number (proportion) of contacts excluded for a single practice.

<sup>1</sup>In 2017, reporting to NPR from specialists in private practice under public funding contracts in Nordland was inadequate. We have therefore replaced the data for contacts with specialists in private practice under public funding contracts in Nordland in 2017 with the average number of contacts for 2015 and 2016. This means that the total number of contacts given in Table 2.4 is not directly comparable with the total number of contacts given in figure tables in the results chapters.

## 2.3 Hospital referral areas

The regional health authorities have a responsibility to provide satisfactory specialist health services to the population in their catchment area (cf. the Specialist Health Service Act Section 2-1a and Section 2-2). In practice, it is the individual health trusts and private providers under a contract with a regional health authority that provide and perform the public health services. Each health trust has a hospital referral area that includes specific municipalities or city districts. Different disciplines can have different hospital referral areas, and for some services, functions are divided between different health trusts and/or private providers. The Gynaecology Healthcare Atlas uses the general hospital referral areas for specialist health services for medical emergency care.

**Table 2.5:** Hospital referral areas and short names used in the text and figures

| Health trust/hospital                                 | Short name      |
|---|-----------------|
| <b>Northern Norway Regional Health Authority</b>      |                 |
| Finnmark Hospital Trust                               | Finnmark        |
| University Hospital of Northern Norway Trust          | UNN             |
| Nordland Hospital Trust                               | Nordland        |
| Helgeland Hospital Trust                              | Helgeland       |
| <b>Central Norway Regional Health Authority</b>       |                 |
| Helse Nord-Trøndelag health trust                     | Nord-Trøndelag  |
| St. Olavs Hospital Trust                              | St. Olavs       |
| Helse Møre og Romsdal health trust                    | Møre og Romsdal |
| <b>Western Norway Regional Health Authority</b>       |                 |
| Helse Førde health trust                              | Førde           |
| Helse Bergen health trust                             | Bergen          |
| Helse Fonna health trust                              | Fonna           |
| Helse Stavanger health trust                          | Stavanger       |
| <b>South-Eastern Norway Regional Health Authority</b> |                 |
| Østfold Hospital Trust                                | Østfold         |
| Akershus University Hospital Trust                    | Akershus        |
| Oslo University Hospital Trust                        | OUS             |
| Lovisenberg Diaconal Hospital                         | Lovisenberg     |
| Diakonhjemmet Hospital                                | Diakonhjemmet   |
| Innlandet Hospital Trust                              | Innlandet       |
| Vestre Viken Hospital Trust                           | Vestre Viken    |
| Vestfold Hospital Trust                               | Vestfold        |
| Telemark Hospital Trust                               | Telemark        |
| Sørlandet Hospital Trust                              | Sørlandet       |

Table 2.5 shows the health trusts or hospitals for which hospital referral areas have been defined and the short versions of the names used in this healthcare atlas. Table B.1 in Appendix B contains a complete list of the municipalities and city districts that belong to the different hospital referral areas. With some exceptions,<sup>2</sup> the hospital referral areas are defined in the same way as in the annual SAMDATA reports (Rønningen et al. 2016).

<sup>2</sup> In this atlas, contacts for which the city district in Oslo is unknown have been assigned to OUS hospital referral area.

Publicly funded private non-commercial hospitals, such as Lovisenberg Diaconal Hospital, Diakonhjemmet Hospital and Haraldsplass Diaconal Hospital, are considered public hospitals. These hospitals have long-term agreements with the regional health authorities to fulfil certain local hospital functions, and they have their own referral areas. In this healthcare atlas, we have defined separate hospital referral areas for Lovisenberg Diaconal Hospital and Diakonhjemmet Hospital, while Haraldsplass Diaconal Hospital's referral area is included in Haukeland hospital's referral area.

## 2.4 Age-adjusted rates

Since we want to compare the use of health services in geographical areas with different age compositions, we use age-adjusted rates. All the rates are calculated per 10,000 women aged 16 years and older. An average rate is calculated for the years 2015–2017, in addition to annual rates per hospital referral area.

The unadjusted rate for an event (e.g. treatment for urinary incontinence) in a hospital referral area is calculated as follows:

$$\frac{\text{Num. of urinary incontinence treatments among women aged 16 and older in the hospital referral area}}{\text{Num. of women aged 16 and older in the hospital referral area}}$$

The rates are adjusted for age by means of direct standardisation using the female population of Norway in the relevant age group in 2016 as the reference population broken down by age groups.<sup>3</sup> The age-adjusted rates are the rates that the areas would have had if the age composition of their female population were identical to that of the country as a whole in 2016. The age-adjusted rate per inhabitant for an event (e.g. treatment for urinary incontinence) in a hospital referral area  $j$  ( $r_j$ ) is calculated as follows:

$$r_j = \sum_{i=1}^K \frac{n_{ij}}{N_{ij}} \times a_i$$

with  $n_{ij}$  being the number of events (treatment for urinary incontinence) in hospital referral area  $j$  and age group  $i$ ,  $N_{ij}$  being the population of hospital referral area  $j$  and age group  $i$ ,  $a_i$  being the national proportion that age group  $i$  makes up of the female population of Norway, and  $K$  being the number of age groups.

We have made it a general requirement that, on average, there should be at least five events in each age group in each hospital referral area (which means that  $n_{ij} \geq K \cdot 5$  in the equation above). We use three age categories for adjustments in this atlas, which means that we require a minimum of 15 events in each hospital referral area to show the result for an area.

Proportions standardised for age are presented in some analyses. In these cases, age-standardised numbers per 10,000 women are used in both the numerator and denominator.

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<sup>3</sup> The age groups are defined in such a way that there are about the same number of events in each age group. The age group division will consequently vary between patient samples.

## 2.5 Assessment of variation

A more thorough description of the assessment of variation in the use of health services can be found in the Healthcare Atlas for the Elderly in Norway (Balteskard et al. 2017) and in the report *Indikatorer for måling av uberettiget variasjon* (SKDE 2016).

There is no single measurement that can tell us whether observed variation is large or small, or warranted or unwarranted. The ratio between the extremes is often used as an indication of whether the observed variation is large or small. If there is twice as many contacts or procedures in one hospital referral area as in another, that will often be described as large or substantial variation. At the same time, the number of events must be taken into consideration. Small numbers mean a larger element of random variation.

The differences in population size between the different hospital referral areas must also be taken into account when interpreting the results in the atlas. Generally speaking, the proportion of the total variation that is due to random variation will be smaller the bigger the population, the bigger the number of patients in the patient sample, the fewer hospital referral areas and the smaller the differences in population between the hospital referral areas.

The number of hospital referral areas and the population are constant in the analyses, while the size of the patient samples varies. It will therefore be challenging to estimate the scope of random variation when making comparisons between hospital referral areas with big and small populations in general, and particularly in the case of small patient samples. With sufficiently big patient samples, the proportion of overall variation caused by random variation will be smaller.

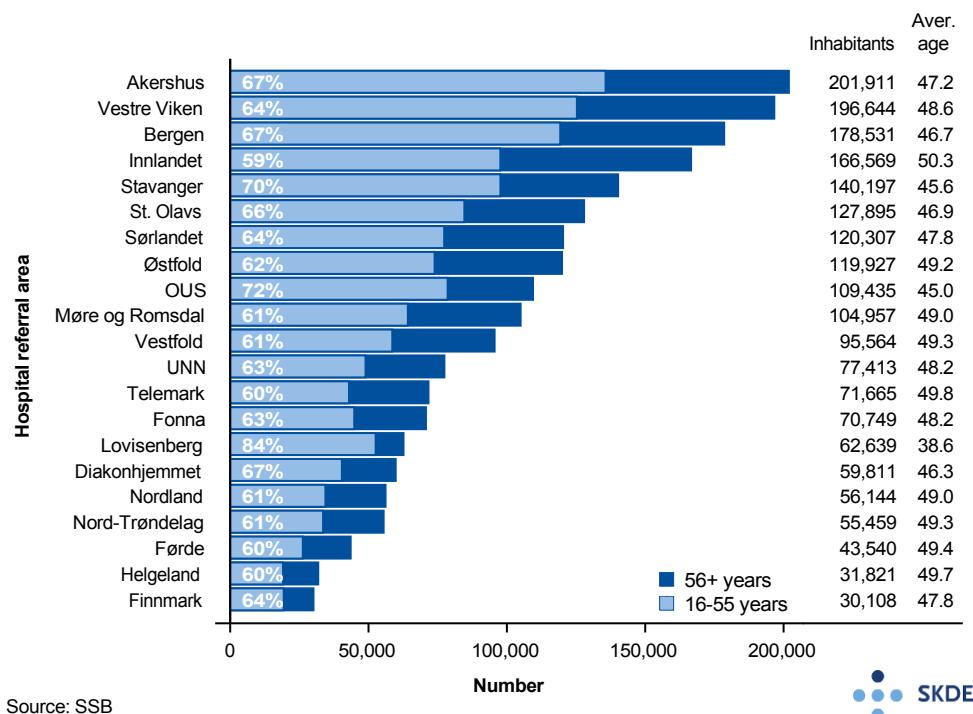
The assessment of whether the variation observed is warranted or unwarranted is based on what it would be reasonable to expect if all the observed variation were warranted. As regards the services included in this healthcare atlas, it is reasonable to expect women to have the same need for them regardless of where they live. It is also a reasonable expectation that all patients are given a chance to make informed choices regarding treatment options for their condition. If the health services are equitably distributed in the population, we would therefore expect little geographical variation in their use, other than random variation. When the observed variation does not tally with these expectations and the element of random variation is not too large taking variation from one year to the next and the size of the samples into account, we can assume that some of the observed variation is unwarranted. The term *unwarranted variation* refers to the part of the observed variation that is not due to chance, patient preferences or differences in underlying morbidity. The overall assessment includes elements of discretionary judgement.

## 2.6 The female population

We will provide a brief overview of how the female population breaks down between the different hospital referral areas, and an overall description of the proportion of the specialist health services' activities that is covered by the Gynaecology Healthcare Atlas.

### 2.6.1 Breakdown by hospital referral area and age

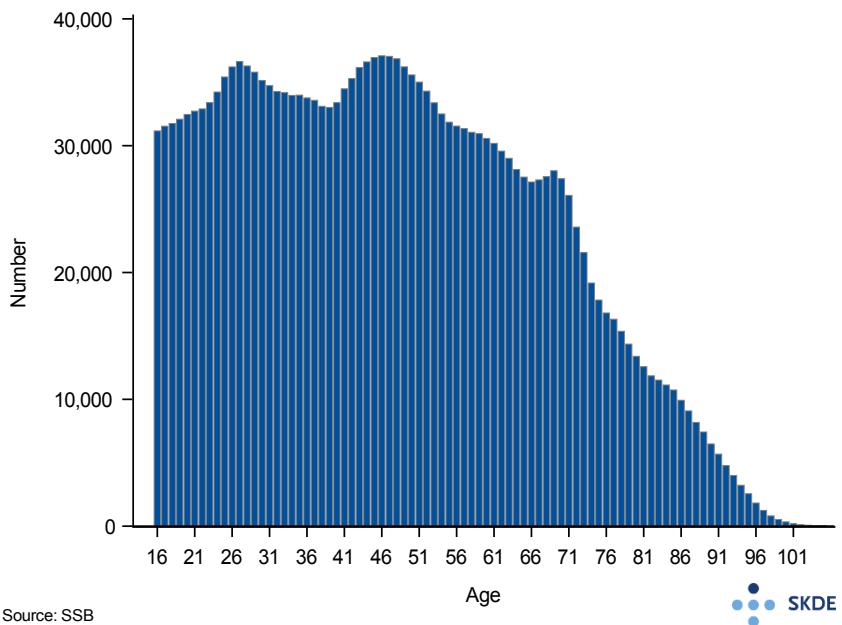
In the period 2015–2017, there were, on average, about 2.1 million women aged 16 years or older in Norway (hereinafter called 'the female population'). The average age of these women was 47.7 years. The size of the female population in the different hospital referral areas differed greatly, from around 30,000 women in the hospital referral areas of Finnmark and Helgeland to more than 200,000 in Akershus (Figure 2.1).



**Figure 2.1:** Number of women aged 16 years or older living in Norway, broken down by hospital referral area and age group. Average for the period 2015–2017.

The average age varied from 38.6 years in Lovisenberg hospital referral area to 50.3 years in the Innlandet area. We have limited the sample for several procedures and examinations to only include women in the age group 16–55 years (see Chapter 2.2.1). In Lovisenberg hospital referral area, 84% of women were younger than 56, while the corresponding proportion for the Innlandet area was 59%.

Figure 2.2 shows the average age distribution in the female population for the period 2015–2017.



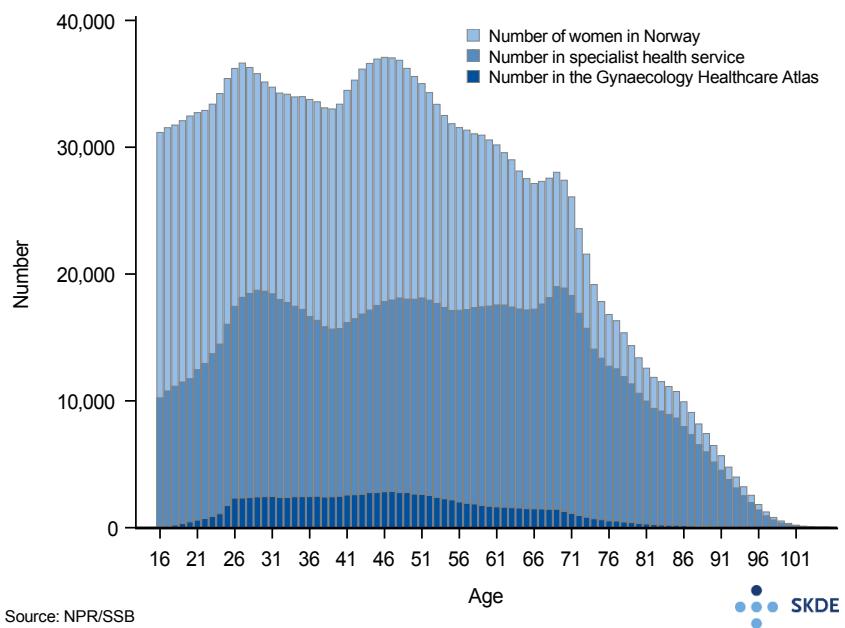
**Figure 2.2:** Number of women aged 16 years or older living in Norway, broken down by age.  
Average for the period 2015–2017.

## 2.6.2 The scope of the Gynaecology Healthcare Atlas

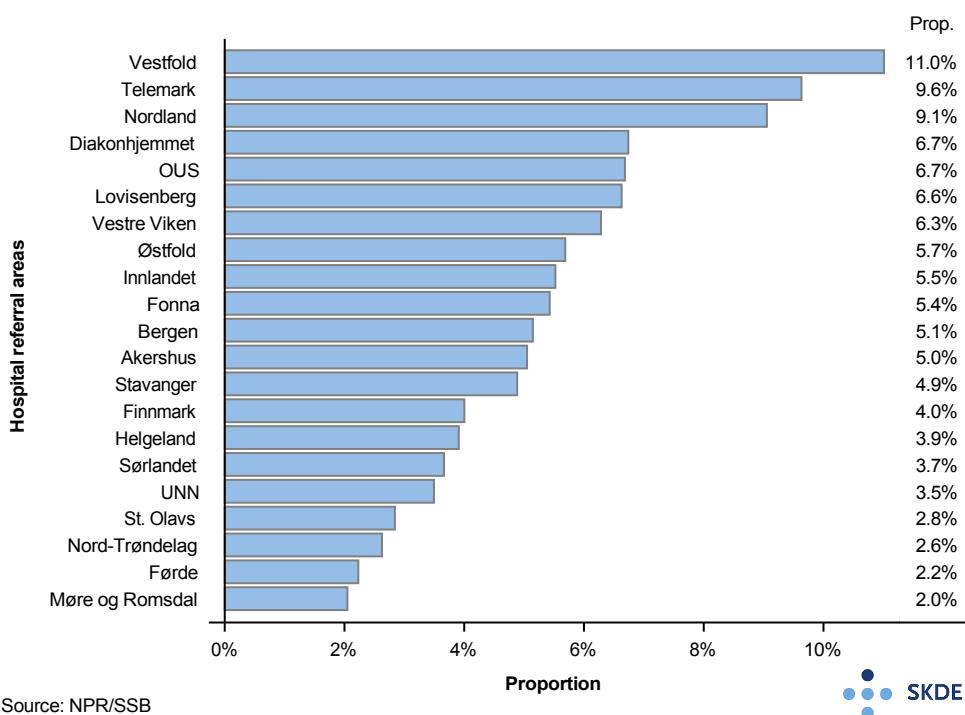
Figure 2.3 shows the age breakdown for the female population as a whole, the part of the female population that has been in contact with the specialist health service, and the part of the female population included in the Gynaecology Healthcare Atlas. The numbers given are averages for the period 2015–2017. About half the female population were in contact with the specialist health service in any one year. The proportion varied from 49% in the hospital referral areas of Stavanger and Lovisenberg to 58% in the Helgeland area (data not shown). Only 10% of them are included in one or more of the Gynaecology Healthcare Atlas's patient samples.

Figure 2.4 shows women included in the Gynaecology Healthcare Atlas as a proportion of the female population, broken down by the different hospital referral areas. We see that the proportion of women included in the Gynaecology Healthcare Atlas varies greatly between hospital referral areas.

## 2.6. The female population



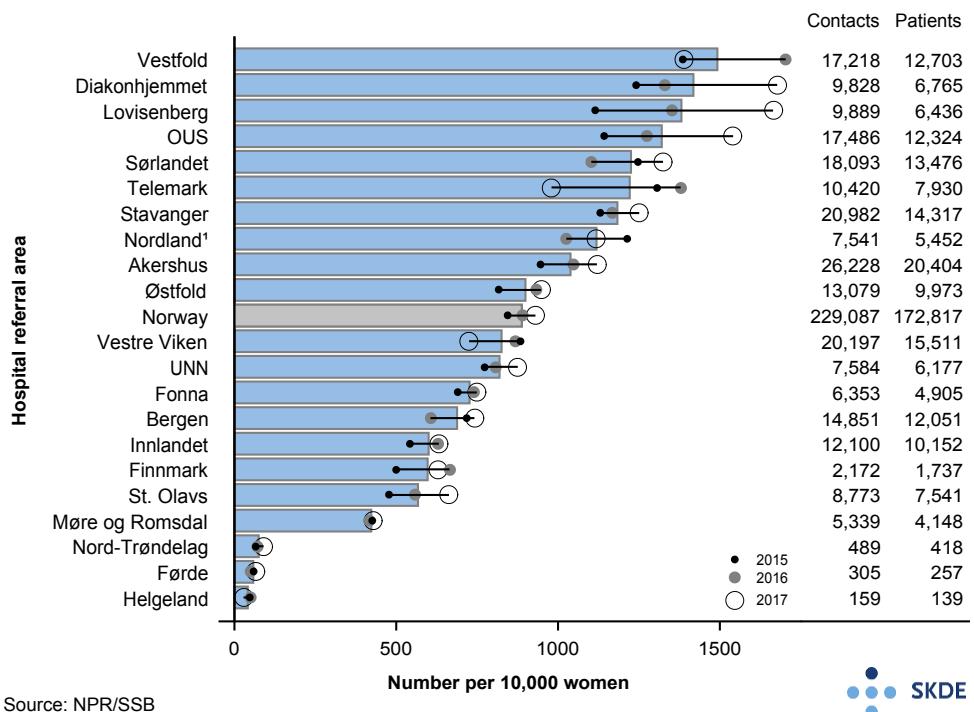
**Figure 2.3:** Number of women in Norway, in the specialist health service and in the Gynaecology Healthcare Atlas, broken down by age. Average for the period 2015–2017.



**Figure 2.4:** Women in the Gynaecology Healthcare Atlas as a proportion of the population, broken down by hospital referral area.

### 2.6.3 The use of specialists in private practice under public funding contracts

Figure 2.5 shows all contacts with gynaecologists in private practice under public funding contracts per 10,000 women in the period 2015–2017, broken down by the health trusts' hospital referral areas. Rates were very low in the hospital referral areas of Nord-Trøndelag, Førde and Helgeland. The reason for this is that there are no gynaecologists in private practice under public funding contracts based in these referral areas.



**Figure 2.5:** Number of contacts with gynaecologists in private practice under public funding contracts per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. Number of contacts and patients per year on the right. <sup>1</sup> Due to inadequate reporting from specialists in private practice under public funding contracts, the number of contacts with such specialists in 2017 in Nordland has been set to the average for 2015 and 2016.

Several of the hospital referral areas showed quite considerable variation from year to year. This is mainly due to public funding contracts for specialists in private practice being entered into or terminated, or inadequate reporting to NPR. The deviation caused by inadequate reporting was particularly marked for specialists in private practice under public funding contracts in the Nordland area for 2017, and this is explained in more detail in Chapter 2.2.2. For this reason, we have chosen to replace data reported by specialists in private practice under public funding contracts for 2017 with the average number of contacts in 2015 and 2016 for women living in the Nordland area.

## 2.7 Other definitions

### Episode of care

A patient can be assessed, treated or followed up in several different departments at a hospital or transferred between different hospitals. In order to be able to count patients in a consistent manner regardless of transfers between departments and hospitals, we have defined the term ‘episode of care’.

All department stays or day patient treatments (defined on the basis of SAMDATA’s derived variable ‘Activity category 3’ (Mangerud et al. 2016)) where the time of registration for one admission is less than eight hours after the time of discharge from a previous department stay or day patient treatment for the same patient, are defined as an episode of care (Hassani et al. 2015; Hansen et al. 2016). This means that all department stays or day patient treatments that are less than eight hours apart count as one episode of care, regardless of whether they took place in the same or different hospitals.

All outpatient contacts are defined as separate episodes of care. This means that if a patient has two outpatient contacts, they will be defined as two different episodes of care regardless of whether the consultations are less than eight hours apart.

Examples of an episode of care:

- a patient is admitted to one department, transferred to another department at the same hospital and discharged
- a patient is admitted to a local hospital, transferred to a university hospital and transferred back to the local hospital without having been discharged or with less than eight hours between discharge and the next admission
- a patient has one outpatient contact

This healthcare atlas presents numbers of episodes of care for gynaecological health services without taking account of the level of care. For some services, we look at *outpatient contacts* in particular. They are defined as episodes of care in aggregate data.

### Outpatient contacts

The term *outpatient contact* is used to describe the following episodes of care:

- outpatient contacts in hospital
- outpatient contacts with specialists in private practice under public funding contracts
- day patient treatments
- department stays where a patient was admitted and discharged, alive, on the same day



## **Chapter 3**

# **Diagnosis and assessment**

The investigation of potential female genital illness consists of mapping the patient's medical history and carrying out pelvic examinations, medical imaging (usually ultrasound) examinations and, if relevant, laboratory tests. Pelvic examinations are carried out by looking and feeling for changes in the external and particularly in the internal genitalia; the vagina, cervix, uterus and ovaries. An ultrasound examination via the vagina (vaginal ultrasound scan) is often used for better overview. This is a simple and useful examination when illness in the inner genitals is suspected. Ultrasound examination cannot distinguish between benign and malignant masses with certainty, but it can be used to distinguish between fluid-filled cysts and solid tumours. In cases of suspected cancer, biopsies and ultrasound will often be supplemented by other diagnostic imaging methods such as CT and MR. Targeted sampling is strived for if infection is suspected. It is often relevant to check a woman's hormonal status as part of an investigation of gynaecological issues.

### **3.1 Postmenopausal bleeding**

The menopause starts one year after a woman's last spontaneous menstruation. The average Norwegian woman reaches menopause at the age of 51 or 52 (Gjelsvik et al. 2011). Bleeding that occurs more than one year after the last spontaneous menstruation is called postmenopausal bleeding and must be investigated, since it could be caused by cancer or cervical neoplasia. The most common cause of postmenopausal bleeding is fragile mucous membranes due to low oestrogen levels or benign changes such as polyps. Bleeding could also be linked to hormone replacement therapy. Women who experience postmenopausal bleeding are to be assessed within a few weeks by means of a pelvic examination, vaginal ultrasound, and usually also a Pap smear and an endometrial biopsy (pipelle biopsy or curettage). Further action taken will depend on the findings made. Topical oestrogen treatment (suppositories, creams or gels) can be used to treat fragile mucous membranes. If the problem is caused by ongoing hormone replacement therapy, the therapy must be adjusted or discontinued. Polyps that cause bleeding should be removed completely in order to reduce bleeding and to make sure that the polyp is not malign. Endometrial hyperplasia brings a certain risk of developing cancer (8–30% risk for patients with atypical hyperplasia (American cancer society 2017)). Oestrogen strengthens the mucous membrane. Hormonal IUDs or gestagens (a female sex hormone) in tablet form could counteract the stimulating effect of oestrogen. If this does not work, hysterectomy may be considered. If the bleeding is found to be caused by cervical neoplasia or cancer, the patient will be treated in

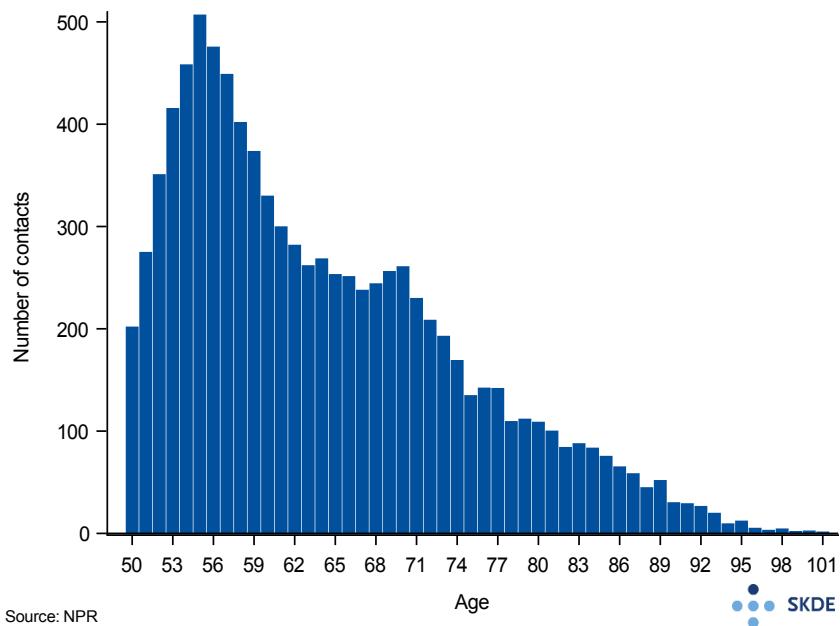
accordance with the relevant treatment protocol.

## Sample

Postmenopausal bleeding is defined by the diagnosis code N95.0 as a primary or secondary diagnosis. The sample is limited to women aged 50 years or older.

## Findings

During the period 2015–2017, just over 7,000 patients with the condition postmenopausal bleeding had a total of about 9,000 outpatient contacts. Figure 3.1 shows the number of outpatient contacts broken down by age.

