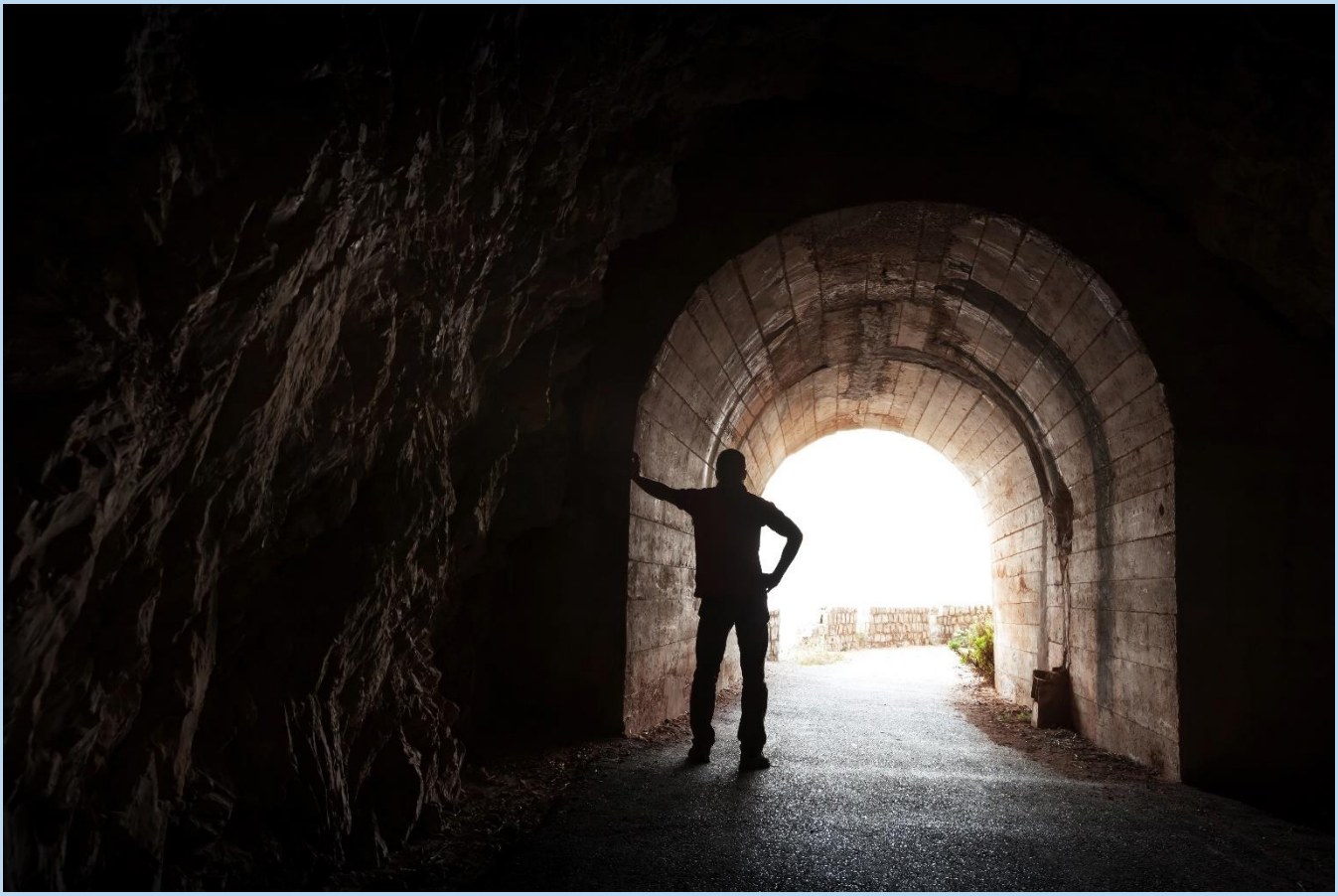
Healthcare Atlas for Mental Healthcare and Substance Abuse Treatment

Overview and analysis of the use of mental healthcare and interdisciplinary specialised addiction services in Norway for the years 2014-2018

June 2020



Helseatlas

HELSE FØRDE

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Foreword

The Ministry of Health and Care Services has charged Northern Norway Regional Health Authority (Centre for Clinical Documentation and Evaluation, SKDE) and Western Norway Regional Health Authority (Helse Førde health trust) with developing a national healthcare atlas service. The Western Norway Regional Health Authority/Helse Førde health trust hereby presents the first Norwegian healthcare atlas for the field of mental healthcare and substance abuse treatment.

Many recipients of mental healthcare and substance abuse treatment are vulnerable people, and these conditions cause considerable social costs. In recent years, the authorities have expressed a clear wish to strengthen services in this field, and an escalation plan has been adopted for the substance abuse treatment field. We hope that the Healthcare Atlas for Mental Healthcare and Substance Abuse Treatment will prove a useful tool in this work in future.

The goal is to provide an overview of the population's use of these specialist health services. We also want to answer the question of whether people's age and where they live have a bearing on what type of and how much treatment they receive within the specific areas of mental healthcare and interdisciplinary specialised addiction treatment.

The analyses in the report are primarily based on data from the Norwegian Patient Registry (NPR) from the period 2014–2018. During the work, we have received good and often invaluable input from the resource group for the healthcare atlas. The good cooperation with colleagues at the Northern Norway Regional Health Authority's Centre for Clinical Documentation and Evaluation (SKDE) has also been a great help, both in the preparations and during the work on this healthcare atlas.

The purpose of a healthcare atlas is to identify any variations in the provision of health services, whether they be of a geographical, demographic or medical nature. We have also endeavoured to assess whether the variation identified is warranted or unwarranted.

We have worked to ensure that this report provides as much relevant knowledge as possible and basic data for qualified analyses, assessments and considerations within the relevant areas of the Norwegian specialist health services.

Førde, 2 June 2020

Arve Varden
Managing director
Helse Førde

Abbreviations

Avt.: Mental healthcare specialist in private practice under a public funding contract

CV: Coefficient of variation

DPC: District psychiatric centre

FT: Ratio

HOD: The Ministry of Health and Care Services

CI: Confidence interval

MAR: Medication-assisted rehabilitation for substance use disorders

NPR: The Norwegian Patient Registry

MHC-CA: Mental healthcare for children and adolescents

MHC-A: Mental healthcare for adults

RHF: Regional health authority

SCV: Systematic Component of Variation

SMD: Severe mental disorder

SUD: Substance use disorder

TSB: Interdisciplinary specialised addiction treatment

Summary

Background
In order to learn more about variation in the use of health services, the Ministry of Health and Care Services charged Western Norway RHA and Northern Norway RHA with developing a national healthcare atlas service. Helse Førde health trust is carrying out this assignment on behalf of the Western Norway Regional Health Authority.

Assessment of variation
There is no standard method that can easily be used to analyse variations in the use of health services between geographical areas. We therefore used several methods. The assessment of whether variation is unwarranted also entails an element of professional judgment.

What was investigated
In the Healthcare Atlas for Mental Healthcare and Substance Abuse Treatment, we have investigated the population's use of mental healthcare and interdisciplinary specialised addiction services. The category mental healthcare includes mental healthcare for adults, mental healthcare for children and adolescents, and mental healthcare specialists in private practice under public funding contracts. Geographical variation in the population's use of such health services was also investigated. The population was divided into three groups by age: children and adolescents (0–17 years), adults (18–64 years) and the elderly (65 years and older).

Data from the Norwegian Patient Registry for the period 2014–2018 were used in the analyses, and both outpatient and inpatient treatment were investigated. In addition to looking at all patients as a group, two sub-groups of the adult and elderly groups were studied in more detail: patients with severe mental disorders and patients with substance use disorder.

Results
The Healthcare Atlas for Mental Healthcare and Substance Abuse Treatment contains information about many aspects of the population's use of and the variation in the use of mental healthcare services, mental healthcare specialists in private practice under public funding contracts and interdisciplinary specialised addiction services during the period 2014–2018.

For adults, who made up the biggest patient group, there was high variation between different parts of Norway in the patients' use of these services. This was particularly clear when patients with substance use disorder and patients with severe mental disorders were studied separately. Both groups showed high variation in the use of outpatient treatment. For inpatient treatment, the variation was less marked for patients with substance use disorder, while there was high variation among those with severe mental illness. We have deemed the variation between hospital referral areas to be unwarranted.

The analyses showed that the variation in use of these health services was very high among the elderly. The use of both outpatient and inpatient treatment varied greatly between different parts of Norway. The variation was high both for elderly patients as a group and when patients with substance use disorder or severe mental disorders were considered separately. The scope of inpatient treatment for substance use disorder was small. There are no indications that the high variation in the use of services was due to the patients' needs alone, and we have deemed it to be unwarranted.

Oslo had the highest use of outpatient services among adult patients, and this tendency was even stronger for elderly patients. The use of specialists in private practice under public funding contracts, which is higher in Oslo compared with the rest of Norway, contributed to the high variation in outpatient contact rates between hospital referral areas.

For children and adolescents as a group, there was little variation in the use of outpatient services between different parts of the country. However, we found differences in outpatient treatment in terms of the number of outpatient contacts per patient. There was high variation in inpatient treatment, but these results must be interpreted in light of the limited number of patients.

Assessments

The results in this healthcare atlas provide a basis for reflection on the population's use of specialist health services in the area of mental healthcare and substance abuse treatment. Knowledge from the healthcare atlas can, in combination with other sources, serve as a point of departure for further analyses to understand the variations and their consequences – for the patients, the health service and society as a whole – in order to contribute to more equitable use of health services.

Conclusion

We found high variation between different parts of Norway in the use of mental healthcare and interdisciplinary specialised addiction services by adult and elderly patients. The variation was particularly pronounced for severe mental disorders or substance use disorder.

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Chapter 1

Introduction

1.1 The remit and basis for data processing

In order to learn more about variation in the use of health services, the Ministry of Health and Care Services (HOD) assigned the task of developing a national healthcare atlas service to Northern Norway Regional Health Authority and Western Norway Regional Health Authority at the enterprise general meeting held in January 2015. The two regional health authorities will cooperate with the Norwegian Directorate of Health in this work, which is intended to shed light on and analyse the use of and variation in services. Helse Førde health trust is responsible for the Western Norway Regional Health Authority's work on healthcare atlases, while the Centre for Clinical Documentation and Evaluation (SKDE) performs this function on behalf of the Northern Norway Regional Health Authority.

Subsequent assignment documents from HOD have emphasised that information about variation in the use of health services is to be used to make improvements. This improvement work can reduce unwarranted variation. Variation in the use of health services that cannot be explained by differences in treatment preferences or morbidity between different parts of Norway can be characterised as unwarranted variation (Wennberg, 2010). High variation between hospital referral areas indicates over- or underuse of health services, which could, in turn, have consequences both for patients and for the health services.

The Healthcare Atlas for Mental Healthcare and Substance Abuse Treatment is based on health data for the period 2014–2018 disclosed by the Norwegian Directorate of Health represented by the Norwegian Patient Registry (NPR). Helse Førde health trust has sole responsibility for the interpretation and presentation of the disclosed data. NPR has no responsibility for analyses or interpretations based on the disclosed data. Since 2016, Helse Førde has held a licence from the Norwegian Data Protection Authority to process health data for the national healthcare atlas service. Since 20 July 2018, the legal basis for the processing of data is the General Data Protection Regulation Article 6(1) letter (e) and Article 9(2) letter (j).

1.2 About health care atlases and variation in the use of health care services

There is a general consensus in Norway that the whole population should have equitable access to health services regardless of where they live, and that the treatment provided shall be appropriate to the patients' needs (Helse-og omsorgsdepartementet, 2016). It is therefore important to find out to what extent this goal is being achieved. In recent years, the healthcare atlas service has compared use

of health services by different patient groups.[1] We have learnt that, in many areas, the use of health services varies between different parts of Norway.

Knowledge about variations in the use of health services is an important prerequisite for studying the relationship between health policy goals and clinical decision-making in more detail. This knowledge raises questions about priorities and efficiency in the health service (Wennberg, 2011), and benefits patients, healthcare professionals, managers and politicians.

Some countries have a longer tradition than Norway of studying geographical variation in the use of health services, i.e. health service research focusing on what is known as *small area variation*. Such research started in the USA already in the 1970s, and John Wennberg of Dartmouth College in Vermont was a pioneer in the field. The use of health services, resource use and costs in different geographical population areas in the USA were mapped and the findings presented in maps etc. (*Atlas of variation*). This work uncovered considerable regional differences and attracted a great deal of attention locally.

1.3 The concept of variation

The purpose of analysing variation in the use of health services is to determine whether patients are receiving equitable services regardless of where in Norway they live. There will always be variation in the use of health services. The objective of a healthcare atlas is to say something about whether the variation is systematic, and also about whether it is warranted or not. The terms *undesirable*, *unwanted* og *unwarranted* variation are used synonymously. In this chapter, we will describe different concepts of variation and how they relate to each other, while information about how the analyses of variation were conducted during the preparation of this healthcare atlas is provided in Chapter 4.4 and Appendix B Method.

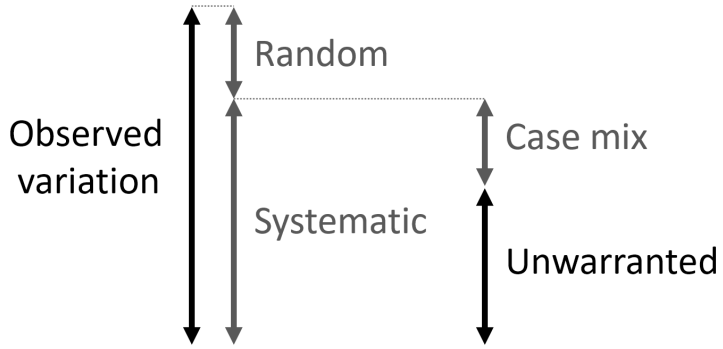

Figure 1.1: Illustration of the components of variation. (Used by permission from SKDE. From the Norwegian Neonatal Healthcare Atlas (Moen et al., 2016))

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The observed variation can be divided into two main components: systematic and random variation (figure 1.1). Random variation is most noticeable in connection with small samples of patients, procedures or other variables. When samples are small, figures can vary quite a lot from year to year within a geographical area due to chance alone. If the element of random variation is too great, we cannot draw any clear conclusions about the systematic variation. The analyses in the healthcare atlas will therefore be based on samples of a sufficient size. The size, for example the number of patients admitted, will

[1] COPD, the elderly, neonates, children, orthopaedics, day surgery, obstetrics and gynaecology

nevertheless vary in hospital referral areas over time, and this could have a bearing on the assessments and conclusions.

In a healthcare atlas, the use of health services is analysed on the basis of patients' home addresses, not where they received treatment. Analyses based on geographical affiliation will result in a more homogeneous patient composition than if the analyses were based on different hospitals.

In Norway, we generally see little difference between geographical areas in terms of prevalence of somatic illness. However, little is known about the prevalence of different mental disorders and substance use disorders in different parts of Norway corresponding to hospital referral areas and DPC referral areas (Folkehelseinstituttet, 2018b). The population's health service needs depend on more than what conditions the patients suffer from. The need for health services can be linked to individual characteristics, such as age, and to factors surrounding the individual, for example socioeconomic or health-related circumstances or housing conditions. Such characteristics form the basis for the calculation of needs indices in the models for distribution of income between regional health authorities (NOU, 2019).

Systematic variation that cannot be explained by chance or patient characteristics is deemed to be unwarranted (see Figure 1.1). In order to be able to identify the unwarranted variation, we endeavour to reduce both the element of random variation and variations relating to patient characteristics. We adjust for age and gender. A clearly unwarranted variation in the use of health services indicates that the service described is not equitably distributed in accordance with the responsibility to provide health services. The existence of unwarranted variation does not tell us whether a service is underused in one hospital referral area or overused in another.

In this healthcare atlas, we will shed light on and analyse variations in the use of health services. However, the analyses do not tell us what the correct level of use of health services is, and nor do we necessarily know what the correct level is.

Chapter 2

Why an atlas on mental healthcare and the treatment of substance use disorders?

Mental disorders and substance use disorders are common in Norway and can cause health loss among people in most age groups (Folkehelseinstituttet, 2018b). Mental disorders are among the conditions where Norway has experienced the greatest increase in the burden of disease in per cent during the period 2014–2017, while the burden of disease for alcohol and substance use disorders decreased (Helse-og omsorgsdepartementet, 2019).

Research shows that depressive disorders and anxiety disorders are among the most common causes of non-fatal health loss in mental healthcare both for women and men. The fact that suicide and overdoses are one of the major causes of death in the age group 15–49 years (Folkehelseinstituttet, 2017) and that persons with severe mental disorders may need to be institutionalised for treatment are clear signs of how serious mental disorders and substance use disorders can be.

In a report about mental health in Norway, *Psykisk helse i Norge* (Folkehelseinstituttet, 2018b), the Norwegian Institute of Public Health (NIPH) concludes that mental disorders are becoming more prevalent both among adults and among adolescent girls aged 15–17 years. NIPH refers to studies showing that 16–22% of the adult population will experience a mental disorder in the course of a 12-month period. As regards children and adolescents, studies show that about 7% of children of preschool and school age experience symptoms consistent with mental disorders, while about 5% of children and adolescents (0–17 years) are treated by the child and adolescent mental healthcare services each year (Folkehelseinstituttet, 2018b). Our findings based on data from the Norwegian Patient Registry for the period 2014–2018 are in agreement with NIPH's findings from 2018.

Health services for patients with mental and/or substance use disorders have been a priority in Norway for several years. Mental healthcare is one of the focus areas of Norway's national healthcare and hospital plan (2020–2023) (Helse-og omsorgsdepartementet, 2019). More attention is to be given to children and adolescents, as well as to users with serious and complex needs. While mental healthcare and interdisciplinary specialised addiction services are to grow faster than the somatic sector, more knowledge is called for about the services patients receive.

The decentralisation of specialist health services through the development of district psychiatric centres (DPC) and outpatient clinics for children and adolescents, have been important organisational measures in the effort to improve the availability of treatment. Nevertheless, not all patients should be treated

by the specialist health service. Municipal health and care services are important in connection with mental health challenges, from preventive measures to treatment and rehabilitation, and public health clinics and school health services are among the services that have been strengthened in recent years.

The health authorities express their intention to prioritise these services by developing priority guides, [2] quality indicators,[3] national quality registers, [4] standard patient pathways, [5] and the Directorate of Health also publishes statistics and reports [6] on mental healthcare and substance abuse treatment.

Children and adolescents in mental healthcare

Mental disorders are often referred to as a young people's disease. In 75% of cases, the disorder manifests itself before the patient turns 25 (Kessler et al., 2005), and suicide is one of the most common causes of death among young people (NHI, 2019).

A high proportion of boys are referred to mental healthcare services at primary school age. Developmental and behavioural disorders are the most common conditions among boys, and 'suspected hyperkinetic disorder' (Attention Deficit Hyperactivity Disorder, ADHD) is a common reason for referral.

Among the girls, the majority of patients are referred at lower secondary school age. Common reasons for referral include 'suspected depression' or 'suspected anxiety disorder'. From puberty, adjustment disorders and eating disorders also become common among girls (Folkehelseinstituttet, 2018b). Ninety-five per cent of patients receive outpatient care, and most admissions are voluntary.

Outpatient contacts for the youngest children could be due to postnatal depression in the mother, in which case the parents receive follow-up for the first year, or they could be services aimed at children with autism, premature children, suspected developmental disorders, disorders caused by exposure to intoxicating substances or complex child welfare cases.

Adults in mental healthcare and substance abuse treatment

Half of the Norwegian population will experience a mental disorder at some point in their life (Malt et al., 2018). The prevalence is higher in rural than in urban areas. Anxiety and depression are the most common conditions, and symptoms of both often occur together. In the course of a year, about 15% of the adult population will get an anxiety disorder, while about 10% will suffer from depression (Folkehelseinstituttet, 2018b). Substance use disorders are common, also in combination with mental disorders.

Psychotic disorders such as schizophrenia or paranoid psychosis are comparatively rare, and only 1-3.5% of the population will suffer from such disorders during their lifetime (Folkehelseinstituttet, 2018c). A psychotic person has an altered perception of reality. He or she can experience hallucinations and develop delusions. Social withdrawal is common, as is cognitive dysfunction. Some experience significant functional impairment and will need extensive help, while other can recover from psychotic disorders.

Alcohol use disorder is the most common substance use disorder in Norway, and is most common among young adults between the ages of 18 and 35 years. Harmful alcohol use is more common among men

[2] www.helsedirektoratet.no/produkter?tema=prioriteringsveileder, as of 12 May 2020
[3] www.helsedirektoratet.no/statistikk/statistikk/kvalitetsindikatorer, as of 23 August 2019
[4] www.kvalitetsregistre.no/, as of 30 October 2019
[5] www.helsedirektoratet.no/tema/psykisk-helse, as of 30 October 2019
[6] www.helsedirektoratet.no/tema/statistikk-registre-og-rapporter, as of 12 May 2020

than women. Patients with substance use disorders often have other mental or somatic disorders as well (Folkehelseinstituttet, 2019).

Mental illness often affects the young and can cause significant functional impairment that makes education and working life difficult. At 36%, mental and behavioural disorders make up the largest group of people who receive disability benefits (NAV, 2019).

Most of them are treated by the primary healthcare service. GPs and emergency primary healthcare services make referrals to outpatient clinics and inpatient treatment when needed. Most admissions are voluntary. Depression is the most common reason for patients seeing their regular GP or the emergency primary healthcare services for mental health problems (Folkehelseinstituttet, 2018c).

There are numerous treatment methods, including different forms of psychotherapy and pharmacological treatment. Therapy can take place individually or in groups. Early intervention usually has a positive effect on a patient's prognosis. The prognosis is very good for some conditions, while others can cause more chronic problems. Even in the case of chronic conditions, a lot can be done to help patients to cope with their illness.

Elderly patients in mental healthcare and substance abuse treatment

The most common mental disorders and their treatment are the same as among the younger segments of the population. However, some elderly people also face other challenges related to their age. Strengthening people's social network, nutrition, physical activity and help with vision and hearing problems are described as protective factors as well as important aspects of the treatment of the most common disorders.[7]

In several European countries, 35% of the elderly have suffered from a mental disorder in the course of the past year (Folkehelseinstituttet, 2018a). The most common problem is depression. Estimates show that about 15–20% of the elderly suffer from depression, while about 10% suffer from anxiety. Depression in elderly patients can affect their memory and ability to concentrate, and may be misinterpreted as dementia (Malt et al., 2018). Norwegian studies show an increasing prevalence of depression, particularly among the oldest age group (Folkehelseinstituttet, 2018a). About one in five suicides take place in the over-65 age group, and men are over-represented (Aldring og Helse, 2019).

Between 5% and 10% of the over-65s have dementia. The most common type of dementia is Alzheimer's disease. In addition to slowly and gradually developing memory problems, cognitive and neurological symptoms are common, and so are agitation, symptoms of depression, apathy and symptoms of psychosis. The disease is characterised by the slow and gradual development of memory problems. The prevalence of dementia increases with age, and 40% of the age group over 89 suffer from dementia (Malt et al., 2018).

New psychological symptoms can also be a sign of underlying somatic illness or medication side effects. It is important not to assume that all changes in symptoms are natural age-related changes. The problems are often complex. Elderly patients are assessed and treated by the primary healthcare service as well as by geriatrics, neurology, geriatric psychiatry and general psychiatry departments and outpatient clinics. These services can be organised in different ways in different parts of Norway.

[7] Norwegian National Advisory Unit on Ageing and Health, www.aldringoghelse.no/

2.1 Main objectives of the healthcare atlas

The main objectives of this atlas is:

- to provide an overview over the population's use of mental healthcare and interdisciplinary specialised addiction services
- to assess geographical variation in the use of these health services

By mental healthcare we mean the specialist health services of mental healthcare for adults, mental healthcare for children and adolescents, and mental healthcare specialists in private practice under public funding contracts.