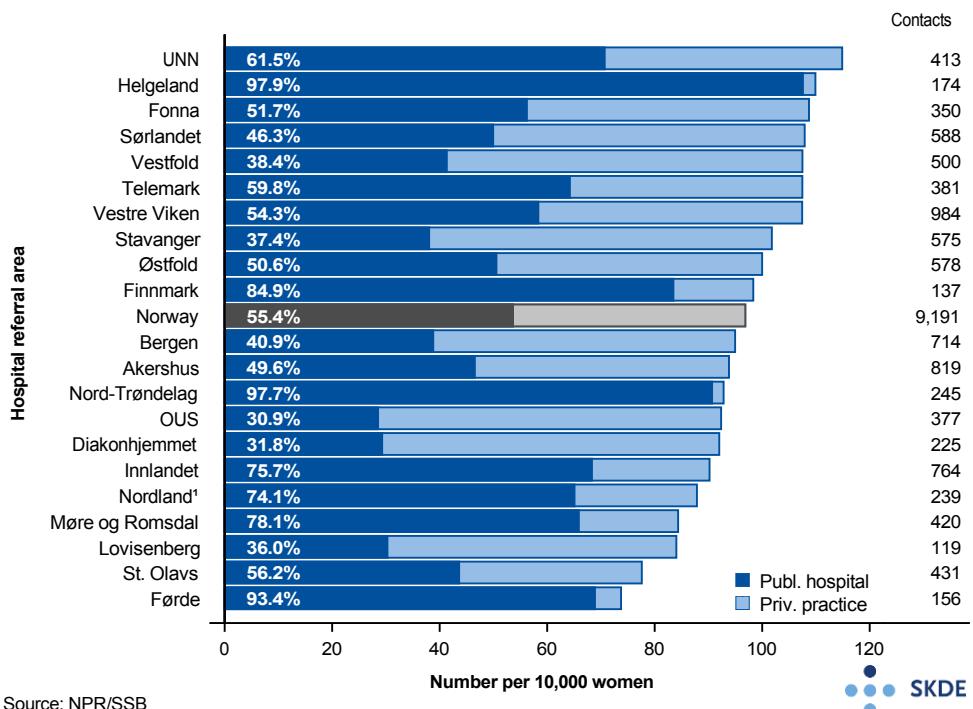


**Figure 3.1:** Number of outpatient contacts for postmenopausal bleeding broken down by age, average per year for the period 2015–2017.

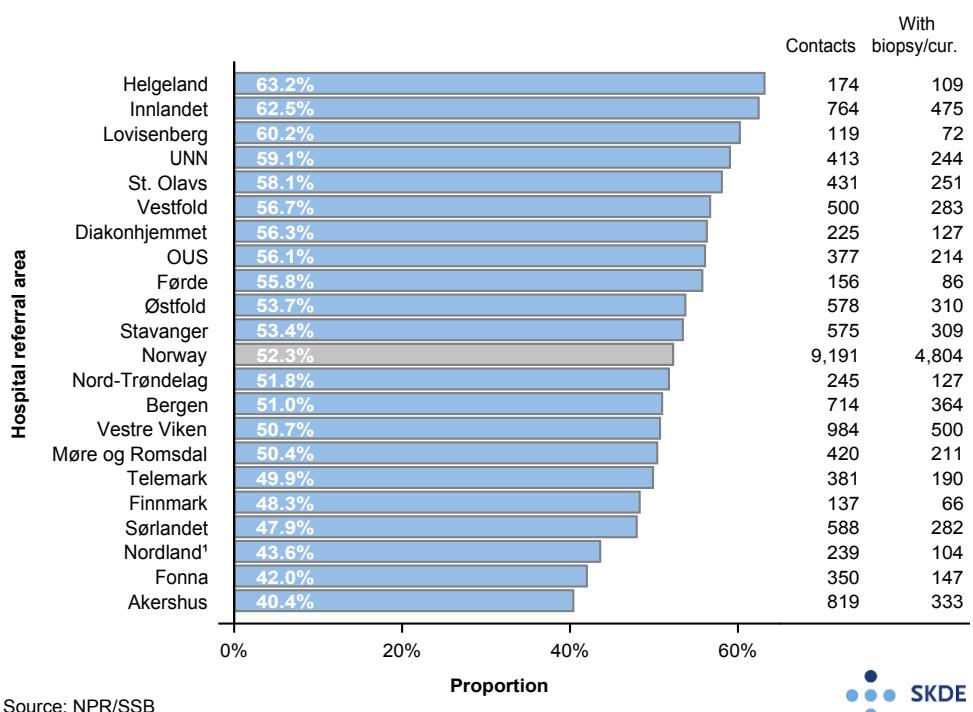
There were about 1.5 times as many contacts for postmenopausal bleeding per 10,000 women in UNN hospital referral area as in the Førde area (Figure 3.2). For Norway as a whole, just over half of the patients were assessed at public hospitals and the rest by specialists in private practice under public funding contracts. The proportion of contacts with specialists in private practice under public funding contracts varied greatly between different parts of Norway. Among residents of Helgeland and Nord-Trøndelag hospital referral areas, only about 2% were assessed by specialists in private practice under public funding contracts, while the corresponding proportion for the areas OUS and Diakonhjemmet was about 70%.

Figure 3.3 shows that endometrial biopsies were taken and/or uterine curettage performed in connection with 40–60% of the contacts for postmenopausal bleeding (see also Chapter 3.2).

### 3.1. Postmenopausal bleeding



**Figure 3.2:** Number of outpatient contacts for postmenopausal bleeding per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by public hospitals or specialists in private practice under public funding contracts. Average number of contacts on the right. The sample is limited to women aged 50 years or older. <sup>1</sup> See footnote 1, page 17.



**Figure 3.3:** Outpatient contacts with endometrial biopsy and/or curettage as a proportion of all outpatient contacts for postmenopausal bleeding, adjusted for age, average per year 2015–2017 broken down by hospital referral area. The sample is limited to women aged 50 years or older. <sup>1</sup> See footnote 1, page 17.

## **Comments**

There is little geographical variation in the use of outpatient contacts for postmenopausal bleeding. This indicates that Norwegian women who experience bleeding after menopause are offered equitable services.

## 3.2 Endometrial diagnosis

Most women who develop endometrial cancer (cancer of the lining of the womb) have experienced abnormal vaginal bleeding. The nature of the bleeding may have changed and become heavier or irregular, or bleeding may have occurred after menopause. A vaginal ultrasound scan is usually performed first in an attempt to identify a tumour or a thickening of the lining of the womb. Then a biopsy is taken of the lining of the womb (endometrial biopsy), usually a small biopsy that can be taken without the need for anaesthesia. If the result is inconclusive or if more information is needed, for example about which type of cancer a patient has, a bigger biopsy is taken by uterine curettage. This procedure requires anaesthesia, usually a general anaesthesia.

### Sample

#### Data from NPR

In data from NPR, endometrial biopsy and curettage are defined by the following surgical procedure codes and tariff codes:

| Endometrial biopsy |        |      |      | Curettage |
|--------------------|--------|------|------|-----------|
| LCA 06             | LUC 05 | 207b | 214c | LCA 10    |
|                    | LUC 15 |      |      | LCA 13    |

The analysis is based on the number of outpatient contacts involving endometrial biopsy and the total number of curettage procedures (regardless of level of care).

Contacts with procedure codes for both curettage and removal of the endometrium (Chapter 5.3) are excluded from this sample because such contacts are classified as treatment, not diagnostic activities. Contacts with a curettage procedure code and a primary diagnosis code from chapter 15 of ICD-10 (Pregnancy, childbirth and the puerperium, diagnosis codes O00-O99) have been excluded from the sample for the same reason.

A code for curettage has been registered for a total of 1,414 contacts with specialists in private practice under public funding contracts. These cases are probably miscoded. Most of them are contacts where a tariff code for endometrial biopsy has been registered in combination with the surgical procedure codes LCA 10 or LCA 13. No procedure code for general anaesthesia is registered for any of the contacts in question. This makes it most likely that the patients have undergone endometrial biopsies. Of these 1,414 contacts, those for which an endometrial biopsy tariff code is registered have been included in our analysis as *outpatient contacts with endometrial biopsy*. The remaining contacts have been excluded.

#### Data from KUHR

This sample also includes the activities of regular GPs and emergency primary healthcare services. The data source is the KUHR (control and payment of reimbursements to health service providers) database. Regular GP (RGP) or emergency primary healthcare consultations registered with at least one of the following tariff codes can be included in the sample:<sup>4</sup>

- 2ad GP consultation

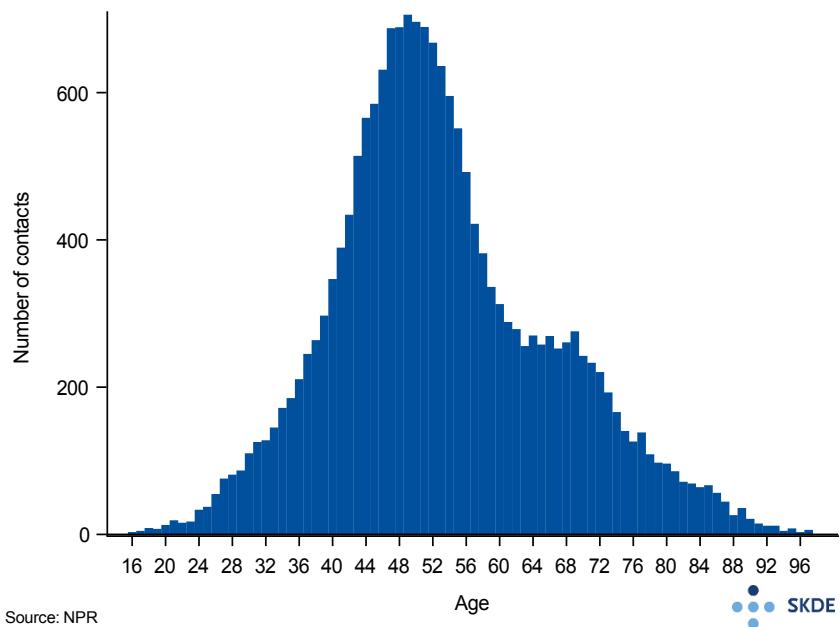
<sup>4</sup>The Norwegian Medical Association's normal tariff for regular GPs and emergency primary healthcare 2016–2017

- 2ae E-consultation with an RGP
- 2ak GP consultation
- 2fk Consultation and supplement for call-out to surgery for emergency care while on out-of-hours emergency primary healthcare duty when a means of transport was used, for first patient
- 11ad Home visit by a GP
- 11ak Home visit by a GP

The sample includes all contacts for women aged 16 years or older with at least one of the above tariff codes in combination with tariff code 214c.

## Findings

During the period 2015–2017, around 17,000 endometrial biopsies and 3,000 curettages were performed by the publicly funded specialist health service in Norway each year. Another approximately 1,000 endometrial biopsies were performed by RGPs or the emergency primary healthcare services. Figure 3.4 shows the number of contacts with the specialist health service broken down by age.

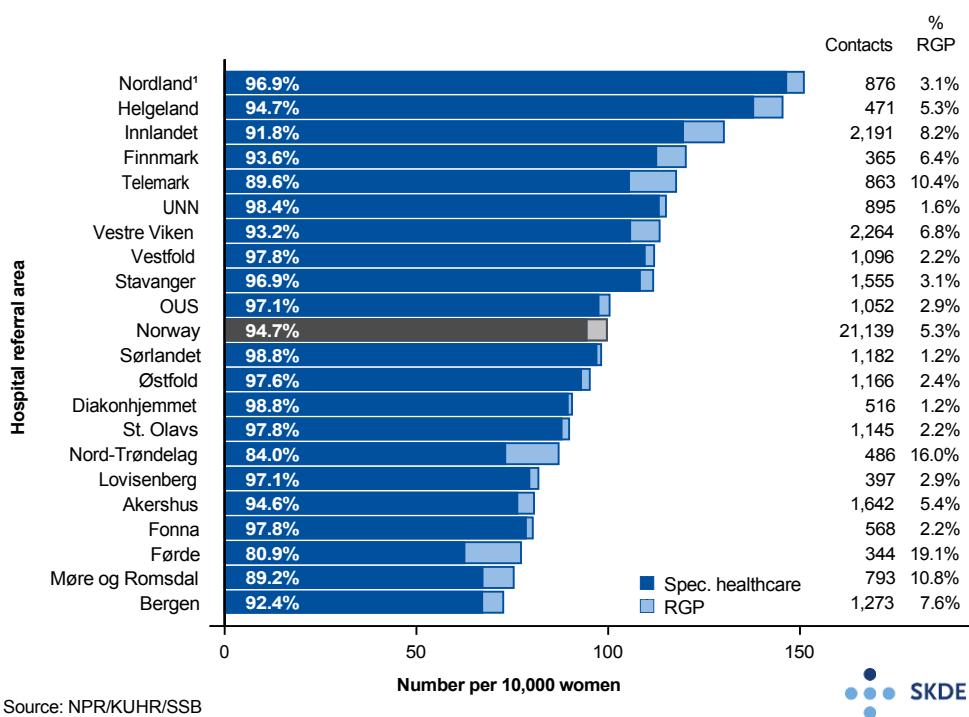


**Figure 3.4:** Number of outpatient contacts where endometrial biopsies or curettages were performed, broken down by age, average per year for the period 2015–2017.

Figure 3.5 shows moderate geographical variation in the use of such examinations. About twice as many endometrial biopsies or curettages were performed per 10,000 women in Nordland hospital referral area as in the Bergen area. The proportion of contacts with RGPs varied from 19.1% for Førde hospital referral area to 1.2% for the areas of Diakonhjemmet and Sørlandet.

Figure 3.6 shows the number of endometrial biopsies and curettages performed by the specialist health service. For Norway as a whole, the proportion of examinations that included curettage (of all endometrial biopsy or curettage examinations) was about 17%, but there was considerable

### 3.2. Endometrial diagnosis

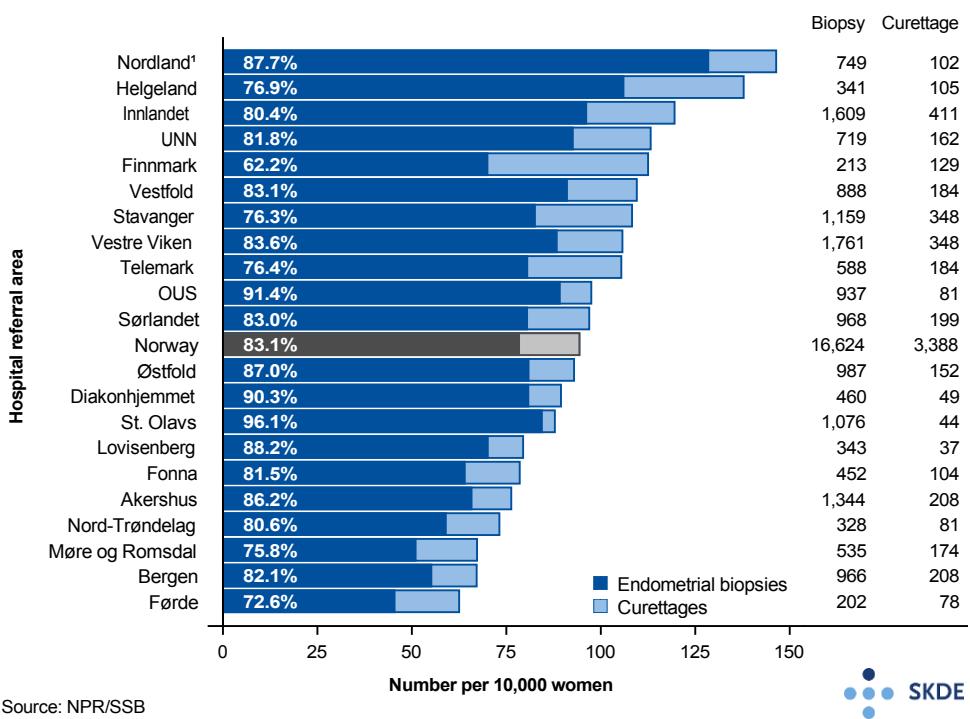


**Figure 3.5:** Number of endometrial biopsies or curettages per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by contacts with the specialist health service and contacts with RGPs or the emergency primary healthcare services, respectively. Average number and proportion of contacts with RGPs on the right. <sup>1</sup> See footnote 1, page 17

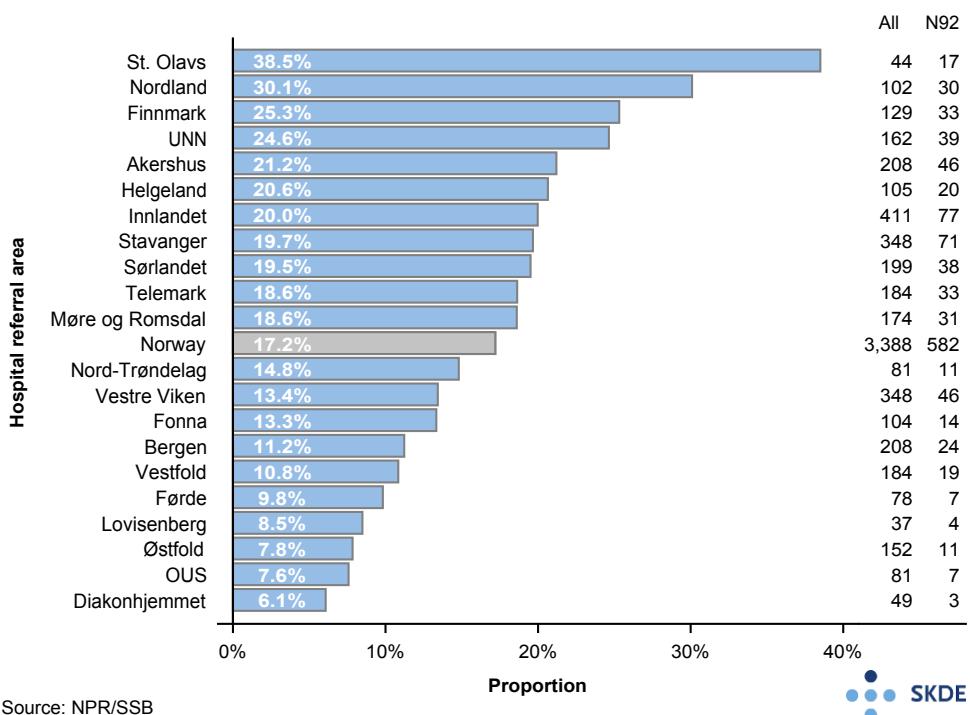
variation between hospital referral areas. For St. Olavs hospital referral area, curettage was only performed during 4% of contacts, while in the Finnmark area, 38% of contacts involved curettage. The variation was somewhat lower in the rates for women with a primary or secondary diagnosis of N95.0 Postmenopausal bleeding (in the age group 50 years or older) than for women with other conditions (in the age group 16–55 years) (data not shown). Curettage was also more common for older women with postmenopausal bleeding (approximately 25% of contacts) than for younger women with other conditions (approximately 10% of contacts) (data not shown).

Figure 3.7 shows curettages performed on patients with a primary diagnosis of N92 excessive and/or frequent menstruation as a proportion of all curettages. St. Olavs hospital referral area had the highest proportion (38.5%), but only a very small number of curettages (see Figure 3.6). Nordland hospital referral area had the second highest proportion (30.1%), and a higher number of curettages. There was considerable geographical variation. The proportion of curettages performed on women with a primary diagnosis of N92 excessive and/or frequent menstruation was about four times as high for Nordland as for Diakonhjemmet hospital referral area.

### Chapter 3. Diagnosis and assessment



**Figure 3.6:** Number of contacts with the specialist health service per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by endometrial biopsy versus curettage. Average number of contacts on the right. <sup>1</sup> See footnote 1, page 17.



**Figure 3.7:** Curettages for a primary diagnosis of N92 excessive and/or frequent menstruation as a proportion of all curettages, adjusted for age, average per year 2015–2017 broken down by hospital referral area. Average number of contacts on the right.

#### **Comments**

Moderate geographical variation was found in the use of endometrial biopsies and curettages. The proportion of examinations during which curettage was performed varied considerably.

Endometrial biopsies and curettages are primarily performed by the specialist health service, but in some hospital referral areas a not insignificant proportion of women had endometrial biopsies taken by their regular GP or the emergency primary healthcare services. The two hospital referral areas that had the highest proportion of endometrial biopsies taken by RGPs and the emergency primary healthcare services (Fig. 3.5) had no specialists in private practice under public funding contracts in the field of gynaecology (see Chapter 2.6). Other factors that could have a bearing on the proportion of endometrial biopsies performed by RGPs or the emergency primary healthcare services include the RGPs' practice profiles, knowledge and interests, and the capacity and waiting times for appointments with outpatient clinics and specialists in private practice under public funding contracts.

The National Health Service (NHS) in the UK has recently recommended that curettage should not be performed for heavy menstrual bleeding unless special reasons indicate that the patient will benefit from the procedure (Iacobucci 2018). There was considerable geographical variation in the proportion of curettages for primary diagnosis N92 excessive and/or frequent menstruation in Norway during the period 2015–2017, but the total number of such procedures was modest.

Endometrial cancer is most common in women in the age group 50–80 years (Engholm et al. 2010). Figure 3.4 shows that a large number of women under 50 years of age undergo endometrial diagnosis with curettage and endometrial biopsy. The number of contacts increases steeply with increasing age for women in the age group 40–50 years, and peaks around the age of 50. This coincides with the age when many women will naturally experience changes in their bleeding pattern caused by hormonal changes associated with menopause.

There is no known geographical variation in morbidity to indicate that there should be a geographical variation in the need for endometrial biopsies and curettages. Moreover, the numbers are so high that random variation will not be expected to contribute much to the variation. The observed variation must therefore be deemed to be unwarranted.

### 3.3 Colposcopy and cervical biopsy

Norwegian women are screened for abnormal cervical cells.<sup>5</sup>. A routine sample from the cervix every three years is recommended for women between the ages of 25 and 69. If cancer or cervical neoplasia is suspected, usually based on a Pap smear or a HPV test, there is reason to examine the cervix by means of colposcopy. A colposcope is a sort of microscope that magnifies and provides good lighting, and it helps to identify areas of abnormal cervical cells from which a biopsy can be taken. A Norwegian study carried out at St. Olavs Hospital showed that abnormal cells that require treatment can look normal under a microscope (Baasland et al. 2016). If the appearance of the cervix is normal during a colposcopy, biopsies are nevertheless collected if a Pap smear and/or HPV test indicate that there is a possibility that abnormal cells may be present. Endocervical curettage is often an option.

#### Sample

Colposcopy and cervical biopsy are defined by the following surgical procedure codes and tariff codes:

| Colposcopy | Cervical biopsy |
|------------|-----------------|
| XLE 00     | LXE 00          |
| 208        | LDA 10          |
|            | LDA 20          |
|            | LDA 96          |

#### Findings

During the period 2015–2017, there were more than 100,000 outpatient contacts per year where colposcopy and/or cervical biopsy were performed. Figure 3.8 shows the number of outpatient contacts broken down by age.

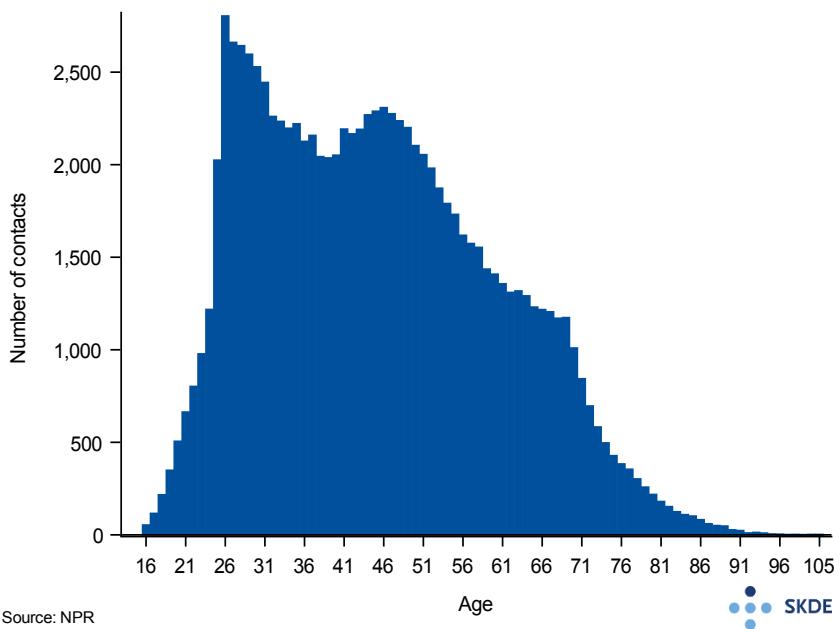
For Norway as a whole, the proportion of contacts where only colposcopy was performed (without a biopsy) (of all outpatient contacts with colposcopy and/or cervical biopsy) was 83%, but this varied considerably between hospital referral areas and between public hospitals and specialists in private practice under public funding contracts. Out of 13,391 contacts at hospitals where colposcopy and/or cervical biopsy were performed, 33% of cases involved only colposcopy (without a biopsy). The corresponding proportion for the 87,424 contacts with specialists in private practice under public funding contracts was 90%. This means that the vast majority of outpatient contacts in the specialist health service where colposcopy and/or cervical biopsy were performed were contacts with specialists in private practice under public funding contracts where only colposcopy was performed (without a biopsy).

Figure 3.9 shows the number of outpatient contacts where colposcopy and/or cervical biopsy were performed per 10,000 women, broken down by contacts with specialists in private practice under public funding contracts where only a colposcopy was performed (without a biopsy) and all other contacts (all contacts at public hospitals and contacts with specialists in private practice under public funding contracts where a cervical biopsy was performed).

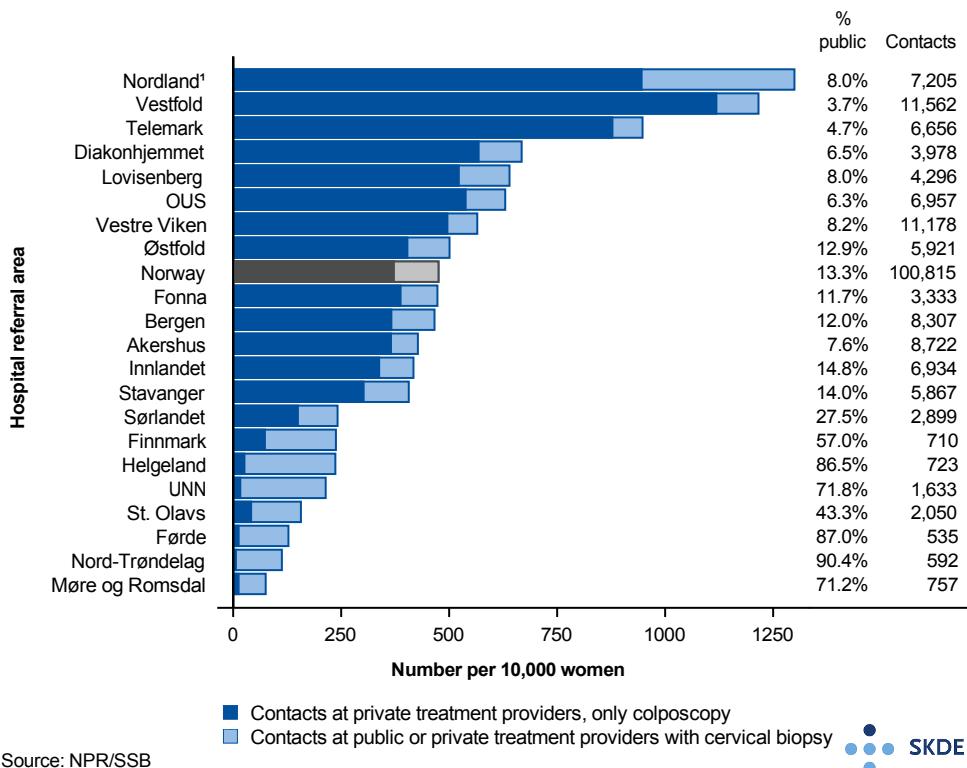
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<sup>5</sup> The Norwegian Cervical Cancer Screening Programme (NCCSP). [www.kreftregisteret.no/screening/livmorhalsprogrammet](http://www.kreftregisteret.no/screening/livmorhalsprogrammet)

### 3.3. Colposcopy and cervical biopsy



**Figure 3.8:** Number of outpatient contacts with colposcopy and/or cervical biopsy broken down by age, average per year for the period 2015–2017.

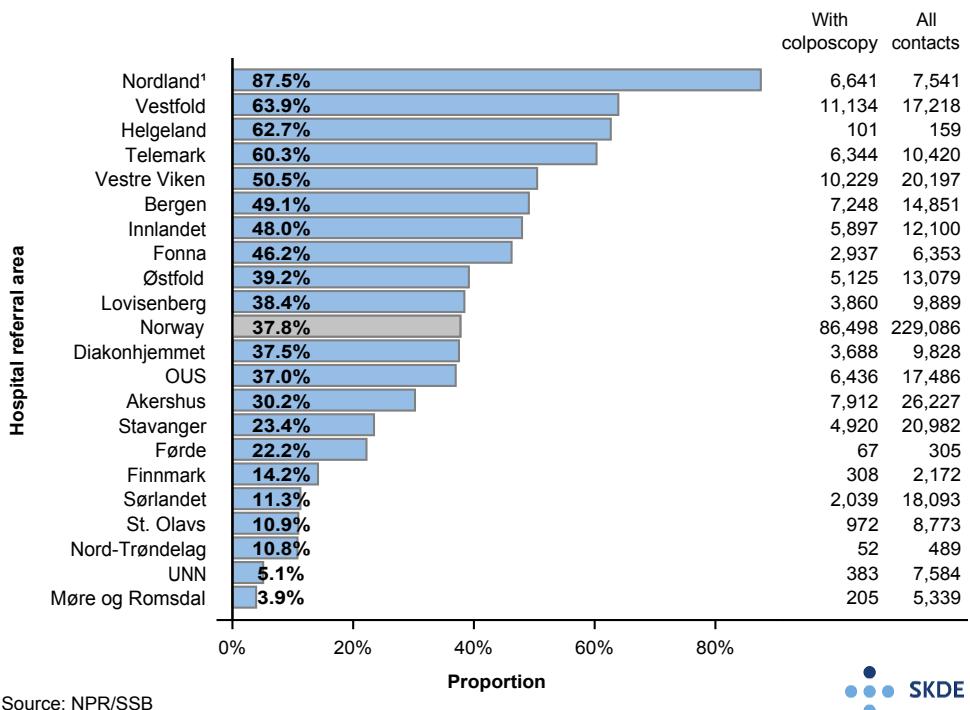


**Figure 3.9:** Number of outpatient contacts with colposcopy and/or cervical biopsy per 10,000 women, adjusted for age, average per year for the period 2015–2017 broken down by hospital referral area and by contacts with specialists in private practices under public funding contracts where only a colposcopy was performed and all other contacts (all contacts at public hospitals and contacts with specialists in private practice under public funding contracts where a cervical biopsy was performed). Percentage carried out at public hospitals and average number of contacts on the right. <sup>1</sup> See footnote 1, page 17.

There was very high geographical variation in the use of colposcopy and/or cervical biopsy. About ten times as many examinations using colposcopy and/or cervical biopsy were performed per 10,000 women in the hospital referral areas of Vestfold and Nordland as in Møre og Romsdal and Nord-Trøndelag.

There was also considerable variation in the proportion of these examinations carried out by specialists in private practice under public funding contracts. For women living in the hospital referral areas of Nord-Trøndelag, Førde and Helgeland, only 10–15% of such examinations were carried out by specialists in private practice under public funding contracts. The corresponding proportion for women living in Vestfold and Telemark was approximately 95%. The proportion of examinations carried out by specialists in private practice under public funding contracts was generally highest in the hospital referral areas that had the highest rates. In most of the areas, the total rate was dominated by contacts with specialists in private practice under public funding contracts where colposcopy was performed without a cervical biopsy.

Figure 3.10 shows contacts where colposcopy was performed as a percentage of all contacts with gynaecologists in private practice under public funding contracts. Women living in Nordland hospital referral area underwent a colposcopy examination in 87.6% of all contacts. The corresponding proportion for women living in Møre og Romsdal hospital referral area was only 3.9%.

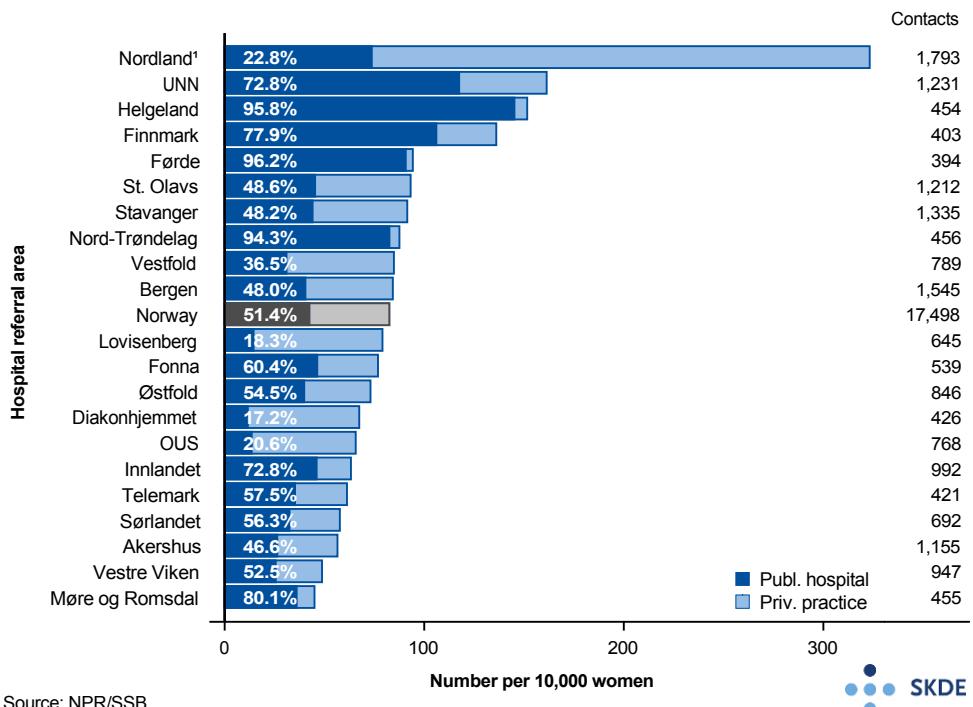


**Figure 3.10:** Contacts where colposcopy was performed as a percentage of all contacts with gynaecologists in private practice under public funding contracts, adjusted for age, average per year for the period 2015–2017 broken down by hospital referral area. Average number of contacts on the right.<sup>1</sup> See footnote 1, page 17.

There was also considerable geographical variation in the use of cervical biopsy (Fig. 3.11), and hospital referral areas in Northern Norway stood out with the highest rates. More than seven times as many cervical biopsies were performed per 10,000 women for Nordland as for Møre og Romsdal hospital referral area. If we exclude Nordland, which had a much higher rate than all the other hospital referral areas, variation was still high. The rates of the hospital referral areas UNN,

### 3.3. Colposcopy and cervical biopsy

Helgeland and Finnmark were quite similar and markedly higher than in the other hospital referral areas. There was moderate variation between the hospital referral areas in Southern Norway.



**Figure 3.11:** Number of outpatient contacts with cervical biopsy per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by public hospitals or specialists in private practice under public funding contracts. Average number of contacts on the right. <sup>1</sup> See footnote 1, page 17.

## Comments

During the period 2015–2017, the publicly funded specialist health service had more than 100,000 outpatient contacts per year involving colposcopy and/or cervical biopsy. In 74% of these examinations, colposcopy was performed without a cervical biopsy. Colposcopy is primarily to be used as an aid when taking a cervical biopsy and in follow-up of patients after treatment (conisation) for abnormal cells. Cervical biopsy is performed on suspicion of cervical neoplasia based on symptoms and/or a Pap smear/HPV test or on suspicion of residual tumour tissue after conisation. Our results indicate that this is not the case in practice.

Colposcopy is a common procedure both at hospitals and for specialists in private practice under public funding contracts, but the proportion of contacts where a colposcopy has been performed alone (without a cervical biopsy) is much higher for specialists in private practice under public funding contracts (90%) than for hospitals (33%). As shown in Figure 3.10, colposcopy is used as part of the pelvic examination for a high percentage of women examined by specialists in private practice under public funding contracts. In some hospital referral areas, colposcopy is used in more than 60% of contacts with specialists in private practice under public funding contracts.

These results suggest that colposcopy is overused in pelvic examinations, mainly in consultations with specialists in private practice under public funding contracts, and the considerable variation between hospital referral areas in the use of colposcopy indicates geographical variation in the extent of overuse.

### Chapter 3. Diagnosis and assessment

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Considerable geographical variation was also found in the use of cervical biopsy, where hospital referral areas in Northern Norway stand out with particularly high rates compared to the other hospital referral areas. There is moderate variation between the hospital referral areas in Southern Norway.

The Norwegian Cervical Cancer Screening Programme started a trial scheme in 2015 whereby samples from half the women aged 34–69 were tested for HPV as a primary screening method instead of the ordinary cytology sample analysis. The trial scheme was introduced in Trøndelag, Hordaland and Rogaland, and one expected an increase in the number of women having cervical biopsies after being found to have HPV in these counties. The population of these counties corresponds to the people resident in the hospital referral areas of Nord-Trøndelag, St. Olavs, Bergen, Fonna and Stavanger, and we see that all these areas have relatively high usage rates for cervical biopsy.

As shown in Figure 3.10, colposcopies are performed in connection with a high percentage of all contacts with specialists in private practice under public funding contracts. Differences in practice both in terms of colposcopy use and follow-up of any findings in cases where there is no suspicion of cervical neoplasia based on symptoms and/or a Pap smear/HPV test can result in geographical differences in the use of cervical biopsy. Differences in practice when it comes to following up patients with uncertain or low-grade cervical cell changes can also give rise to geographical differences in the use of cervical biopsy.

There is no known geographical variation in morbidity to indicate that there should be any significant geographical variation in the use of cervical biopsies. Nor is it likely that chance can fully explain the observed variation, and the variation must therefore be deemed to be unwarranted.

## Chapter 4

# Reproductive health

### 4.1 Sterilisation

Sterilisation is a highly effective contraception method that very rarely fails. Female sterilisation is carried out by cutting and blocking the fallopian tubes. This prevents sperm from coming into contact with the eggs released from the ovaries, making fertilisation impossible. The procedure is usually carried out under general anaesthesia using a keyhole technique (laparoscopy). It is also possible to be sterilised in connection with a planned caesarean section.

You have to be 25 years or older to be able to, in the words of the Act relating to Sterilisation, ‘submit a request for sterilisation’. The doctor treating the woman fills in an application and submits it to a hospital. The decision is up to the woman, while the doctor provides advice and guidance on the procedure and its consequences. There is no requirement to obtain the consent of the woman’s partner or spouse. The procedure is permanent, meaning that the fallopian tubes cannot be reconstructed. Complications associated with this procedure are very rare. It does not disrupt hormone production, and the woman’s menstruation and sexual function are maintained.

Full or partial patient payment or higher patient charges have been introduced for some types of treatment, including sterilisation. This is intended to cover expenses relating to consumables or other services in addition to the patient charge, and the amounts are not included in the basis for exemption cards for user fee group 1.<sup>6</sup> Such patient payment have been introduced for both male and female sterilisations if not medical indication exists. A female sterilisation procedure costs NOK 6,000 in a publicly funded hospital, while the price for male sterilisation is approximately NOK 1,300. Patients who for some reason cannot use other forms of contraception will have their medically indicated sterilisation covered. It is a relatively simple procedure to carry out if the abdominal cavity is already open, which is why no patient payment applies to sterilisation in connection with procedures such as a caesarean section.

Waiting times for a laparoscopic procedure at a public hospital can be as long as two years. Some patients therefore choose to go to private clinics where they pay the full costs of the procedure themselves. No data are available for sterilisations that the patients pay for themselves. The Gynaecology Healthcare Atlas only includes women sterilised at publicly funded hospitals.

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<sup>6</sup>Exemption card for health services: <https://helfo.no/frikort-for-helsetjenester>

## Sample

Female sterilisation is defined by the following surgical procedure codes:

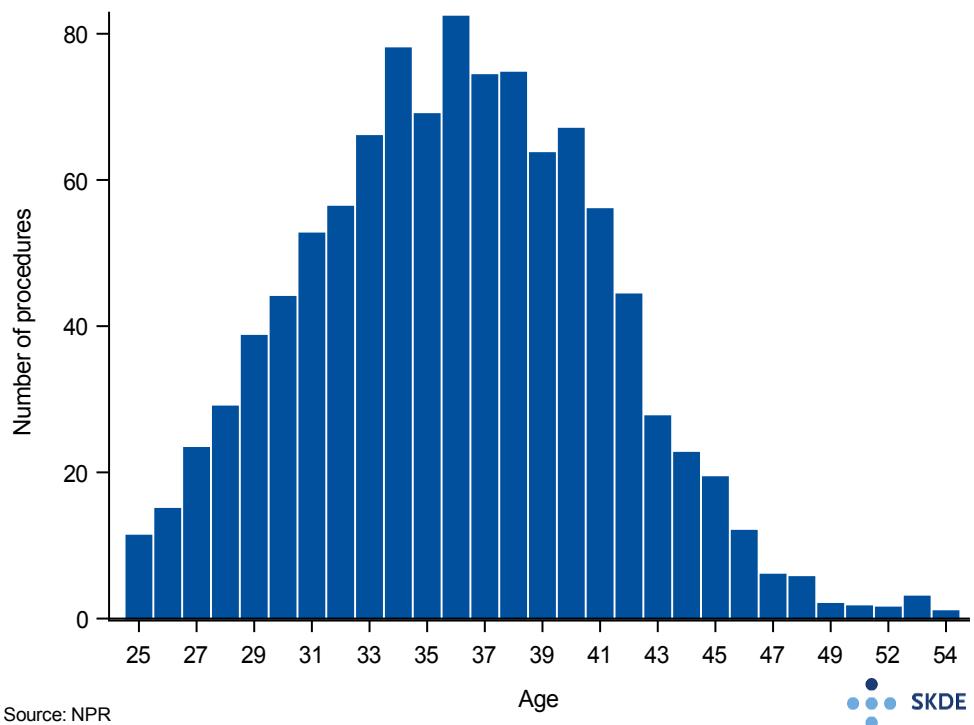
| Open surgery <sup>a</sup> | Laparoscopic procedures |
|---------------------------|-------------------------|
| LGA 00                    | LGA 11                  |
| LGA 10                    | LGA 21                  |
| LGA 20                    | LGA 22                  |
| LGA 96                    | LGA 24                  |

<sup>a</sup> Sterilisation in connection with other open surgery.

The sample is limited to women in the age group 25–55 years.

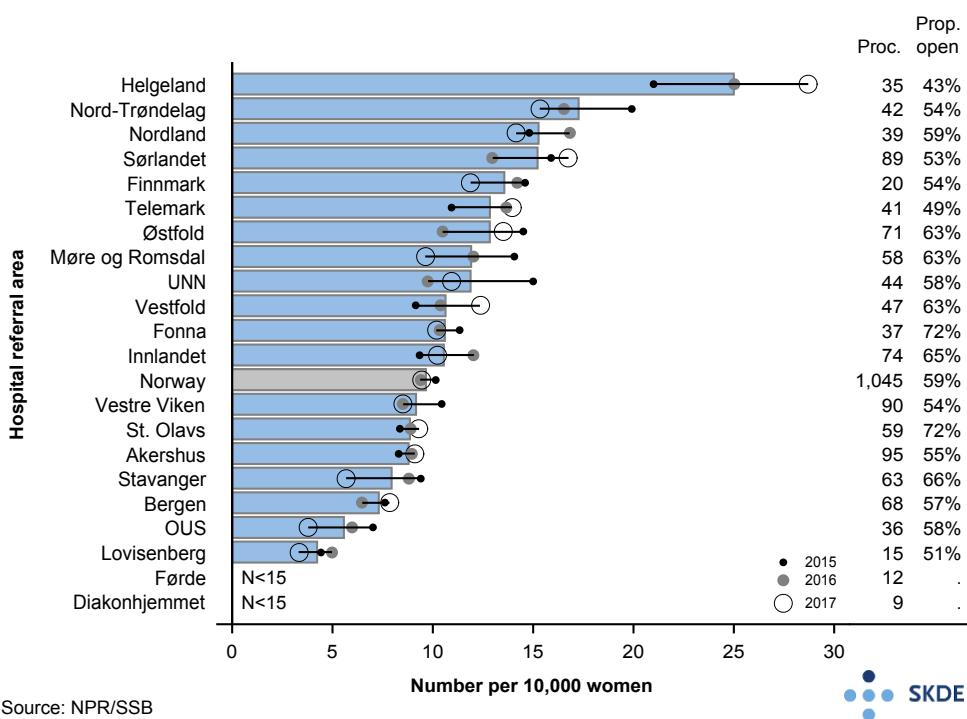
## Findings

During the period 2015–2017, approximately 1,000 sterilisation procedures per year were performed on Norwegian women aged 25–55 years. Figure 4.1 shows the number of procedures broken down by age.



**Figure 4.1:** Number of sterilisation procedures broken down by age, average per year for the period 2015–2017.

Figure 4.2 shows high geographical variation in sterilisation rates. About six times as many women living in Helgeland hospital referral area were sterilised compared with women living in the Lovisenberg area. In the majority of hospital referral areas, the proportion of procedures carried out as open surgery, i.e. in connection with another procedure such as a caesarean section, is about 50–65%.



**Figure 4.2:** Number of sterilisation procedures per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. The sample is limited to women in the age group 25–55 years. Average number of procedures and number of open procedures on the right.

## Comments

There was high geographical variation in the use of female sterilisation. The number of women who chose sterilisation decreased following the introduction of patient payment for female sterilisation in 2002. The number of men who chose to be sterilised increased at the same time (Helsedirektoratet 2012). The effect of patient payment, the use of alternative methods and couples who prefer that the man be sterilised can vary between hospital referral areas. The way in which the provision concerning exemption from patient payment for sterilisation is practised has been known<sup>7</sup> to vary. It is possible that there are still differences in how the rules are practised, and if this is the case, that could lead to differences in the use of sterilisation. It is also possible that women who have children at a young age are more likely to use sterilisation as a contraception method, and this could have an effect on the observed variation. Practices may also differ between hospital referral areas in terms of counselling and information about alternative contraception methods.

There is considerable geographical variation in the use of sterilisation by means of open surgery, which usually means sterilisation performed in connection with a planned caesarean section. In such circumstances, the procedure does not require much extra resources. During the period 2015–2017, about 570 sterilisations per year were performed in connection with caesarean sections. According to the Medical Birth Registry of Norway, about 3,250 planned caesarean sections were performed each year in the same period.

The use of sterilisation must be presumed to largely be controlled by women's contraceptive preferences. However, the observed variation in the use of sterilisation is so high that it is natural

<sup>7</sup>Letter from the Norwegian Directorate of Health dated 4 January 2012.

## Chapter 4. Reproductive health

to ask whether some of the variation can be explained by differences in how the exemption from patient payment is practiced or different practices in relation to counselling and information about alternative methods.

## 4.2 Surgical treatment in connection with spontaneous abortions

A spontaneous abortion is the involuntary loss of a pregnancy before week 22. Up to 20–30% of recognised pregnancies end in a spontaneous abortion, and the prevalence is strongly linked to age (Wilcox et al. 1988; Dhaded et al. 2018). Most spontaneous abortions occur in the first trimester. After a spontaneous abortion, the level of the pregnancy hormone (hCG) in the blood will fall over time. In case of doubt or suspected retained pregnancy tissue, a vaginal ultrasound examination can be carried out.

Spontaneous abortions can be divided into complete and incomplete abortions. A complete abortion involves some vaginal bleeding, and the uterus empties itself of pregnancy tissue. An incomplete abortion could involve a degree of vaginal bleeding, but some non-viable pregnancy tissue remains in the uterus. The recommendation in cases of incomplete abortion is to monitor closely for a week or two if the woman experiences intense pain or heavy bleeding. If the uterus has not emptied during this period, pharmacological treatment will be attempted to make the uterus contract. In some cases, pregnancy tissue remains in the uterus, and surgical removal may be necessary. Surgical treatment is recommended for signs of infection and retained pregnancy tissue.

Four out of five women who suffer a spontaneous abortion go on to have at least one successful pregnancy. The chance of a successful pregnancy later depends on the woman's age and number of previous spontaneous abortions (Smith et al. 2009).

### Sample

Spontaneous abortion is defined by the diagnosis codes O03, O05 and O06 as a primary or secondary diagnosis.

Surgical treatment in connection with spontaneous abortions is defined by these diagnosis codes in combination with the following surgical procedure codes:

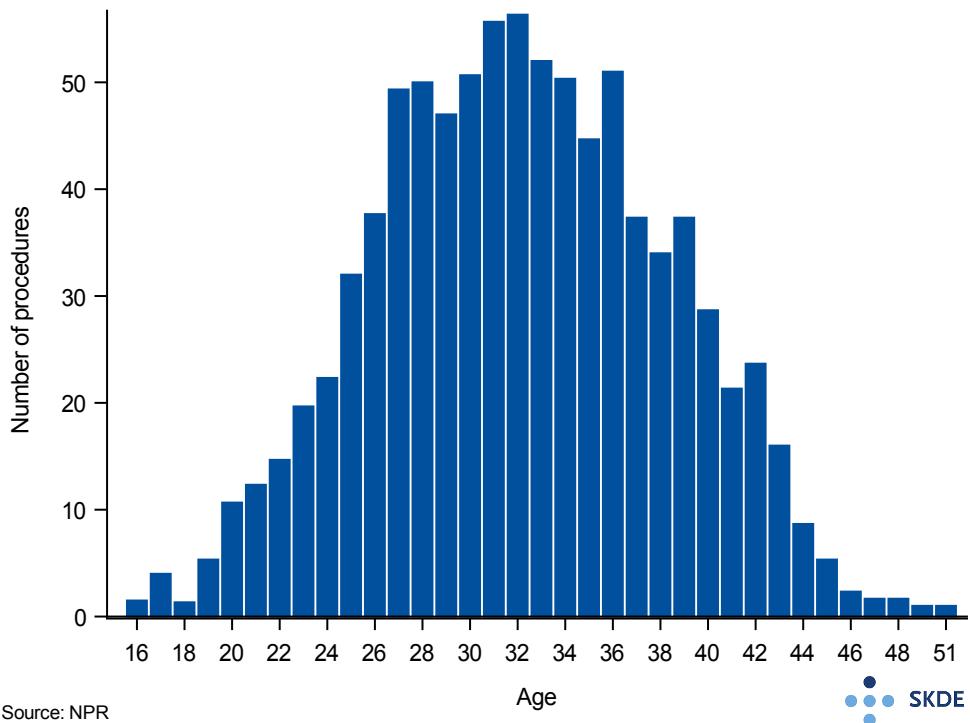
| Procedure codes |        |
|-----------------|--------|
| LCH 00          | MBA 00 |
| LCH 03          | MBA 03 |
| LCH 13          | MBA 96 |
| LCH 20          |        |
| LCH 96          |        |

The LCH codes are intended for use in connection with induced abortions, and not for treatment of spontaneous abortion. In practice, however, these codes are quite frequently used in combination with the diagnosis code for spontaneous abortions, and procedures with this combination of codes are therefore included in our analysis.

The sample is limited to women aged 16–55 years.

## Findings

During the period 2015–2017, just under 900 surgical procedures per year were performed on Norwegian women in connection with spontaneous abortions. Figure 4.3 shows the number of procedures broken down by age.



**Figure 4.3:** Number of procedures in connection with spontaneous abortions broken down by age, average per year for the period 2015–2017.

Figure 4.4 shows that many hospital referral areas have a rate that is relatively close ( $\pm 30\%$ ) to the national average of 6.4 procedures per 10,000 women. Nevertheless, the geographical variation is considerable. The use of surgical treatment following a spontaneous abortion was five times as high for women living in Førde hospital referral area, which has the highest rate, as for women living in the Stavanger area, which has the lowest rate. The hospital referral areas of Helgeland and Nord-Trøndelag have the second highest rates, which are more than twice as high as for women living in Diakonhjemmet and Innlandet hospital referral areas, which have the second lowest rates.

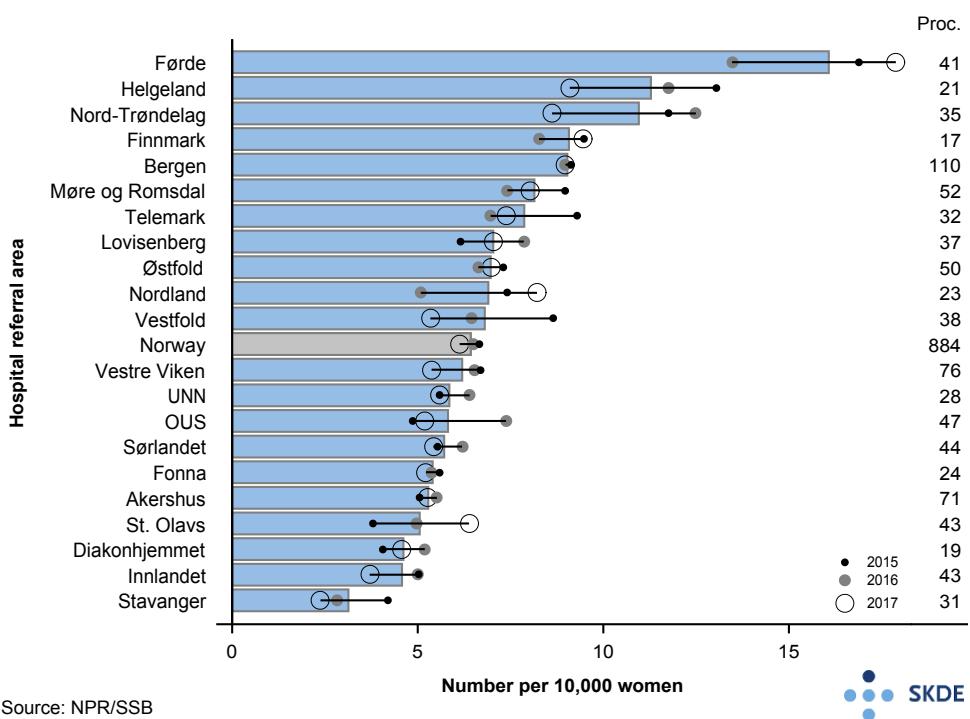
## Comments

The observed geographical variation in the use of surgical treatment in connection with spontaneous abortions is high. However, if we exclude the three hospital referral areas with the highest rates, which are all relatively small and thus particularly susceptible to random variation, we find moderate variation.