In our analyses, the population will be divided into three groups by age: children and adolescents (0–17 years), adults (18–64 years) and the elderly (65 years and older). For the adult and elderly groups we will, in addition to looking at all the patients as a group, study in more detail the use of health services by two groups: patients with severe mental disorders (schizophrenia, bipolar disorder and severe depression) and patients with substance use disorders. The analyses will be based on data from the Norwegian Patient Registry for the period 2014–2018, and both outpatient and inpatient treatment will be investigated.

It is a goal for this healthcare atlas to provide more knowledge about the population's use of specialist health services in accordance with the needs expressly stated by the health authorities (Helse-og omsorgsdepartementet, 2019). It is also part of the objective, in combination with other sources, to publish analyses that the health trusts and regional health authorities can use for management purposes, and to form a basis for understanding and explaining variation in the use of health services.

Chapter 3

Important terms and definitions

This chapter describes important terms and definitions related to the analyses in this healthcare atlas. See Appendix B for a more detailed description of the methods used.

The specialist health service is responsible for both mental healthcare and interdisciplinary specialised addiction treatment (TSB). The term **mental healthcare** refers to the assessment and treatment of mental disorders, in addition to the care and nursing required in connection with this.[8] **TSB** offers diagnosis, assessment and treatment for substance addiction and other forms of addiction. That services are interdisciplinary means that they are to be provided by personnel with expertise in the areas of medicine, psychology and social work.[9]

Sample: Patients who were in contact with one or more of the sectors mental healthcare for children and adolescents, mental healthcare for adults, interdisciplinary specialised addiction treatment and mental healthcare specialists in private practice under public funding contracts during the period 2014–2018 were included in the sample. The number of unique patients was calculated per hospital referral area and per year.

For the main analyses, the patients were divided into three age segments: children (0–17 years), adults (18–64 years) and the elderly (65 years and older). The patient's age was defined as age on the date of contact.

For the adult and elderly age segments, we studied two groups of patients in more detail: patients with *severe mental disorders (SMD)* (schizophrenia, bipolar disorder and severe depression) and patients with *substance use disorder (SUD)* (mental and behavioural disorders due to psychoactive substance use, except tobacco).[10] (See Appendix B for a more detailed definition.)

Hospital referral areas: The healthcare atlas assesses variation in the use of health services between hospital referral areas in order to determine whether people have equitable access to health services regardless of where they live. The hospital referral areas correspond to the health trusts' catchment areas, see Table 3.1 and Appendix C.

District psychiatric centres (DPC) are professionally independent units with responsibility for general mental healthcare, and they belong to the specialist health service. These centres provide day, inpatient,

[8] Act relating to the provision and implementation of mental health care, www.lovdata.no, downloaded on 4 September 2019

[9] Act relating to Specialist Health Services Section 2-1, www.lovdata.no, downloaded on 4 September 2019

[10] We have used diagnosis codes for primary or secondary diagnoses, and will identify patients with severe mental disorders or substance use disorder in both groups.

outpatient and ambulant services. Some DPCs are co-located with hospital departments. Some analyses were based on **DPC referral areas**; areas that correspond to the DPCs' 'catchment areas' (Appendix D).

Table 3.1: Hospital referral areas with short names

Hospital referral area / catchment area for:	Short name, hospital referral area
Finnmark Hospital Trust	Finnmark
University Hospital of Northern Norway Trust	UNN
Nordland Hospital Trust	Nordland
Helgeland Hospital Trust	Helgeland
Helse Nord-Trøndelag health trust	Nord-Trøndelag
St. Olavs Hospital Trust	St. Olavs
Helse Møre og Romsdal health trust	Møre og Romsdal
Helse Førde health trust	Førde
Helse Bergen health trust	Bergen
Helse Fonna health trust	Fonna
Helse Stavanger health trust	Stavanger
Østfold Hospital Trust	Østfold
Akershus University Hospital Trust	Ahus
Oslo University Hospital Trust	OUS
Diakonhjemmet Hospital	Diakonhjemmet
Lovisenberg Diaconal Hospital	Lovisenberg
Innlandet Hospital Trust	Innlandet
Vestre Viken Hospital Trust	Vestre Viken
Vestfold Hospital Trust	Vestfold
Telemark Hospital Trust	Telemark
Sørlandet Hospital Trust	Sørlandet

Gender and age adjustment The rates in the report have been adjusted for gender and age, except in Table 4.1. The denominator includes the number of inhabitants in the age segment we are studying.

Outpatient treatment: All contacts where a patient was admitted and discharged on the same day, regardless of stated level of care.

Direct outpatient contacts (outpatient contacts) are all outpatient contacts minus indirect contacts. The contacts concern either assessment/observation or treatment where the patient and/or parents/guardians/next of kin were physically present. Counting all contacts minimises the effect on analyses of changes to the funding model during the period.

Indirect contact: outpatient contacts without the patient or next of kin being physically present. Phone calls, videoconferencing or meetings between healthcare professionals etc. fall into this category.

For outpatient contacts, we calculated:
Outpatient contact rate: Average number of direct outpatient contacts per year per 1,000 population.
Indirect contact rate: Average number of indirect contacts per year per 1,000 population.
Patient rates: Average number of patients per year per 1,000 population.
Contacts per patient: Number of direct outpatient contacts in the hospital referral area/number of unique patients in the same hospital referral area, per year.
Intensity: Based on each outpatient contact: average number of outpatient contacts per 30-day period per hospital referral area and year.

Admissions: all stays in / admissions to an institution with a duration of more than zero days registered in mental healthcare for adults, mental healthcare for children and adolescents, or interdisciplinary

specialised addiction treatment. Admissions less than eight hours apart have been added together.[11]

For inpatient treatment, we calculated:
Admission rate: Average number of admissions per year per 1,000 population.
Day rate: Average number of inpatient days per year per 1,000 population.
Duration of admission: number of days per admission per year
Patient rate: Average number of inpatients per year per 1,000 population.

[11] By adding together admissions less than eight hours apart we get fewer and longer admissions.

Chapter 4

Results

During the period 2014–2018, an average of more than 265,000 people per year were in contact with the mental healthcare or interdisciplinary specialised addiction services in Norway. The average age was 35 years. Figure 4.1 shows the average age distribution of the Norwegian population and for the segment of the population included in this healthcare atlas, i.e. people who were in contact with the mental healthcare or interdisciplinary specialised addiction services during the period in question.

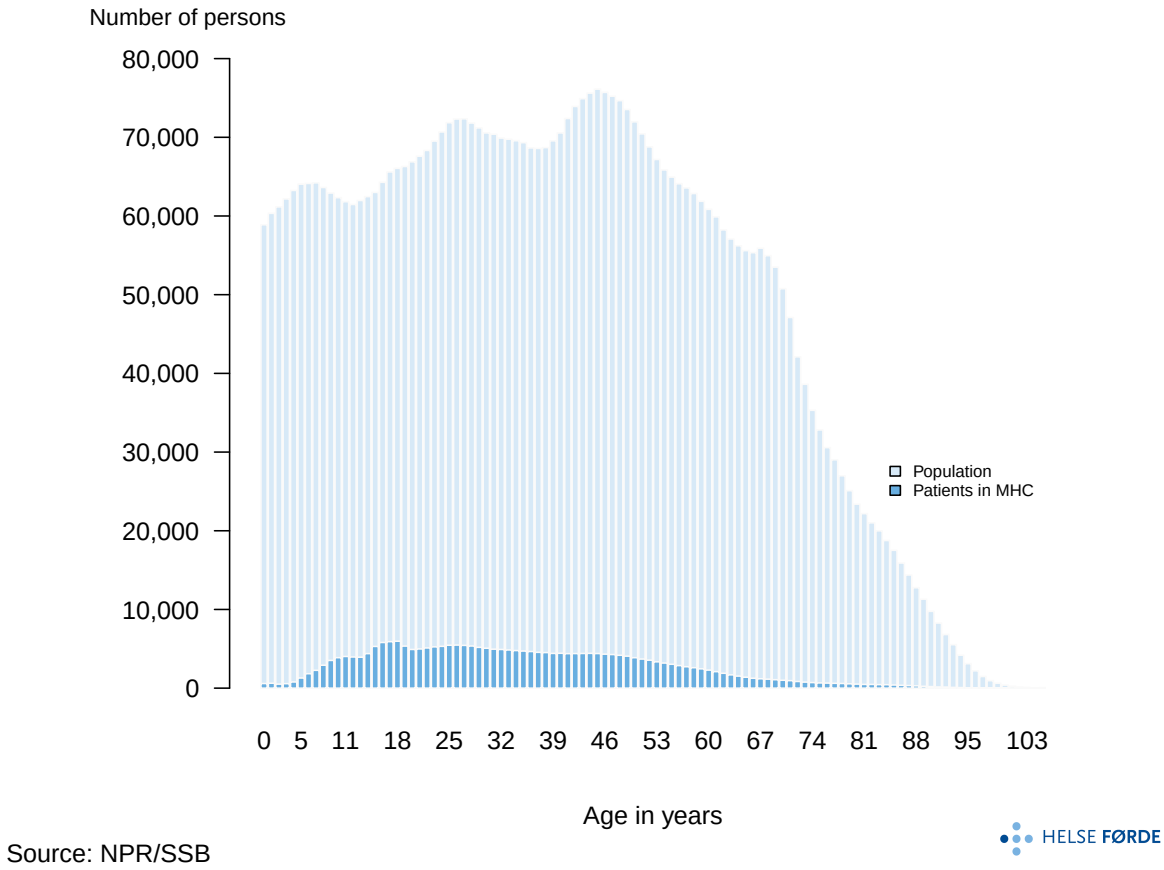

Figure 4.1: Population in Norway and the total number of patients treated by mental healthcare and interdisciplinary specialised addiction services and mental healthcare specialists in private practice under public funding contracts, broken down by age. Average per year for the period 2014–2018.

The segment of the population who was in contact with the relevant services and is included in the healthcare atlas included 52,100 children and adolescents aged 0–17 years, 195,000 adults aged 18–64 years, and 18,100 elderly aged 65 years and older. Of all the patients included in the healthcare atlas, 20% were children and adolescents, and the percentage varied from 8% in Lovisenberg hospital referral area to 28% in the Førde area. Adult patients made up 73% of all patients in the healthcare atlas, and the percentage varied from 66% in Førde hospital referral area to 89% in the Lovisenberg area. Elderly patients made up 7% of all patients, with the highest proportion of elderly patients (10%) in the hospital referral areas of Nord-Trøndelag and Diakonhjemmet and the lowest proportion (4%) in the Lovisenberg area.

When we looked at the use of specialist health services for mental disorders and substance use disorders for the population as a whole, we found that women made up the majority of patients in all adult age groups (Figure 4.2). In the younger age groups, boys were in the majority up to the age of 14 years, and when we look at interdisciplinary specialised addiction treatment separately, men dominated all age groups (data not shown).

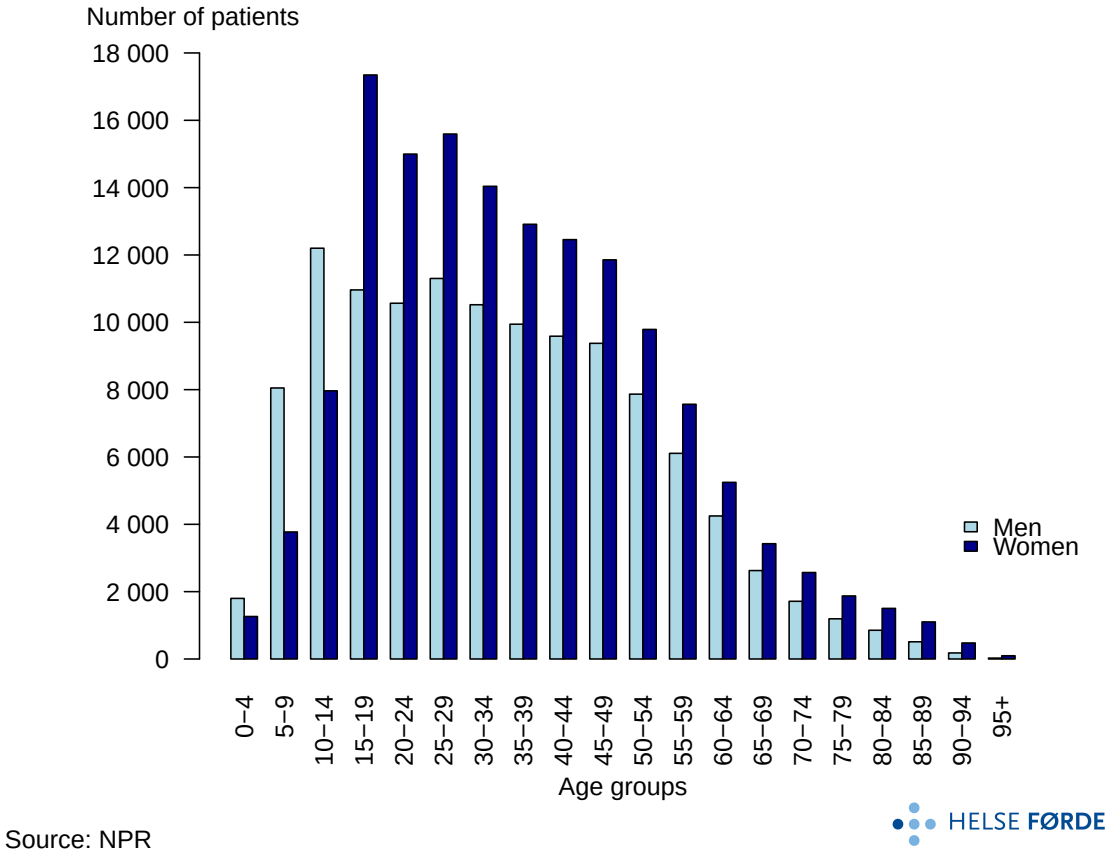

Figure 4.2: Number of patients in mental healthcare and interdisciplinary specialised addiction services in Norway, broken down by gender and age group. Average per year for the period 2014–2018.

There was considerable difference between hospital referral areas in terms of how many of their inhabitants were in contact with mental healthcare and interdisciplinary specialised addiction services, from approximately 4,100 persons per year in Finnmark hospital referral area to more than 23,000 persons in Bergen (Figure 4.3). The average age varied from 32 years in Helgeland hospital referral area to 38 years in the Diakonhjemmet area. However, the average percentage of the population that was in contact with the specialist health service due to mental disorders or substance use disorder was 5% both

for Norway as a whole and for most of the hospital referral areas. The hospital referral areas with a slightly higher percentage were Lovisenberg (7%), Vestfold and Telemark (6%), while the Ahus area had a somewhat lower percentage (4%).

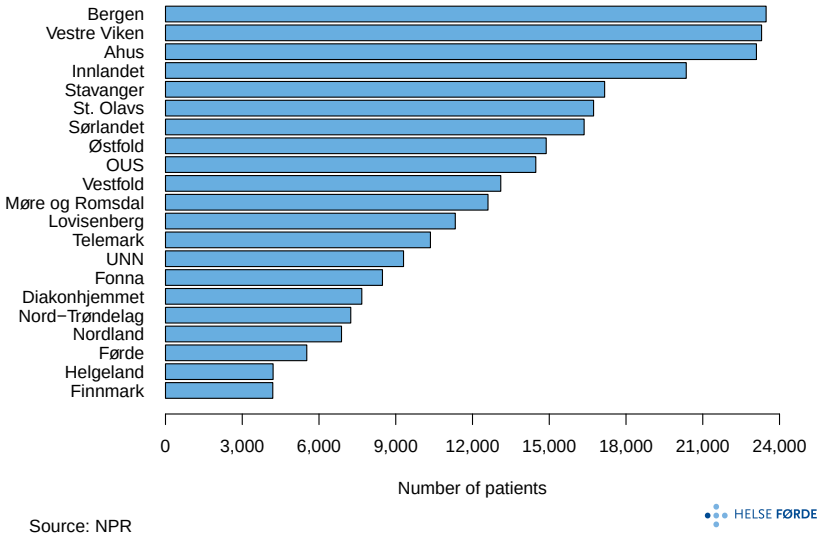

Figure 4.3: Number of patients in mental healthcare and interdisciplinary specialised addiction services (all ages), broken down by hospital referral area. Average per year for the period 2014–2018.

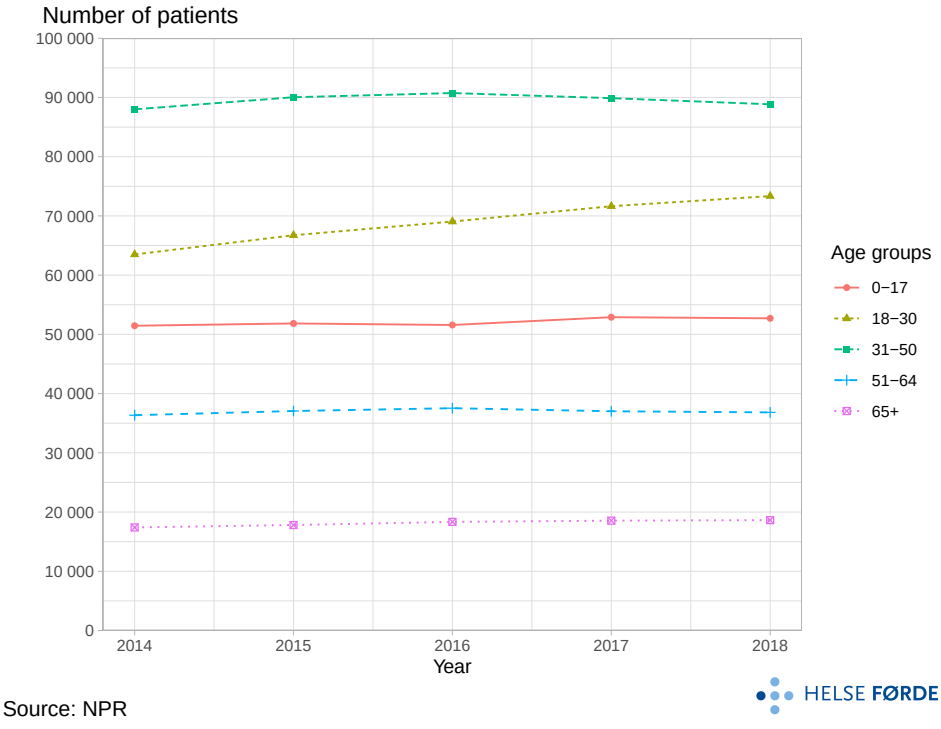

Figure 4.4: Total number of patients treated by mental healthcare and interdisciplinary specialised addiction services and mental healthcare specialists in private practice under public funding contracts in Norway over time, broken down by age.

If we break the patients down into smaller age groups, Figure 4.4 shows that the largest group of patients is found in the age group 31–50 years, while patients aged 65 years and older made up the smallest group. We see an increasing number of patients in the age group 18–30 years in the period 2014–2018, while the number of patients in the other age groups remained stable.

Table 4.1 shows the number of patients per 1,000 population in the relevant age group for the five age groups. They are overall rates for patients who have received treatment from mental healthcare services for children and adolescents, mental healthcare services for adults, interdisciplinary specialised addiction services and mental healthcare specialists in private practice. With the exception of the final column, the rates displayed in this table are crude rates, i.e. not adjusted for age and gender.

Table 4.1: Mental healthcare and interdisciplinary specialised addiction services. Patient rates (number of patients per 1,000 population) for different age groups and in total. The annual average number of patients in contact with mental healthcare and interdisciplinary specialised addiction services for the period 2014–2018. The adjusted overall patient rate has been adjusted for age and gender.

	Patient rate per age group (year)					Overall patient rate	
Hospital referral area	0-17	18-30	31-50	51-64	65 +	Crude rate	Adjusted rate
Finnmark	58.5	92.4	63.7	36.2	18.6	55.3	55.6
UNN	48.3	74.3	59.7	36.0	19.8	48.8	49.2
Nordland	54.3	82.3	56.5	33.9	22.9	50.0	51.0
Helgeland	64.7	94.1	61.2	37.2	14.8	53.6	55.8
Nord-Trøndelag	56.3	92.1	60.3	35.1	28.6	54.0	55.3
St. Olavs	48.9	84.1	60.9	37.6	21.7	52.9	52.1
Møre og Romsdal	47.9	76.0	55.0	34.2	24.3	47.6	48.4
Førde	62.4	72.7	58.7	37.8	18.2	50.4	51.5
Bergen	47.7	75.8	63.7	45.1	20.6	52.9	52.3
Fonna	44.0	71.9	57.3	38.0	20.3	47.1	47.6
Stavanger	43.1	69.9	53.4	37.2	24.5	47.7	46.8
Østfold	46.5	83.2	67.6	41.8	15.8	51.4	52.7
OUS	39.7	71.0	67.2	54.1	28.1	55.1	53.7
Lovisenberg	40.0	79.5	93.7	87.5	43.8	77.4	73.9
Diakonhjemmet	45.4	70.7	64.4	52.4	35.0	55.7	55.2
Ahus	39.4	66.9	52.2	38.2	18.7	44.2	44.1
Innlandet	51.1	88.9	71.2	45.2	17.2	53.8	56.4
Vestre Viken	40.8	77.6	60.3	42.5	18.2	48.3	49.1
Vestfold	52.8	96.1	71.1	45.9	20.3	57.2	58.7
Telemark	58.1	93.9	76.2	47.8	24.5	60.0	61.9
Sørlandet	44.9	84.7	71.5	43.9	22.0	54.9	55.3
Norway	46.2	76.0	62.2	41.9	21.3	50.9	50.9

The rates for the period are consistently highest in the age group 18–30 years, both for Norway as a whole (76 patients per 1,000 population) and for the hospital referral areas (between 67 and 96 patients per 1,000 population), with the exception of Lovisenberg hospital referral area, where the highest patient rate was found in the age group 31–50 years. The 31–50 years group is the second biggest both for Norway as a whole (62 patients per 1,000 population) and in most of the areas (between 52 and 94 patients per 1,000 population). The exceptions are the hospital referral areas of Førde and Helgeland, which have more patients per 1,000 population in the age group 0–17 years. In the age group 65 years and older, Lovisenberg and Diakonhjemmet hospital referral areas stand out with 44 and 35 patients, respectively, per 1,000 population, while most areas were close to the national average of 21 patients per 1,000 population. The greatest differences between hospital referral areas were found in the two oldest

age groups.

The overall patient rate varies between hospital referral areas, from 44 patients per 1,000 population in the Ahus area to 77 (crude rate) / 74 (adjusted rate) in the Lovisenberg area.

4.1 Children and adolescents in mental healthcare

During the period 2014–2018, approximately 52,100 children and adolescents (0–17 years) per year were in contact with mental healthcare services, mental healthcare specialists in private practice under public funding contracts and/or specialised addiction services in Norway. The number of children and adolescents who were in contact with the specialist health service remained relatively stable throughout the period (Figure 4.4). There were more boys among the youngest patients, while girls outnumbered them in the age group 15–19 years (Figure 4.2). On average, 5% of all children and adolescents (0–17 years) per year were in contact with the specialist health services in Norway. The percentage increased from 1% for the youngest children to 9% for 17-year-olds (Figure 4.1). Each year, an average of 49,000 children and adolescents had one or more direct outpatient contacts (Table 4.2), and just under 1,800 were admitted as inpatients (Table 4.3), in the above-mentioned specialist health services. We have not looked in more detail at how many patients had only indirect contacts or what proportion of patients received more than one type of treatment in the course of a year.