According to the Norwegian Society of Gynecology and Obstetrics' gynaecology guidelines *Veileder i gynekologi* (2015),<sup>8</sup> surgical treatment is to be considered in cases where pharmacological treatment has failed and in cases of suspected infection. There is no known geographical

<sup>8</sup>legeforeningen.no/Fagmed/Norsk-gynekologisk-forening/Veiledere/Veileder-i-gynekologi-2015

## 4.2. Surgical treatment in connection with spontaneous abortions



**Figure 4.4:** Number of procedures in connection with spontaneous abortions per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. The sample is limited to women aged 16–55 years. Average number of procedures on the right.

variation in the prevalence of spontaneous abortion, which indicates that the current recommendations are not followed. However, the numbers are so small that a not insignificant element of random variation is to be expected, even in the bigger hospital referral areas. Although random variation can explain some of the observed variation, the scale of it raises questions about whether the recommendations provided in the guidelines are complied with.

If the patient has to travel far to get to a hospital, performing a surgical procedure may be more expedient than starting a course of pharmacological treatment that may not be effective. It is also possible that the preferences of women influence the use of surgical treatment to a certain extent. Other possible reasons for the observed variation include treatment practices and emergency care operating theatre capacity.

It is difficult to determine whether differences in patient preferences and needs and the element of random variation are sufficient to explain the variation observed, but the variation is high enough to give reason to question whether it could be unwarranted.

## 4.3 Surgical treatment in connection with abortion on request up to 12 weeks

The Act of 1975 Relating to the Termination of Pregnancy gives women the right to decide whether they want to terminate or complete a pregnancy before the end of the twelfth week of pregnancy. The woman herself has to request an abortion and sign the form. Before the procedure, the woman has to undergo a pelvic examination with vaginal ultrasound to establish the gestational age of the pregnancy. Medical abortion was introduced in 1998, and its use increased rapidly (Løkeland et al. 2017). Around 2010, it had become the preferred abortion method. The woman is given the drug mifepristone, which increases the effect of prostaglandin on the muscles and dilates the cervix. A few hours after this drug has been administered, the amniotic sac starts to detach from the uterus. After two days, the woman takes the prostaglandin tablets that trigger uterine contractions. This is often done at home, alternatively as day patient treatment at a hospital. Complications occur or the method is unsuccessful in approx. 5% of cases.<sup>9</sup>.

A surgical procedure is performed if repeated medical procedures are unsuccessful, if the woman requests it, or if indicated by communication problems. Surgical abortions are performed as day patient treatment under general anaesthesia. The cervical canal is dilated, and an instrument is inserted into the uterus to empty it. Finally, the uterine wall is gently scraped to ensure that the uterus is empty. No differences have been found between the medical and surgical abortion method in terms of risk of spontaneous abortion, ectopic pregnancy, premature birth or low birth weight in connection with subsequent pregnancies.

### Sample

The sample was defined by the Norwegian Registry of Pregnancy Termination, and is limited to women who terminated a pregnancy before the end of the 12th week. The sample is divided into women who terminated their pregnancies by medical abortion and women who underwent surgical treatment. The sample is limited to women aged 16–55 years.

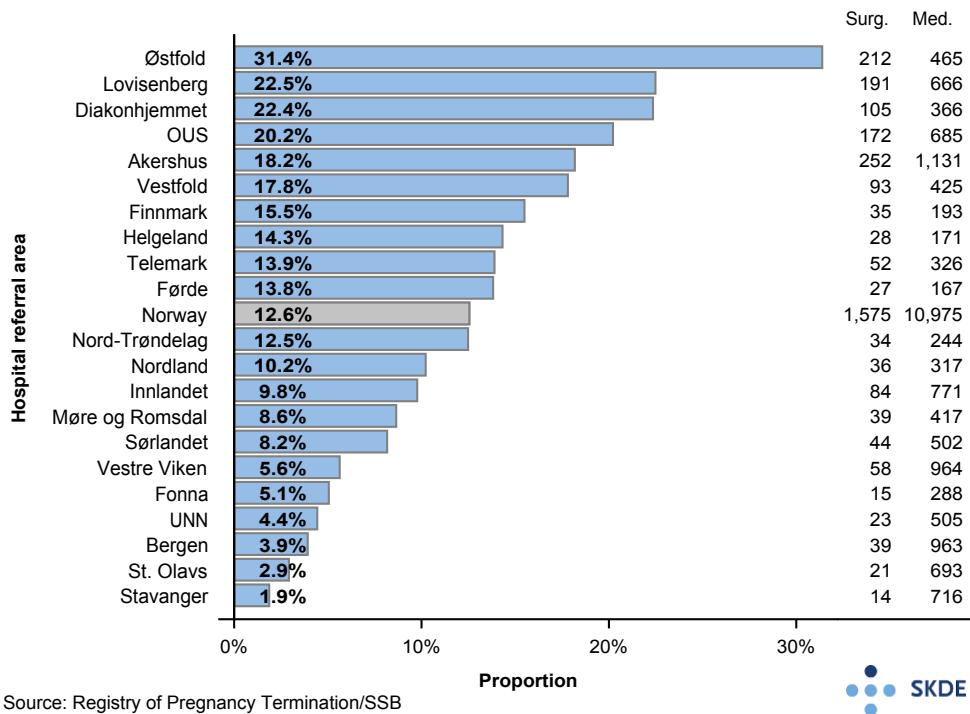
### Findings

During the period 2015–2017, around 12,000 Norwegian women per year chose to terminate a pregnancy before week 12. Figure 4.5 shows the percentage of terminations on request before week 12 where the surgical method was used. For Norway as a whole, around 13% of abortions on request before week 12 were surgical, and the geographical variation was very high. More than 30% of women living in Østfold hospital referral area and around 20% of women living in the hospital referral areas in Oslo (Lovisenberg, Diakonhjemmet and OUS) who chose to terminate a pregnancy had surgical procedures. Only 1.9% of women living in the Stavanger area had surgical abortions.

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<sup>9</sup>Norwegian Society of Gynecology and Obstetrics' *Veileder i gynekologi* (2015)

#### 4.3. Surgical treatment in connection with abortion on request up to 12 weeks



**Figure 4.5:** Abortions on request performed using the surgical method as a proportion of all abortions on request, adjusted for age, average per year 2015–2017 broken down by hospital referral area. The sample is limited to women aged 16–55 years. Average number of abortions on request on the right.

#### Comments

The geographical variation in the use of the surgical method for abortions on request is very high. It is worth noting that for the population of the hospital referral areas of Diakonhjemmet and OUS, the proportion of abortions on request performed surgically is high, while the rate for surgical procedures in connection with spontaneous abortions is relatively low. A surgical procedure for abortion on request can be planned and scheduled for a time when operating theatre capacity is available. This is often not possible in connection with spontaneous abortions, and it is therefore possible that the preferences of the women influence the choice of method more for abortions on request. It is also possible that some hospitals still do not offer medical abortions in weeks 9–12 of pregnancy (Løkeland et al. 2017). If this is the case, that could explain some of the variation. As mentioned above, the surgical method is also used in cases where communication is problematic, for example if the woman does not speak Norwegian. It is possible that an uneven distribution of non-Norwegian-speaking people in the different hospital referral areas can be the reason for some of the variation in the use of the surgical method for abortions on request. Other possible reasons include treatment practices, for example the importance attached to the women's wishes and differences in counselling and information practices.

Even though part of the variation can be linked to women's preferences or differences in the geographical distribution of non-Norwegian-speaking women, the contrasts are nevertheless so great that this can hardly explain all of it. The numbers are also so high that random variation is not expected to have a significant effect on results, and the observed variation must therefore be deemed to be unwarranted.

## 4.4 In vitro fertilisation

If a couple has actively tried to become pregnant for one year without succeeding, they are defined as infertile and are eligible for help to try to become pregnant. During the period 2015–2017, approximately 2,500 Norwegian children per year were born as a result of what is known as assisted conception.<sup>10</sup> This accounts for approximately 4.0% of all children born in Norway each year. There are several assisted conception methods. Insemination involves inserting sperm from the woman's partner or from a donor into the womb via a fine catheter. However, IVF (in vitro fertilisation) is the most common method. It involves retrieving eggs from the woman's ovaries. The eggs are then mixed with sperm, and fertilisation takes place in a glass dish. The fertilised egg develops into an embryo over 2–5 days, and the embryo is then transferred to the woman's uterus. Any embryos left over can be frozen for use later. Before retrieving eggs from the woman, preparatory hormone treatment is required in order to ensure than multiple eggs mature and are released at the same time. The hormone treatment is also intended to ensure that the uterus is prepared to receive and retain the embryo. This hormone treatment has side effects. About half of all who receive IVF treatment in Norway succeed in becoming pregnant and having a child. It is recommended that the woman should not be older than 38–40 years, as treatment is often less successful with increasing age.

Six public hospitals and several private clinics offer assisted conception services in Norway. The price of the treatment is the same at all the public hospitals, while the private providers charge different prices. As for sterilisation, 'patient payment' or higher patient charges have been introduced for assisted conception. It is intended to cover expenses relating to consumables or other services in addition to the patient charge, and the amounts are not included in the basis for exemption cards. The patient payment is NOK 1,500 per treatment cycle, and each couple is given three attempts at public hospitals. Couples who want more than three attempts have to go to private clinics and pay the full costs themselves. The patient charges for medication (hormone treatment) for three attempts usually come to approximately NOK 17,000.

### Sample

IVF is defined by the surgical procedure codes LCA 30 and LCW30K. The sample is limited to women aged 16–55 years.

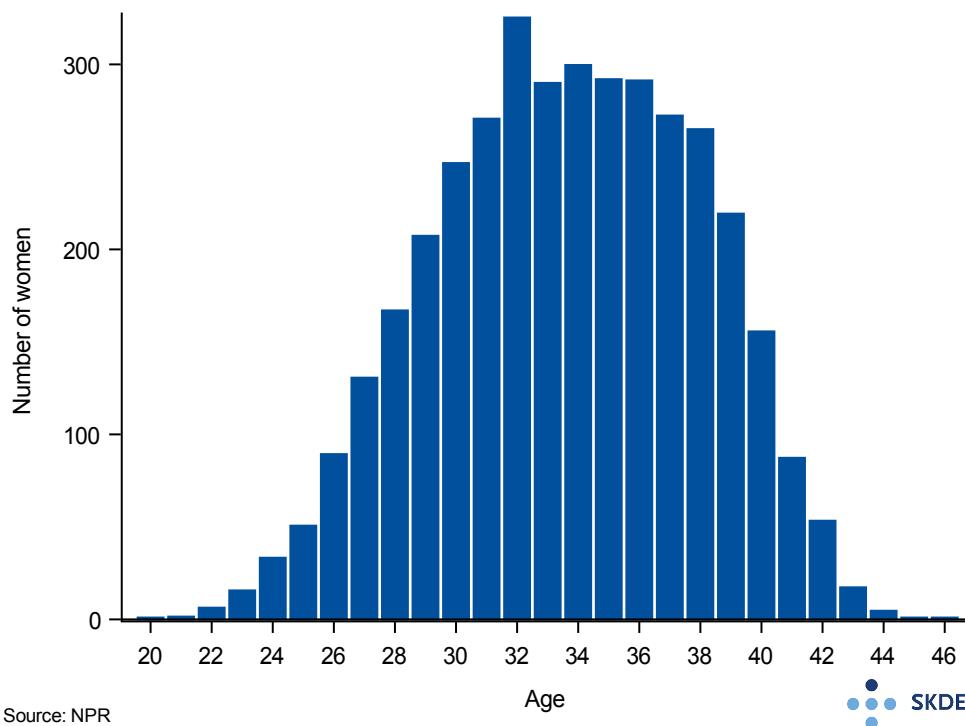
The treatment can last for some time if several attempts are needed. For example, a woman who starts treatment for the first attempt in 2015 can be in a treatment process with attempts in 2016 as well. The analysis is based on the number of patients who have had at least one contact with the health service for which at least one of the relevant procedure codes was registered during the course of a year. We have counted the number of patients for each of the years 2015, 2016 and 2017, and show the average rate adjusted for age for the period 2015–2017. This means that if a woman had two attempts in 2015, she will be counted once in 2015. If a woman had one attempt in 2015 and one in 2016, she will be counted twice, once in 2015 and once in 2016. The proportion of women who are under treatment for more than one year is assumed to be more or less the same in the different hospital referral areas.

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<sup>10</sup><http://statistikkbank.fhi.no/mfr/>

## Findings

During the period 2015–2017, about 3,800 women a year underwent publicly funded IVF treatment. Figure 4.6 shows the number of women who received IVF treatment broken down by age.

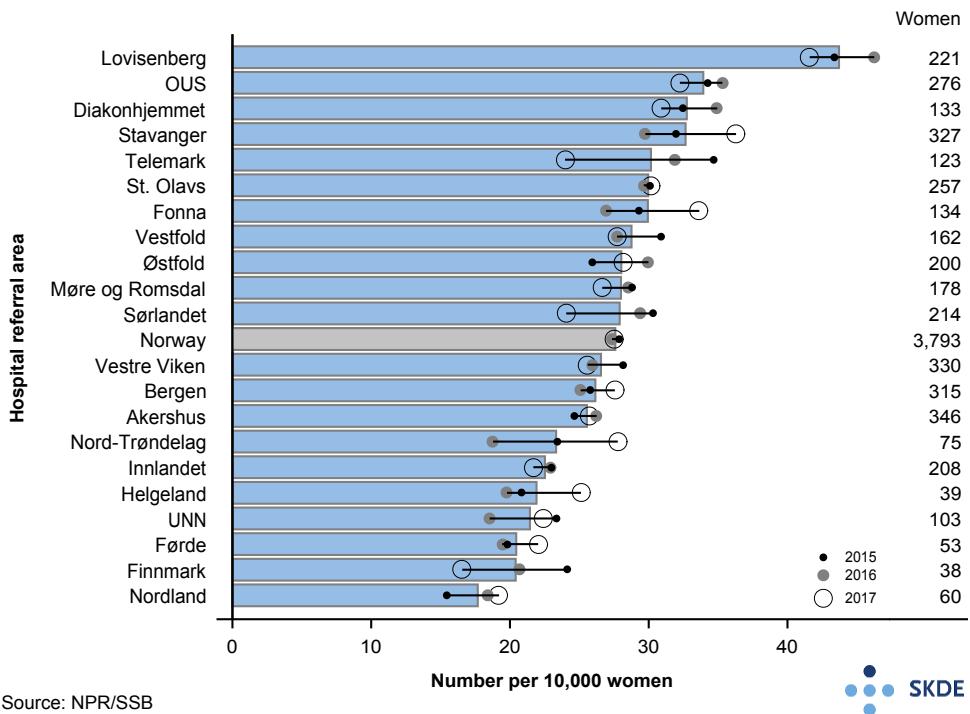


**Figure 4.6:** The number of women who received IVF treatment broken down by age, total for the period 2015–2017.

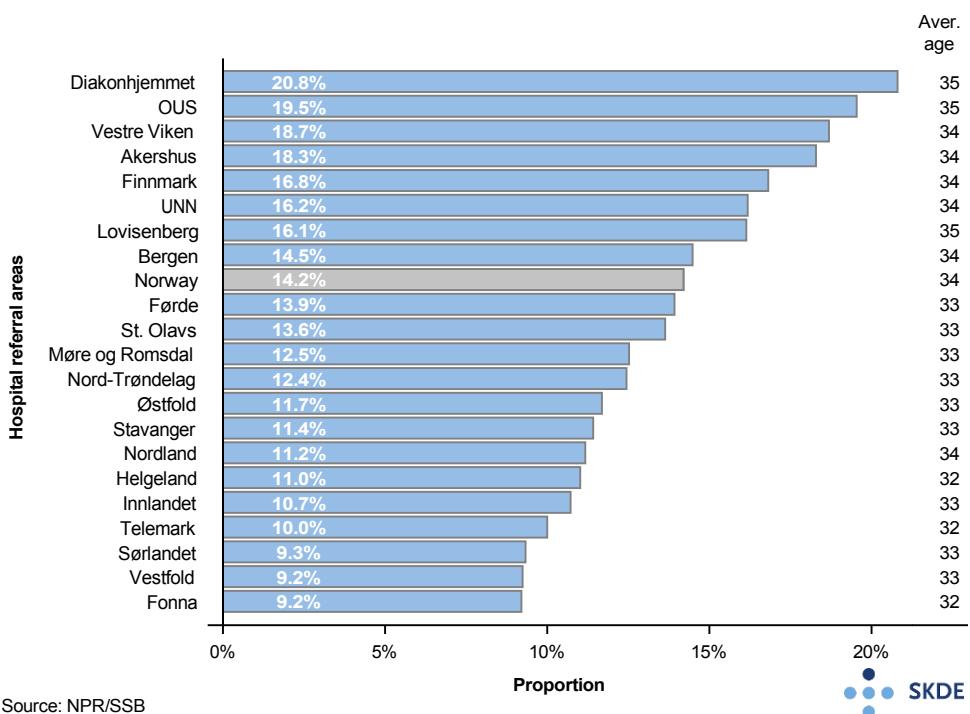
Figure 4.7 shows that 28% more women had IVF treatment in Lovisenberg hospital referral area, which had the highest rate, than in the OUS area, which had the second highest rate. If we exclude Lovisenberg, variation was moderate, with the rate of OUS hospital referral area being about twice as high as that of the Nordland area.

Figure 4.8 shows the proportion of women who had IVF treatment who were 39 years or older. The proportion differs greatly between hospital areas, and was highest in the hospital referral areas of Diakonhjemmet and OUS, where nearly 20% of women were 39 years or older. In the areas Fonna, Vestfold and Sørlandet, under 10% of the women were 39 years or older.

## Chapter 4. Reproductive health



**Figure 4.7:** Number of women who have received IVF treatment per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. The sample is limited to women aged 16–55 years. Average number of women who have received IVF treatment on the right.



**Figure 4.8:** Percentage of women who received IVF treatment who were 39 years or older. The average age of the women in the sample on the right. The sample is limited to women aged 16–55 years.

## **Comments**

The average age of first-time mothers was between 27 and 29 years in most hospital referral areas during the period 2015–2017. This variation is so modest that it can hardly explain the differences between areas in use of IVF. However, the average ages for the hospital referral areas in Oslo (Diakonhjemmet, Lovisenberg and OUS) were somewhat higher, at about 31–32 years. We see that these hospital referral areas also have the highest IVF rates. It is possible that women living in Oslo have a somewhat greater need for IVF treatment because, on average, they delay having children a little longer than women in the rest of Norway. It is also worth noting that the use of IVF varies considerably between the different hospital referral areas in Oslo.

The proportion of women giving birth at the age of 39 years or older also varies greatly between hospital referral areas. In the Diakonhjemmet and OUS areas, around 20% of women who received IVF treatment had reached an age when a high success rate cannot be expected.

There is no known geographical variation in infertility to indicate that there should be any significant geographical variation in the use of IVF. The geographical variation in the average age of first-time mothers is also so small, at least if we exclude the hospital referral areas in Oslo, that women's choices regarding when they want to have children can hardly explain the observed variation. Nor is it likely that the variation is due to chance, and there is reason to question whether the use of IVF is equitably distributed.



## **Chapter 5**

# **Surgical treatment of gynaecological conditions**

### **5.1 Endometriosis**

Endometriosis is a condition where tissue similar to the lining of the womb (endometrium) grows in places other than the uterine cavity and causes an inflammatory condition. Endometriosis usually involves endometrial tissue located in the pelvic organs: on the peritoneum near the uterus, the fallopian tubes or ovaries, but also on the bowel or bladder. Endometrial tissue can also be found inside the muscle of the uterus itself, in which case it is called adenomyosis. In very rare cases, endometrial tissue is located far away from the uterus, for example in the lungs, nose or brain. The lining of the womb changes through the menstrual cycle. The mucous membrane thickens to be ready to receive a fertilised egg. Towards the end of the cycle, hormone levels drop and the womb lining is shed and leaves the body during menstruation. The same thing happens to endometrial tissue outside the uterus. The blood from this tissue is either trapped in little nodules or flows freely inside the abdominal cavity. Endometriosis may cause cysts to form in the ovaries. They are often called ‘chocolate cysts’ because of their brown content, which gets its colour from old blood. As endometriosis develops, it leads to low-grade (mild) inflammation in the abdominal cavity, which can in time cause adhesions of the internal genitals and sometimes the bowel.

The acute and the chronic inflammation both cause abdominal pain. The size of the endometriosis lesions and the intensity of pain are not necessarily related. The chronic inflammation and adhesions can also cause infertility. Serious complications, such as narrowing of the bowel or urinary tract, are rare.

Endometriosis affects women of childbearing age. It is assumed that approximately 10% of all women have endometriosis, and the proportion is believed to be higher among women who suffer from abdominal pain and infertility. Symptoms of endometriosis include excessive pain before and during menstruation, pain during sexual intercourse or infertility, but many patients with visible endometriosis experience no symptoms. Ordinary pain killers have little effect.

A pelvic examination with a vaginal ultrasound and pelvic MR are useful in diagnosing the condition, but a diagnostic laparoscopy (keyhole examination) is usually required for a definitive diagnosis.

Treatment is individual and depends on the woman’s age and whether she wants to have children,

among other things. Hormone treatment to stop the woman menstruating is the preferred option. If hormonal treatment is not effective, surgical treatment, preferably laparoscopic surgery, is an option. Open surgery should be avoided, as it significantly increases the risk of adhesions. The surgical treatment will depend on the extent of the endometriosis. Peritoneal endometriosis is the most common form. It can be treated by cutting or burning away the endometrial tissue. Ovarian cysts can be removed, and adhesions can be freed. This can provide good pain relief and increase the chance of pregnancy. Infertility can be treated with IVF. If the condition is troublesome and the woman does not want children, hysterectomy is a possible treatment for adenomyosis. Major surgery may be an option in cases of severe ureter and bowel changes. Most women experience no further symptoms after menopause, when they no longer menstruate.

## Sample

Endometriosis is defined by the diagnosis codes (ICD-10) N80.0-N80.9 as a primary or secondary diagnosis. Surgical treatment of the condition is defined by the relevant diagnosis codes in combination with the following surgical procedure codes (NCSP):

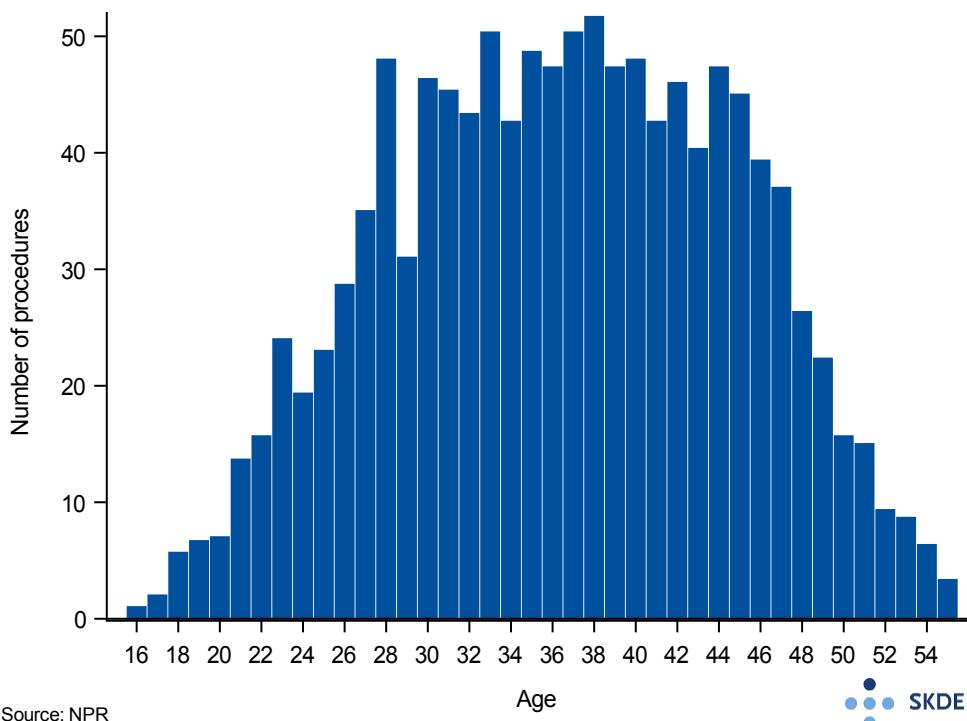
| Hysterectomy <sup>a</sup>          |        |        |        |        |        |        |        |        |        |        |  |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| LCC 10                             | LCD 00 |        |        |        |        |        |        |        |        |        |  |
| LCC 11                             | LCD 01 |        |        |        |        |        |        |        |        |        |  |
| LCC 20                             | LCD 04 |        |        |        |        |        |        |        |        |        |  |
|                                    | LCD 10 |        |        |        |        |        |        |        |        |        |  |
|                                    | LCD 11 |        |        |        |        |        |        |        |        |        |  |
|                                    | LCD 30 |        |        |        |        |        |        |        |        |        |  |
|                                    | LCD 31 |        |        |        |        |        |        |        |        |        |  |
|                                    | LCD 40 |        |        |        |        |        |        |        |        |        |  |
|                                    | LCD 96 |        |        |        |        |        |        |        |        |        |  |
|                                    | LCD 97 |        |        |        |        |        |        |        |        |        |  |
| <sup>a</sup> Removal of the uterus |        |        |        |        |        |        |        |        |        |        |  |
| Other procedures                   |        |        |        |        |        |        |        |        |        |        |  |
| LAC 00                             | LAD 00 | LAE 10 | LAF 00 | LBD 00 | LBE 00 | LCC 00 | LCF 00 | JAA 10 | JAL 20 | JAP 00 |  |
| LAC 01                             | LAD 01 | LAE 11 | LAF 01 | LBD 01 | LBE 01 | LCC 01 | LCF 01 | JAA 11 | JAL 21 | JAP 01 |  |
| LAC 10                             |        | LAE 20 | LAF 10 |        |        | LCC 05 | LCF 96 |        |        |        |  |
| LAC 11                             |        | LAE 21 | LAF 11 |        |        | LCC 96 | LCF 97 |        |        |        |  |
| LAC 20                             |        |        | LAF 20 |        |        | LCC 97 |        |        |        |        |  |
| LAC 21                             |        |        | LAF 30 |        |        |        |        |        |        |        |  |

The sample is limited to women in the age group 16–55 years.