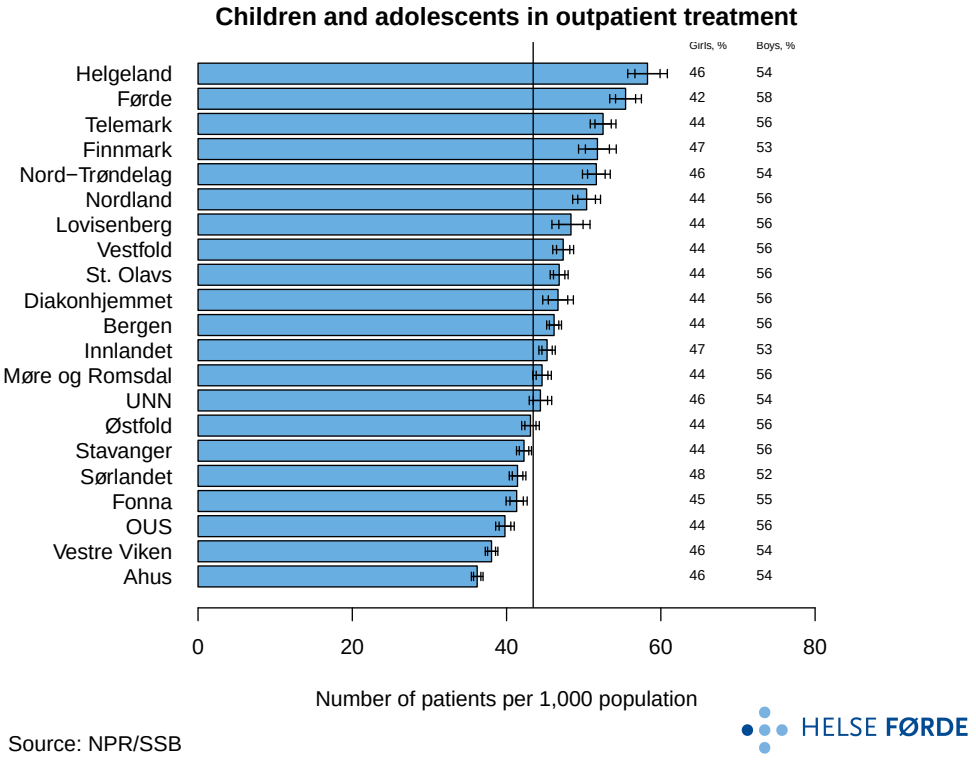

Figure 4.5: Patient rate for outpatient treatment in mental healthcare and interdisciplinary specialised addiction services: Number of child and adolescent patients (0–17 years) per 1,000 population, broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The table shows the percentage distribution: girls on the left, boys on the right. The rates have been adjusted for age and gender.

4.1.1 Outpatient treatment

We found the highest patient rates in hospital referral areas with relatively small populations, while the rates for the Oslo region tended to be lower (Figure 4.5). The average rate per year for 2014–2018 was highest in Helgeland hospital referral area with 58 patients per 1,000 population and lowest in the Ahus area with 36. The boys made up between 52% and 58% of the patient group in each hospital referral area.

The number of child and adolescent outpatients per 1,000 population remained relatively stable in most areas during the period 2014–2018, but there was an upward trend in the hospital referral areas of Helgeland, Stavanger, Vestfold and Fonna. If we look only at the patient rates for 2018 or the average rate for the period as a whole, the same hospital referral areas had the highest and lowest patient rates. We found the variation in patient rates to be relatively low, but higher than we would expect based on chance (Table 4.17 in Chapter 4.4).

Outpatient contacts

Children and adolescents had an average of 584,000 outpatient contacts with the mental healthcare services (MHC-CA and MHC-A), mental healthcare specialists in private practice and/or interdisciplinary specialised addiction services per year during the period 2014–2018 (Table 4.2).

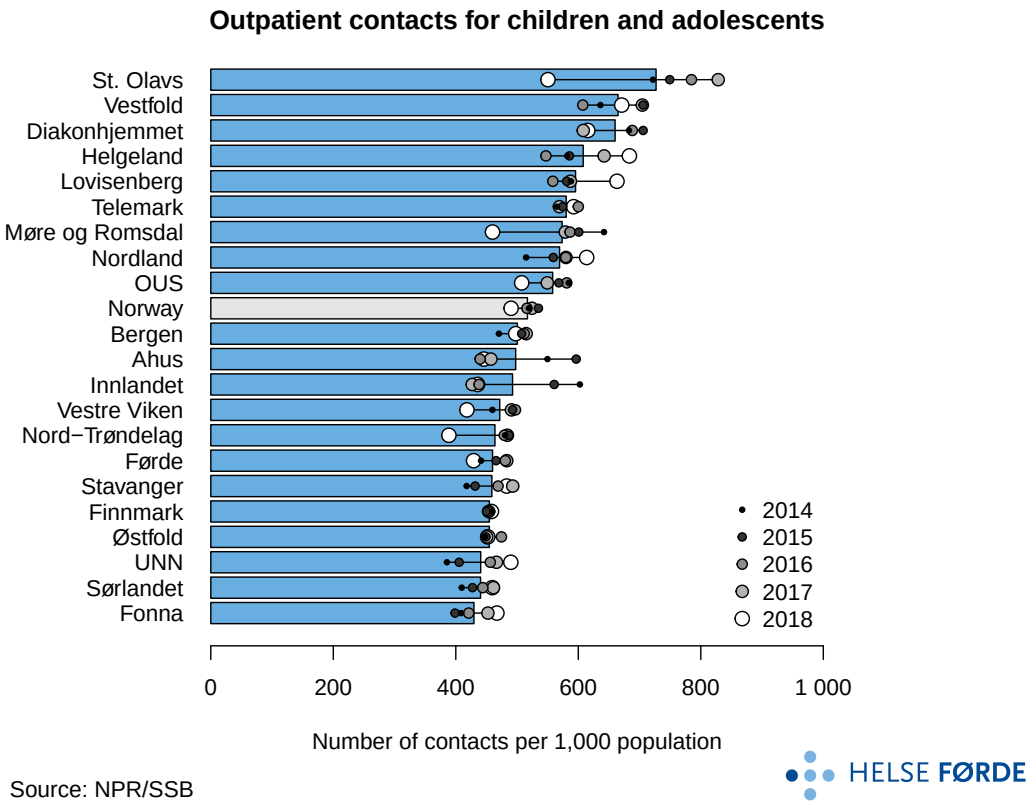

Figure 4.6: Contact rates for outpatient treatment of children and adolescents (0–17 years) in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

The average rate per year during the period 2014–2018 for Norway as a whole was 517 outpatient contacts per 1,000 population. The annual contact rate changed somewhat from year to year in several hospital referral areas, and there was a small decrease for Norway as a whole (Figure 4.6).[12]

[12]It is possible that the decrease observed in some hospital referral areas could be due to the introduction of a new patient

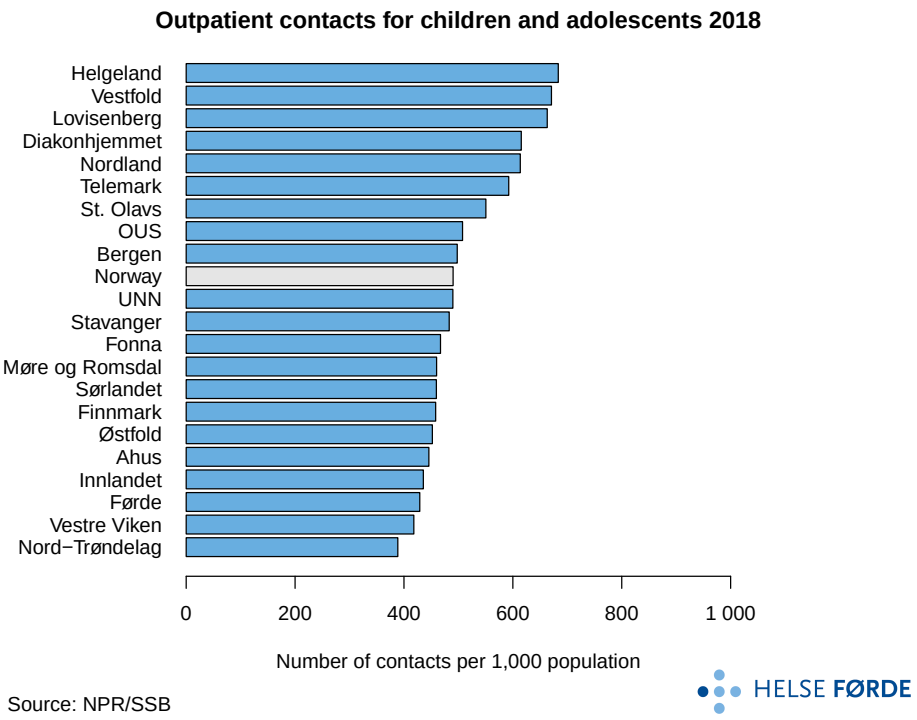

Figure 4.7: Contact rates for outpatient treatment of children and adolescents (0–17 years) in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the contact rates for 2018. The rates have been adjusted for age and gender.

If we consider the period 2014–2018 as a whole, the average outpatient contact rate for children and adolescents varied between hospital referral areas, from 726 in the St. Olavs area to 429 in the Fonna area per year. The variation between hospital referral areas in terms of outpatient contact rate was relatively low (Figure 4.6 and Table 4.16). The outpatient contact rate for 2018 shows registered outpatient contacts after activity-based funding had been introduced for outpatient services and all the health trusts had introduced a new patient record system. The highest contact rates for 2018 were found among children and adolescents from the hospital referral areas of Helgeland (683), Vestfold (671) and Lovisenberg (663), while children and adolescents from the Nord-Trøndelag area had 389 outpatient contacts per 1,000 population (Figure 4.7). The contact rate for Norway as a whole was 490 in 2018.

Most of children and adolescents' outpatient contacts were with the mental healthcare services. The percentage of outpatient contacts performed by public treatment providers varied from 87% to nearly 100%. Telemark hospital referral area stood out with specialists in private practice under public funding contracts providing approximately 13% of children and adolescents' outpatient contacts.

When we looked at the average outpatient contact rates per year for the period 2014–2018 by region, we found that children and adolescents in Central Norway had the highest rate (590), followed by South-Eastern Norway (510) and Northern Norway (510), while children and adolescents in Western Norway had the lowest outpatient contact rate (468) per year (unpublished data).

For the country as a whole, we found that girls (0–17 years) had a higher average outpatient contact rate per year than boys during the period 2014–2018. The average contact rates per year were 537 for girls

record system for the child and adolescent psychiatry service rather than an actual decrease in activity (Helsedirektoratet, 2018). We see this clearly for Central Norway Regional Health Authority in 2018, and for Ahus and Innlandet hospital referral areas in 2016.

and 498 for boys. The outpatient contact rates for 2018 was 517 for girls and 464 for boys. During the period 2014–2018, girls had an average of between 423 and 748 outpatient contacts per 1,000 population per year, depending on which hospital referral area they belonged to. The corresponding contact rates for boys varied between 402 and 707, depending on hospital referral area.

On average, children and adolescents had between 8.3 and 16 *outpatient contacts per patient* per year during the period 2014–2018. The number of contacts per patient was highest in St. Olavs hospital referral area and lowest in the Førde area. For Norway as a whole, the average number was 12 outpatient contacts per child or adolescent patient (Table 4.2).

Table 4.2: Outpatient treatment of children and adolescents in mental health care and interdisciplinary specialised addiction services. Number of contacts, number of patients and contacts per patient, broken down by hospital referral area and for Norway as a whole. The figures represent the average values per year for the period 2014–2018 and apply to children and adolescents aged 0–17 years.

Hospital referral area	Number of contacts	Number of patients	Contacts per patient
St. Olavs	48,121	3,113	15.5
Vestfold	32,916	2,342	14.1
Diakonhjemmet	14,949	1,074	13.9
OUS	29,198	2,124	13.7
Ahus	60,537	4,413	13.7
Møre og Romsdal	34,131	2,653	12.9
Vestre Viken	51,565	4,157	12.4
Lovisenberg	9,340	803	11.6
Nordland	16,895	1,491	11.3
Telemark	21,138	1,909	11.1
Innlandet	38,810	3,529	11.0
Bergen	48,306	4,457	10.8
Stavanger	39,040	3,613	10.8
Sørlandet	30,315	2,847	10.6
Østfold	28,836	2,722	10.6
Helgeland	10,375	989	10.5
Fonna	18,324	1,758	10.4
UNN	17,735	1,786	9.9
Nord-Trøndelag	14,191	1,573	9.0
Finnmark	7,581	859	8.8
Førde	11,690	1,401	8.3
Norway	583,992	49,094	11.9

Indirect contacts

During the period 2014–2018, an average of 274,000 indirect outpatient contacts per year were registered for children and adolescents by mental healthcare or addiction services in Norway. This represented 32% of all outpatient contacts. Indirect contacts accounted for 43% of all children and adolescents' outpatient contacts in Finnmark hospital referral area, but 24% in the areas of Nordland and Møre og Romsdal (Table A.1). The number of registered indirect contacts per 1,000 population changed in many hospital referral areas, and changed considerably in some areas, during the period 2014–2018.[13] The average rate

[13]From 2017, the funding system for outpatient activities in mental healthcare for children and adolescents changed with the introduction of activity-based funding. Coding rules and coding practices were changed at the same time. It is possible that the changes we see for indirect contact rates and registration of types of indirect contact could reflect these changes. Among other things, this reorganisation has meant that indirect contacts, for example telephone or video calls with patients that are

per year for Norway as a whole was 243. The highest indirect contact rate was found in the Vestfold area, with an average of 357, and the lowest was found in the Fonna area, which had 154 contacts per 1,000 population per year (Figure 4.8).

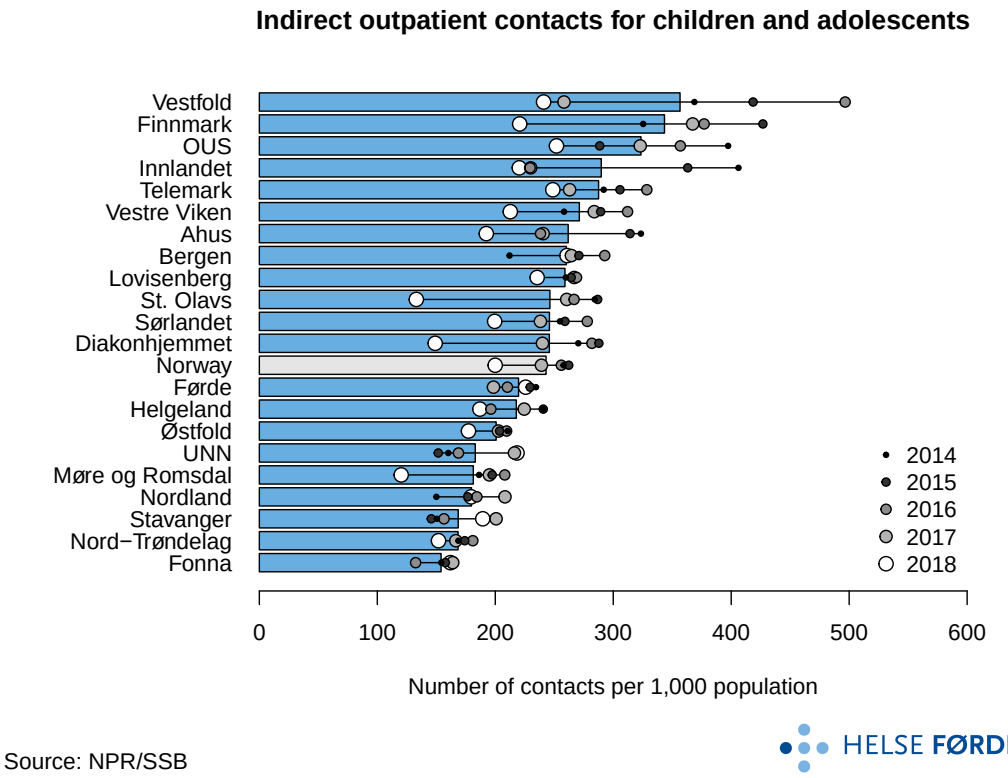

Figure 4.8: Contact rates for indirect contacts in outpatient treatment of children and adolescents (0–17 years) in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Indirect contact rates decreased in most of the hospital referral areas in 2018. Indirect contacts for 2018 only gave rates for the year ranging from 261 in Bergen hospital referral area to 120 in the Møre og Romsdal area (Figure 4.8). For the age group 0–17, we found that the number of telephone conversations *with* patients had increased from 29,000 in 2016 to 97,000 in 2018. Teleconferences with first-line services *about* patients increased (from 5,500 to 53,000), while the number of 'phone calls' registered dropped sharply from 108,000 in 2016 to 24,000 in 2018. There was a distinct increase in the number of collaborative meetings with first-line services and other services during the three-year period (from 2,500 to 23,000), while few indirect telemedicine and tele/videoconference contacts were registered (approximately 120 in 2018).

Age segments

By dividing the child and adolescent patients into three age groups, we found that the youngest group, children aged 0–5 years, had the lowest number of outpatient contacts per 1,000 population. The average outpatient contact rate for Norway as a whole was 92 a year, ranging from 212 for children in the Vestfold area to 37 in Finnmark (Figure 4.9). The outpatient contact rate varied considerably between hospital referral area, and there was greater variation for the youngest children than for the other two age groups (Table 4.16). Girls aged 0–5 years had an average outpatient contact rate of between 31 and 122 per year, while the boys' rates varied from 44 to 297 (Figures A.1 and A.2).

consultation-like in nature, can be considered ordinary consultations.

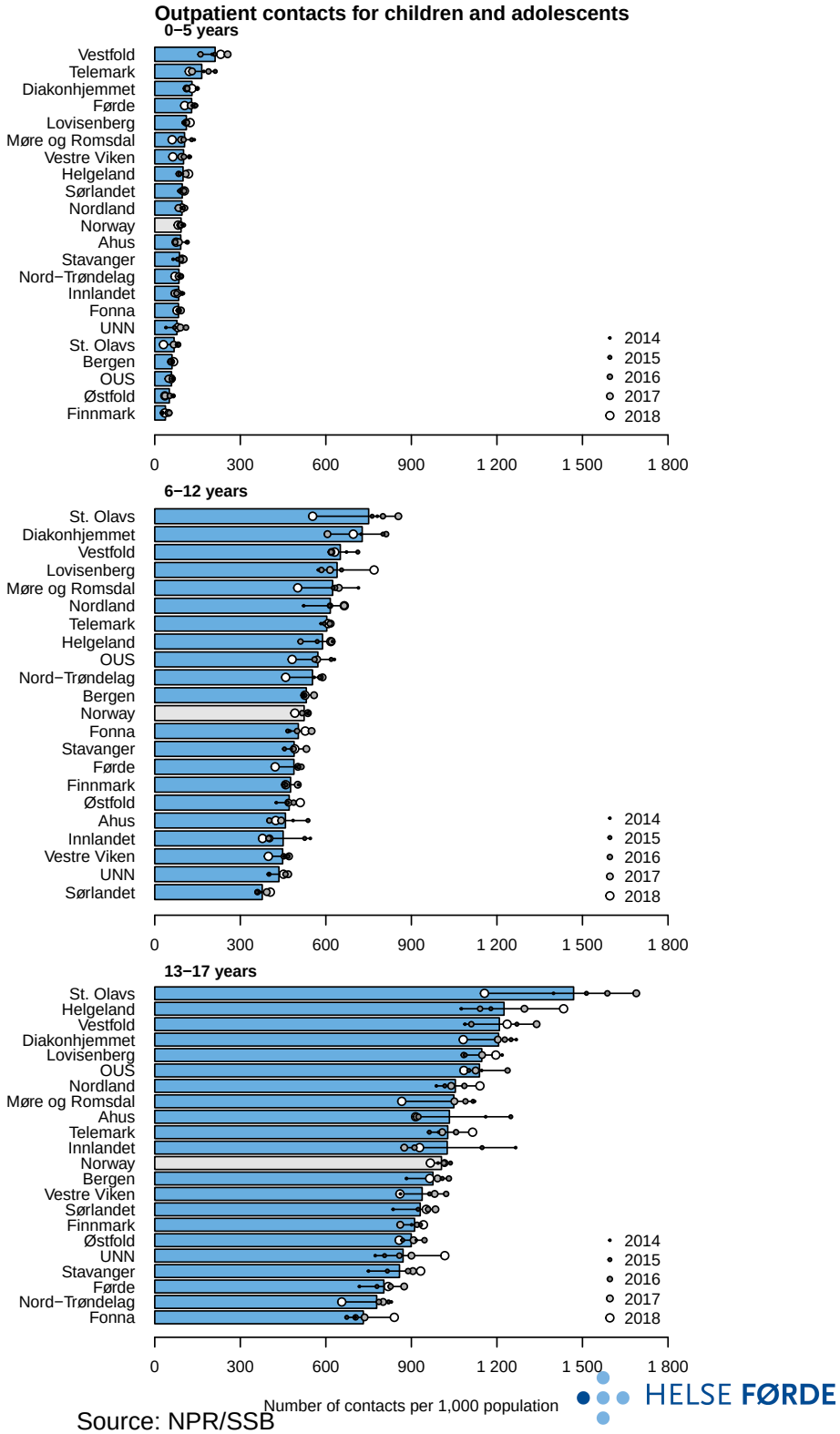

Figure 4.9: Contact rates, age group breakdown. Outpatient contact rates for treatment in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole, for the age groups 0–5 years, 6–12 years and 13–17 years. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

For Norway as a whole, the average outpatient contact rate for children in the age group 6–12 years was 524 per year. The contact rate was highest in St. Olavs hospital referral area at 750, and lowest in the Sørlandet area at 377 contacts per 1,000 population (Figure 4.9). There was moderate variation in the number of contacts (Table 4.16). Boys also had more outpatient contacts than girls in the age group 6–12 years. Contact rates varied between 502 and 995 for boys, and between 246 and 502 per year for girls (Figures A.1 and A.2).

For Norway as a whole, the average outpatient contact rate for children and adolescents in the age group 13–17 years was 1,006 per year. In other words, the number of outpatient contacts per 1,000 population was highest in this age group. St. Olavs hospital referral area had an average contact rate of 1,469, while the rate for the Fonna area was 731 per year (Figure 4.9). The variation between hospital referral areas' outpatient contact rates for teenagers (13–17 years) was relatively low (Table 4.16). The outpatient contact rate was higher for girls at an average of between 973 and 1,927 per year, while we found between 502 and 1,034 outpatient contacts per year per hospital referral area for boys (Figures A.1 and A.2).

4.1.2 Main findings - outpatient treatment for children and adolescents

- At 49,000 patients a year, children and adolescents made up the second biggest patient group in this healthcare atlas. The variation between hospital referral areas in outpatient treatment was low, both in terms of contact rates and patient rates. The hospital referral areas' contact rates varied from 429 to 762.
- The introduction of a new patient record system in some health trusts during this period and an increase in child and adolescent mental health services provided by the municipal health service could both be factors in the decrease in the outpatient contact rate for Norway as a whole in 2018.
- There were considerable differences in child and adolescent patients' number of outpatient contacts per year. The areas with the highest numbers had about twice as many contacts per patient as the areas with fewest contacts per patient.
- When we looked at the age group 13–17 years, where girls were in the majority, separately, we found that the group had the highest contact rate in this healthcare atlas (1,005), higher than corresponding rates for adult and elderly patients.
- The registered *types* of indirect contacts shifted towards more telephone conversations *with* patients and collaborative meetings *about* patients. These changes could be linked to the introduction of activity-based funding and a greater focus on coding of indirect contacts.

We found different patterns of use for outpatient clinics in different hospital referral areas. For example, children and adolescents from Førde hospital referral area had a relatively high contact rate for children in the age group 0–5 year. In the hospital referral areas of Vestfold and Diakonhjemmet, children and adolescents had relatively high contact rates in all age segments, while in the Helgeland and OUS areas, they had high contact rates in their teens.