## Findings

During the period 2015–2017, an average of about 1,200 operations for endometriosis were performed per year in Norway. Figure 5.1 shows the number of procedures broken down by age.

Figure 5.2 shows that there is high geographical variation in the use of surgical procedures to treat endometriosis. The number per 10,000 women who receive surgical treatment for endometriosis is nearly three times higher in Lovisenberg than in St. Olavs hospital referral area. For Norway as a whole, the proportion of procedures involving removal of the uterus (hysterectomies) was 27%. The proportion of hysterectomies varied from 16% for women living in Lovisenberg hospital referral area to 42% for women in the Vestfold area. Figure 5.3 shows the proportion of procedures carried out as open, laparoscopic and vaginal procedures. The proportion of open



**Figure 5.1:** Number of procedures for endometriosis broken down by age, average per year for the period 2015–2017.

surgery varied from 31.6% for women living in Nord-Trøndelag hospital referral area to 4.5% for women in the Bergen area.

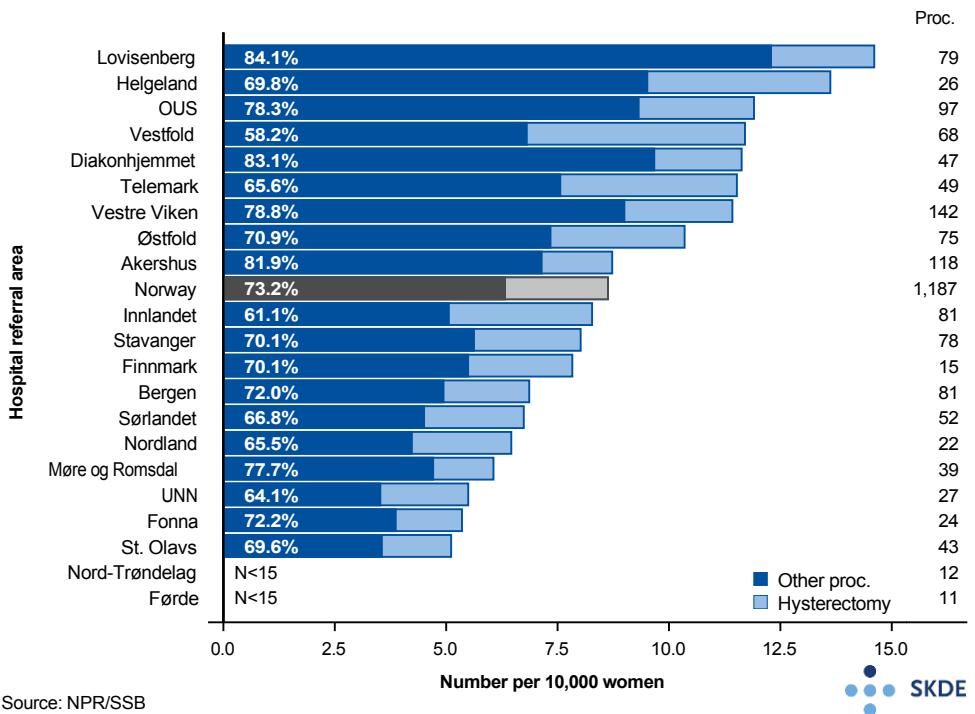
## Comments

The geographical variation in the use of surgical treatment of endometriosis is high. However, the total number of procedures per year is so modest that a not insignificant element of random variation is to be expected. This is confirmed by the fact that we find a relatively high degree of variation between years in many of the hospital referral areas that use surgical treatment the most for endometriosis (data not shown).

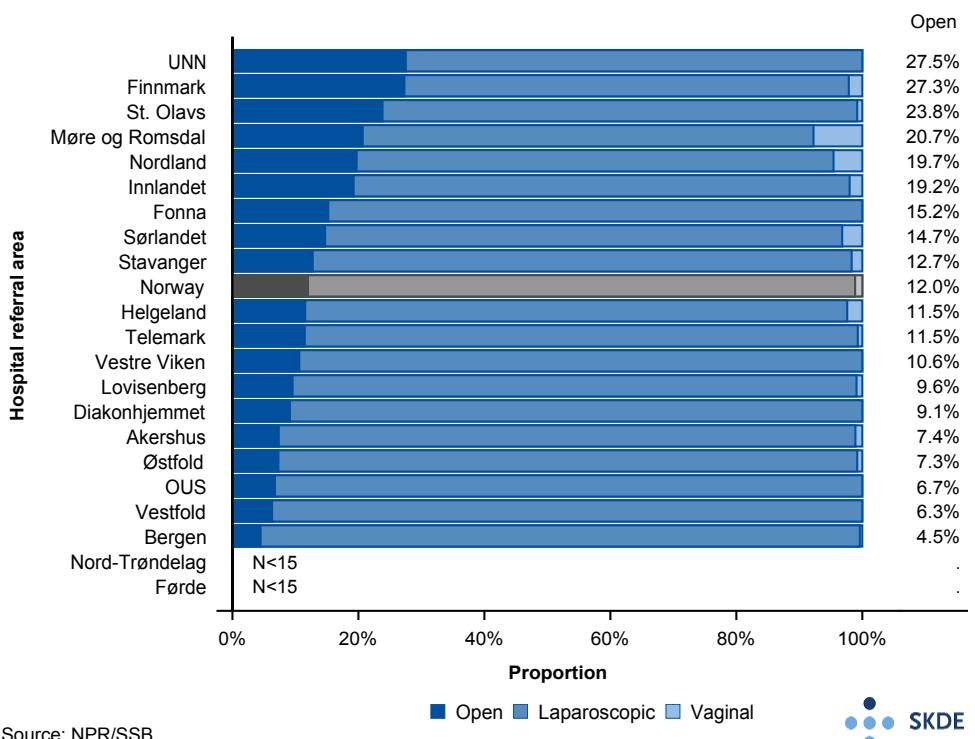
It is recommended that open surgery be avoided for endometriosis patients. In some hospital referral areas, open surgery was nevertheless used in over 25% of such cases. There are considerable differences between hospital referral areas in terms of the proportion of patients treated with open surgery. The variation in the proportion of hysterectomies is more moderate.

There is no known geographical variation in the prevalence of endometriosis, but it is difficult to determine whether differences in patient preferences, the use of pharmacological treatment and elements of random variation can be sufficient to explain the observed variation. However, the variation is high enough to give reason to question whether it could be unwarranted.

## Chapter 5. Surgical treatment of gynaecological conditions



**Figure 5.2:** Number of procedures for endometriosis per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by hysterectomies versus other procedures. The sample is limited to women aged 16–55 years. Average number of procedures on the right.



**Figure 5.3:** Percentage of procedures for endometriosis performed as open, laparoscopic and vaginal procedures, respectively. The sample is limited to women aged 16–55 years.

## 5.2 Uterine myomas

Benign tumours, leiomyomas, that develop from the uterine muscle are often called myomas or fibroids. Uterine myomas are common, and are found in 70% of women of childbearing age. It is estimated that only 15–30% experience symptoms. Factors that increase the risk of uterine myomas are obesity, early menarche, childlessness and African ethnicity. Uterine myomas can cause painful, prolonged and/or excessive menstruation and symptoms of pressure on the bladder and bowel. Uterine myomas increase the risk of reduced fertility and problems in connection with pregnancy and childbirth. Most myoma patients have no symptoms and do not require treatment. Contraceptive pills or hormonal IUDs can help to reduce bleeding significantly. Other types of medication can be used to try to shrink large uterine myomas, sometimes in preparation for surgery. Patients who do not achieve adequate treatment effect with medication can be offered embolisation or surgical treatment. Embolisation consists of inserting microspheres in the blood supply, causing the myomas to shrink. Small myomas inside the uterine cavity can be removed via the vagina by means of hysteroscopic resection. If the woman wants to be able to conceive and have children, larger myomas can sometimes be removed separately, but it is more common to remove the whole uterus. In many cases, the procedure can be performed laparoscopically or vaginally, but open surgery will be necessary in some cases.

### Sample

Fibroids are defined by the diagnosis codes D25.0-D25.9 as a primary or secondary diagnosis. Surgical treatment of the condition is defined by the relevant diagnosis codes in combination with the following surgical procedure codes:

| Hysterectomy | Other procedures |
|--------------|------------------|
| LCC 10       | LCD 00           |
| LCC 11       | LCD 01           |
| LCC 20       | LCD 04           |
|              | LCB 10           |
|              | LCB 11           |
|              | LCB 14           |
|              | LCB 20           |
|              | LCB 25           |
|              | LCC 00           |
|              | LCC 01           |
|              | LCC 05           |
|              | LCC 96           |
|              | LCC 97           |
| LCD 30       |                  |
| LCD 31       |                  |
| LCD 40       |                  |
| LCD 96       |                  |
| LCD 97       |                  |

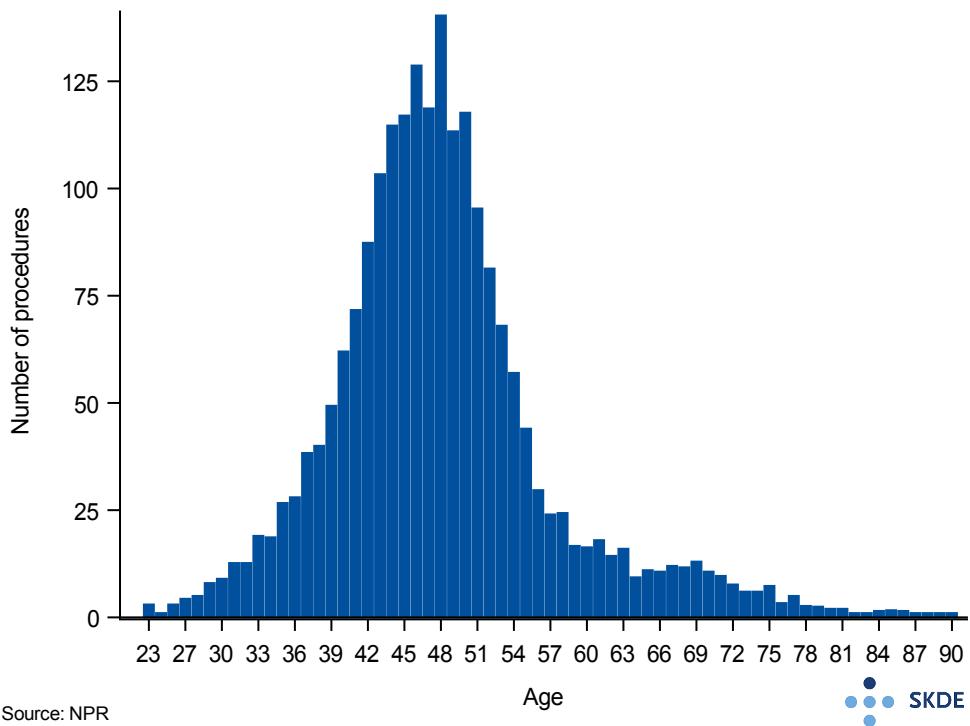
### Findings

During the period 2015–2017, about 2,000 procedures for uterine fibroids were performed per year. Figure 5.4 shows the number of procedures broken down by age.

Figure 5.5 shows the number of surgical procedures to treat uterine fibroids. If we exclude the two hospital referral areas with the lowest rates (Bergen and Førde), there is little geographical variation in the use of surgical treatment of uterine fibroids. The proportion of procedures involving removal of the uterus varied from 88% for women living in Nord-Trøndelag hospital referral area to 58% for women living in the Lovisenberg area.

Abnormal uterine bleeding is a symptom of uterine fibroids, and there is therefore considerable overlap between surgical procedures for fibroids and for excessive and/or frequent menstruation

(see Chapter 5.3). Approximately 27% of the procedures included in Figure 5.5 are also included in Figure 5.8.



**Figure 5.4:** Number of procedures for uterine fibroids (myomas) broken down by age, average per year for the period 2015–2017.

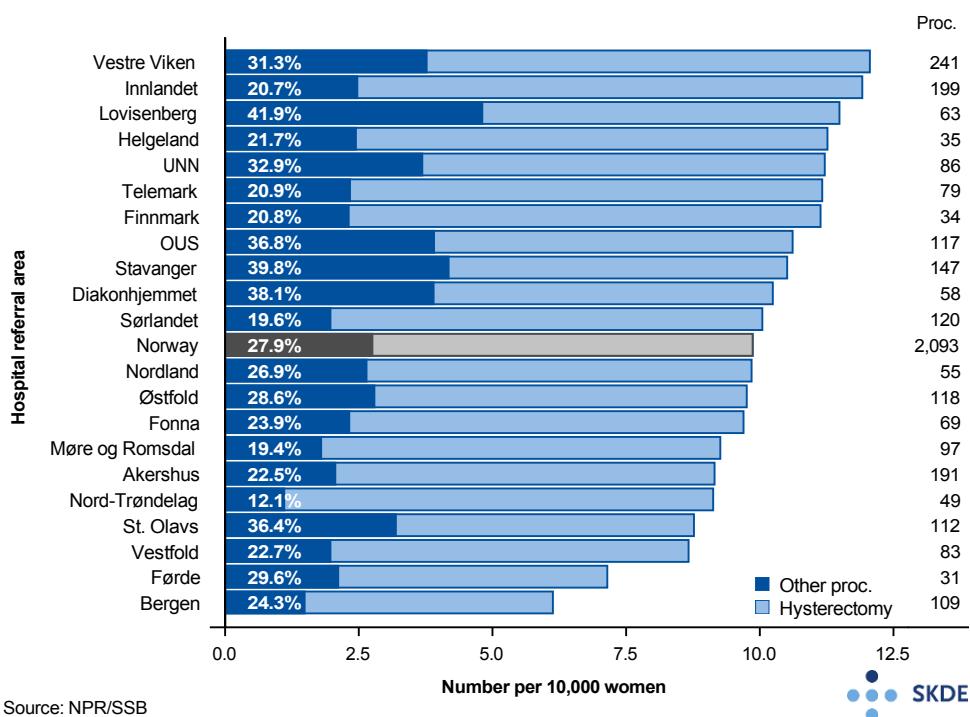
In addition to the procedures included in Figure 5.5 a small number of hospitals carry out a total of about 40 embolisations each year. The treatment involves inserting microspheres into the blood supply, which causes the myomas to ‘die’.

Figure 5.6 shows the proportion of procedures carried out as open, laparoscopic and vaginal procedures, respectively. The proportion of open procedures varied from 55% for women living in Nord-Trøndelag hospital referral area to 14% for women in the Vestfold area.

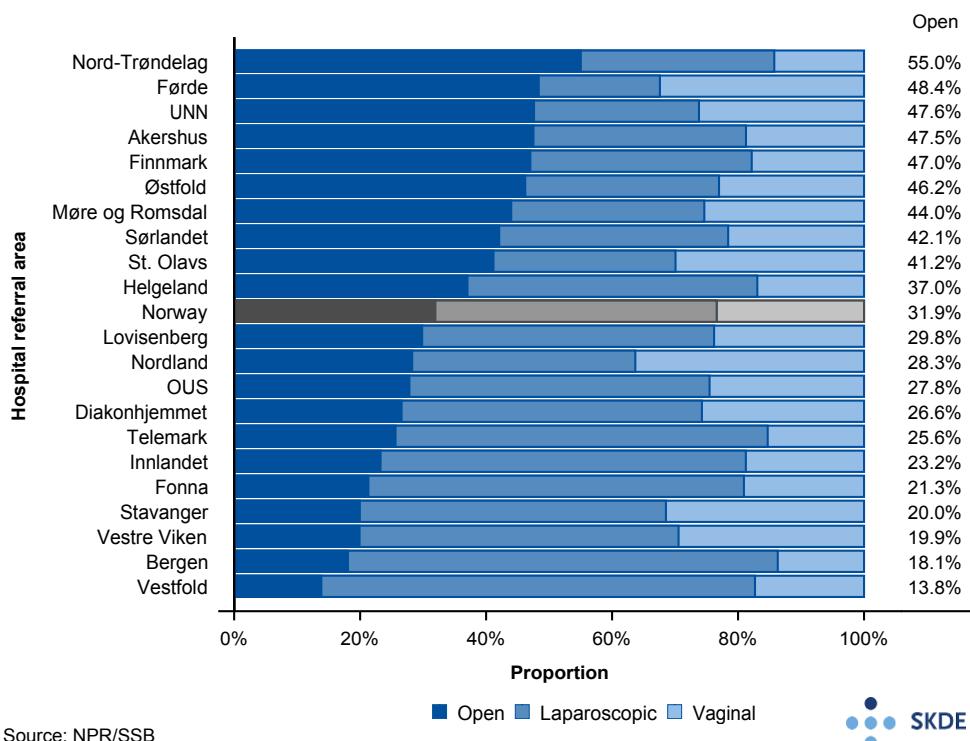
## Comments

If we exclude the two hospital referral areas with the lowest rates (Bergen and Førde), there is little geographical variation in the use of surgery to remove uterine fibroids. The proportion of hysterectomy procedures was high, and there was little geographical variation in the use of hysterectomy to treat this condition. This indicates that there is a high degree of consensus in the specialist community about the medical indications for surgical treatment of uterine fibroids. However, the proportion of open procedures varied greatly.

## 5.2. Uterine myomas



**Figure 5.5:** Number of procedures for uterine fibroids per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by hysterectomies versus other procedures. Average number of procedures on the right.



**Figure 5.6:** Proportion of procedures for uterine fibroids performed as open, laparoscopic and vaginal procedures, respectively.

## 5.3 Excessive and/or frequent menstruation

Abnormal uterine bleeding occurs in approximately 15–20% of women of childbearing age, and is a common reason for referral to specialists. The bleeding can be regular with heavier flow and/or irregular and not follow a clear cycle. Irregular ovulation can cause irregular menstruation in teenagers and women who are approaching menopause. Other common causes of abnormal uterine bleeding include uterine changes such as endometrial hyperplasia, polyps (growths in the inner lining of the uterus) or myomas (uterine fibroids). Copper IUDs, metabolic conditions and diseases of the blood that affect its ability to coagulate can cause heavy bleeding resulting in anaemia. Hormonal contraception (hormonal IUDs, contraceptive implants and contraceptive injections) can cause irregular menstruation. In some cases, it may be relevant to examine the patient with a view to excluding the possibility of underlying malignant disease.

The treatment will depend on the patient's symptoms and wishes and the underlying cause of the problem. If irregular menstruation is caused by hormonal contraception, changing contraception method is a possibility. Hormonal imbalances and heavy bleeding caused by uterine changes can usually be treated with different hormonal treatments. Surgery may be offered to patients who do not achieve adequate symptom relief from hormonal treatment. Surgery depends on the cause of the problem and whether the patient wants to have children. Underlying malignant disease must be ruled out in advance. Removing or destroying the endometrium will be an effective form of treatment for most patients that have not been found to have uterine changes. Fibroids or polyps can be surgically removed (Chapter 5.2). Alternatively, the uterus can be removed in case of severe changes or if other forms of surgical treatment are ineffective. Hysterectomies can be performed as laparoscopic, vaginal or open procedures.

### Sample

Excessive and/or frequent menstruation is defined by the diagnosis codes N92.0-N92.6 as a primary or secondary diagnosis. Surgical treatment of the condition is defined by the relevant diagnosis codes in combination with the following surgical procedure codes:

| Hysterectomy | ER/EA <sup>a</sup> | Other procedures                           |
|--------------|--------------------|--|
| LCC 10       | LCD 00             | LCA 16      LCB 28      LCB 10      LCC 00 |
| LCC 11       | LCD 01             | LCB 32      LCB 11      LCC 01             |
| LCC 20       | LCD 04             | LCB 14      LCC 05                         |
|              | LCD 10             | LCB 20      LCC 96                         |
|              | LCD 11             | LCB 25      LCC 97                         |
|              | LCD 30             |  |
|              | LCD 31             |  |
|              | LCD 40             |  |
|              | LCD 96             |  |
|              | LCD 97             |  |

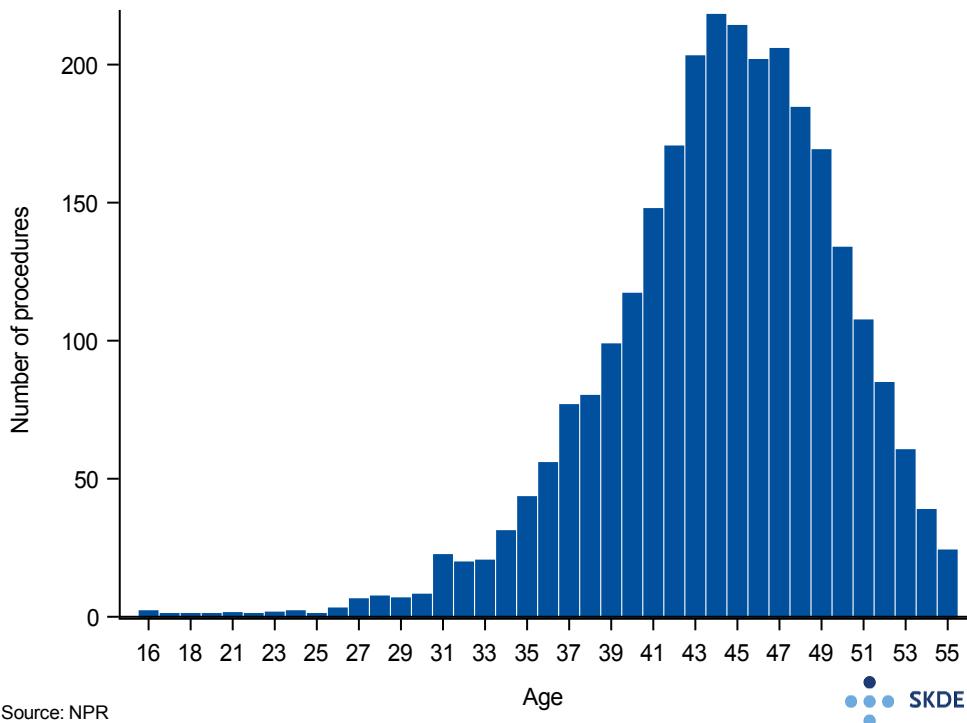
<sup>a</sup> Removal of the endometrium (endometrial resection/ablation)

The sample is limited to women aged 16–55 years.

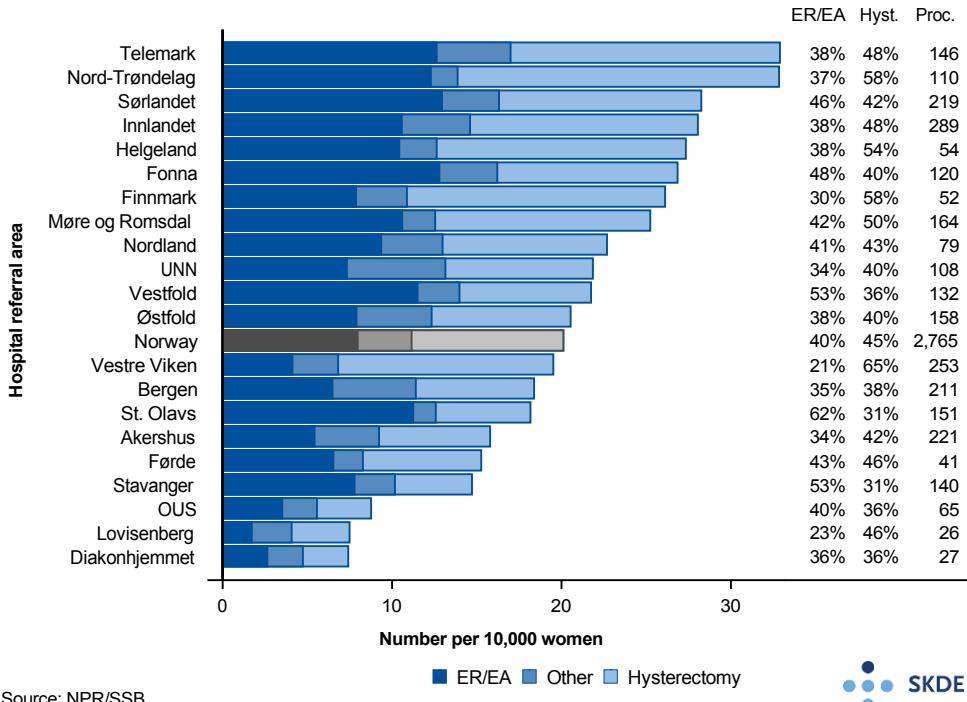
### Findings

During the period 2015–2017, approximately 2,700 surgical treatments of excessive and/or frequent menstruation were performed each year. Figure 5.7 shows the number of procedures broken down by age.

### 5.3. Excessive and/or frequent menstruation



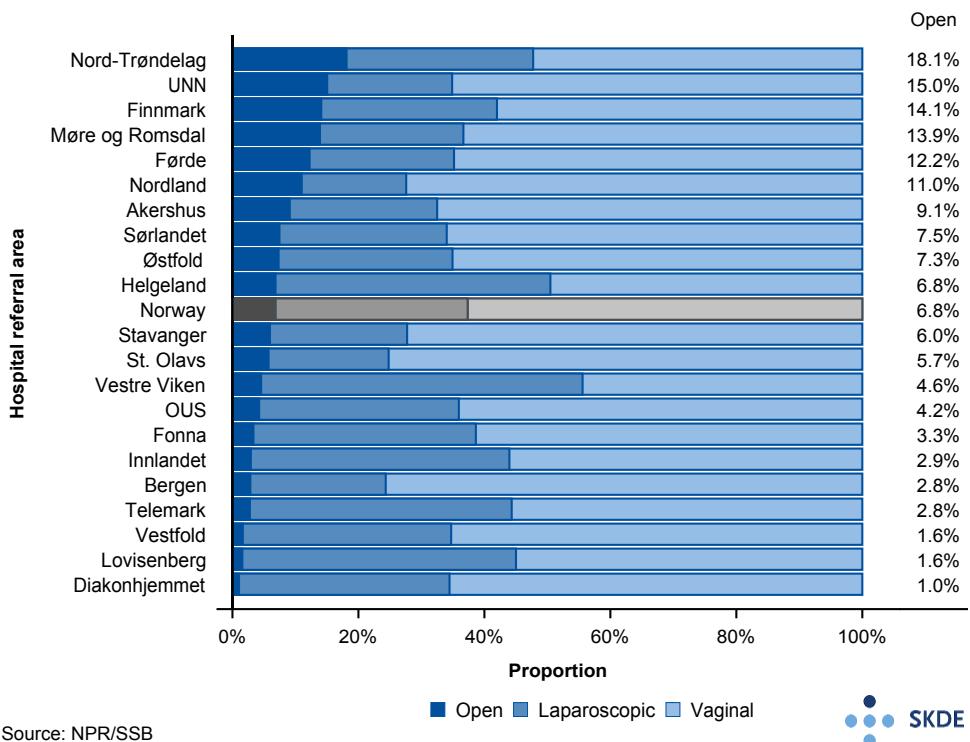
**Figure 5.7:** Number of procedures for excessive and/or frequent menstruation broken down by age, average per year for the period 2015–2017.



**Figure 5.8:** Number of procedures for excessive and/or frequent menstruation per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by hysterectomies, removal of the endometrium (ER/EA) and other procedures, respectively. The sample is limited to women aged 16–55 years. The proportion of procedures involving removal of the endometrium, the proportion of hysterectomies and the average number of procedures on the right.