4.1.3 Inpatient treatment

Patient rates The average number of children and adolescents receiving inpatient treatment varied between hospital referral areas, from 4.0 in Finnmark to 0.7 in Ahus per 1,000 population per year during the period 2014–2018. The patient rates were relatively high for all hospital referral areas in Northern Norway, and low in South-Eastern Norway. Wide confidence intervals mean that the rates were based on a small number of patients. The variation was high, and higher than we would expect based on chance (Figure 4.10 and Table 4.19).

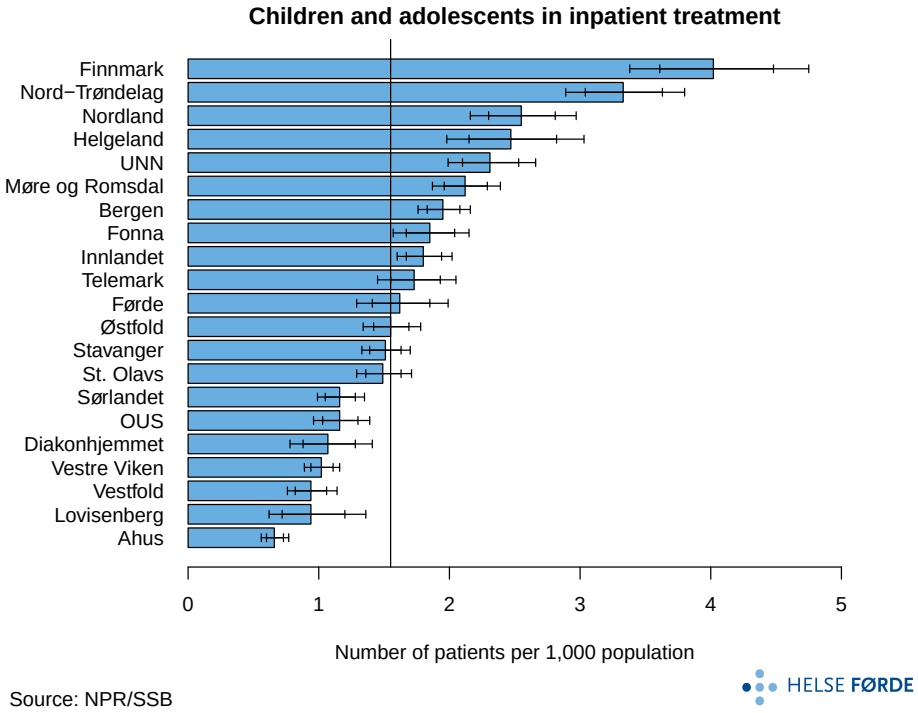

Figure 4.10: Patient rates for inpatient treatment in mental healthcare and interdisciplinary specialised addiction services: Number of child and adolescent patients (0–17 years) per 1,000 population, broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

Admission rates Children and adolescents in Norway had a total of just under 2,600 admissions in mental healthcare per year during the period 2014–2018 (Table 4.3). The admission rate remained stable throughout the period at an average of 2.3 admissions per 1,000 population per year.[14]

Children and adolescents from Northern Norway had the highest number of admissions per 1,000 population (Figure 4.11). The admission rate for Finnmark hospital referral area increased to 7.0 in 2018, while the average admission rate per year for the period 2014–2018 was 5.8. The lowest admission rates for children and adolescents were found in and around Oslo, with an average admission rate of 1.1 per year in Ahus hospital referral area. There was very high variation in admission rates between hospital referral areas.

[14] An average of 33 admissions per year with a duration exceeding 365 days were excluded from further analyses.

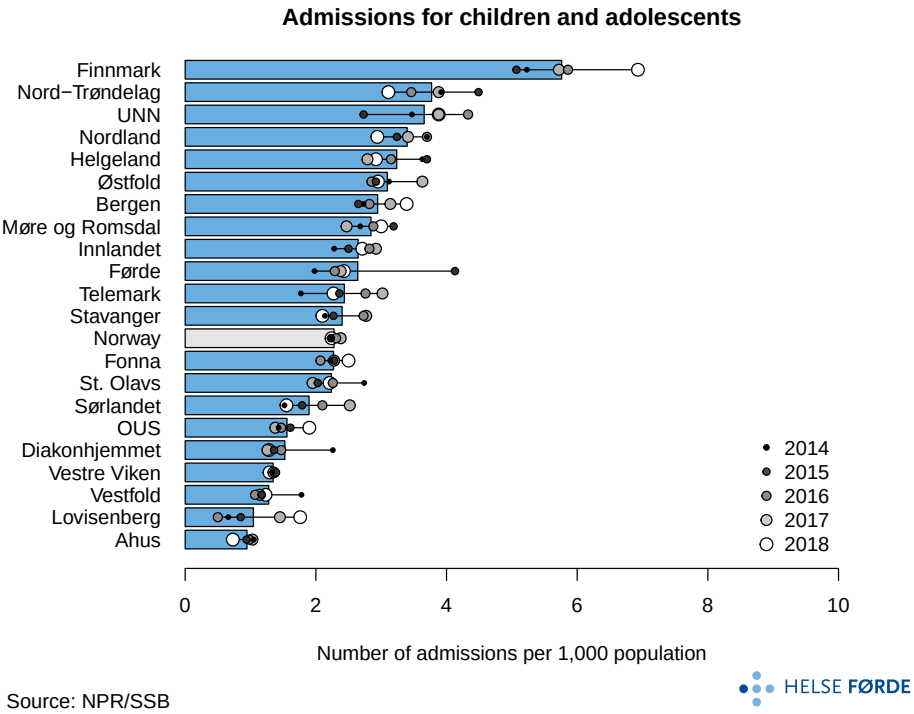

Figure 4.11: Admission rates for inpatient treatment of children and adolescents (0–17 years) in mental healthcare and interdisciplinary specialised addiction services: Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

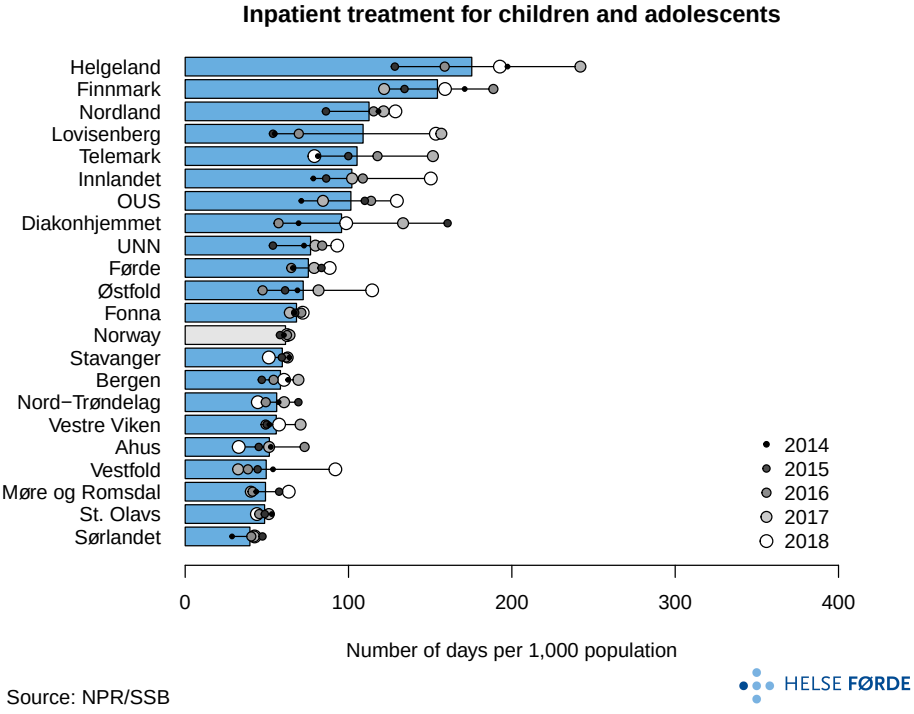

Figure 4.12: Day rates for children and adolescents (0–17 years) in mental healthcare and interdisciplinary specialised addiction services: Number of days per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Day rates Children and adolescents in Norway spent an average of 61 days in an institution per 1,000 population per year during the period 2014–2018 (Figure 4.12). The day rate was stable for Norway as a whole, but changed, sometimes considerably, between years for the different hospital referral areas. We found low day rates in the Central Norway health region. The day rates varied from 40 in Sørlandet hospital referral area to 175 for children and adolescents from the Helgeland area and 154 for the Finnmark area.

Duration of admissions (days per admission) was longest in the areas in Oslo, which all exceeded 45 days per admission per year during the period 2014–2018. The average duration of admissions varied from 67 days in Lovisenberg hospital referral area to 14 days per admission in Nord-Trøndelag (Table 4.3).

Table 4.3: Inpatient treatment of children and adolescents in mental healthcare and interdisciplinary specialised addiction services. Number of patients, days, admissions and days per admission, broken down by hospital referral area and for Norway as a whole. The figures represent the average values per year for the period 2014–2018 and apply to children and adolescents aged 0–17 years.

Hospital referral area	Number of patients	Number of days	Number of admissions	Days per admission
Lovisenberg	13	1,000	15	67.0
OUS	59	4,871	79	62.0
Ahus	80	5,589	114	48.9
Diakonhjemmet	23	1,530	33	46.9
Vestre Viken	111	6,043	146	41.3
Helgeland	43	2,165	57	38.0
Telemark	65	3,355	91	36.9
Innlandet	145	7,652	214	35.8
Vestfold	47	2,053	64	32.1
Nordland	78	2,974	104	28.7
Finnmark	68	2,498	97	25.7
Fonna	79	2,415	98	24.7
Stavanger	127	4,379	201	21.8
St. Olavs	98	3,102	148	21.0
Østfold	99	4,153	198	21.0
UNN	94	2,988	148	20.1
Sørlandet	80	2,403	131	18.3
Møre og Romsdal	128	2,913	172	17.0
Førde	43	1,175	70	16.9
Bergen	189	4,511	284	15.9
Nord-Trøndelag	103	1,675	117	14.3
Norway	1,770	69,444	2,581	26.9

4.1.4 Main findings - inpatient treatment for children and adolescents

- There was very high variation in admission rates and patient rates for children and adolescents, and the admission rate varied between 1 and 6 on average per year. However, the number of child and adolescent patients admitted for inpatient treatment was low; an average of 1,770 patients per year. Children and adolescents in Finnmark had both the highest patient rate and the highest admission rate.
- There were marked differences in the duration of admissions, with an average of 14 days per admission in Nord-Trøndelag hospital referral area compared with 67 days per admission in the South-Eastern Norway health region, which had the lowest admission rate.
- Patient rates also varied exceptionally much between hospital referral areas, with the highest rates found in the Northern Norway health region and in Nord-Trøndelag hospital referral area.

4.1.5 Overall assessment for children and adolescents

In terms of resources, four outpatient contacts can be said to correspond to one day in an institution. By seeing outpatient and inpatient services in conjunction with each other in this way, we found that children and adolescents from Helgeland hospital referral area had the highest use of services, but that levels of use were also high among children and adolescents from the hospital referral areas of Finnmark, Diakonhjemmet, Lovisenberg and Nordland. In other words, we detected a somewhat higher use of these services in parts of the Northern Norway health region and in Oslo. We do not currently possess sufficient knowledge to draw any definite conclusion about whether the variation in the use of these services was unwarranted.

4.2 Adults in mental healthcare and interdisciplinary specialised addiction treatment

During the period 2014–2018, more than 195,000 adults (18–64 years) per year were in contact with mental healthcare services, mental healthcare specialists in private practice under public funding contracts and/or interdisciplinary specialised addiction services in Norway. These patients made up 6% of Norway's adult population, varying from 9% at 18 years of age to 3% at 64 years. Approximately 57% of the patients were women (Figures 4.1 and 4.2).

The number of adult patients per year increased during the period. Patients in the age segment 18–30 years accounted for most of this increase, with about 10,000 more patients over the five-year period (from 62,815 to 72,824). The patient volume was more stable in the age segments 31–50 and 51–64 years, with about 90,000 and 37,000 patients, respectively, per year (Figure 4.4).

On average, more than 181,000 adult patients per year had one or more outpatient contacts (Table 4.4), and 27,700 were admitted for one or more admissions in the above-mentioned specialist health services during the period 2014–2018 (Table 4.7). In other words, the majority of patients used outpatient services only, some received both outpatient and inpatient treatment, and a small number of patients received only inpatient treatment.

4.2.1 Outpatient treatment

The number of adult outpatients per 1,000 population remained stable in most hospital referral areas during the period. Five of the hospital referral areas with the highest average patient rates per year were in the South-Eastern Norway health region. With 83 patients per 1,000 population, Lovisenberg hospital referral area had the highest patient rate by far. The lowest outpatient rates (48)

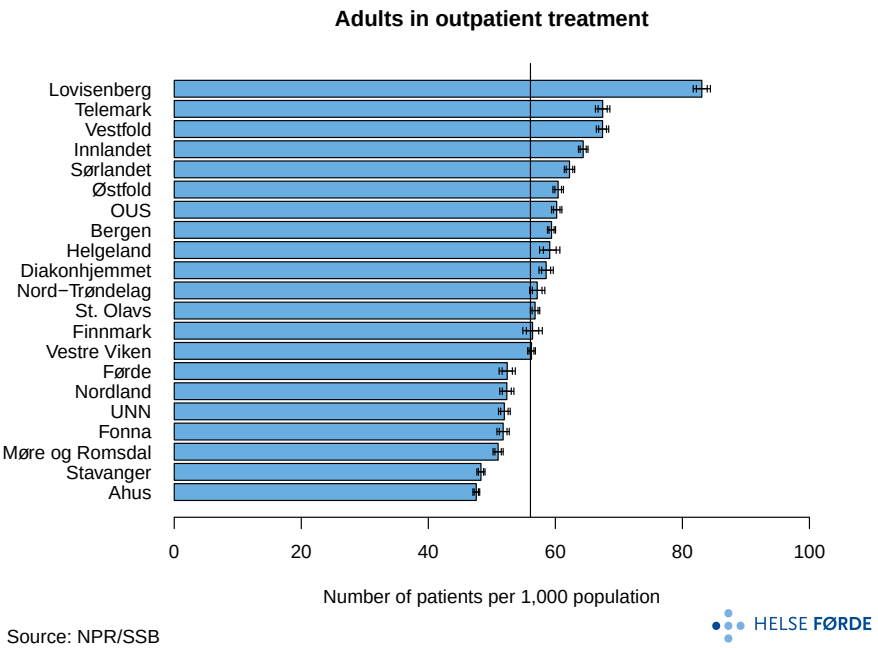

Figure 4.13: Patient rates for outpatient treatment in mental healthcare and interdisciplinary specialised addiction services: Number of adult patients (18–64 years) per 1,000 population, broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

were found in the hospital referral areas of Stavanger and Ahus. The variation in patient rates between hospital referral was low, but exceeds what can be explained by chance (Figure 4.13).

Outpatient contacts

Adults had nearly 2,250,000 outpatient contacts per year during the period 2014–2018 with mental healthcare services, mental healthcare specialists in private practice under public funding contracts and/or interdisciplinary specialised addiction services in Norway (Table 4.4). The outpatient contact rate for adults remained relatively stable for Norway as a whole during the period 2014–2018, with an average of 696 contacts per 1,000 population per year. We nevertheless found an increase in the contact rates for adults from Vestfold, Bergen and Fonna hospital referral areas (Figure 4.14).

Together with adults from Norway's two largest cities, adults from Vestfold and Sørlandet hospital referral areas had the most outpatient contacts per 1,000 population per year during the period 2014–2018. Adult inhabitants of the Lovisenberg area had more outpatient contacts than people in the rest of the country by far, with an average of 1,229 contacts per 1,000 population per year. The lowest average contact rate per year was found among inhabitants of Finnmark (473) and Førde (461) hospital referral areas (Figure 4.14). We deemed the variation in outpatient contact rates for adults to be moderate (Table 4.16).

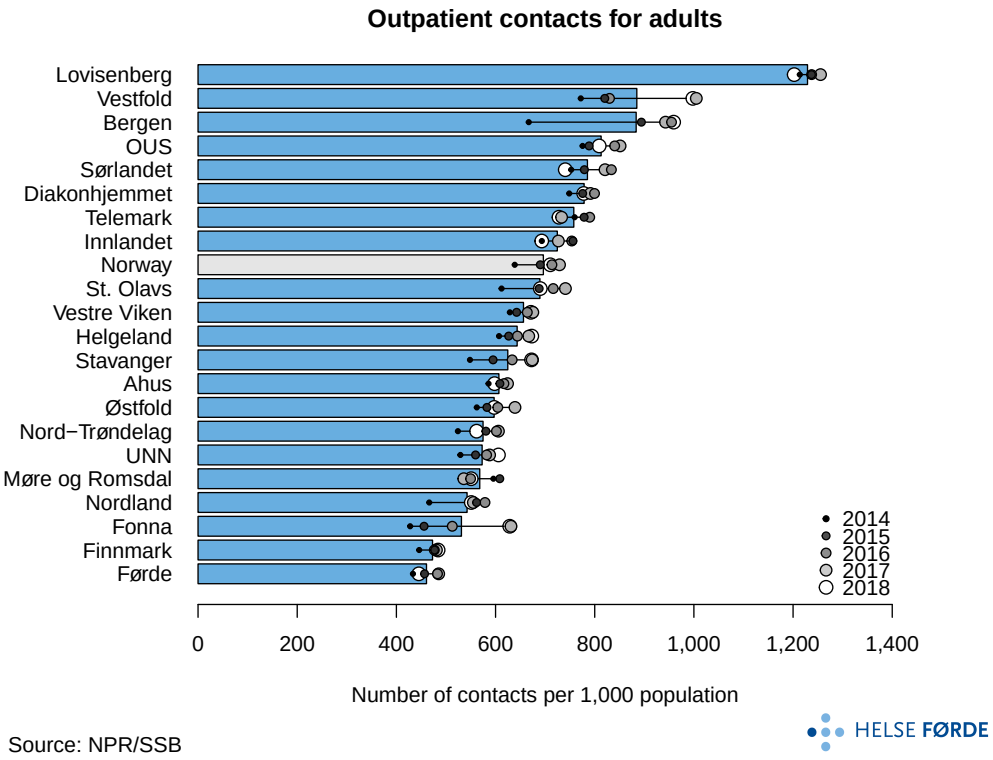

Figure 4.14: Contact rates for outpatient treatment of adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Contacts per patient We found the highest number of outpatient contacts per patient in the hospital referral areas of Bergen and Lovisenberg, which had just over 14 contacts per year. The hospital referral areas with the lowest number of contacts per patient were Førde (8.7) and Finnmark (8.3) (Table 4.4). If we look at Norway as a whole, patients had about the same number of outpatient contacts regardless of

Table 4.4: Outpatient treatment of adults in mental healthcare and interdisciplinary specialised addiction services. Number of contacts, number of patients and contacts per patient, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to adults aged 18–64 years.

Hospital referral area	Number of contacts	Number of patients	Contacts per patient
Bergen	248,245	16,687	14.9
Lovisenberg	136,742	9,413	14.5
OUS	144,273	10,596	13.6
Diakonhjemmet	71,913	5,411	13.3
Vestfold	120,134	9,166	13.1
Stavanger	143,518	11,052	13.0
Ahus	195,589	15,285	12.8
Sørlandet	141,155	11,221	12.6
St. Olavs	139,824	11,514	12.1
Vestre Viken	190,112	16,236	11.7
Innlandet	157,191	14,064	11.2
Telemark	76,198	6,840	11.1
Møre og Romsdal	88,230	7,943	11.1
UNN	66,688	6,074	11.0
Helgeland	28,792	2,670	10.8
Nordland	44,055	4,282	10.3
Fonna	56,794	5,537	10.3
Nord-Trøndelag	44,209	4,418	10.0
Østfold	102,330	10,369	9.9
Førde	28,856	3,310	8.7
Finnmark	21,857	2,619	8.3
Norway	2,246,703	180,897	12.4

whether they were being treated by a specialist in private practice under a public funding contract or by a public service provider (Table A.2). The exceptions from this rule include patients in Bergen and Sørlandet hospital referral areas, where we found that patients of public service providers had more contacts. Patients from other hospital referral areas (Oslo and the surrounding area, and three areas in the Northern Norway health region) had more outpatient contacts if they were treated by specialists in private practice under public funding contracts.

The *intensity* of outpatient treatment was measured as the average number of outpatient contacts over a 30-day period. An average outpatient treatment intensity of between 3.5 and 4.5 was the norm for many hospital referral areas during the period 2014–2018. The intensity for adults from Sørlandet hospital referral area was 4.9, while the areas with the lowest intensity were Førde (3.1) and Finnmark (2.8) (Figure 4.15).

Indirect contacts

During the period 2014–2018, an average of more than 584,000 indirect outpatient contacts per year with mental healthcare or addiction services were registered for adult patients. This represented 21% of all outpatient contacts. Indirect contacts accounted for approximately 27% of all outpatient contacts for adults per year in Fonna and Stavanger hospital referral areas, and 15% in the Bergen area (Table A.3).

The number of indirect contacts per 1,000 population remained stable for Norway as a whole during the

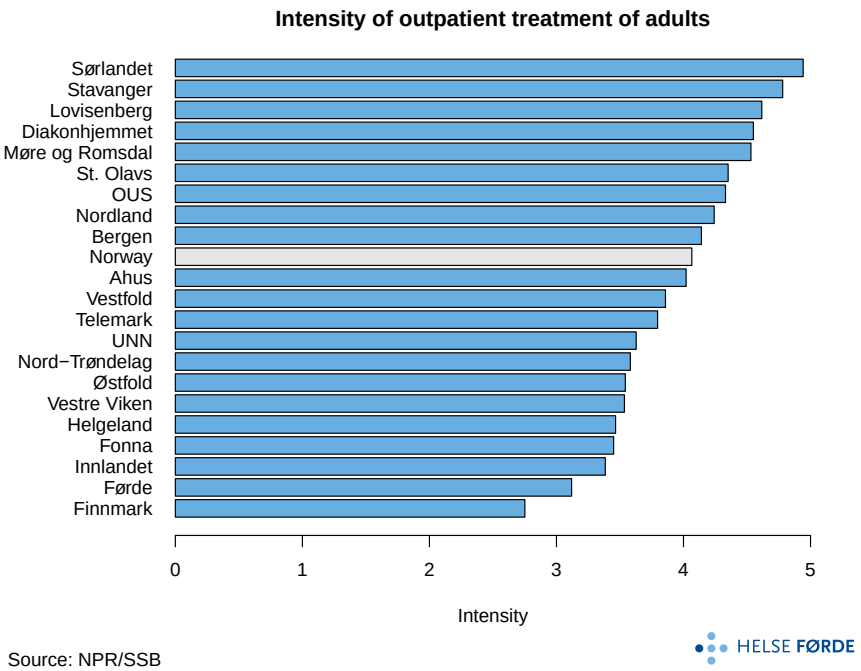

Figure 4.15: Intensity of outpatient treatment of adults (18-64 years) in mental healthcare and interdisciplinary specialised addiction services. The bars show average values for the period 2014–2018.

period 2014–2018, with an average rate of 181 per year. The highest indirect contact rate was found in the Lovisenberg area, which had an average of 297, and the lowest was found in the Førde area, which had 121 contacts per 1,000 population per year. We found particularly pronounced changes in the rates per year for indirect contacts in Vestfold and Finnmark hospital referral areas during the period (Figure A.3).