Figure 5.8 shows that there is high geographical variation in the use of surgical treatment of excessive and/or frequent menstruation. The rates for residents of Telemark and Nord-Trøndelag hospital referral areas are more than four times as high as the rates for the areas of Diakonhjemmet and Lovisenberg. The number of procedures (data not shown) varies somewhat from year to year in several of the hospital referral areas that have the highest rates, while the rate remained stable over the period for the hospital referral areas with the lowest rates. The proportion of hysterectomies varied from 31% for women living in Stavanger and St. Olavs hospital referral areas to 65% for women living in Vestre Viken. The usage rate for hysterectomy to treat excessive and/or frequent menstruation is particularly low for residents of the hospital referral areas in Oslo (Diakonhjemmet, Lovisenberg and OUS). The proportion of procedures involving removal of the endometrium varied from 21% for women living in Vestre Viken hospital referral area to 62% for women living in the St. Olavs area.

Figure 5.9 shows the proportion of procedures carried out as open, laparoscopic and vaginal procedures, respectively. The proportion of open procedures varied from 18% for women living in Nord-Trøndelag hospital referral area to 1% for women in the Diakonhjemmet area.



**Figure 5.9:** Proportion of procedures for excessive and/or frequent menstruation in the period 2015–2017 performed as open, laparoscopic and vaginal procedures, respectively. The sample is limited to women aged 16–55 years.

### 5.3. Excessive and/or frequent menstruation

#### **Comments**

The geographical variation in the use of surgery to treat excessive and/or frequent menstruation is high, and the hospital referral areas in Oslo (Diakonhjemmet, Lovisenberg and OUS) stand out with particularly low rates. The geographical variation in the proportion of hysterectomies for this condition was moderate, while it was high for the proportion of surgeries involving removal of the endometrium. There was also high geographical variation in the proportion of open procedures.

If we exclude the low rates for residents of the hospital referral areas in Oslo, the geographical variation is more moderate. Residents of Telemark and Nord-Trøndelag hospital referral areas have about twice as many operations as residents of the Stavanger area.

Pharmacological treatment of abnormal uterine bleeding can be effective. The knowledge and practice of regular GPs and access to and the capacity of hospital outpatient clinics and gynaecologists in private practice can all have a bearing on what proportion of women with these conditions receive pharmacological treatment. The individual specialists' knowledge and views on different treatment options as well as the women's own preferences can also have an effect.

There is no known geographical variation in the prevalence of this condition that would explain the observed geographical variation in the use of surgical treatment, nor is it likely that it is entirely due to chance and different patient preferences. The variation must therefore be deemed to be unwarranted.

The results indicate that women in Norway who need surgical treatment for excessive and/or frequent menstruation do not have equitable access to services.

## 5.4 Hysterectomy for patients who do not have cancer

The surgical removal of the uterus is known as hysterectomy (from the Greek word *hystera*, meaning uterus). If the reason for the operation is cancer of the genitalia, the ovaries and lymph nodes in the pelvis and along the major blood vessels will often be removed. If the uterus is removed due to conditions other than cancer, such as myomas, abnormal uterine bleeding or endometriosis, the ovaries will usually be left in place and hormone production will function as normal. There are several different hysterectomy techniques: open surgery, keyhole surgery (laparoscopic hysterectomy) or removal via the vagina without keyhole surgery (vaginal hysterectomy). The national guidelines for gynaecology recommend using the vaginal or the laparoscopic technique.

The National Norwegian Gynaecological Endoscopic Registry (NGER) is a national medical quality register that collects data on patients who are treated with minimally invasive methods such as hysteroscopy and laparoscopic surgery.<sup>11</sup> The registry does not compare these results with those of open surgery, but shows that complications decrease year by year and that fewer operations that start out as laparoscopic procedures are converted to open surgery during the operation.

In recent years, robot-assisted surgery has been introduced as an alternative to the laparoscopic technique. There are no clear indications that robot-assisted surgery is better than laparoscopic surgery for patients without cancer, while it is more costly to use a robot. Robot-assisted surgery may be preferable for patients with cancer, obesity or complex surgical conditions such as advanced endometriosis and pelvic adhesions (Smorgick 2017).

### Sample

Hysterectomy is defined by the following surgical procedure codes:

| Open surgery |        | Vaginal surgery |        |        | Laparoscopic surgery |        | Robot-assisted surgery |
|--------------|--------|-----------------|--------|--------|----------------------|--------|------------------------|
| LCC 10       | LCD 00 | LCC 20          | LCD 10 | LEF 13 | LCC 11               | LCD 01 | ZXC 96                 |
|              |        |                 | LCD 40 |        |                      | LCD 04 |                        |
|              |        |                 |        |        |                      | LCD 11 |                        |
|              |        |                 |        |        |                      | LCD 31 |                        |
|              |        |                 |        |        |                      | LCD 97 |                        |

The sample is limited to women for whom no diagnosis code for cancer is registered. Patients with diagnosis codes C00-C97, D06 or D07 as a primary or secondary diagnosis have been excluded from the analysis.

### Findings

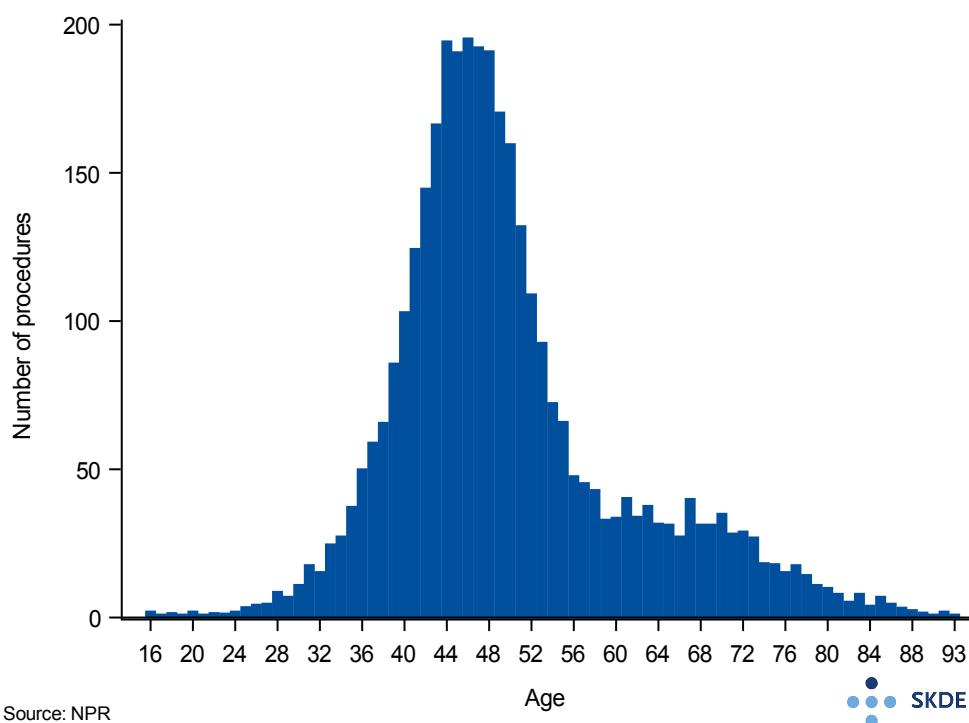
During the period 2015–2017, around 3,500 hysterectomies per year were performed in Norway on patients who had not been diagnosed with cancer. Figure 5.10 shows the number of procedures broken down by age.

Figure 5.11 shows procedures involving hysterectomy broken down by the patient's primary diagnosis into three categories: N92 Excessive and/or frequent menstruation, D25 Leiomyoma of uterus, and other conditions. There was great geographical variation in the use of hysterectomies.

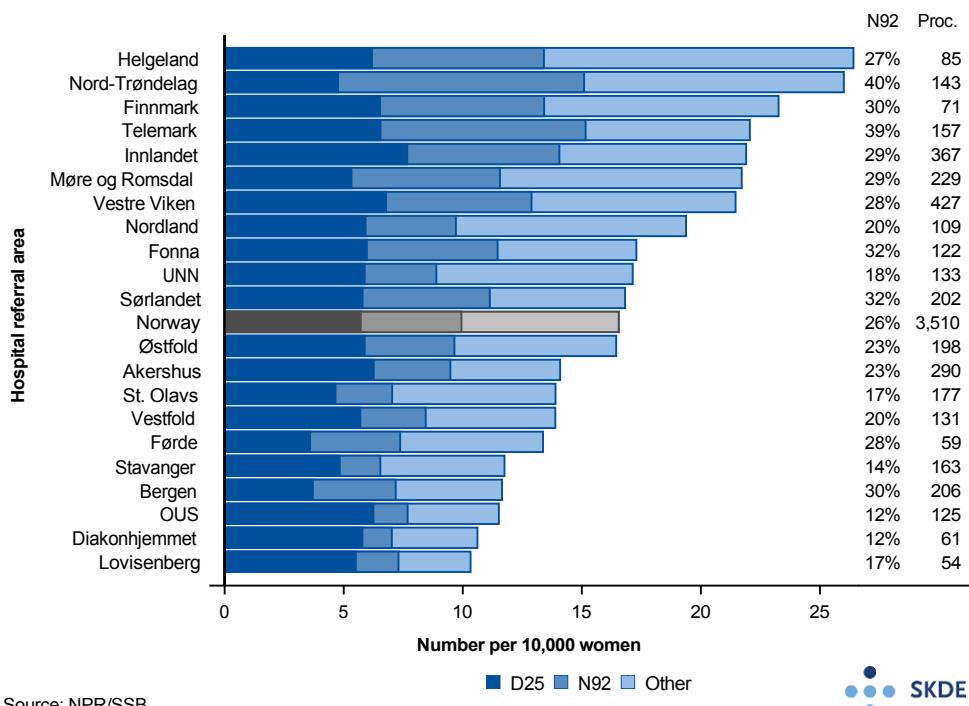
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<sup>11</sup>National Norwegian Gynaecological Endoscopic Registry

#### 5.4. Hysterectomy for patients who do not have cancer



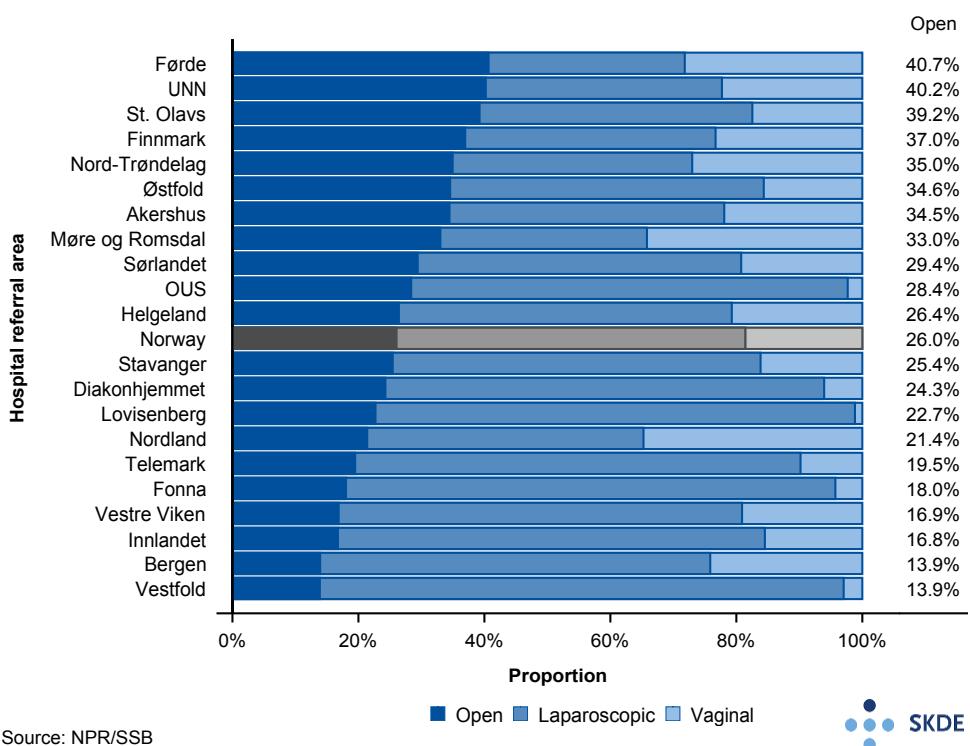
**Figure 5.10:** Number of hysterectomies broken down by age, average per year for the period 2015–2017.



**Figure 5.11:** Number of hysterectomies per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by procedures with a primary diagnosis of N92 (Excessive and/or frequent menstruation), D25 (Leiomyoma of uterus) and others. Average number of procedures and proportion with primary diagnosis N92 on the right.

Residents of the hospital referral areas of Helgeland and Nord-Trøndelag had about 2.4 times as many hysterectomies as residents of the Lovisenberg and Diakonhjemmet areas. Operations for the primary diagnosis N92 Excessive and/or frequent menstruation or D25 Leiomyoma of uterus accounted for 50–70% of all hysterectomies performed in Norway during the period 2015–2017 on patients who had not been diagnosed with cancer. The greatest variation was found in the use of hysterectomy on patients with the primary diagnosis N92 Excessive and/or frequent menstruation.

Figure 5.12 shows the proportion of hysterectomies performed as open, laparoscopic and vaginal procedures, respectively. The proportion of open surgery varied considerably between hospital referral areas. For women living in Vestfold and Bergen hospital referral areas, only 14% of procedures were open surgery, while for residents of the areas of Førde and UNN, open surgery was used in 40% of cases.

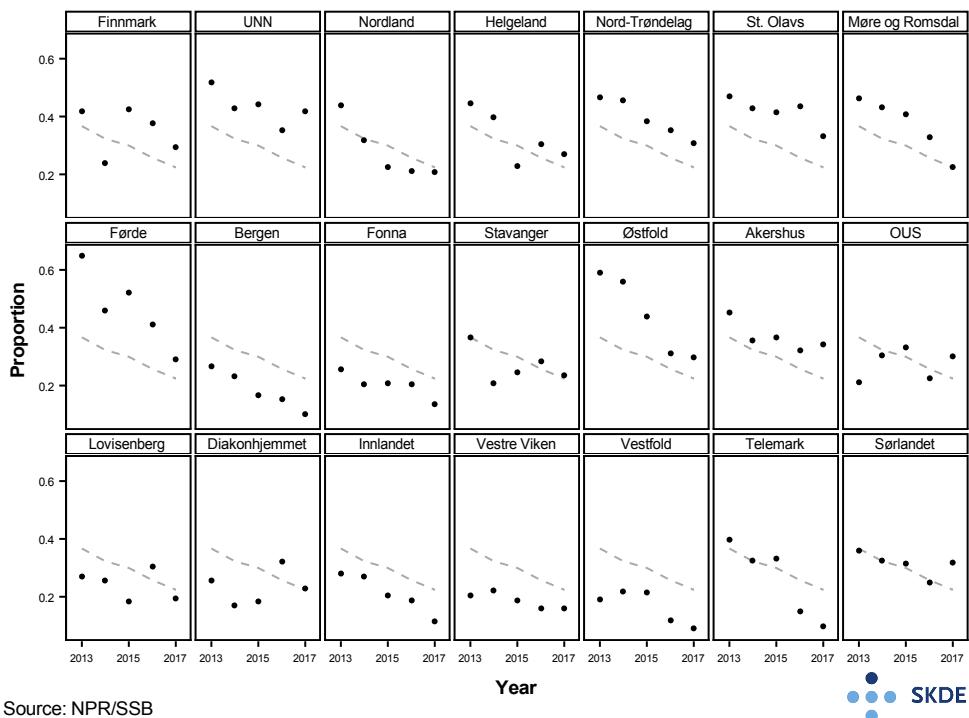


**Figure 5.12:** Proportion of hysterectomies performed as open, laparoscopic and vaginal procedures, respectively.

Figure 5.13 shows the development in the use of open surgery for hysterectomies during the period 2013–2017. Norway as a whole showed a decreasing trend in the period 2013–2017, with the proportion of open surgery being approximately halved from about 40% in 2013 to approximately 20% in 2017. The proportion of open surgery was decreasing or remained virtually constant in all hospital referral areas.

Table 5.1 shows the proportion of laparoscopic hysterectomies (proportion not adjusted for age) performed as robot-assisted surgery. The proportion is not stated for hospital referral areas with an average of fewer than five robot-assisted surgical procedures per year. Among the seven hospital referral areas where the number of patients who underwent robot-assisted surgery was not completely negligible, the proportion varies from 76% for residents of the St. Olavs area to 8% for residents of Bergen hospital referral area.

## 5.4. Hysterectomy for patients who do not have cancer



**Figure 5.13:** Development in open surgery as a proportion of all hysterectomies for the period 2013–2017, adjusted for age, average per year broken down by hospital referral area. The grey dotted line indicates the national trend.

**Table 5.1:** Number of laparoscopic hysterectomies, number of robot-assisted laparoscopic hysterectomies and robot-assisted procedures as a proportion of all laparoscopic procedures. Average per year for the period 2015–2017. Numbers and proportions are only stated for hospital referral areas with five or more robot-assisted laparoscopic hysterectomies per year on average.

| Hosp. ref. area | Lap. hyst. | No robot-ass. | % robot-ass. |
|-----------------|------------|---------------|--------------|
| St. Olavs       | 77         | 59            | 76,6 %       |
| Telemark        | 110        | 65            | 59,1 %       |
| Sørlandet       | 103        | 39            | 37,9 %       |
| Stavanger       | 96         | 26            | 27,1 %       |
| Innlandet       | 244        | 51            | 20,9 %       |
| UNN             | 50         | 9             | 18,0 %       |
| Bergen          | 127        | 10            | 7,9 %        |
| Others          |            | < 5           |              |

### Comments

There is considerable geographical variation in the use of hysterectomy for patients who do not have cancer. There is no known geographical variation in morbidity to indicate that there should be a geographical variation in the need for hysterectomies in Norway. Nor is it likely that differences in patient preferences or chance can fully explain the observed variation, and the variation must therefore be deemed to be unwarranted.

The proportion of procedures carried out as open surgery varies considerably between hospital referral areas. However, the proportion of open surgery has decreased during the period 2013–2017 in all the hospital referral areas that were above the national average in 2013. If this trend

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continues, the variation in the choice of surgical technique will probably decrease in the years ahead.

## **5.5 Transcervical surgical treatment of myomas, polyps and abnormal uterine bleeding**

### **5.5 Transcervical surgical treatment of myomas, polyps and abnormal uterine bleeding**

Some conditions, such as myomas (uterine fibroids) and polyps (growths in the inner lining of the uterus/cervix), can be surgically treated by inserting an instrument via the vagina and through the cervical canal into the uterine cavity. Such procedures are often referred to as transcervical procedures. An electrical cutting loop can be used to resect myomas and polyps inside the uterus. Such a loop can also be used to partially or completely remove the endometrium. The endometrium is removed down to the muscle layer to prevent it from growing back. There are also other methods where heat is used to destroy the endometrium.

The most common reason for removing or destroying the endometrium is frequent and heavy bleeding. Polyps in the uterine cavity or the cervix may occur both before and after menopause. Removing such polyps can be an effective treatment for women who experience troublesome intermenstrual bleeding. Polyps that cause postmenopausal bleeding should be removed, as there is an increased risk that they may develop into cancer. Transcervical surgical treatment of myomas, polyps and abnormal uterine bleeding can be a good alternative to a hysterectomy for some patients.

#### **Sample**

Surgical treatment of myomas, polyps and abnormal uterine bleeding through the cervix (hereinafter called ‘transcervical procedures’) is defined by the following surgical procedure codes:

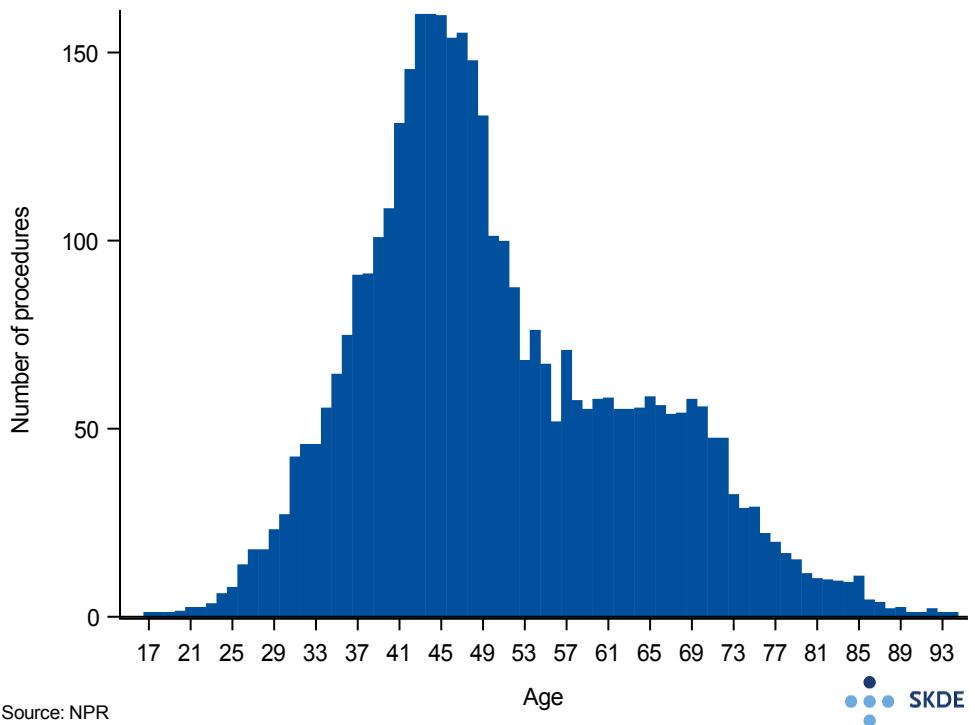
| Transcervical procedures |        |
|--------------------------|--------|
| LCA 16                   | LCB 20 |
|                          | LCB 25 |
|                          | LCB 28 |
|                          | LCB 32 |

The sample is limited to women for whom no diagnosis code for cancer is registered. Patients with diagnosis codes C00-C97, D06 or D07 as a primary or secondary diagnosis have been excluded from the analysis.

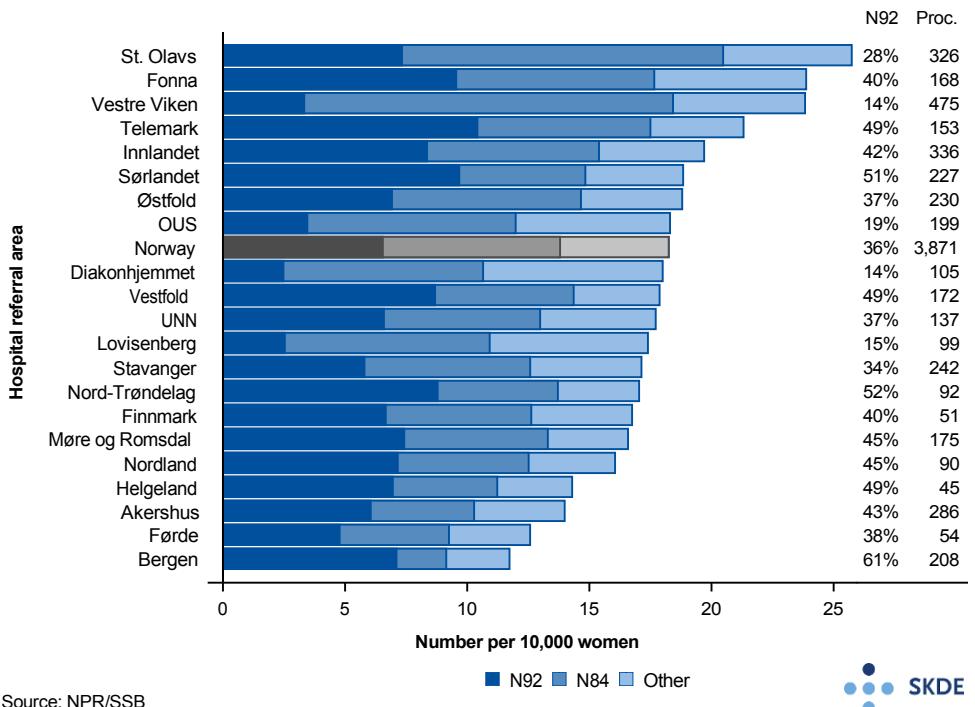
#### **Findings**

During the period 2015–2017, about 3,900 transcervical procedures were performed each year. Figure 5.14 shows the number of procedures broken down by age.

Figure 5.15 shows the number of transcervical procedures per 10,000 women broken down by hospital referral area and by the patient’s primary diagnosis into three categories: N92 Excessive and/or frequent menstruation, N84 Polyp of female genital tract, and other conditions. There is moderate variation between hospital referral areas in the use of such procedures. More than twice as many such procedures were performed on women living in the St. Olavs area as on women living in Bergen hospital referral area.



**Figure 5.14:** Number of transcervical procedures broken down by age, average per year for the period 2015–2017.



**Figure 5.15:** Number of transcervical procedures per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area and by procedures with a primary diagnosis of N92 (Excessive and/or frequent menstruation), N84 (Polyp of female genital tract) and others. Average number of procedures and proportion with primary diagnosis N92 on the right.

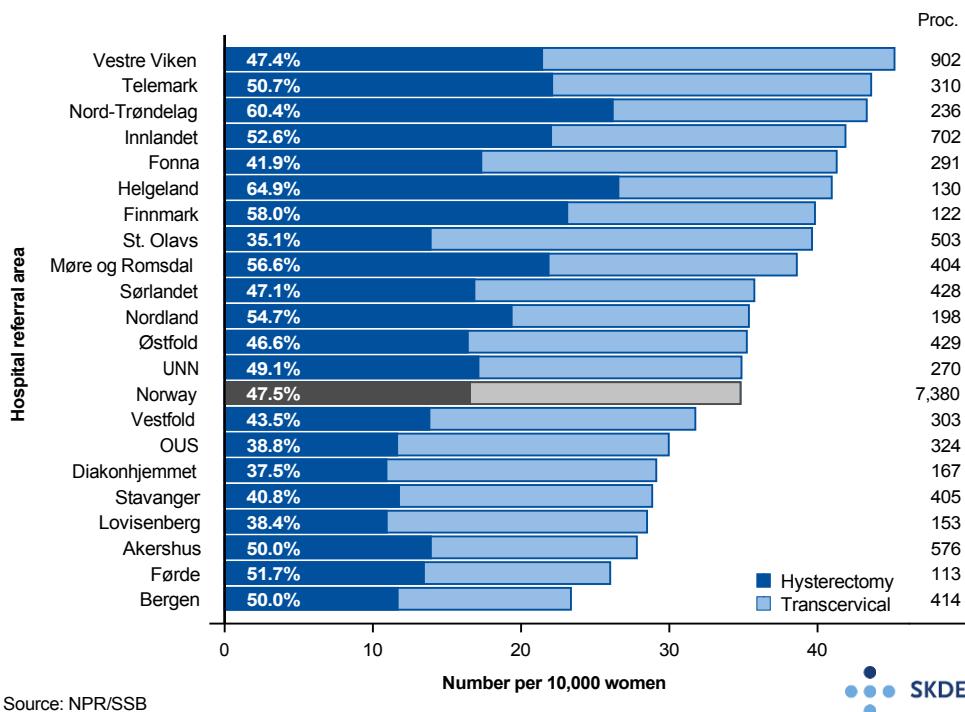
## 5.5. Transcervical surgical treatment of myomas, polyps and abnormal uterine bleeding

Most transcervical procedures are performed on patients with a primary diagnosis of N92 Excessive and/or frequent menstruation or N84 Polyp of female genital tract. The lowest proportions of procedures for a primary diagnosis of N92 Excessive and/or frequent menstruation are found in the hospital referral areas in Oslo (Diakonhjemmet, Lovisenberg and OUS) plus Vestre Viken. Bergen hospital referral area has the lowest proportion of procedures for a primary diagnosis of N84 Polyp of female genital tract.