As regards the *type* of indirect contact, we found an increased number of telephone conversations *with* patients (from 146,000 in 2016 to 263,000 in 2018), as well as of teleconferences with first-line services *about* patients (from 21,500 to nearly 106,000).[15] The number of registered 'phone calls' not otherwise specified decreased from 250,000 to 79,000 during the same period. The scope of tele/videoconferencing and telemedicine was low during the period, but increased from about 400 in 2016 to 900 in 2018. Indirect contacts with patients are expected to become more common in future, and could replace face-to-face consultations with patients. Another type of indirect contacts for which we found a strong increase was collaborative meetings with first-line services and other services, which quadrupled to 33,000 contacts in 2018.

Age segments

For adults aged 18–30 years, we found that the average outpatient contact rate for Norway as a whole was 871 per year, and that it increased from 2014 to 2018. There was a marked increase in the outpatient contact rates from 2014 to 2015 for patients in many hospital referral areas. The highest average contact rate per year for adults was found in Vestfold hospital referral area (1,163), while the area with the lowest rate was Førde (589) (Figure 4.16).

For the age groups 31–50 and 51–64 years, we found that adults from hospital referral areas in Oslo and

[15] From 2017, telephone conversations that are consultation-like in nature and replace an ordinary consultation can be included in the calculation basis for activity-based funding.

Bergen, along with other hospital referral areas that included urban municipalities (Vestfold, Sørlandet) tended to have a higher outpatient contact rate than adults from less densely populated areas. The hospital referral area Lovisenberg had the highest outpatient contact rate for both age groups (31–50 years: 1,432 and 51–64 years: 1,201). The increase in the outpatient contact rate for the Lovisenberg area could be due to the area's well-developed services under the Faster Return to Work scheme (see Chapter 5.2 for more information about this scheme). The lowest outpatient contact rates for adults were found in Finnmark hospital referral area (31–50 years: 465 and 51–64 years: 199) (Figure 4.16). We observed a marked decrease in the outpatient contact rate for patients aged 50 years and older in most hospital referral areas.

By splitting the adult group (18–64 years) into several age segments, we found fewer outpatient contacts per 1,000 population among the oldest age segment (51–64 years), and we also found that variation within age segments increased with age (Table 4.16); from little variation among young adults to high variation in the age group 51–64 years.

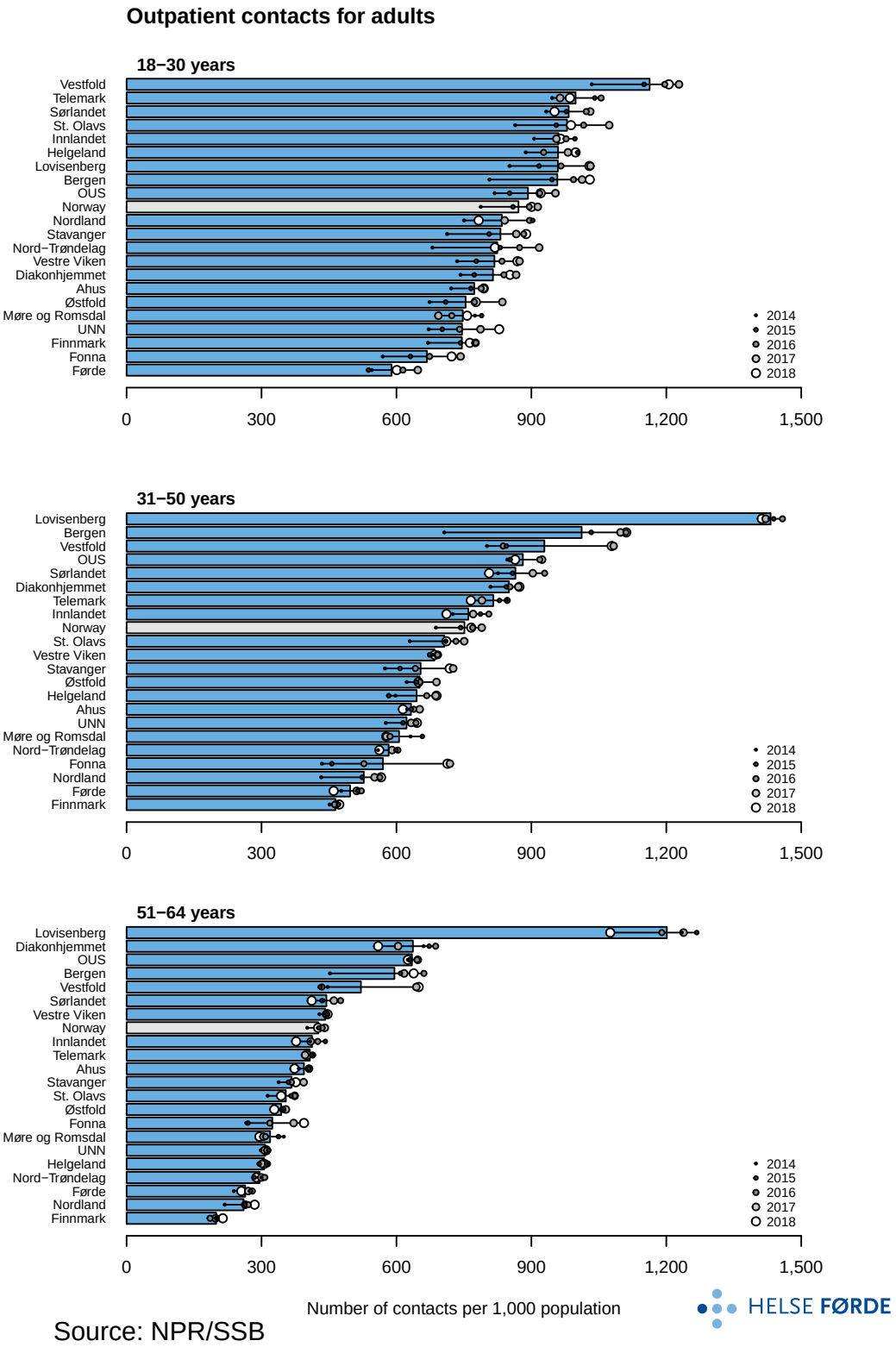

Figure 4.16: Contact rates, age group breakdown. Outpatient contact rates for treatment in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole, for the age groups 18–30 years, 31–50 years and 51–64 years. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Sectors

Adult patients had the most contacts in per cent with the mental healthcare sector (MHC-A and MHC-CA together), ranging from 88% of contacts in the hospital referral areas of Finnmark and Helgeland to under 50% in the Bergen and Diakonhjemmet areas. The highest use of specialists in private practice under public funding contracts (Avt) in per cent was found in the hospital referral areas Diakonhjemmet (43%), OUS (37%) and Lovisenberg (34%) in Oslo. The northern parts of Norway had the lowest use in per cent, with 8% of contacts in both Finnmark and Helgeland hospital referral areas being with specialists in private practice under public funding contracts (Figure 4.17).

More than 20% of the outpatient contacts of adult inhabitants of the hospital referral areas Bergen, Vestfold and Fonna were registered under the sector interdisciplinary specialised addiction treatment (TSB). The lowest percentage of outpatient contacts registered under TSB (less than 5%) was found in hospital referral areas in Northern Norway (Finnmark, Nordland, Helgeland) and Western Norway (Førde) (Figure 4.17).

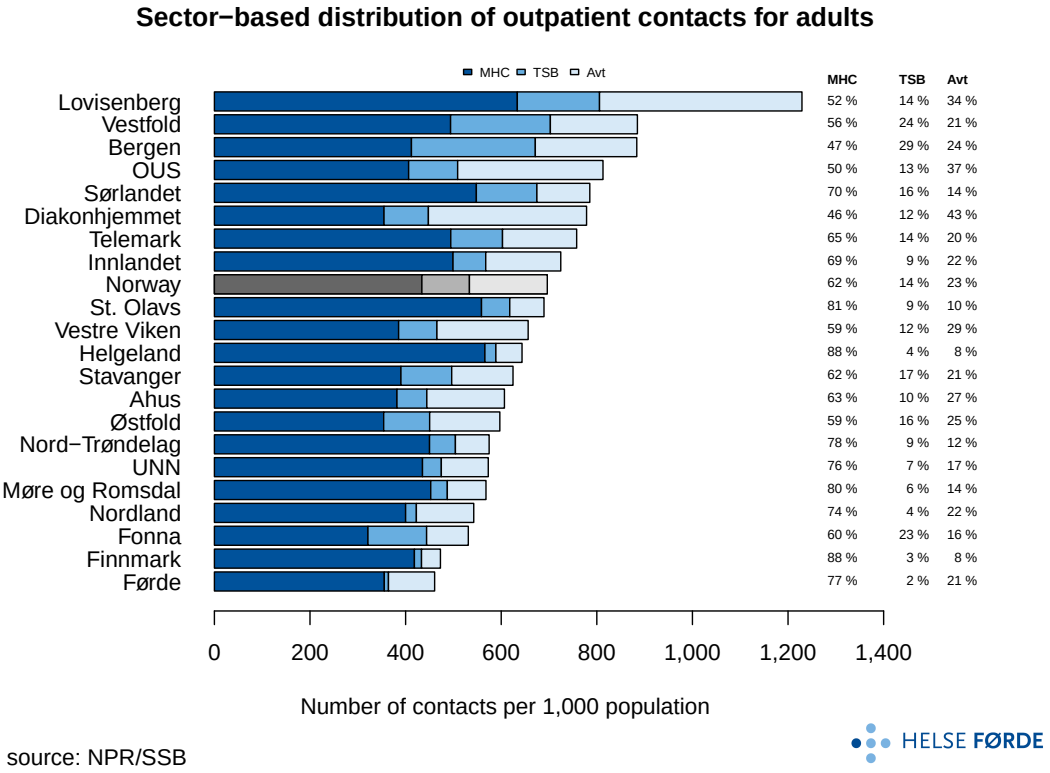

Figure 4.17: Contact rates, broken down by sector. Outpatient contact rate for adults (18–64 years), broken down by hospital referral area and for Norway as a whole, percentage distribution broken down by the sectors mental healthcare (MHC), interdisciplinary specialised addiction treatment (TSB) and mental healthcare specialists in private practice under public funding contracts (Avt). The bars show average values per year for the period 2014–2018. The rates have been adjusted for age and gender.

Substance use disorder

In Norway as a whole, about 25,000 adults with substance use disorder had at least one outpatient contact with mental healthcare services (MHC-A and MHC-CA), interdisciplinary specialised addiction services or mental healthcare specialists in private practice under public funding contracts per year during the period 2014–2018 (Table 4.5). See Appendix B for the definition of substance use disorder.

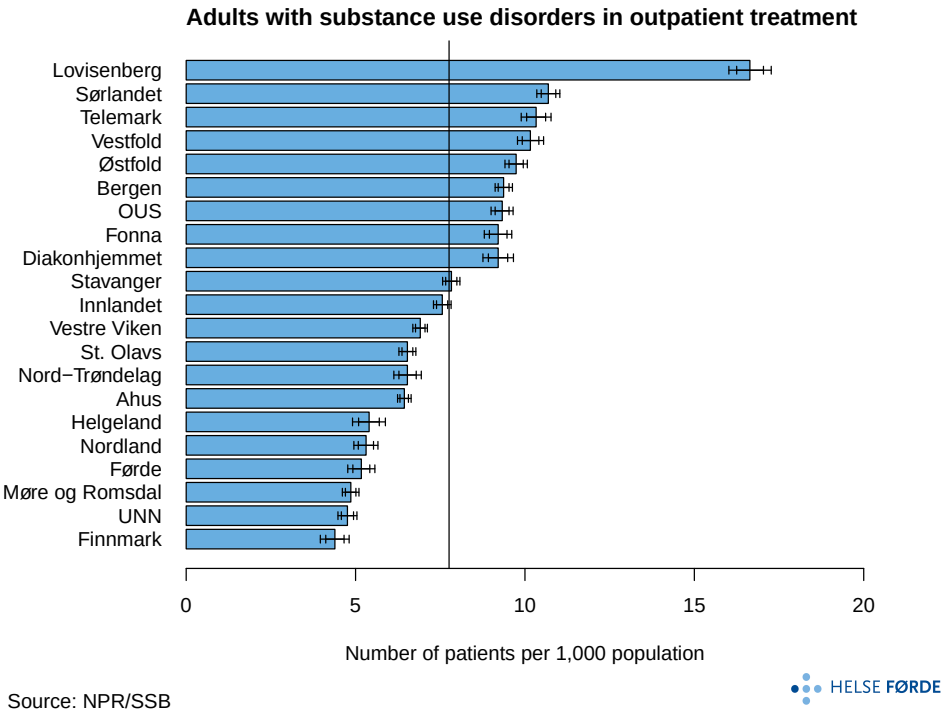

Figure 4.18: Patient rates, adults with substance use disorder receiving outpatient treatment. Number of adults (18–64 years) with substance use disorder per 1,000 population, broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

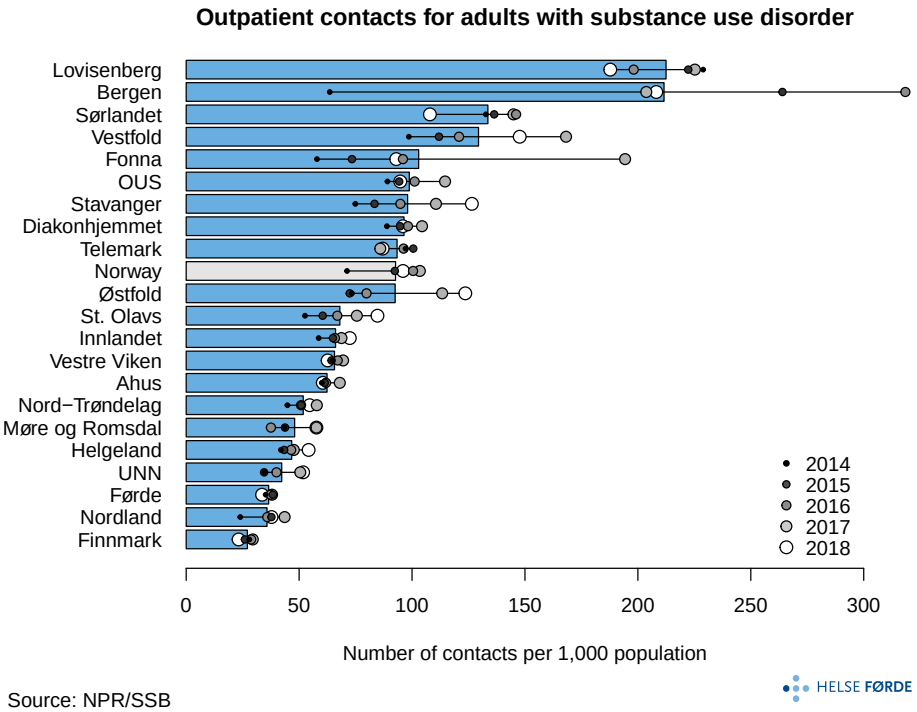

Figure 4.19: Contact rates, adults with substance use disorder receiving outpatient treatment. Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Several hospital referral areas had a *patient rate* of between 5 and 11 per year for adults with substance use disorder. Lovisenberg hospital referral area had by far the highest number of outpatients with substance use disorder per 1,000 population with a patient rate of 17. The area with the lowest patient rate was Finnmark (4.4). The variation in patient rates was high, and exceeded what can be explained by chance (Figure 4.18 and Table 4.17).

Contact rates For adults with substance use disorder in Norway as a whole, we found an average of nearly 300,000 outpatient contacts per year (Table 4.5), or 93 contacts per 1,000 population.[16] The average contact rates per year were markedly higher for adults in the hospital referral areas of Lovisenberg and Bergen (212). The contact rate per year changed considerably in several hospital referral areas over the period in question. The hospital referral areas with the lowest average contact rates were Førde and the areas in the Northern Norway health region. The contact rate for adults in the Finnmark area was 27. There was very high variation between hospital referral areas in outpatient contact rates for adults with substance use disorder (Figure 4.19 and Table 4.16).

Table 4.5: Outpatient treatment of patients with substance use disorder. Includes contacts with mental health-care and interdisciplinary specialised addiction services. Number of contacts, number of patients and contacts per patient, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to adults aged 18–64 years.

Hospital referral area	Number of contacts	Number of patients	Contacts per patient
Bergen	59,542	2,644	22.5
Vestfold	17,569	1,372	12.8
Lovisenberg	21,644	1,704	12.7
Stavanger	22,782	1,803	12.6
Sørlandet	23,799	1,914	12.4
Fonna	11,059	988	11.2
OUS	16,950	1,590	10.7
Diakonhjemmet	8,769	832	10.5
St. Olavs	13,720	1,312	10.5
Møre og Romsdal	7,516	762	9.9
Ahus	20,102	2,068	9.7
Østfold	15,843	1,666	9.5
Vestre Viken	18,833	1,984	9.5
Telemark	9,364	1,046	9.0
UNN	4,923	554	8.9
Innlandet	14,418	1,661	8.7
Helgeland	2,066	242	8.5
Nord-Trøndelag	4,022	509	7.9
Førde	2,302	328	7.0
Nordland	2,869	432	6.6
Finnmark	1,258	204	6.2
Norway	299,349	25,027	12.0

The average number of *contacts per patient* with substance use disorder was 23 per year in Bergen hospital referral area, while adults with substance use disorder from the Finnmark area had the fewest contacts at 6.2 contacts on average (Table 4.5).

[16] The dispensing of drugs for medication-assisted (MAR) treatment without further outpatient contact is not included in these figures.

In Norway, 77% of contacts for adult patients with substance use disorder as a primary or secondary diagnosis during the period 2014–2018 took place in the sector interdisciplinary specialised addiction treatment (TSB). Eleven per cent of contacts were with mental healthcare services.[17]

Patients with substance use disorder from the hospital referral areas of Bergen and Østfold had most of their outpatient contacts with TSB (91% and 88%, respectively). In Førde hospital referral area, only 18% of the contacts of patients with substance use disorder were with TSB, while 80% were with mental healthcare services. This group of patients had relatively few outpatient contacts with specialists in private practice under public funding contracts. However, we found that patients from Nordland hospital referral areas had 6% of their contacts with such specialists (unpublished data).

Severe mental disorders

In Norway as a whole, just under 20,000 adults with severe mental disorders had at least one outpatient contact with mental healthcare services (MHC-A and MHC-CA), interdisciplinary specialised addiction services or mental healthcare specialists in private practice under public funding contracts per year during the period 2014–2018 (Table 4.6). See Appendix B for the definition of severe mental disorders.

Patient rates With an average of 11 adults with severe mental disorders per 1,000 population per year, Lovisenberg hospital referral area had by far the highest outpatient rate for adults. The lowest outpatient rate was found in the Østfold area (4.4) (Figure 4.20). The variation in patient rates was low, but higher than can be explained by random variation (Table 4.17).

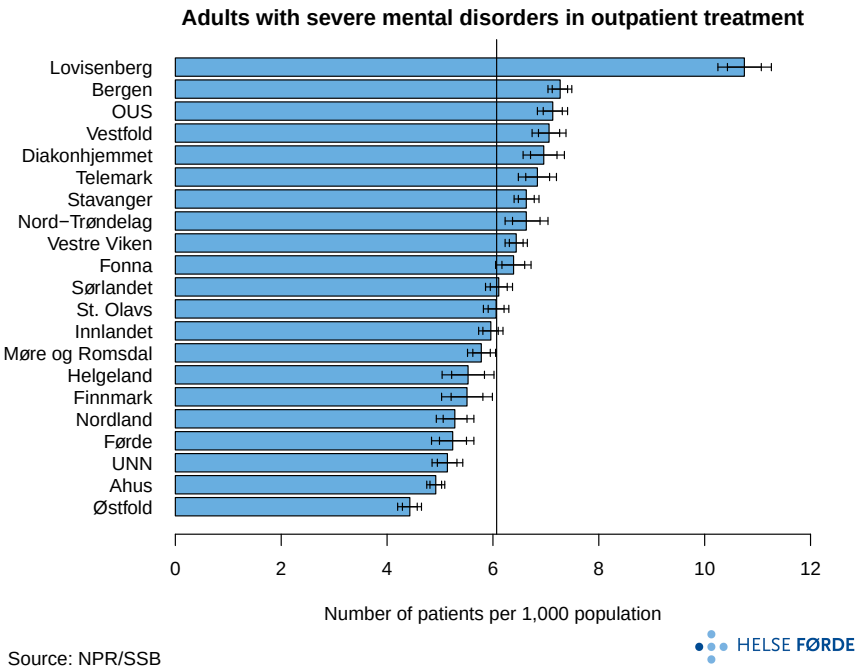

Figure 4.20: Patient rates, adults with severe mental disorders receiving outpatient treatment. Number of adults (18–64 years) with severe mental disorders per 1,000 population broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

Contact rates Adults with severe mental disorders had a total of about 308,000 outpatient contacts per year for Norway as a whole. The number of outpatient contacts per 1,000 population remained stable

[17] Adults with substance use disorder as a primary diagnosis had 88% of their contacts with TSB, and 21% with mental healthcare services.

Table 4.6: Outpatient treatment of adults with severe mental disorders. Number of contacts, number of patients and contacts per patient, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year (2014–2018) and concern contacts with mental healthcare and interdisciplinary specialised addiction services for adults (18–64 years).

Hospital referral area	Number of contacts	Number of patients	Contacts per patient
Lovisenberg	25,402	1,099	23.1
Sørlandet	22,982	1,097	20.9
St. Olavs	21,546	1,213	17.8
Stavanger	26,369	1,514	17.4
Diakonhjemmet	10,733	634	16.9
OUS	20,739	1,241	16.7
Møre og Romsdal	14,424	908	15.9
Bergen	30,580	2,014	15.2
Telemark	10,508	699	15.0
UNN	8,696	596	14.6
Ahus	23,086	1,589	14.5
Vestfold	13,919	965	14.4
Østfold	10,258	766	13.4
Vestre Viken	24,891	1,874	13.3
Fonna	8,774	684	12.8
Nord-Trøndelag	6,248	511	12.2
Innlandet	15,905	1,313	12.1
Nordland	4,976	428	11.6
Helgeland	2,677	249	10.8
Førde	3,461	329	10.5
Finnmark	1,971	255	7.7
Norway	308,145	19,586	15.7

during the period 2014–2018, with an average rate per year of 95 (Figure 4.21 and Table 4.6).

Lovisenberg hospital referral area had the highest outpatient contact rate for adults with severe mental disorders with an average of 262 contacts per 1,000 population per year. Four hospital referral areas (Helgeland, Østfold, Førde and Finnmark) had contact rates of 60 or below. Patients with severe mental disorders had particularly few outpatient contacts per 1,000 population in Finnmark hospital referral area (43) (Figure 4.21 and Table 4.16). There was high variation between hospital referral areas. However, if we exclude the Lovisenberg area, the variation was more moderate.

The average number of *contacts per patient* with severe mental disorders per year during the period 2014–2018 varied from 23 in Lovisenberg hospital referral area to 7.7 in the Finnmark area (Table 4.6). This difference in contacts per patient can explain some of the variation in contact rates.