### Comments

There is moderate geographical variation in the use of transcervical procedures for patients who do not have cancer. The number of transcervical procedures performed per year is about the same as the number of hysterectomies, and the scope of geographical variation in their use is comparable. However, the actual geographical variation, i.e. which hospital referral areas have high and low rates, differs for these two types of procedures.

Figure 5.16 shows the total number of hysterectomies and transcervical procedures per 10,000 women broken down by hospital referral area. We see that the hospital referral areas of Telemark, Innlandet and Vestre Viken, all of which had relatively high usage rates for hysterectomy, also had high rates for transcervical procedures. On the other hand, we find that the Bergen and Førde areas had relatively low usage rates for both hysterectomy and transcervical procedures. The hospital referral areas in Oslo (OUS, Diakonhjemmet and Lovisenberg) had the lowest usage rates for hysterectomies, but their use of transcervical procedures was around the national average. Overall, there is no clear correlation between the usage rates for hysterectomy and transcervical procedures.



**Figure 5.16:** Number of hysterectomies and transcervical procedures per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. Average number of procedures on the right.

The proportion of hysterectomies was highest in the hospital referral areas of Helgeland, Nord-

## Chapter 5. Surgical treatment of gynaecological conditions

Trøndelag and Finnmark, and lowest in St. Olavs, OUS, Diakonhjemmet and Lovisenberg. It is worth noting that the combined usage rate for hysterectomy and transcervical procedures was about the same in the three hospital referral areas of St. Olavs, Finnmark and Helgeland.

There is no known geographical variation in morbidity to indicate that there should be a geographical variation in the need for transcervical procedures in Norway. Nor is it likely that differences in patient preferences or chance can fully explain the observed variation, and the variation must therefore be deemed to be unwarranted.

# **Chapter 6**

## **Surgical treatment of prolapse and incontinence**

### **6.1 Pelvic organ prolapse**

The pelvic organs are supported by muscles and connective tissue, and when this support system is weakened, the organs in question can prolapse or descend into the vagina. The uterus and the vaginal portion of the cervix may descend into the vagina, the bladder can bulge backwards into and possibly out of the vagina (cystocele), or the rectum can bulge forward into and possibly out of the vagina (rectocele). The degree of prolapse is described using a system of four categories from stage 1 (least severe) to stage 4 (most severe, complete prolapse). Complete prolapse is when the whole uterus is outside the vaginal opening. Common symptoms include a sensation of a lump in the vaginal opening and a feeling of heaviness, and problems passing urine or stools. Pelvic organ prolapse is probably caused by a number of factors. Increasing age, having borne multiple children, oestrogen deficiency, being overweight, heavy physical labour, constipation and chronic coughing are all factors that increase the risk. Treatment is individual, and only patients who experience distressing symptoms require treatment. Conservative treatment with weight reduction and pelvic floor exercises can be useful in mild cases. Topical oestrogen treatment (in the form of suppositories, cream or gel) can be tried for stage 1 prolapse in menopausal women. A ring pessary works for many patients, but the ring can cause pressure sores. There are different surgical techniques for tightening the connective tissue in the anterior and/or posterior wall of the vagina. The vaginal vault will usually have to be fixated, and the vaginal portion of the cervix sometimes has to be shortened. About 90% of the patients in a Norwegian study were satisfied with the outcome after undergoing surgical treatment, and few experience recurrence of prolapse symptoms (Oversand et al. 2014).

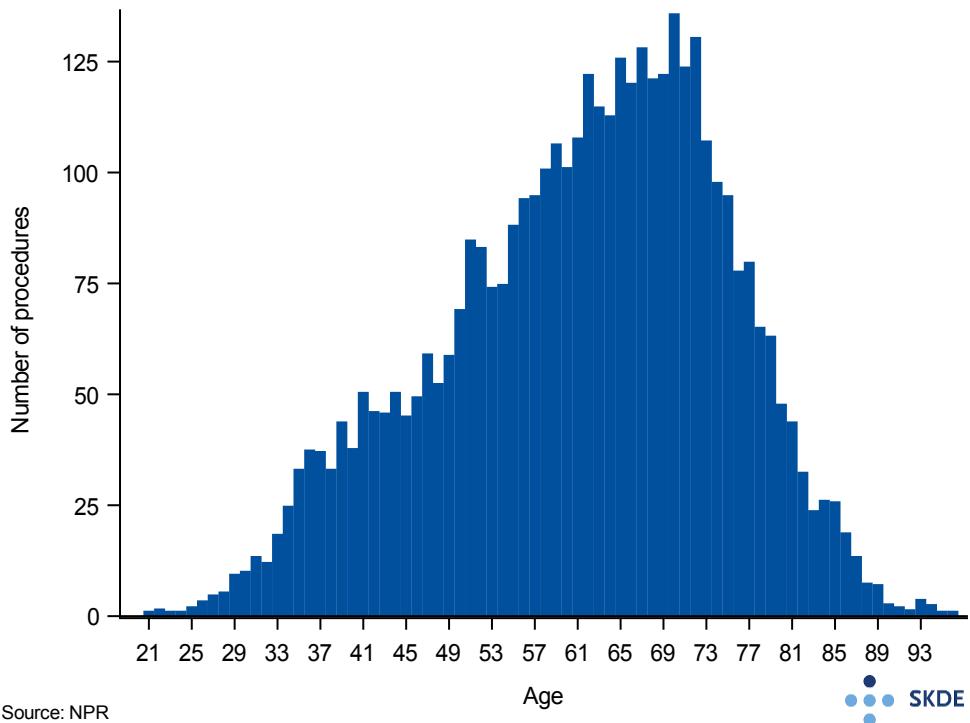
### **Sample**

Pelvic organ prolapse is defined by the diagnosis codes N81.0-N81.9 as a primary or secondary diagnosis. Surgical treatment of the condition is defined by these diagnosis codes in combination with the following surgical procedure codes:

| Surgery for prolapse |        |        |        |        |
|----------------------|--------|--------|--------|--------|
| LEF 00               | LEF 13 | LEF 23 | LEF 41 | LEF 53 |
| LEF 03               | LEF 16 | LEF 34 | LEF 50 | LEF 96 |
| LEF 10               | LEF 20 | LEF 40 | LEF 51 | LEF 97 |

## Findings

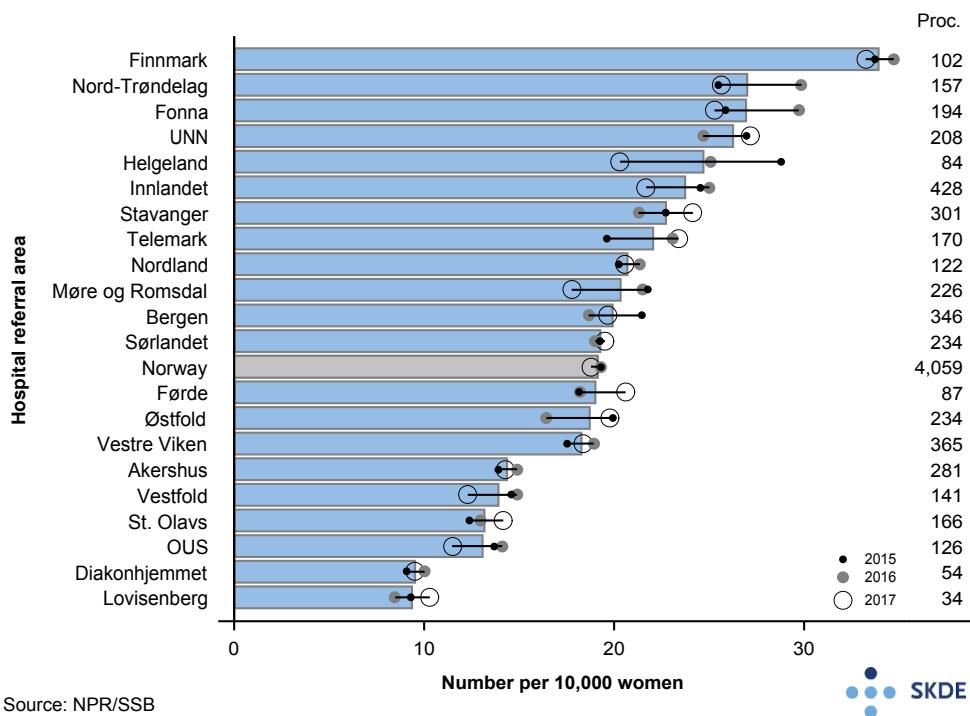
During the period 2015–2017, around 4,000 procedures for pelvic organ prolapse were performed per year. Figure 6.1 shows the number of procedures broken down by age.



**Figure 6.1:** Number of procedures for pelvic organ prolapse broken down by age, average per year for the period 2015–2017.

Figure 6.2 shows the use of surgical treatment of pelvic organ prolapse. There was considerable geographical variation in the use of surgical treatment of pelvic organ prolapse. Residents of Finnmark hospital referral area, which has the highest rate, underwent about 25% more such operations than women living in Nord-Trøndelag hospital referral area, which had the second highest rate. Women living in the Nord-Trøndelag area had more than twice as many operations for pelvic organ prolapse as residents of the hospital referral areas of Diakonhjemmet and Lovisenberg, which have the lowest rates. If we exclude the hospital referral areas with the highest and lowest rates (Finnmark, Lovisenberg and Diakonhjemmet), the variation is moderate.

## 6.1. Pelvic organ prolapse



**Figure 6.2:** Number of procedures for pelvic organ prolapse per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. Average number of procedures on the right.

### Comments

The geographical variation in the use of surgical treatment of pelvic organ prolapse is high. If we exclude the hospital referral areas with the highest (Finnmark) and lowest (Diakonhjemmet and Lovisenberg) rates, the variation is moderate.

The number of such procedures is relatively high, and the rates remained stable from one year to the next in most of the hospital referral areas. This indicates that chance is not an important explanatory factor for this variation.

There is no known geographical variation in morbidity to indicate that there should be any significant geographical variation in the need for such operations between hospital referral areas. Since it cannot be assumed to be due to chance or be ascribed to women's preferences with respect to conservative treatment versus surgery, the variation must be deemed to be unwarranted.

## 6.2 Urinary incontinence

Urinary incontinence (leaking) is common among women. Approximately 25% of women over 20 years of age in Norway experience some degree of urinary incontinence (Hannestad et al. 2000), and the condition causes significant problems for just over one third of these women. Urinary incontinence can reduce people's quality of life, affect their social life and limit physical activity. It is also a type of problem that people tend not to talk about. It becomes more common with increasing age. Urinary incontinence is most common in women who have given birth, but can also occur in women who have not. There are two main types of urinary incontinence. Stress incontinence is triggered by physical activity and exertion, including sneezing and coughing. The cause is usually weak pelvic muscles and connecting tissue following pregnancy and childbirth, or hormonal changes after menopause. Urge incontinence, also known as urgency incontinence, is the involuntary passing of urine in connection with a sudden and intense need to urinate. It is usually caused by the muscle in the wall of the bladder being overactive. It is a point to distinguish between these two types of urinary incontinence, as their causes and treatment are different. Around half of all patients with urinary incontinence suffer from stress incontinence only, just over 10% suffer from urge incontinence only, while just over a third have mixed incontinence (a mix of both types).

Stress incontinence can be improved by systematic pelvic floor exercises. Surgical treatment of stress incontinence is done by putting in a synthetic sling to support the urethra. The sling will prevent the urethra from moving during coughing and exertion. If surgery is not an option, an alternative method involves injecting a gelatinous mass (expander) around the urethra. Urge incontinence can be relieved through bladder training and pharmacological treatment. All overweight patients with urinary incontinence would benefit from losing weight. Patients with postmenopausal vaginal dryness can benefit from topical oestrogen treatment, as oestrogen can also keep the mucous membranes in the bladder and urethra thick and strong.

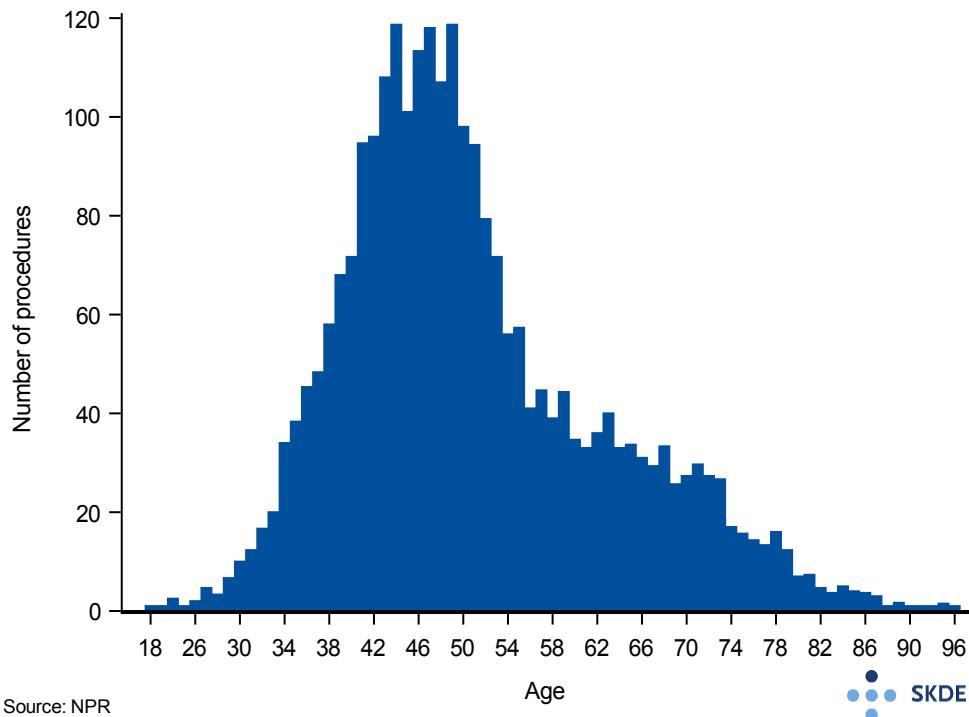
### Sample

Urinary incontinence is defined by the diagnosis codes (ICD-10) N39.3 or N39.4 as a primary or secondary diagnosis. Surgical treatment of the condition is defined by these diagnosis codes in combination with the following surgical procedure codes:

| Surgery for urinary incontinence |        |        |
|----------------------------------|--------|--------|
| LEG 00                           | KDG 00 | KDV 20 |
| LEG 10                           | KDG 02 | KDV 22 |
| LEG 13                           | KDG 10 |        |
| LEG 20                           | KDG 20 |        |
| LEG 97                           | KDG 21 |        |
|                                  | KDG 30 |        |
|                                  | KDG 31 |        |
|                                  | KDG 40 |        |
|                                  | KDG 43 |        |
|                                  | KDG 50 |        |
|                                  | KDG 60 |        |
|                                  | KDG 96 |        |
|                                  | KDG 97 |        |

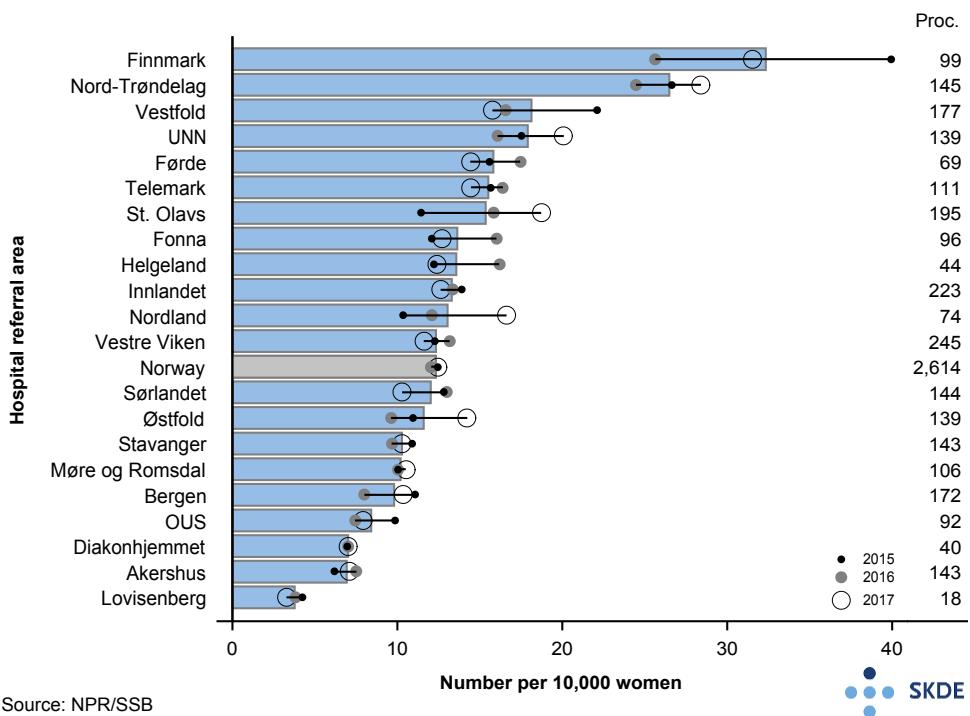
## Findings

During the period 2015–2017, about 2,500 incontinence operations per year were performed in Norway. Figure 6.3 shows the number of procedures broken down by age.



**Figure 6.3:** Number of procedures for urinary incontinence broken down by age, average per year for the period 2015–2017.

As shown in Figure 6.4, the rates varied greatly between hospital referral areas. On average, women living in Finnmark hospital referral area had more than eight times as many operations for incontinence as women living in the Lovisenberg area, and about 4.5 times as many operations as women living in the hospital referral areas of Diakonhjemmet and Akershus. The rate for Finnmark hospital referral area varies greatly between years, and some other areas also show considerable variation from one year to the next, while the rates of the hospital referral areas where the fewest women receive treatment remain very stable from year to year. If we exclude the two hospital referral areas with the highest rates (Finnmark and Nord-Trøndelag) and Lovisenberg hospital referral area, which is at the bottom of the list, the geographical variation is still high. Women living in Vestfold and UNN hospital referral areas had about 2.5 times as many operations for incontinence as women in the hospital referral areas of Akershus and Diakonhjemmet.



**Figure 6.4:** Number of urinary incontinence procedures per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. Average number of procedures on the right.

## Comments

The geographical variation in surgical treatment of urinary incontinence is considerable, even if we exclude the hospital referral areas with the highest and lowest rates (Finnmark, Nord-Trøndelag and Lovisenberg).

Table 6.1 compares the 2016 scores on three quality indicators from the Norwegian Female Incontinence Registry (NFIR) for the hospitals that treat the majority of the women in the hospital referral areas of Finnmark, Lovisenberg and Vestfold.

**Table 6.1:** Scores for 2016 on three quality indicators from the Norwegian Female Incontinence Registry (NFIR) for the six institutions that treated the majority of women living in the hospital referral areas of Finnmark, Vestfold and Lovisenberg in the period 2015–2017.

| Hospital referral area | Rate <sup>a</sup> | Treatment location           | Percentage treated | Ki1 <sup>b</sup> | Ki2 <sup>c</sup> | Ki3 <sup>d</sup> |
|------------------------|-------------------|------------------------------|--------------------|------------------|------------------|------------------|
| Finnmark               | 32                | Clinic Hammerfest            | 69                 | 92               | 82               | N<10             |
|                        |                   | Clinic Kirkenes              | 30                 | 85               | 72               | N<10             |
| Vestfold               | 18                | Vestfold Hospital            | 97                 | 88               | 64               | 93               |
| Lovisenberg            | 4                 | OUS - Ullevål                | 48                 | 92               | 81               | 92               |
|                        |                   | Akershus University Hospital | 35                 | 82               | 74               | 84               |
|                        |                   | Bærum Hospital               | 13                 | 94               | 87               | 97               |

<sup>a</sup> Number of procedures per 10,000 women

<sup>b</sup> Ki1: Percentage highly satisfied on check-up (PROM)

<sup>c</sup> Ki2: Stress incontinence index < 3 on check-up (subjectively cured) (PROM)

<sup>d</sup> Ki3: Percentage without stress incontinence on check-up (objectively cured)

## 6.2. Urinary incontinence

Overall, these hospitals' scores on the patient-reported outcome measure (PROM) 'Percentage highly satisfied on check-up' were quite similar. With the exception of Vestfold Hospital, which received a slightly lower score, the scores on the patient-reported outcome measure (PROM) 'Stress incontinence index < 3 on check-up (subjectively cured)' were also quite similar. Unfortunately, the number of stress tests carried out after operations at Finnmark Hospital is too low to allow for comparisons based on this indicator across all six treatment locations. However, the scores for Vestfold Hospital, where nearly all the women living in Vestfold hospital referral area were treated, appear to be at least as high as those of the three treatment locations that operated a total of 96% of the patients resident in Lovisenberg hospital referral area. It is striking how similar the scores are, considering that Finnmark's rate was eight times higher than that of Lovisenberg hospital referral area, and Vestfold had a rate that was 4.5 times higher than that of the Lovisenberg area.

There is no known geographical variation in morbidity that can explain the geographical variation in surgical treatment. Nor is it likely that women's preferences with respect to conservative treatment versus surgery, or random variation, can explain geographical variation on the scale observed. The variation must therefore be deemed to be unwarranted.



## **Chapter 7**

# **Discussion**

### **Main findings**

High or very high geographical variation was found in the use of most of the services studied in the Gynaecology Healthcare Atlas. In most cases, the observed variation was deemed to be unwarranted.

- There was considerable geographical variation in the use of colposcopy, cervical biopsy and endometrial biopsy/curettage in connection with assessment for cancer/neoplasia of the uterus and cervix. However, the results indicate that women who experience post-menopausal bleeding receive equitable services when it comes to assessment to establish whether the cause of the bleeding is cancer, cervical neoplasia or something else.
- There is considerable geographical variation in the use of gynaecological surgery, except for surgical treatment of uterine fibroids.
- There is considerable geographical variation in the proportion of open procedures in gynaecological surgery.
- The scale of the observed variation highlights the discussion of over- and undertreatment in relation to several of these services.

### **Diagnosis and assessment**

The geographical variation was particularly high for the use of colposcopy and biopsy in assessments for cervical cancer. Unfortunately, it is difficult to isolate the variation in the use of colposcopy because it is uncertain whether the correct codes have been registered for all colposcopies performed in hospitals. For this reason, we had to look at colposcopies and cervical biopsies together. A comparison of the *use of cervical biopsy* and *the use of colposcopy and/or cervical biopsy* clearly shows that the geographical variation in the use of colposcopy was greater than the geographical variation in the use of cervical biopsy. Most of the variation in the use of colposcopy is due to differences in the practice of specialists in private practice under public funding contracts. The results in this healthcare atlas confirm previous findings (Rosenlund et al. 2017) that indicate a high and geographically unevenly distributed overuse of colposcopy.

## Chapter 7. Discussion

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In this healthcare atlas, we have looked at a limited part of the specialist health service's activities in the field of gynaecological diagnostics. Consequently, the results do not present a comprehensive picture of the activities. However, a rough analysis (where hospital contacts with diagnosis codes linked to pregnancy, childbirth and the postnatal period have been excluded) shows considerable geographical variation in the use of outpatient contacts in gynaecology during the period 2015–2017, and that it was mostly hospital referral areas with high rates for contacts with specialists in private practice under public funding contracts that had the highest rates overall.

## Reproductive health

The geographical variation in the proportion of abortions on request performed as surgical procedures was found to be very high. No correlation could be found between hospital referral areas with a high proportion of abortions on request performed surgically and areas with high rates for surgical treatment in connection with spontaneous abortions.

The geographical variation in surgical treatment of spontaneous abortions was not as high as the geographical variation in the proportion of abortions on request performed as surgical procedures, but it was still considerable. Most women who suffer a spontaneous abortion do not need treatment, but we cannot rule out the possibility of a certain geographical variation in whether or not spontaneous abortions are treated, either surgically or pharmacologically. Unfortunately, pharmacological treatment for spontaneous abortion is not sufficiently well coded to be counted. This also means that it is not possible to determine the proportion of spontaneous abortions requiring treatment that were surgically treated. It is a weakness in the analysis that this cannot be determined.

However, there is no known reason why there should be geographical variation in the prevalence of spontaneous abortion, the proportion of spontaneous abortions that require treatment or the treatment method. We therefore find it reasonable to deem the observed variation to be unwarranted, even if it is impossible to confirm whether the greatest variation is in the proportion of spontaneous abortions for which treatment is provided or in the treatment method.

## Gynaecological surgery

In the part of the atlas dealing with gynaecological surgery, we have primarily chosen to base the structure of our presentation on surgical treatment of a number of conditions (excessive and/or frequent menstruation, uterine fibroids, endometriosis, pelvic organ prolapse and urinary incontinence). This structure presents certain challenges. Several of the procedures are used to treat more than one of the conditions listed. For examples, patients with all of these conditions, with the exception of urinary incontinence, can be treated with hysterectomy. That is why we have included separate chapters on hysterectomy and transcervical procedures as a supplement to the chapters on specific conditions.

In addition, patients can suffer from more than one condition. For example, it is not uncommon to have uterine fibroids or endometrial polyps that cause excessive and/or frequent menstruation. In such cases, it can be somewhat arbitrary whether the diagnosis code registered for the procedure is endometrial polyps, uterine fibroids, excessive and/or frequent menstruation or a combination or two or three of them.

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One in four women who underwent surgery to treat uterine fibroids also had a diagnosis code for excessive and/or frequent menstruation registered. Since the data do not indicate which condition was the primary reason for surgery, we have included such procedures in both samples. There was considerable variation in the use of surgical treatment of excessive and/or frequent menstruation and little variation in the use of surgical treatment of uterine fibroids. In our opinion, the results are so robust that an element of random coding for some procedures should not have any significant impact.

Endometrial polyps is another possible cause of excessive and/or frequent menstruation. It is possible that coding practices may vary somewhat and that some operations for women with excessive and/or frequent menstruation caused by endometrial polyps are only coded with the diagnosis code for endometrial polyps. By including procedures with diagnosis code N84.0 Polyp of corpus uteri as a primary or secondary diagnosis code in the sample for excessive and/or frequent menstruation together with diagnosis codes N92.0-N92.6 Excessive, frequent and irregular menstruation, we have investigated whether it is likely to have a significant impact on the results (see Figure C.1 in Appendix C). We find that the order of the hospital referral areas changes somewhat when procedures for polyps in the uterus (with or without associated abnormal uterine bleeding) are included in the sample, but variation is still high, and the same hospital referral areas are found at the top (Telemark and Nord-Trøndelag) and at the bottom (OUS, Lovisenberg and Diakonhjemmet) of the list.