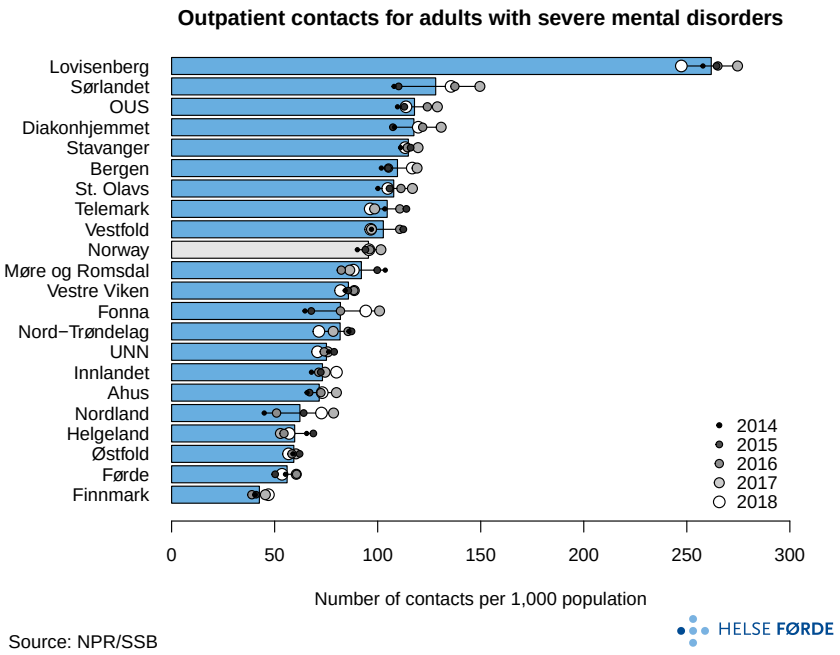

Figure 4.21: Contact rates, adults with severe mental disorders receiving outpatient treatment. Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

DPC referral area and RHA area [18]

Based on the contact rates per DPC referral area, we found a tendency for these services to be used more in urban areas, and the DPC referral areas of Lovisenberg in Oslo and Kronstad in Bergen stand out with the highest rates by far. In South-Eastern Norway RHA's area, the use of these services was highest in city districts in Oslo and in Kristiansand, but the DPC referral areas of Nordre Vestfold, Søndre Vestfold and Kongsvinger also had high contact rates. The highest use of outpatient services in Western Norway RHA's area was among inhabitants of Bergen, and in Central Norway RHA's area, the highest level was found in Trondheim. Northern Norway RHA's area did not show the same clear tendency for higher use in urban areas. We found the lowest outpatient contact rates for adults in some DPC referral areas under Western Norway and Norther Norway RHAs, with Vesterålen DPC referral area having the lowest rate (Figures 4.22 and 4.23). We have deemed the variation in outpatient contact rate between the DPC referral areas to be moderate (Table 4.16).

If we look at the outpatient contact rates for adults per region, we found the highest average rate per year in the South-Eastern Norway RHA area, with 721 outpatient contacts per 1,000 population during the period 2014–2018. Adult inhabitants of the Western Norway RHA's area had an outpatient contact rate of 651 per year, while the contact rates were 573 for adults living in Central Norway RHA's area and 550 for adults in Northern Norway RHA's area on average per year (Figure 4.22). The average outpatient contact rate for adults from South-Eastern Norway RHA's area was higher than in the other regions. The Western Norway health region had somewhat higher internal variation than the other regions.

[18] Patients are assigned to the DPCs' 'catchment areas' (DPC referral areas) on the basis of which municipality or city district they are resident in, regardless of where they received treatment.

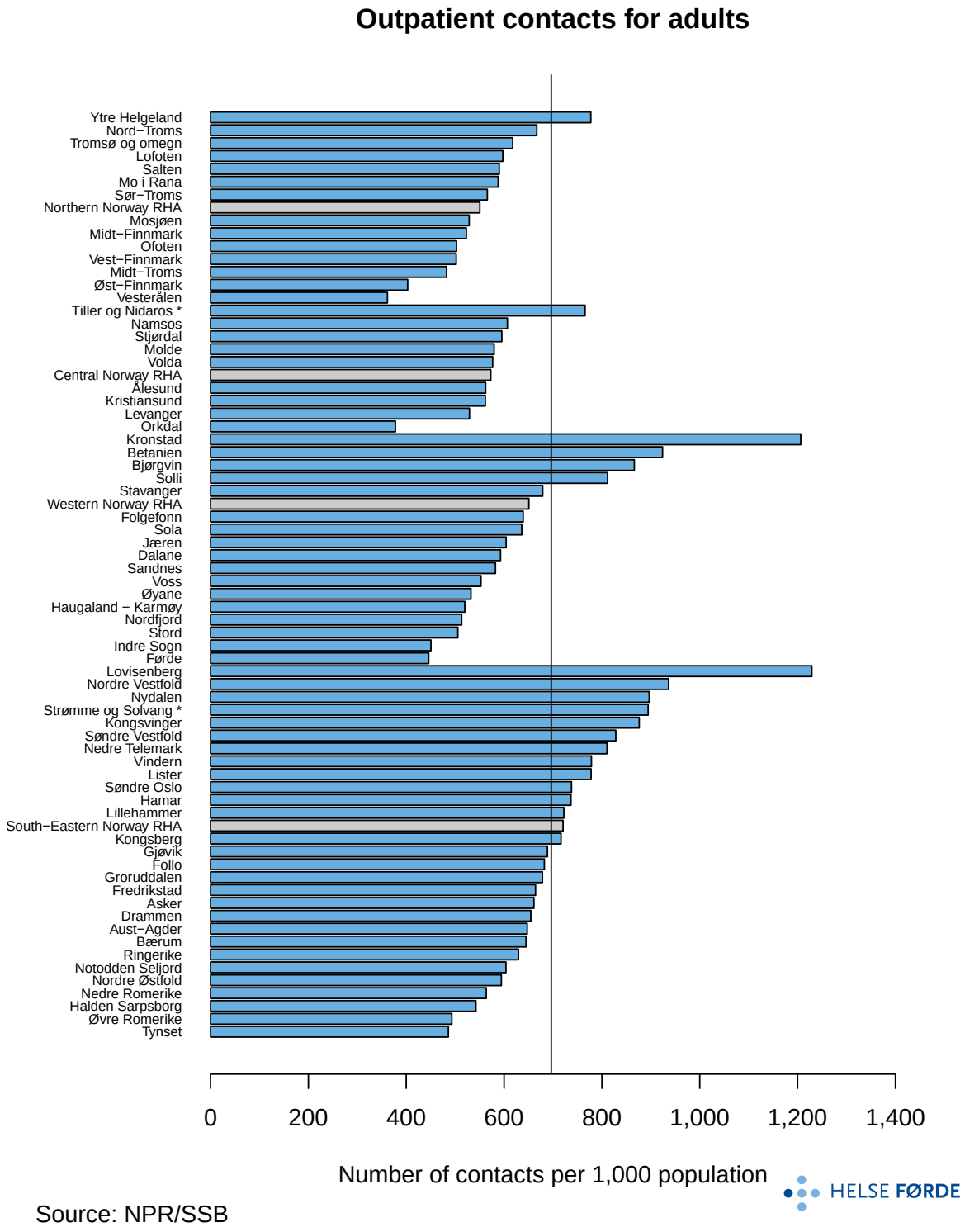

Figure 4.22: Contact rates broken down by DPC referral area and RHA. Outpatient treatment of adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services. Number of contacts per 1,000 population, broken down by DPC referral area and for Norway as a whole. The bars show average values per year for the period 2014–2018. The rates have been adjusted for age and gender. Asterisks indicate that areas have been combined, see Appendix B.

Northern Norway RHA Broken down by DPC referral area, we found the highest and lowest outpatient contact rates among adults from the Ytre Helgeland area with an average of 777 contacts and the Vesterålen area with 362 contacts per 1,000 population per year (Figure 4.22).

Central Norway RHA The highest and lowest outpatient rates were found in Tiller and Nidaros DPC referral areas with 765 and Orkdal with 378 contacts per 1,000 population (Figure 4.22).

Western Norway RHA had by far the most contacts for adults from Kronstad DPC referral area, with 1,206 per 1 000 population. The lowest outpatient contact rates for adults were found in the DPC referral areas of Førde (446) and Indre Sogn (450) (Figure 4.22).

South-Eastern Norway RHA Four of the five DPC referral areas in Oslo had a higher-than-average outpatient contact rate. Adults in the Lovisenberg area had the highest rate at 1,229 contacts per 1,000 population. Adults resident in Tynset DPC referral area had the region's lowest outpatient contact rate (486) (Figure 4.22).

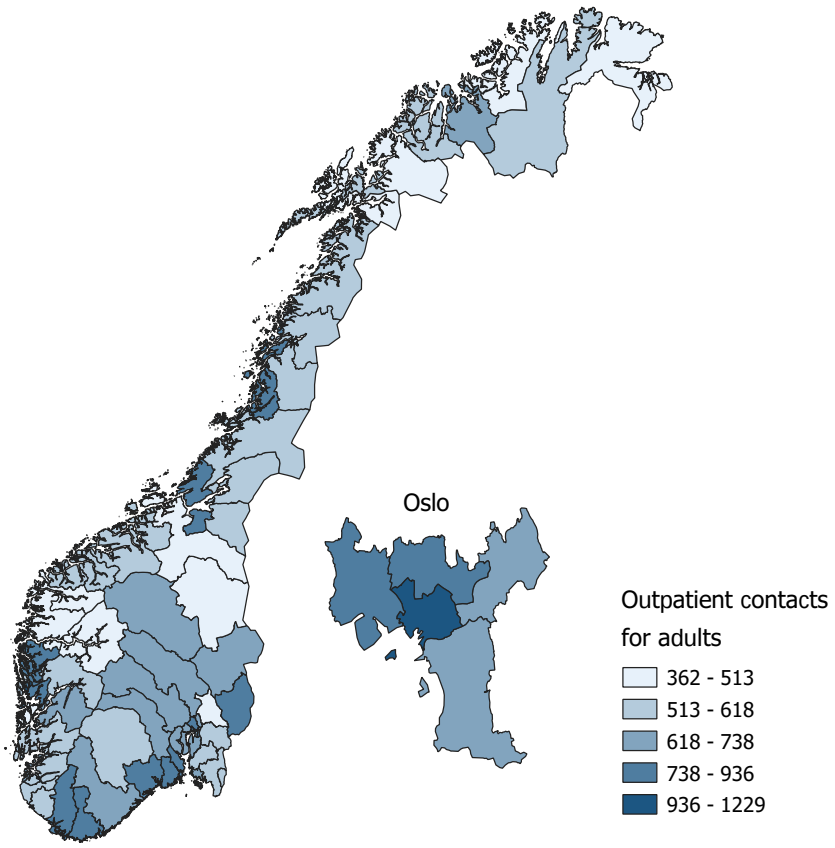

Figure 4.23: Contact rates broken down by DPC referral area and RHA. Outpatient treatment of adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services. Number of contacts per 1,000 population, broken down by DPC referral area. The map shows average values per year for the period 2014–2018. The rates have been adjusted for age and gender.

4.2.2 Main findings - outpatient treatment for adults

- At more than 180,000 patients per year, adults receiving outpatient treatment make up the largest group in this healthcare atlas by far. Considering that the patient rate did not vary much between hospital referral areas, it is interesting to note that their contact rates varied from 461 to 1,229. Adults from the Bergen and Oslo areas had the highest number of outpatient contacts per patient, and patients in Bergen hospital referral area had nearly twice as many contacts as patients from the Finnmark area. Adults resident in Oslo also had the highest use of specialists in private practice under public funding contracts in per cent.
- We found very high variation when we isolated patients with substance use disorder from the group of adults receiving outpatient treatment, as the resulting contact rate per year varied from 27 to 212 between hospital referral areas. There was also high variation in patient rates between hospital referral areas, and patients from Bergen hospital referral area had three times as many contacts per year as adults from Nordland and Finnmark.
- We found high variation when we isolated patients with severe mental disorders from the group of adults receiving outpatient treatment, as the resulting contact rate per year varied from 43 to 262 between hospital referral areas. There was not much variation in patient rates, but patients from Lovisenberg hospital referral area had a particularly high number of contacts per patient, and three times as many contacts as patients from the Finnmark area.

The outpatient care received by adults with severe mental disorders or substance use disorder differed depending on where in Norway they lived. The relatively higher use of outpatient mental healthcare and substance abuse treatment services in the big cities could be due to a greater need for treatment among the population of those areas. We also found that the services offered to individual patients in those same cities were more extensive than the services provided elsewhere. Variations in the use of outpatient services were significant and concerned a large number of vulnerable patients. We deem the variation in the use of outpatient services to be unwarranted.

4.2.3 Inpatient treatment

Patient rates In addition to Finnmark, Nordland and UNN hospital referral areas in the Northern Norway health region, the hospital referral areas of Lovisenberg and Telemark are among the areas with the highest number of adults admitted as inpatients per 1,000 population per year. The highest patient rate by far was found for adults in the Finnmark area (13).

Among the hospital referral areas with the lowest patient rates, several were located in and around Oslo. This applies both to OUS and Ahus, and the Diakonhjemmet area had the lowest patient rate by far (6.0). The average patient rates did not vary much between hospital referral areas during the period 2014–2018, but the variation nevertheless exceeded what can be explained by random variation (Figure 4.24 and Table 4.19).

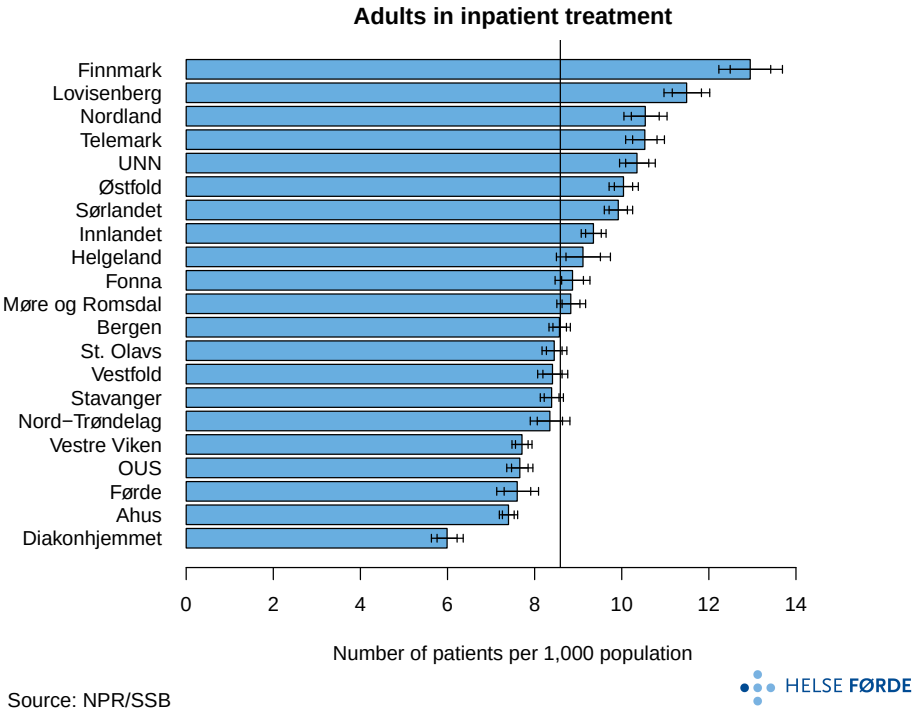

Figure 4.24: Patient rates for inpatient treatment in mental healthcare and interdisciplinary specialised addiction services: Number of adult patients (18–64 years) per 1,000 population, broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

Admission rates. During the period 2014–2018, adults in Norway had 50,800 admissions per year in mental healthcare (MHC-A and MHC-CA) and interdisciplinary specialised addiction services (Table 4.7).[19] This gives us an average rate per year of 16 admissions per 1,000 population per year during the period. The admission rate remained stable, both for Norway as a whole and for most hospital referral areas. With an average admission rate of 25 per year, adults in UNN and Finnmark hospital referral areas had markedly more admissions per adult inhabitant than people in the rest of Norway. The lowest admission rate for adults was found in Diakonhjemmet hospital referral area (9.2) (Figure 4.25. We found the variation in admission rates between hospital referral areas to be moderate (tabell 4.18).

[19]Less than 1% of admissions per year were excluded from further analyses. These were admissions that lasted for more than 365 days.

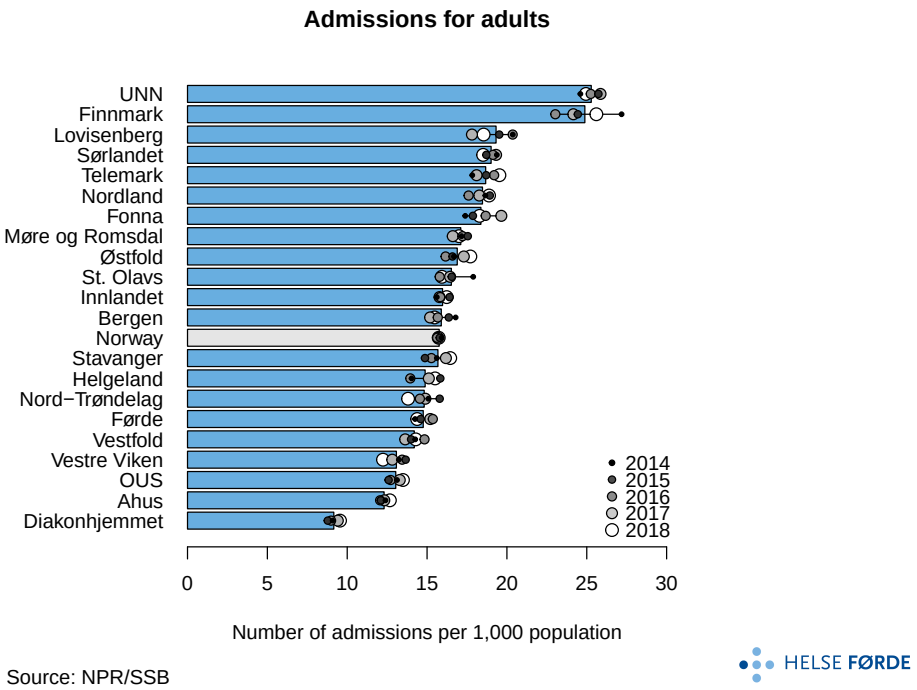

Figure 4.25: Admission rates for inpatient treatment of adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services: Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

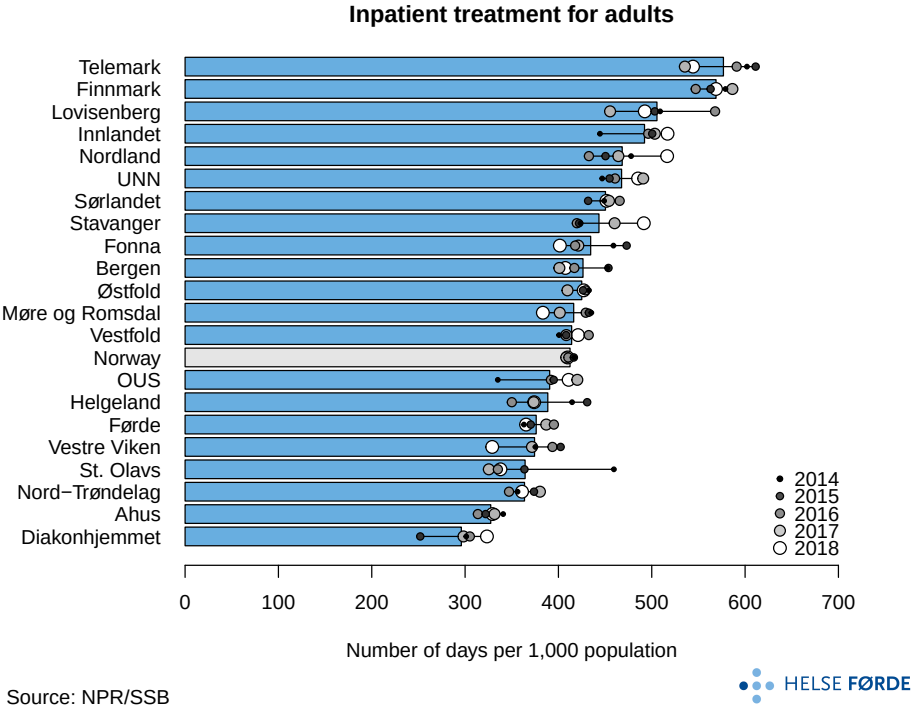

Figure 4.26: Day rates for adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services: Number of days per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Day rates. Adults in Norway spent an average of 412 days in an institution per 1,000 population per year during the period 2014–2018. The rates per year remained stable during the period. Finnmark hospital referral area also had a high day rate (569), second only to Telemark (577) in terms of inpatient days spent in institutions by adults per 1,000 population. Diakonhjemmet hospital referral area had the lowest day rate (296) for adults (Figure 4.26).

Table 4.7: Inpatient treatment of adults in mental healthcare and interdisciplinary specialised addiction services. Number of patients, days, admissions and days per admission, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to adults aged 18–64 years.

Hospital referral area	Number of patients	Number of days	Number of admissions	Days per admission
Diakonhjemmet	543	27,071	838	32.3
Telemark	1,072	57,915	1,893	30.6
Innlandet	2,065	107,188	3,525	30.4
OUS	1,310	67,601	2,236	30.2
Vestfold	1,143	55,632	1,928	28.8
Stavanger	1,916	102,037	3,574	28.5
Vestre Viken	2,220	106,895	3,774	28.3
Lovisenberg	1,156	52,997	1,938	27.3
Bergen	2,397	120,082	4,449	27.0
Ahus	2,373	104,653	3,946	26.5
Helgeland	418	17,721	684	25.9
Nordland	863	38,029	1,508	25.2
Førde	483	23,578	937	25.2
Østfold	1,724	72,069	2,891	24.9
Nord-Trøndelag	651	28,138	1,158	24.3
Møre og Romsdal	1,393	65,336	2,700	24.2
Sørlandet	1,786	80,672	3,419	23.6
Fonna	951	46 411	1,971	23.5
Finnmark	604	26,560	1,158	22.9
St. Olavs	1,699	73,898	3,315	22.3
UNN	1,214	54,729	2,956	18.5
Norway	27,685	1,329,212	50,800	26.2

Duration of admissions (days per admission) Adults in Diakonhjemmet hospital referral area had the longest admissions, averaging 32 days per admission. Five of the hospital referral areas with the longest admissions were in the South-Eastern Norway health region. The length of admissions was shortest in UNN hospital referral area (19 days per admission) during the period 2014–2018, while admissions varied between 22 and 30 days on average for adults from most areas in Norway (Table 4.7).

Age segments

By dividing the adult group into three age segments, we found a change in the admission rate at the patient age of 50 in terms of where in Norway patients had the most admissions per 1,000 population. In the age segments 18–30 years and 31–50 years, the number of admissions per 1,000 population was lowest for adults from Finnmark and UNN hospital referral areas and from the areas in Oslo (Figure 4.27).

There was a particular difference between the different areas in Oslo in terms of institutional admission rates for the age group 51–64 years. Compared to other parts of Norway, adults in the age group 51–64 years from Lovisenberg hospital referral area had the most admissions per 1,000 population, while the group from the Diakonhjemmet area had fewest admissions (Figure 4.27).

Admission rates for Norway decreased somewhat with increasing patient age, from an average of 18 admissions per 1,000 population per year in the group 18–30 years, to 16 in the group 31–50 years and 13 in the group 51–64 years. The variation in admission rates between hospital referral areas was more moderate for the group aged 18–30 years than for patients aged 30 years and older, where there was high variation (Table 4.18).