For some patients, transcervical surgery will be a good alternative to a hysterectomy. It would perhaps be natural to assume that the hospital referral areas with the highest hysterectomy usage rates would be among the areas with the lowest usage rates for transcervical procedures, and vice versa. However, the results show no clear correlation between the use of hysterectomy and the use of transcervical procedures.

We have studied a limited selection of gynaecological surgery activities, primarily in relation to five different conditions. The results do not provide an exhaustive description of activities in the field of gynaecological surgery, and therefore do not provide a basis for an overall assessment of geographical variation in the use of gynaecological surgery. However, the results do give us a clear indication that there is variation, sometimes considerable variation, in treatment practices for a number of conditions. It is reasonable to assume that this is also the case for conditions not studied in this healthcare atlas.

## Variation in surgical technique

Most of the procedures covered by the Gynaecology Healthcare Atlas showed considerable geographical variation in the proportion of open surgery. For all the procedures described in Chapter 5 Surgical treatment of gynaecological conditions, the hospital referral areas of Nord-Trøndelag, UNN, Førde and Finnmark had a relatively high proportion and Vestfold and Bergen hospital referral areas a low proportion of open procedures.

However, the proportion of open hysterectomy procedures decreased in all those four hospital referral areas from 2013 to 2017. The same was true for most other hospital referral areas. This suggests that we are in the middle of a process whereby open surgery is increasingly replaced by laparoscopic and vaginal procedures, but where development has not progressed at the same speed everywhere. It is to a certain extent inevitable that changes and new techniques are introduced gradually and at different paces. The fact that we are now in the middle of such a process of change makes it difficult to assess whether the present variation in the use of different

techniques is to be expected.

Hopefully, our results can contribute to this professional assessment by referring to a trend for the five-year period from 2013 to 2017 and describe the situation as it was during the period 2015–2017.

## Do the results indicate over- or undertreatment?

A high level of geographical variation in the use of health services due to differences in treatment practices cannot necessarily be directly linked to over- or undertreatment because there is often no evidence-based consensus about indications for treatment (Brownlee et al. 2017). However, the considerable variation in the use of gynaecological health services documented in this healthcare atlas gives reason to ask whether it may in some cases be an expression of over- or undertreatment of some sections of the population. When it comes to the use of colposcopy, there are so many procedures and the observed geographical variation is so conspicuous that there cannot be much doubt that the procedure is overused. This overuse is mostly related to routine examinations of healthy women (Rosenlund et al. 2017), despite the fact that using colposcopy for screening purposes is not recommended (Cantor et al. 2008).

There was also very high geographical variation in surgical treatment of urinary incontinence. It is a challenge when interpreting the findings that the hospitals that treat women who live in the hospital referral areas of Finnmark and Nord-Trøndelag, which had the highest rates, do not to any great extent measure their outcomes in degrees of stress incontinence after surgery (see Chapter 6.2). Figures from the Norwegian Female Incontinence Registry (NFIR) for three different postoperative quality indicators nevertheless indicate that there are no major differences in outcomes between hospital referral areas with high and low rates. If the reason for the high geographical variation is differences in treatment practice and it is not possible to identify any material differences in outcomes between the treatment locations, this could be an indication of undertreatment in some areas.

There is also very high geographical variation in the use of surgery in connection with abortions on request. Much of the variation is probably linked to differences in practice as regards counselling, information and the extent to which the women's own treatment preferences are taken into consideration. According to the Patients' and Users' Rights Act,<sup>12</sup> women have the right to participate in the choice of method in connection with abortions on request. Medical abortion is the recommended method on medical grounds, but it is not possible to draw up any general rules for what the 'correct' choice is, because it depends on the individual patient's wishes and situation. This means that the terms over- and undertreatment are not particularly relevant in this context. If the reason for the great geographical variation is that women in some parts of the country are not given a real choice, there is nevertheless reason to question whether this is good practice.

There is a growing international focus on health services with little or no benefit. The NHS has proposed a list of 17 procedures to be publicly funded only in exceptional circumstances (Iacobucci 2018). Two of the procedures on this list are included in this atlas, namely curettage and hysterectomy for heavy menstrual bleeding. For both these procedures, the atlas found high geographical variations that are deemed to be unwarranted.

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<sup>12</sup> <https://lovdata.no/dokument/NL/lov/1999-07-02-63>

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It can be difficult to determine what constitutes the correct level of use, even when there seems to be consensus on the indications for treatment. Indications can be interpreted in different ways and assessed differently in relation to the symptoms, needs and preferences of individual patients. This entails discretionary judgement by the local specialist community, and this could lead to differences in practice between different communities. The Norwegian Medical Association has started the *Gjør kloke valg!* campaign, which is a Norwegian version of the *Choosing Wisely* campaign. This campaign contributes to active and systematic assessments by the specialist communities of how beneficial tests and treatments are. This type of arena for discussing the benefit and extent of services may be a constructive way to proceed both to understand the reasons for the geographical variation documented and to implement measures to limit unwarranted variation.

## Challenges and limitations in the data

### Variation in coding practice

The procedure chosen to define the samples in this atlas aims to minimise the effect of variation in coding practices (see Chapter 2.2 Definition of sample data from NPR). We believe that this approach has enabled us to arrive at reasonably reliable estimates for the use of the different services, and that the remaining incorrect coding does not represent a threat to the conclusions in this healthcare atlas.

### Privately funded activities

NPR does not contain information about specialist health services that are paid for in full by the patient or an insurance company, and nor is such information available from other sources. The healthcare atlases are primarily an attempt to map how the health trusts discharge their responsibility to provide equitable and satisfactory specialist health services to the population in their hospital referral areas. The focus is therefore on specialist health services provided by public hospitals or publicly funded private hospitals and specialists in private practice under public funding contracts.

Generally speaking, it is difficult to assess what influence the use of privately funded services has on the use of publicly funded specialist health services in the field of gynaecology. Privately funded gynaecological surgery activity is probably quite limited. Consequently, privately funded activities should not have a significant impact on the part of the atlas that deals with surgical procedures. However, there is little doubt that the results in the part of the atlas that deals with diagnosis and assessment are influenced by the activities of specialists in private practice without public funding contracts (30% of gynaecologists in private practice have no public funding contract), as these activities are not evenly geographically distributed in Norway. The same is true of IVF, where there is also a significant amount of privately funded activities.

Some procedures that have traditionally been performed by the primary healthcare service may gradually have been taken over by specialists in private practice under public funding contracts and other specialists in private practice. Examples include ordinary pelvic examinations, IUD insertions and cervical cancer screening (Pahle et al. 2017; Rosenlund et al. 2017). This shift of tasks away from the primary healthcare service to the specialist health service may have developed differently in different places in Norway. This could possibly explain some of the

observed geographical variation in the use of some publicly funded gynaecological specialist health services.

## Summary

The Gynaecology Healthcare Atlas is primarily characterised by a high level of geographical variation that threatens the objective of equitable services. In some cases, we found greater variation than has ever been documented in other Norwegian healthcare atlases. The results indicate sometimes great variation in treatment practices for many of the forms of examination and treatment studied in this atlas. This variation highlights the discussion of over- and undertreatment in relation to several of these services, and the atlas should form a constructive basis for professional discussion in connection with the Norwegian Medical Association's *Gjør kloke valg!* campaign.

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## **Appendices**



## **Appendix A**

### **Summary table**

Appendix A. Summary table

Patient samples, number of contacts/patients/procedures, average age, ratio between the highest and lowest rate (R1), second highest and second lowest rate (R2), referral area with the highest and lowest rate. Average per year for the period 2015–2017.

| Sample                                      | Number  | Aver. age | R1   | R2   | Highest        | Rate high | Lowest          | Rate low |
|---|---------|-----------|------|------|----------------|-----------|-----------------|----------|
| Postmenopausal bleeding, contacts           | 9,186   | 64.0      | 1.6  | 1.4  | UNN            | 114.8     | Førde           | 73.5     |
| Endometrial diagnosis                       | 21,136  | 52.5      | 2.1  | 1.9  | Nordland       | 151.0     | Bergen          | 72.6     |
| Colposcopy and cervical biopsy, contacts    | 10,0815 | 45.2      | 17.3 | 10.8 | Nordland       | 1,299.3   | Møre og Romsdal | 75.3     |
| Cervical biopsy, contacts                   | 17,497  | 40.4      | 7.2  | 3.3  | Nordland       | 323.7     | Møre og Romsdal | 45.0     |
| Sterilisation, procedures                   | 1,045   | 36.0      | 5.9  | 3.1  | Helgeland      | 25.0      | Lovisenberg     | 4.2      |
| Spontaneous abortions, procedures           | 884     | 32.2      | 5.1  | 2.5  | Førde          | 16.1      | Stavanger       | 3.1      |
| Abortion on request, % surg.                | 1,575   | —         | 16.7 | 7.6  | Østfold        | 31.3      | Stavanger       | 1.9      |
| In vitro fertilisation, patients            | 3,793   | 33.6      | 2.5  | 1.7  | Lovisenberg    | 43.7      | Nordland        | 17.7     |
| Endometriosis, procedures                   | 1,186   | 36.5      | 2.8  | 2.6  | Lovisenberg    | 14.3      | St. Olavs       | 5.1      |
| Uterine myomas, procedures                  | 2,093   | 48.0      | 2.0  | 1.7  | Vestre Viken   | 12.1      | Bergen          | 6.1      |
| Excessive/frequent menstruation, procedures | 2,765   | 44.3      | 4.4  | 4.3  | Nord-Trøndelag | 32.8      | Diakonhjemmet   | 7.4      |
| Hysterectomy, procedures                    | 3,509   | 49.8      | 2.4  | 2.4  | Helgeland      | 26.5      | Diakonhjemmet   | 10.9     |
| Transcervical surgical procedures           | 3,871   | 50.4      | 2.2  | 1.9  | St. Olavs      | 25.7      | Bergen          | 11.7     |
| Pelvic organ prolapse, procedures           | 4,059   | 61.4      | 3.6  | 2.8  | Finnmark       | 33.9      | Lovisenberg     | 9.4      |
| Urinary incontinence, procedures            | 2,614   | 50.9      | 8.6  | 3.8  | Finnmark       | 32.3      | Lovisenberg     | 3.8      |

## Appendix B

# Hospital referral areas

Table B.1 shows which municipalities and city districts constitute the different health trust's hospital referral areas. Since the population figures for 2017 are actually the population figures as of 1 January 2018 as published by Statistics Norway, the hospital referral areas are defined on the basis of the municipality structure for 2018. In 2018, Rissa and Leksvik municipalities were merged to form Indre Fosen. In 2013–2017, Rissa belonged to St. Olavs hospital referral area, while Leksvik belonged to Nord-Trøndelag. In this healthcare atlas, all of Indre Fosen is allocated to St. Olavs hospital referral area. Health services used by the population of Leksvik will therefore be included under the St. Olavs area in this atlas, even though they technically belonged to Nord-Trøndelag hospital referral area during the period 2013–2017.

**Table B.1:** Hospital referral areas

| Hospital referral area | Municipalities   |
|------------------------|--|
| Finnmark               | 2002 Vardø, 2003 Vadsø, 2004 Hammerfest, 2011 Kautokeino, 2012 Alta, 2014 Loppa, 2015 Hasvik, 2017 Kvalsund, 2018 Måsøy, 2019 Nordkapp, 2020 Porsanger, 2021 Karasjok, 2022 Lebesby, 2023 Gamvik, 2024 Berlevåg, 2025 Tana, 2027 Nesseby, 2028 Båtsfjord, 2030 Sør-Varanger  |
| UNN                    | 1805 Narvik, 1851 Lødingen, 1852 Tjeldsund, 1853 Evenes, 1854 Ballangen, 1902 Tromsø, 1903 Harstad, 1911 Kvæfjord, 1913 Skånland, 1917 Ibestad, 1919 Gratangen, 1920 Lavangen, 1922 Bardu, 1923 Salangen, 1924 Målselv, 1925 Sørreisa, 1926 Dyrøy, 1927 Tranøy, 1928 Torsken, 1929 Berg, 1931 Lenvik, 1933 Balsfjord, 1936 Karlsøy, 1938 Lyngen, 1939 Storfjord, 1940 Kåfjord, 1941 Skjervøy, 1942 Nordreisa, 1943 Kvænangen |
| Nordland               | 1804 Bodø, 1837 Meløy, 1838 Gildeskål, 1839 Beiarn, 1840 Saltdal, 1841 Fauske, 1845 Sørfold, 1848 Steigen, 1849 Hamarøy, 1850 Tysfjord, 1856 Røst, 1857 Værøy, 1859 Flakstad, 1860 Vestvågøy, 1865 Vågan, 1866 Hadsel, 1867 Bø, 1868 Øksnes, 1870 Sortland, 1871 Andøy, 1874 Moskenes  |
| Helgeland              | 1811 Bindal, 1812 Sømna, 1813 Brønnøy, 1815 Vega, 1816 Vevelstad, 1818 Herøy, 1820 Alstahaug, 1822 Leirfjord, 1824 Vefsn, 1825 Grane, 1826 Hattfjelldal, 1827 Dønna, 1828 Nesna, 1832 Hemnes, 1833 Rana, 1834 Lurøy, 1835 Træna, 1836 Rødøy  |

## Appendix B. Hospital referral areas

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| Hospital referral area | Municipalities  |
|------------------------|---|
| Nord-Trøndelag         | 5004 Steinkjer, 5005 Namsos, 5019 Roan, 5020 Osen, 5034 Meråker, 5035 Stjørdal, 5036 Frosta, 5037 Levanger, 5038 Verdal, 5039 Verran, 5040 Namdalseid, 5041 Snåsa, 5042 Lierne, 5043 Rørvik, 5044 Namsskogan, 5045 Grong, 5046 Høylandet, 5047 Overhalla, 5048 Fosnes, 5049 Flatanger, 5050 Vikna, 5051 Nærøy, 5052 Leka, 5053 Inderøy  |
| St. Olavs              | 1567 Rindal, 5001 Trondheim, 5011 Hemne, 5012 Snillfjord, 5013 Hitra, 5014 Frøya, 5015 Ørland, 5016 Agdenes, 5017 Bjugn, 5018 Åfjord, 5021 Opdal, 5022 Rennebu, 5023 Meldal, 5024 Orkdal, 5025 Røros, 5026 Holtålen, 5027 Midtre Gauldal, 5028 Melhus, 5029 Skaun, 5030 Klæbu, 5031 Malvik, 5032 Selbu, 5033 Tydal, 5054 Indre Fosen  |
| Møre og Romsdal        | 1502 Molde, 1504 Ålesund, 1505 Kristiansund, 1511 Vanylven, 1514 Sande, 1515 Herøy, 1516 Ulstein, 1517 Hareid, 1519 Volda, 1520 Ørsta, 1523 Ørskog, 1524 Norddal, 1525 Stranda, 1526 Stordal, 1528 Sykkylven, 1529 Skodje, 1531 Sula, 1532 Giske, 1534 Haram, 1535 Vestnes, 1539 Rauma, 1543 Nesset, 1545 Midsund, 1546 Sandøy, 1547 Aukra, 1548 Fræna, 1551 Eide, 1554 Averøy, 1557 Gjemnes, 1560 Tingvoll, 1563 Sunndal, 1566 Surnadal, 1571 Halsa, 1573 Smøla, 1576 Aure |
| Førde                  | 1401 Flora, 1411 Gulen, 1412 Solund, 1413 Hyllestad, 1416 Høyanger, 1417 Vik, 1418 Balestrand, 1419 Leikanger, 1420 Sogndal, 1421 Aurland, 1422 Lærdal, 1424 Årdal, 1426 Luster, 1428 Askvoll, 1429 Fjaler, 1430 Gauldal, 1431 Jølster, 1432 Førde, 1433 Naustdal, 1438 Bremanger, 1439 Vågsøy, 1441 Selje, 1443 Eid, 1444 Hornindal, 1445 Gloppen, 1449 Stryn  |
| Bergen                 | 1201 Bergen, 1233 Ulvik, 1234 Granvin, 1235 Voss, 1238 Kvam, 1241 Fusa, 1242 Samnanger, 1243 Os, 1244 Austevoll, 1245 Sund, 1246 Fjell, 1247 Askøy, 1251 Vaksdal, 1252 Modalen, 1253 Osterøy, 1256 Meland, 1259 Øygarden, 1260 Radøy, 1263 Lindås, 1264 Austrheim, 1265 Fedje, 1266 Masfjorden  |
| Fonna                  | 1106 Haugesund, 1134 Suldal, 1135 Sauda, 1145 Bokn, 1146 Tysvær, 1149 Karmøy, 1151 Utsira, 1160 Vindafjord, 1211 Etne, 1216 Sveio, 1219 Bømlo, 1221 Stord, 1222 Fitjar, 1223 Tysnes, 1224 Kvinnherad, 1227 Jondal, 1228 Odda, 1231 Ullensvang, 1232 Eidfjord  |
| Stavanger              | 1101 Eigersund, 1102 Sandnes, 1103 Stavanger, 1111 Sokndal, 1112 Lund, 1114 Bjerkreim, 1119 Hå, 1120 Klepp, 1121 Time, 1122 Gjesdal, 1124 Sola, 1127 Randaberg, 1129 Forsand, 1130 Strand, 1133 Hjelmeland, 1141 Finnøy, 1142 Rennesøy, 1144 Kvitsøy  |

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| Hospital referral area | Municipalities/city districts   |
|------------------------|---|
| Østfold                | 0101 Halden, 0104 Moss, 0105 Sarpsborg, 0106 Fredrikstad, 0111 Hvaler, 0118 Aremark, 0119 Marker, 0122 Trøgstad, 0123 Spydeberg, 0124 Askim, 0125 Eidsberg, 0127 Skiptvet, 0128 Rakkestad, 0135 Råde, 0136 Rygge, 0137 Våler, 0138 Hobøl  |
| Akershus               | 0121 Rømskog, 0211 Vestby, 0213 Ski, 0214 Ås, 0215 Frogner, 0216 Nesodden, 0217 Oppgård, 0221 Aurskog-Høland, 0226 Sørum, 0227 Fet, 0228 Rælingen, 0229 Enebakk, 0230 Lørenskog, 0231 Skedsmo, 0233 Nitredal, 0234 Gjerdrum, 0235 Ullensaker, 0237 Eidsvoll, 0238 Nannestad, 0239 Hurdal, the following city districts in 0301 Oslo: 10 Grorud, 11 Stovner, 12 Alna   |
| OUS                    | The following city districts in 0301 Oslo: 03 Sagene, 08 Nordre Aker, 09 Bjerke, 13 Østensjø, 14 Nordstrand, 15 Søndre Nordstrand, 17 Marka, Uppgitt bydel Oslo   |
| Lovisenberg            | The following city districts in 0301 Oslo: 01 Gamle Oslo, 02 Grünerløkka, 04 St. Hanshaugen, 16 Sentrum   |
| Diakonhjemmet          | The following city districts in 0301 Oslo: 05 Frogner, 06 Ullern, 07 Vestre Aker  |
| Innlandet              | 0236 Nes, 0402 Kongsvinger, 0403 Hamar, 0412 Ringsaker, 0415 Løten, 0417 Stange, 0418 Nord-Odal, 0419 Sør-Odal, 0420 Eidskog, 0423 Grue, 0425 Åsnes, 0426 Våler, 0427 Elverum, 0428 Trysil, 0429 Åmot, 0430 Stor-Elvdal, 0432 Rendalen, 0434 Engerdal, 0436 Tolga, 0437 Tynset, 0438 Alvdal, 0439 Folldal, 0441 Os, 0501 Lillehammer, 0502 Gjøvik, 0511 Dovre, 0512 Lesja, 0513 Skjåk, 0514 Lom, 0515 Vågå, 0516 Nord-Fron, 0517 Sel, 0519 Sør-Fron, 0520 Ringebu, 0521 Øyer, 0522 Gausdal, 0528 Østre Toten, 0529 Vestre Toten, 0533 Lunner, 0534 Gran, 0536 Søndre Land, 0538 Nordre Land, 0540 Sør-Aurdal, 0541 Etnedal, 0542 Nord-Aurdal, 0543 Vestre Slidre, 0544 Øystre Slidre, 0545 Vang |
| Vestre Viken           | 0219 Bærum, 0220 Asker, 0532 Jevnaker, 0602 Drammen, 0604 Kongsberg, 0605 Ringerike, 0612 Hole, 0615 Flå, 0616 Nes, 0617 Gol, 0618 Hemsedal, 0619 Ål, 0620 Hol, 0621 Sigdal, 0622 Krødsherad, 0623 Modum, 0624 Øvre Eiker, 0625 Nedre Eiker, 0626 Lier, 0627 Røyken, 0628 Hurum, 0631 Flesberg, 0632 Rollag, 0633 Nore og Uvdal, 0711 Svelvik, 0713 Sande   |
| Vestfold               | 0701 Horten, 0704 Tønsberg, 0710 Sandefjord, 0712 Larvik, 0715 Holmesstrand, 0716 Re, 0729 Færder   |
| Telemark               | 0805 Porsgrunn, 0806 Skien, 0807 Notodden, 0811 Siljan, 0814 Bamble, 0815 Kragerø, 0817 Drangedal, 0819 Nome, 0821 Bø, 0822 Sauherad, 0826 Tinn, 0827 Hjartdal, 0828 Seljord, 0829 Kviteseid, 0830 Nissedal, 0831 Fyresdal, 0833 Tokke, 0834 Vinje  |
| Sørlandet              | 0901 Risør, 0904 Grimstad, 0906 Arendal, 0911 Gjerstad, 0912 Vegårshei, 0914 Tvedstrand, 0919 Froland, 0926 Lillesand, 0928 Birkenes, 0929 Åmli, 0935 Iveland, 0937 Evje og Hornnes, 0938 Bygland, 0940 Valle, 0941 Bykle, 1001 Kristiansand, 1002 Mandal, 1003 Farsund, 1004 Flekkefjord, 1014 Vennesla, 1017 Songdalen, 1018 Søgne, 1021 Marnardal, 1026 Åseral, 1027 Audnedal, 1029 Lindesnes, 1032 Lyngdal, 1034 Hægebostad, 1037 Kvinesdal, 1046 Sirdal  |

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## Appendix C

# Excessive and/or frequent menstruation — supplementary analysis

### Sample

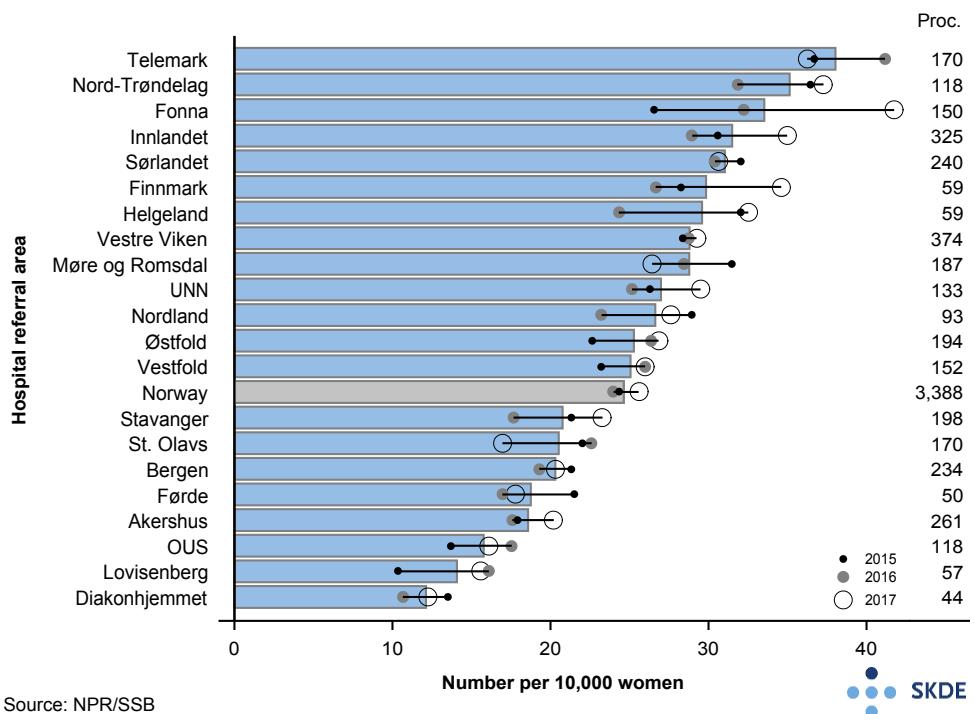
Excessive and/or frequent menstruation is defined by the diagnosis codes N92.0-N92.6 and/or N84.0 as a primary or secondary diagnosis. Surgical treatment of the condition is defined by the relevant diagnosis codes in combination with the following surgical procedure codes:

| Hysterectomy |        | ER/EA <sup>a</sup> |        | Other procedures |        |
|--------------|--------|--------------------|--------|------------------|--------|
| LCC 10       | LCD 00 | LCA 16             | LCB 28 | LCB 10           | LCC 00 |
| LCC 11       | LCD 01 |                    | LCB 32 | LCB 11           | LCC 01 |
| LCC 20       | LCD 04 |                    |        | LCB 14           | LCC 05 |
|              | LCD 10 |                    |        | LCB 20           | LCC 96 |
|              | LCD 11 |                    |        | LCB 25           | LCC 97 |
|              | LCD 30 |                    |        |                  |        |
|              | LCD 31 |                    |        |                  |        |
|              | LCD 40 |                    |        |                  |        |
|              | LCD 96 |                    |        |                  |        |
|              | LCD 97 |                    |        |                  |        |

<sup>a</sup> Removal of the endometrium (endometrial resection/ablation)

The sample is limited to women aged 16–55 years.

## Result



Source: NPR/SSB

**Figure C.1:** Number of procedures for excessive and/or frequent menstruation with the diagnosis code N84.0 Polyp of corpus uteri included as a sample criteria per 10,000 women, adjusted for age, average per year 2015–2017 broken down by hospital referral area. Average number of procedures on the right.

## **Appendix D**

### **The reference group**

The reference group for the Gynaecology Healthcare Atlas comprised (in alphabetical order):

|                          |  |
|--------------------------|--|
| Stine Andreasen          | Senior consultant, head of section<br>Women and children's clinic, Nordland Hospital Trust |
| Kari Bøckmann            | User perspective representative  |
| Yngvild Skåtun Hannestad | Gynaecologist in private practice  |
| Bente Kristin Johansen   | Senior Medical Officer<br>The Norwegian Medical Association                                |
| Lise Anett Nohr          | General practitioner   |





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## **Helseatlas**

Email: [helseatlas@skde.no](mailto:helseatlas@skde.no)

[www.helseatlas.no/en](http://www.helseatlas.no/en)

## **Senter for klinisk dokumentasjon og evaluering**

Email: [post@skde.no](mailto:post@skde.no)

Phone: +47 77 75 58 00

[www.skde.no](http://www.skde.no)

Postal address:

SKDE

Postboks 6

9038 Tromsø

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