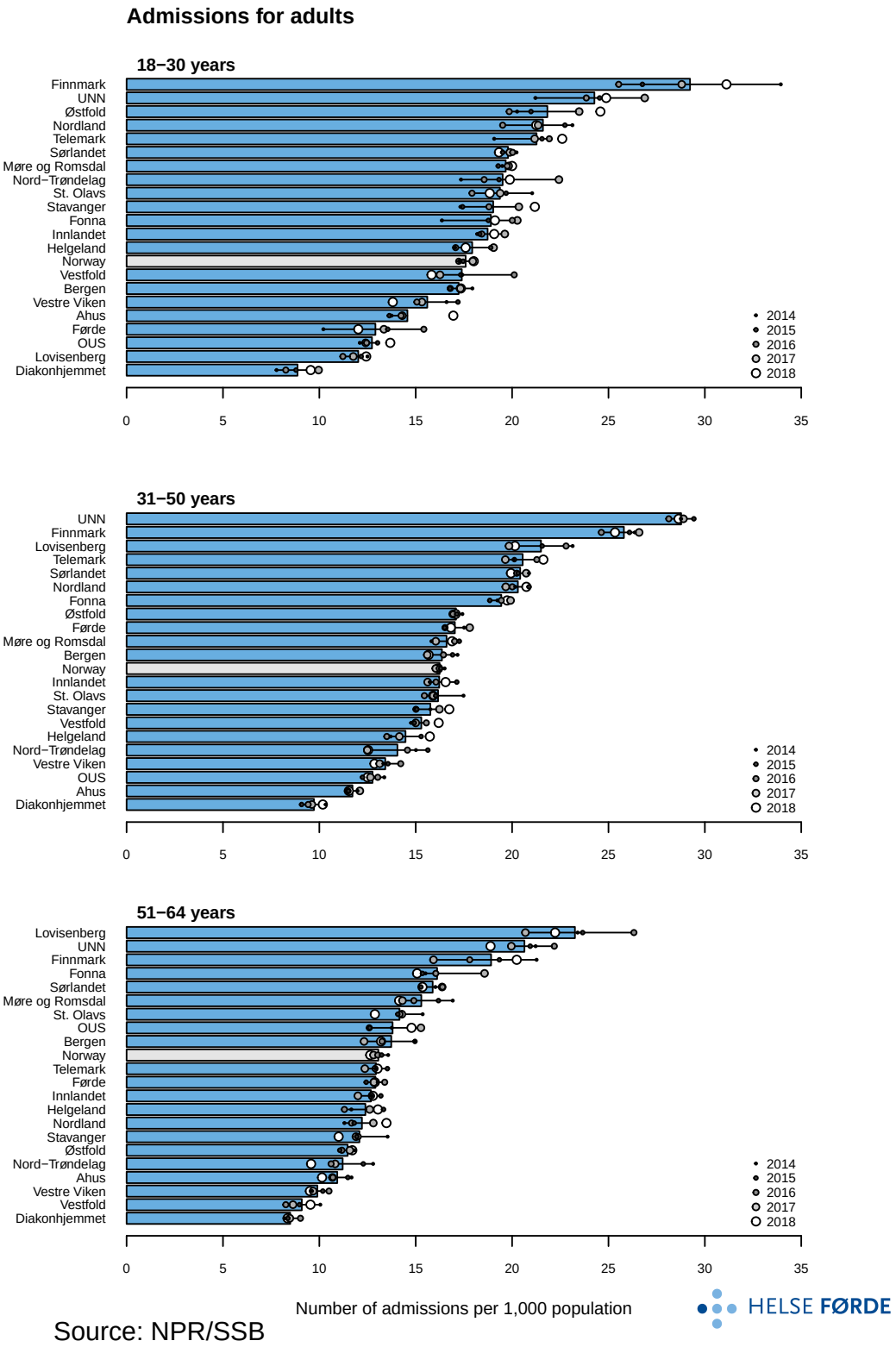

Figure 4.27: Admission rates, age group breakdown: Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole, for the age groups 18–30 years, 31–50 years and 51–64 years. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Where did adult patients receive inpatient treatment?
During the period 2014–2018, an average of 84% of adult patients' admissions in mental healthcare or substance abuse treatment services took place in the hospital referral area in which the patient was resident. Adults from the hospital referral areas of Finnmark, Helgeland, Lovisenberg and Diakonhjemmet were most likely to receive inpatient treatment in areas other than where they lived (Figure 4.28). Finnmark Hospital and Helgeland Hospital do not have their own psychiatric hospitals. Therefore, patients from Helgeland and Finnmark who are in need of inpatient treatment receive such treatment outside their own hospital referral area, and our findings thus reflect the division of functions between health trusts under the Northern Norway Regional Health Authority. Lovisenberg Diaconal Hospital and Diakonhjemmet Hospital do not offer inpatient interdisciplinary specialised addiction treatment. Patients from these hospital referral areas will therefore receive such treatment outside of the area where they are resident.

Adults from UNN, St. Olavs and Bergen had the lowest percentage of admissions in institutions outside their own hospital referral area.

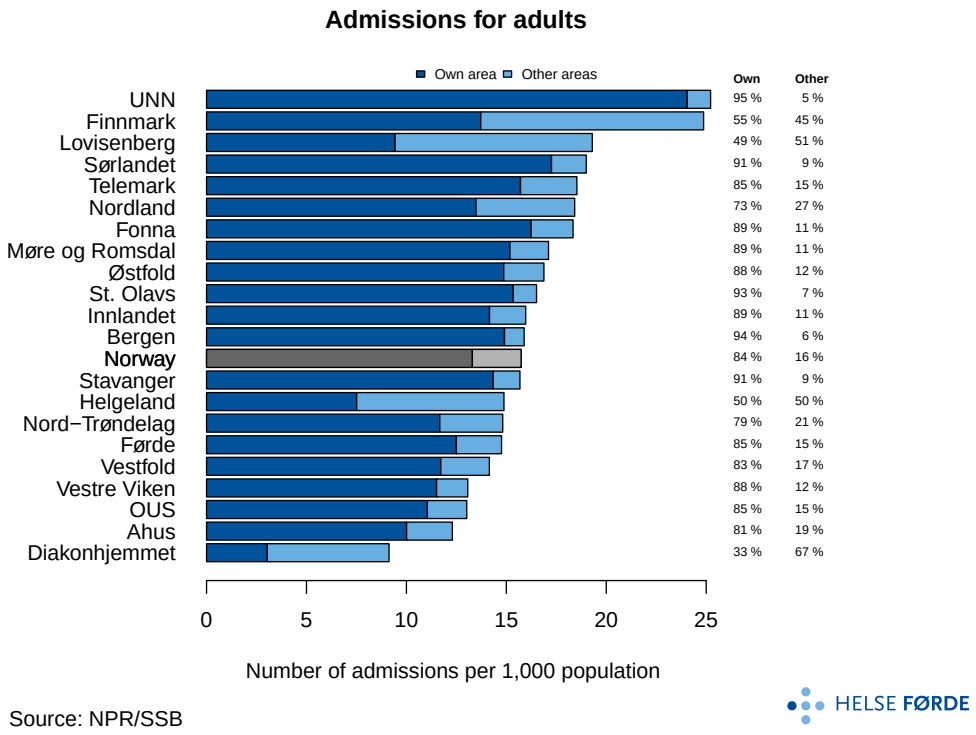

Figure 4.28: Admission rates, broken down by treatment in own or other hospital referral area: Number of admissions per 1,000 population (18-64 years), broken down by hospital referral area and for Norway as a whole. The bars show the average value per year for the period 2014–2018 with the percentage distribution broken down by where the patients received treatment. The rates have been adjusted for age and gender.

Most of the patients' admissions in mental healthcare or addiction services were provided by public service providers. For adults in Norway as a whole, this accounted for 81% of all admissions (Figure 4.29). All private institutions with public funding contracts are located in the health regions of Western Norway and South-Eastern Norway. It was therefore to be expected that it was in these regions that adult patients admissioned in such institutions. The fact that nearly half of all admissions of adult patients living in Lovisenberg and Diakonhjemmet hospital referral areas took place in private institutions with public funding contracts suggests that they received much of their inpatient treatment at the local health trust's own institutions or other institutions with a similar contract with the RHA. Private institutions

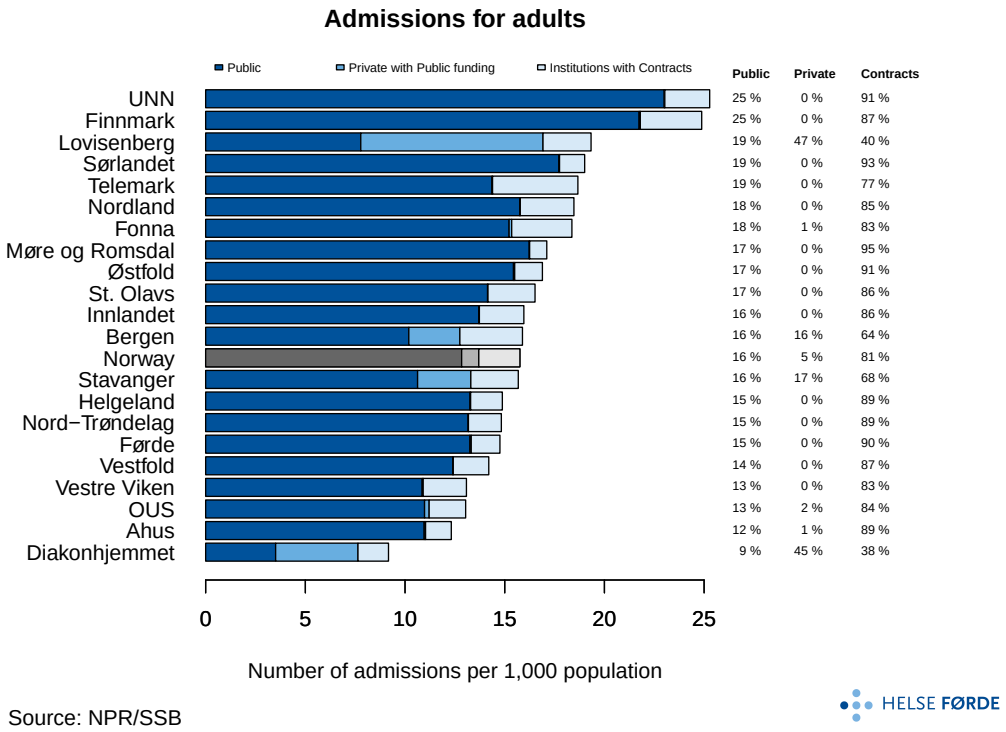

Figure 4.29: Admission rates, broken down by treatment in public or private institution: Number of admissions per 1,000 population (18-64 years), broken down by hospital referral area and for Norway as a whole. The bars show the average value per year for the period 2014–2018 with the percentage distribution broken down by where the patients received treatment. The rates have been adjusted for age and gender.

with service procurement contracts accounted for 23% of all admissions for adult patients in Telemark hospital referral area, but only 5% of admissions in the Møre og Romsdal area. When we looked at adults with substance use disorder separately, we found that a somewhat higher percentage of admissions were in private institutions with service procurement contracts. The percentage varied from 8% in Sørlandet hospital referral area to 44% in the Bergen area (unpublished data).

Substance use disorder

Patient rates. During the period 2014–2018, an average of 11,500 adults with substance use disorder were admitted for inpatient treatment in mental healthcare or interdisciplinary addiction services in Norway (Table 4.8).

In most parts of the country, between 3 and 5 adults with substance use disorder per 1,000 population per year were admitted to an institution for treatment. Four out of the five hospital referral areas with the highest patient rates were in the South-Eastern Norway health region. The Lovisenberg area stood out with the highest patient rate (6.6), while the Førde area had the lowest patient rate (2.3) for inpatients. We found that the variation in patient rates was moderate, but exceeded what can be explained by random variation (Figure 4.30 and Table 4.19).

Admission rates. Norwegian adults with substance use disorder had an average of nearly 20,000 admissions in mental healthcare (MHC-A and MHC-CA combined) or interdisciplinary specialised addiction services per year during the period 2014–2018 (Table 4.8). The admission rate was 6.2 per 1,000 adult population. The admission rate was stable for Norway as a whole, but there was a marked increase in the rate for Nordland hospital referral area during the period. The highest admission rate we

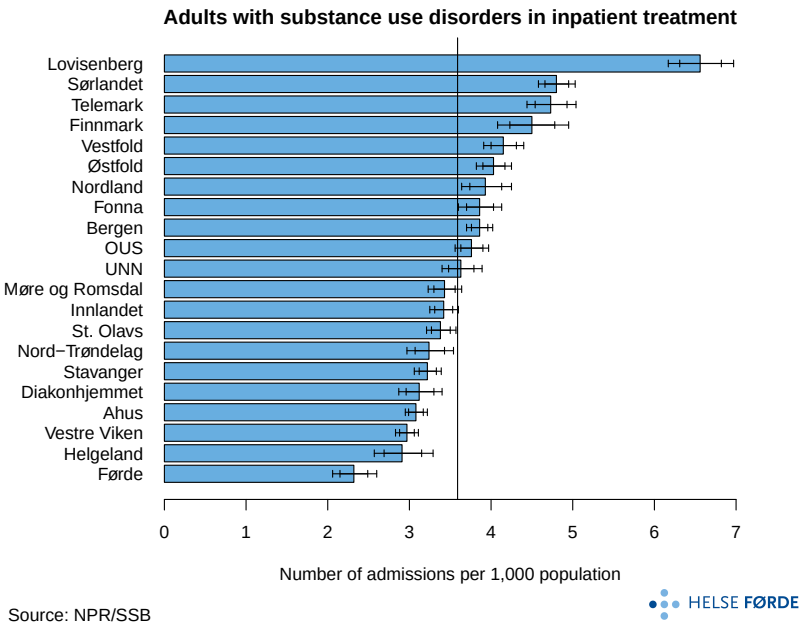

Figure 4.30: Patient rates, adults with substance use disorder receiving inpatient treatment. Number of adults (18–64 years) with substance use disorder per 1,000 population broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

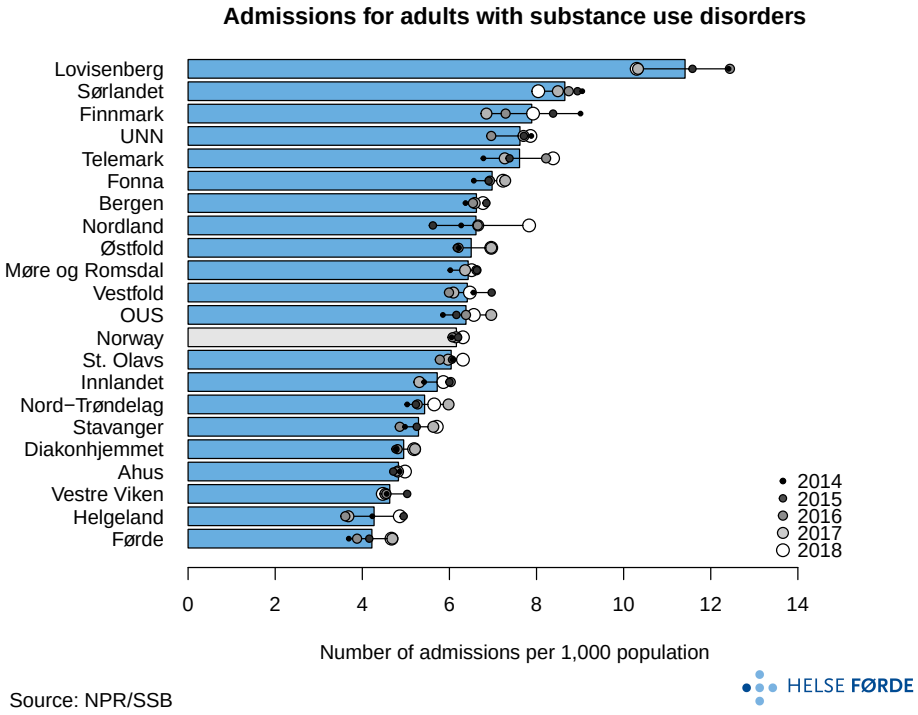

Figure 4.31: Admission rates, adults with substance use disorder receiving inpatient treatment. Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

found for adults with substance use disorder was for Lovisenberg hospital referral area (11.4). Adults from Helgeland hospital referral area stood out from others in the Northern Norway health region with a relatively low admission rate (4.2) (Figure 4.31 and Table 4.18). The variation in admission rates was also moderate.

The *duration of admissions* (days per admission) for adults with substance use disorder varied from 26 days per admission for patients from the UNN area to 45 days per admission for patients in Telemark hospital referral area. In many parts of Norway, admissions for adult patients with substance use disorder lasted between 30 and 33 days (Table 4.8).

Table 4.8: Inpatient treatment for adults with substance use disorder. Includes admissions in mental healthcare and interdisciplinary specialised addiction services. Number of patients, days, admissions and days per admission, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to adults aged 18–64 years.

Hospital referral area	Number of patients	Number of days	Number of admissions	Days per admission
Telemark	476	34,102	758	45.0
Innlandet	748	49,466	1,251	39.5
Vestfold	559	33,503	862	38.9
Stavanger	741	46,009	1,214	37.9
Helgeland	132	7,296	193	37.8
Vestre Viken	852	46,823	1,328	35.3
Nord-Trøndelag	253	14,218	423	33.6
Bergen	1,084	62,362	1,861	33.5
Ahus	987	51,809	1,548	33.5
Førde	146	8,883	267	33.3
Nordland	320	17,768	537	33.1
Diakonhjemmet	282	14,556	450	32.3
Finnmark	210	11,781	366	32.2
Fonna	414	23,541	748	31.5
OUS	639	34,112	1,088	31.4
Lovisenberg	652	34,608	1,138	30.4
Møre og Romsdal	541	30,804	1,013	30.4
Sørlandet	858	46,351	1,544	30.0
Østfold	689	32,533	1,111	29.3
St. Olavs	681	33,349	1,214	27.5
UNN	424	23,419	888	26.4
Norway	11,562	657,292	19,802	33.2

Severe mental disorders

Patient rates Each year during the period 2014–2018, 7,900 Norwegian adults with severe mental disorders had at least one admission in mental healthcare (MHC-A or MHC-CA) or interdisciplinary specialised addiction services (Table 4.9).

The hospital referral areas with the highest number of adults per 1,000 population admitted to an institution to receive treatment for a severe mental disorder were Finnmark and Lovisenberg. Both areas had a patient rate of 3.5, while the lowest number of inpatients per 1,000 population was registered for the Ahus area (2.0). The variation between hospital referral areas was low, but exceeded what can be explained by chance (Figure 4.32 and Table 4.19).

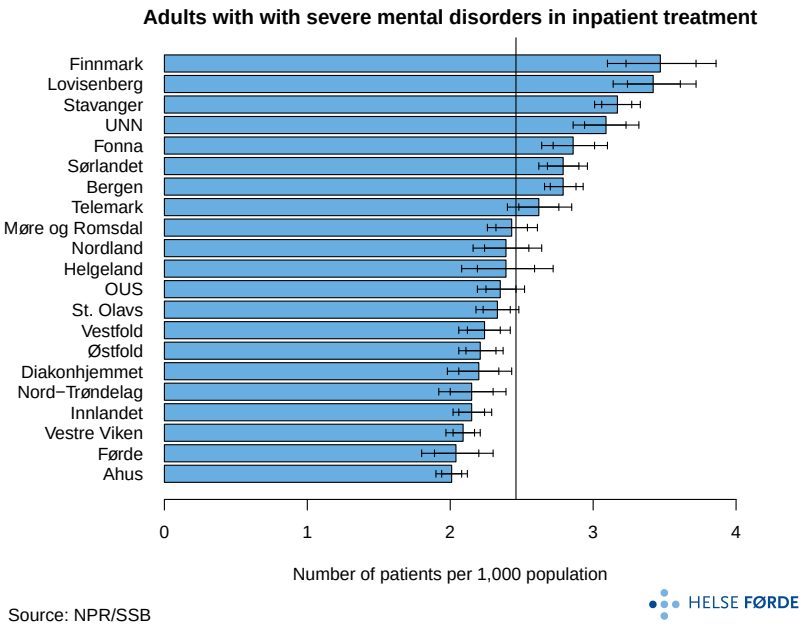

Figure 4.32: Patient rates, adults with severe mental disorders receiving inpatient treatment. Number of adults (18–64 years) with severe mental disorders (SMD) per 1,000 population broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

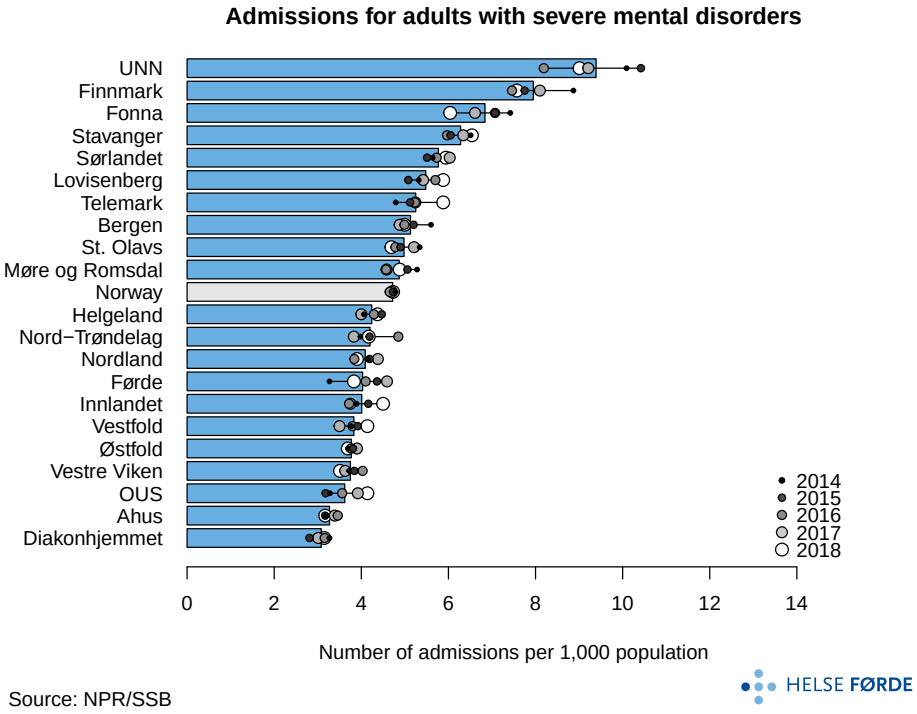

Figure 4.33: Admission rates, adults with severe mental disorders receiving inpatient treatment. Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Table 4.9: Inpatient treatment of adults with severe mental disorders. Includes admissions in mental healthcare and interdisciplinary specialised addiction services. Number of patients, days, admissions and days per admission, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to adults aged 18–64 years.

Hospital referral area	Number of patients	Number of days	Number of admissions	Days per admission
OUS	403	26,242	619	42.4
Diakonhjemmet	197	11,491	278	41.3
Østfold	384	22,285	653	34.1
Ahus	648	35,645	1,055	33.8
Bergen	774	46,245	1,420	32.6
Vestre Viken	607	35,133	1,093	32.2
Innlandet	482	28,761	901	31.9
Lovisenberg	339	17,012	537	31.7
Vestfold	307	16,228	526	30.8
Stavanger	721	42,686	1,426	29.9
Førde	130	7,599	255	29.8
Telemark	269	15,032	538	27.9
St. Olavs	462	26,816	985	27.2
Møre og Romsdal	386	21,106	778	27.1
Nord-Trøndelag	167	8,728	329	26.5
Helgeland	110	5,096	196	26.0
Nordland	194	8,426	331	25.4
Sørlandet	502	24,703	1,037	23.8
Finnmark	161	8,031	370	21.7
Fonna	307	14,940	735	20.3
UNN	360	18,004	1,091	16.5
Norway	7,920	440,210	15,151	29.1

Admission rates For Norway as a whole, adults with severe mental disorders had an average of 4.7 institution admissions per 1,000 population per year during the period 2014–2018. Adults from the areas of UNN and Finnmark had the most admissions per 1,000 population (admission rates of 9.4 and 8.0, respectively), while several hospital referral areas in and around Oslo had low admission rates. The lowest admission rate was found in Diakonhjemmet hospital referral area (3.1) (Figure 4.33). There was high variation in admission rates (Table 4.18).

The *duration of admissions* (days per admission) for adults with severe mental disorders varied from 17 days per admission in the UNN area to 42 days per admission in OUS hospital referral area (Table 4.9). We found that adults with severe mental disorders living in Northern Norway RHA's hospital referral areas had shorter admissions than adults in other parts of Norway, and all four hospital referral areas in the Northern Norway health region were among the six areas with the lowest number of days per admission. Adults from OUS and Diakonhjemmet hospital referral areas in Oslo had the longest admissions.

DPC referral areas and RHA areas[20]

Based on the DPC referral areas, we found that seven of the ten DPC referral areas with the highest admission rate per year during the period 2014–2018 for adults belonged to Northern Norway RHA. The admission rates were markedly higher than for adults from other DPC referral areas (Figures 4.34 and 4.35). There was high variation between different DPC referral areas' admission rates for adults (Table 4.18).

The region with the highest average admission rate for adults was the Northern Norway health region with 21 admissions per 1,000 population, while South-Eastern Norway RHA had the lowest average admission rate at 15 per year. For the regions of Western Norway RHA and Central Norway RHA, the average admission rate was 16 per year during the period 2014–2018 (Figure 4.34). The greatest internal variation observed in a health region was found in Northern Norway RHA.

Northern Norway RHA We found that the DPC referral areas with the highest admission rates were all located in UNN and Finnmark hospital referral areas, and Nord-Troms DPC referral area had the highest rate for adults (32). The Ytre Helgeland area had the lowest admission rate (11) for adults (Figure 4.34).

Central Norway RHA The admission rates for adults varied from 20 in Kristiansund DPC referral area to 13 per year in the Orkdal area (Figure 4.34).

Western Norway RHA. The DPC referral area with the highest number of admissions per 1,000 adult population in this region was the Folgefonn area with an admission rate of 21 per year. Voss DPC referral area had the lowest admission rate (11) for adults (Figure 4.34).

South-Eastern Norway RHA. Four of the five DPC referral areas in Oslo had admission rates below the regional average, with the lowest admission rate found in Vindern DPC referral area (9.2). For the region as a whole, we found that the admission rate was highest in the DPC referral area of Strømme and Solvang with an average of 20 admissions per 1,000 population per year (Figure 4.34).

[20]Patients are assigned to the DPCs' 'catchment areas' (DPC referral areas) on the basis of which municipality or city district they are resident in, regardless of where they received treatment.

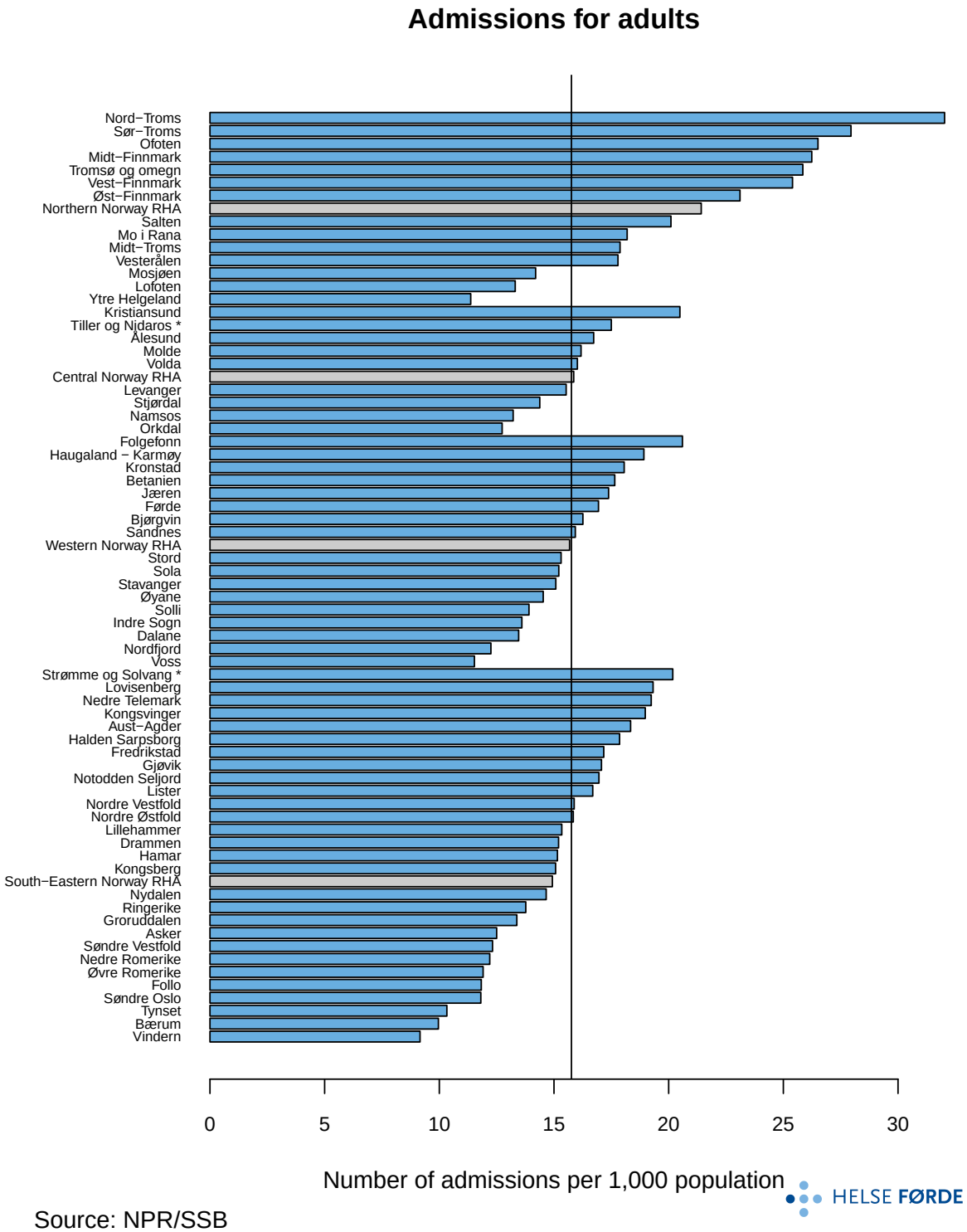

Figure 4.34: Admission rates broken down by DPC referral area and RHA. Inpatient treatment for adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services. Number of admissions per 1,000 population, broken down by DPC referral area and for Norway as a whole. The bars show average values per year for the period 2014–2018. The rates have been adjusted for age and gender. Asterisks indicate that DPC referral areas have been combined, see Appendix B.

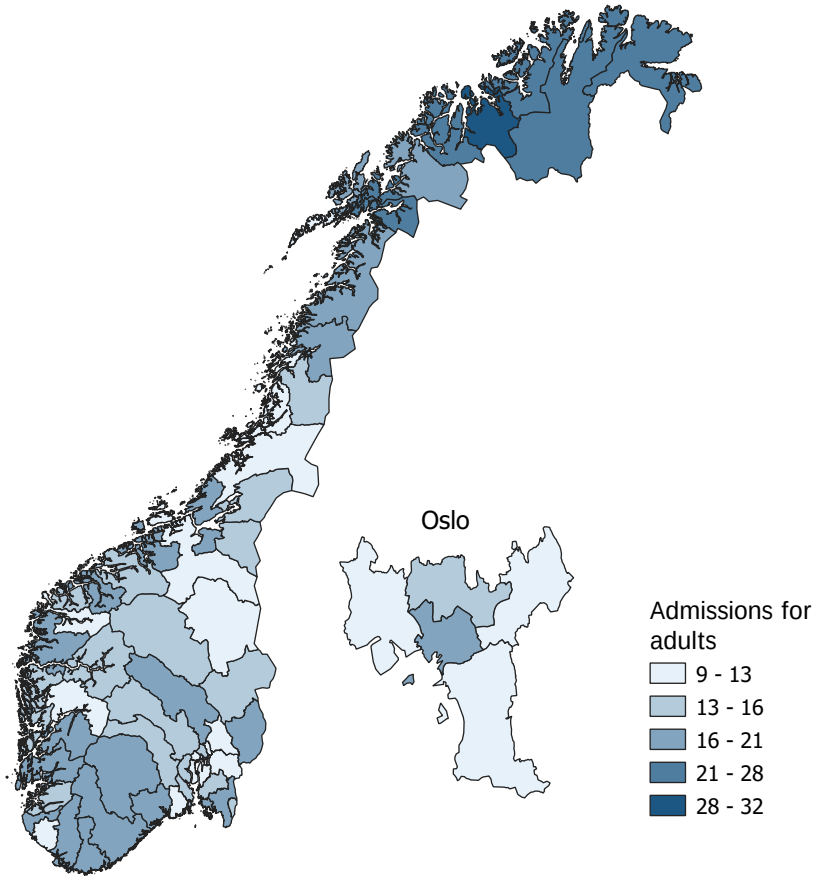

Figure 4.35: Admission rates broken down by DPC referral area and RHA. Inpatient treatment for adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services. Number of admissions per 1,000 population, broken down by DPC referral area. The map shows average values per year for the period 2014–2018. The rates have been adjusted for age and gender.

4.2.4 Main findings - inpatient treatment for adults

- Adult patients receiving inpatient treatment was a far smaller group than patients receiving outpatient treatment, comprising about 27,000 patients per year. There was nevertheless marked variation, with nearly three times as many admissions per 1,000 population in UNN and Finnmark hospital referral areas as in the Diakonhjemmet area. On the other hand, patients in Diakonhjemmet hospital referral area had one and a half times as long admissions compared with patients from the UNN area.
- When we studied patients with substance use disorder separately from the rest of the group of adults receiving outpatient treatment, we found a less pronounced variation than in outpatient treatment of patients with substance use disorder. This group of patients accounted for about one third of adults receiving inpatient treatment, with admission rates varying from 4 to 11 on average per year between hospital referral areas, and the duration of admissions was one and a half time as long in Telemark hospital referral area compared to the UNN area.
- When we studied patients with severe mental disorders separately from the rest of the group of adults receiving inpatient treatment, we found that the variation was high, but not as high as for outpatient treatment. Admission rates varied from 3 to 9 on average per year between hospital referral areas, and the duration of admissions varied from 17 to 42 days.

4.2.5 Overall assessment for adults

We found differences in the use of outpatient and inpatient services in different parts of Norway, with a tendency towards more outpatient treatment in cities and more inpatient treatment in Northern Norway RHA. For example, we found a low outpatient contact rate and many short admissions for adults in Finnmark and UNN hospital referral areas, while adults from the OUS area had a high outpatient contact rate and a small number of long admissions. If we consider one day of inpatient treatment and four outpatient appointments to be equivalent in terms of resource use, we found that there was still a difference between the use of these services in different hospital referral areas, with adults from Lovisenberg and Telemark hospital referral areas having the highest use. Our findings show that there is unwarranted variation in the treatment of adults, and this is particularly evident when patients with severe mental disorders or substance use disorder are considered separately.

4.3 Elderly patients in mental healthcare and interdisciplinary specialised addiction treatment

During the period 2014–2018, the number of persons aged 65 years or older who were in contact with mental healthcare services, mental healthcare specialists in private practice under public funding contracts and/or interdisciplinary specialised addiction services remained relatively stable. We found only a small increase from 17,404 to 18,640 patients per year. The number of patients makes up about 2% of the population in this age group. Sixty-one per cent of patients were women (Figures 4.1, 4.4 and 4.2). For Norway as a whole, an average of 15,000 elderly patients per year had one or more outpatient contacts (Table 4.10), and 3,800 were admitted for inpatient treatment in the above-mentioned specialist health services during the period 2014–2018 (Table 4.13).

4.3.1 Outpatient treatment

The hospital referral areas in Oslo had the highest patient rates for the elderly during the period 2014–2018, with an average patient rate per year of 36 for the Lovisenberg area and 31 for the Diakonhjemmet area. Østfold and Helgeland hospital referral areas had the lowest patient rates at about 12 outpatients per 1,000 population per year. We found high variation in patient rates between hospital referral areas, higher than what can be explained by chance. Narrow confidence intervals mean that the rates are based on a higher number of patients (Figure 4.36).

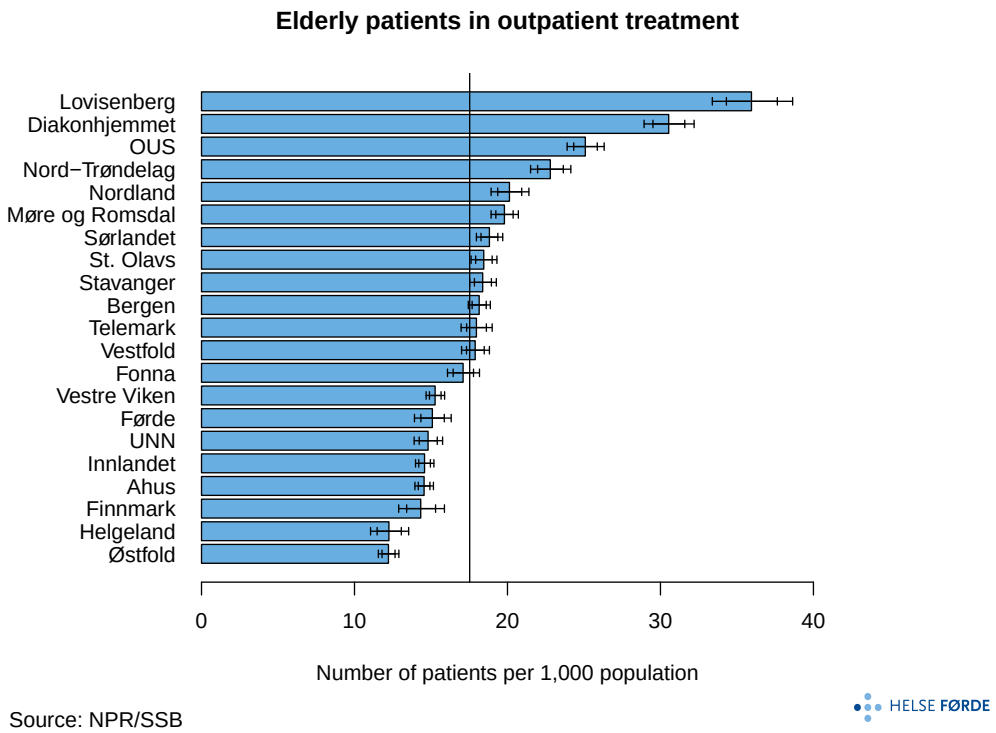

Figure 4.36: Patient rates for outpatient treatment in mental healthcare and interdisciplinary specialised addiction services: Number of elderly patients (65 years and older) per 1,000 population, broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

Outpatient contacts

In Norway as a whole, elderly patients had just under 104,000 outpatient contacts per year during the period 2014–2018. This is based on the total number of contacts with mental healthcare services, mental healthcare specialists in private practice under public funding contracts and/or interdisciplinary specialised addiction services (Table 4.10). The outpatient contact rate per year remained stable throughout the period, with an average rate of 122 contacts a year per 1,000 population for Norway as a whole. Elderly patients in the Oslo region had considerably more outpatient contacts per 1,000 population than elderly patients in the rest of Norway during the period 2014–2018. Residents of Lovisenberg hospital referral area had 413 contacts, residents of the Diakonhjemmet area had 321, and residents of the OUS area had 247 outpatient contacts on average per 1,000 population per year. Helgeland and Finnmark hospital referral areas had the fewest contacts, with average outpatient contact rates of 63 and 44, respectively, for elderly patients (Figure 4.37). The variation in outpatient contact rates was particularly pronounced for elderly patients (Table 4.16).

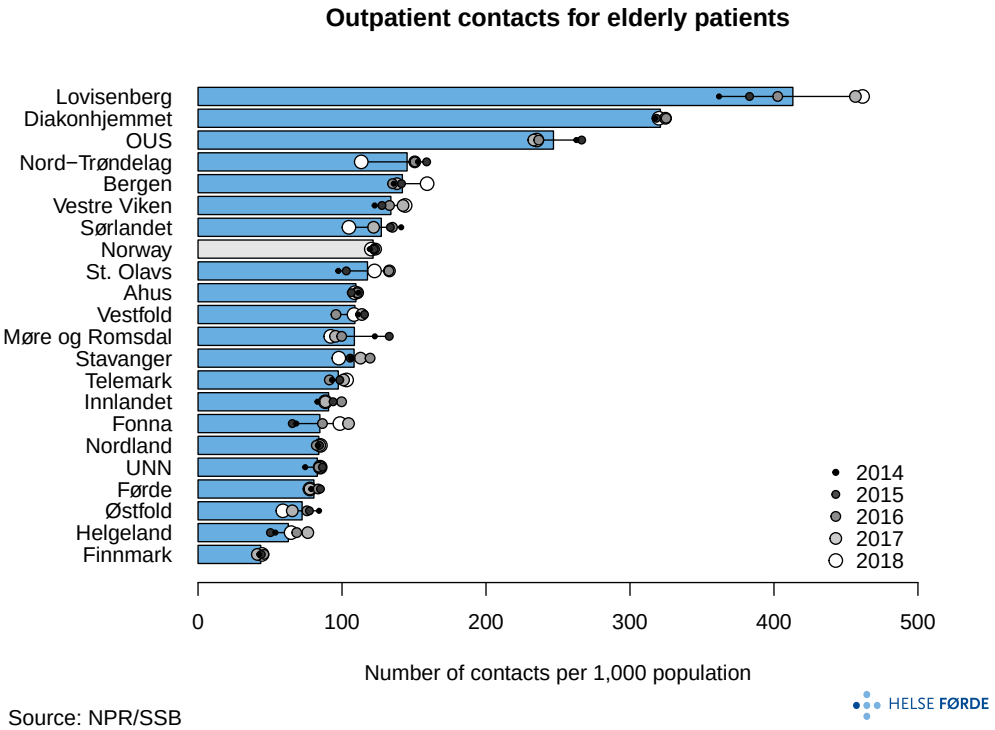

Figure 4.37: Contact rates for outpatient treatment of elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Contacts per patient. The number of outpatient contacts per patient was highest among elderly people living in Oslo and the surrounding areas. Along with elderly patients from the Bergen area, they had more contacts per year on average than elderly patients in the rest of Norway. The highest value was found in the Lovisenberg area with nearly 12, and the lowest in the Finnmark area with 3.1 contacts per patient (Table 4.10). The number of outpatient contacts was higher for elderly patients treated by specialists in private practice under public funding contracts than for those treated by public service providers (Table A.4). Førde hospital referral area was an exception from this rule, as elderly patients resident in the area had the same number of contacts regardless of whether they were treated by a public service provider or a specialist in private practice under a public funding contract.

Table 4.10: Outpatient treatment of elderly patients in mental healthcare and interdisciplinary specialised addiction services. Number of contacts, number of patients and contacts per patient, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to elderly people aged 65 years and older.

Hospital referral area	Number of contacts	Number of patients	Contacts per patient
Lovisenberg	4,377	371	11.8
Diakonhjemmet	7,146	677	10.6
OUS	8,090	831	9.7
Vestre Viken	10,844	1,238	8.8
Bergen	9,515	1,225	7.8
Ahus	8,602	1,130	7.6
Sørlandet	6,211	914	6.8
St. Olavs	5,888	921	6.4
Nord-Trøndelag	3,677	580	6.3
Innlandet	7,047	1,138	6.2
Vestfold	4,539	746	6.1
Østfold	3,851	649	5.9
Stavanger	5,020	851	5.9
UNN	2,743	489	5.6
Telemark	3,260	599	5.4
Møre og Romsdal	5,124	953	5.4
Førde	1,595	306	5.2
Helgeland	957	188	5.1
Fonna	2,540	517	4.9
Nordland	2,130	513	4.1
Finnmark	552	180	3.1
Norway	103,709	14,970	6.9

The *intensity of outpatient treatment* is an indicator of how often a patient had a direct outpatient contact with mental healthcare services, interdisciplinary specialised addiction services or specialists in private practice under public funding contracts. The intensity was measured as the average number of outpatient contacts over a 30-day period per year. We found that a number of areas had an intensity of between 2.7 and 3.8. Elderly patients from Lovisenberg hospital referral area had the highest outpatient treatment intensity (4.5) during the period in question, while the lowest treatment intensity was found in the Finnmark area (2.0) (Figure 4.38).

Indirect contacts

During the period 2014–2018, an average of nearly 46,000 indirect outpatient contacts per year with mental healthcare services, specialists in private practice under public funding contracts or interdisciplinary specialised addiction services were registered for elderly patients. They accounted for an average of 31% of all outpatient contacts, varying from 40% or more in the hospital referral areas of Nord-Trøndelag, Stavanger and Ahus, to 12% for elderly patients from the Nordland area (Table A.5).

Elderly patients' number of indirect contacts per 1,000 population remained stable for Norway as a whole during the period 2014–2018, with an average rate of 53. As for outpatient contacts, the highest rates for indirect contacts were also found in the Oslo area. Lovisenberg hospital referral area had an indirect contact rate of 188, while the rates for the areas of OUS and Diakonhjemmet were about 113. The areas with the lowest indirect rates were Helgeland (19) and Nordland (12).

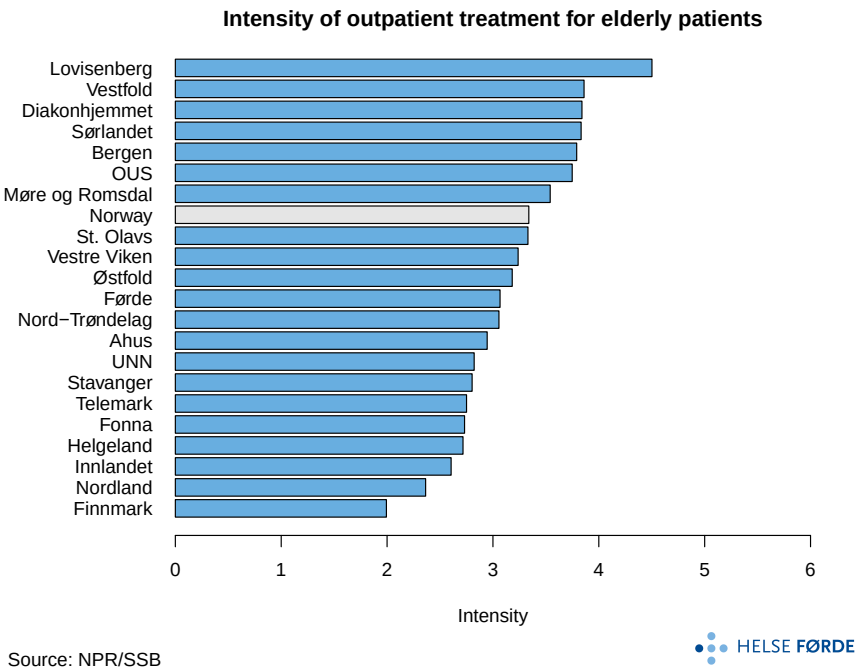

Figure 4.38: Intensity of outpatient treatment for elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services. The bars show average values for the period 2014–2018.

There were clear changes during the period 2014–2018 in the types of indirect contacts registered for elderly patients. These changes may be due to changes in the funding and coding systems. As regards the use of telephone, we found that for elderly patients in Norway as a whole, the number of telephone conversations with patients increased from about 12,000 in 2016 to 20,000 in 2018, while the number of registered 'phone calls' not otherwise specified decreased from 21,000 to just over 7,000. Teleconferences with first-line services increased from 2,000 to 10,000 registered indirect contacts. Only a very small number of telemedicine and tele/videoconference contacts were registered (about 20 per year). We also found a strong increase in registered collaborative meetings with first-line services and other services during the same period – from 400 to nearly 22,000.

Age segments

Both the outpatient contact rates and the variation between different hospital referral areas' contact rates were higher in the 65–74 years age segment than for patients aged 75 years and older. The hospital referral areas in Oslo had the highest rates and the Helgeland and Finnmark areas the lowest rates in both age segments. The contact rates for the age group 65–74 years were 558 for patients from Lovisenberg hospital referral area and 49 for patients from the Finnmark area, while the corresponding contact rates for the oldest age group were 231 and 37, respectively, on average per year. There was a marked increase in the contact rate for the age group 65–74 years in the Lovisenberg area during the period in question (Figure 4.39 and Table 4.16).

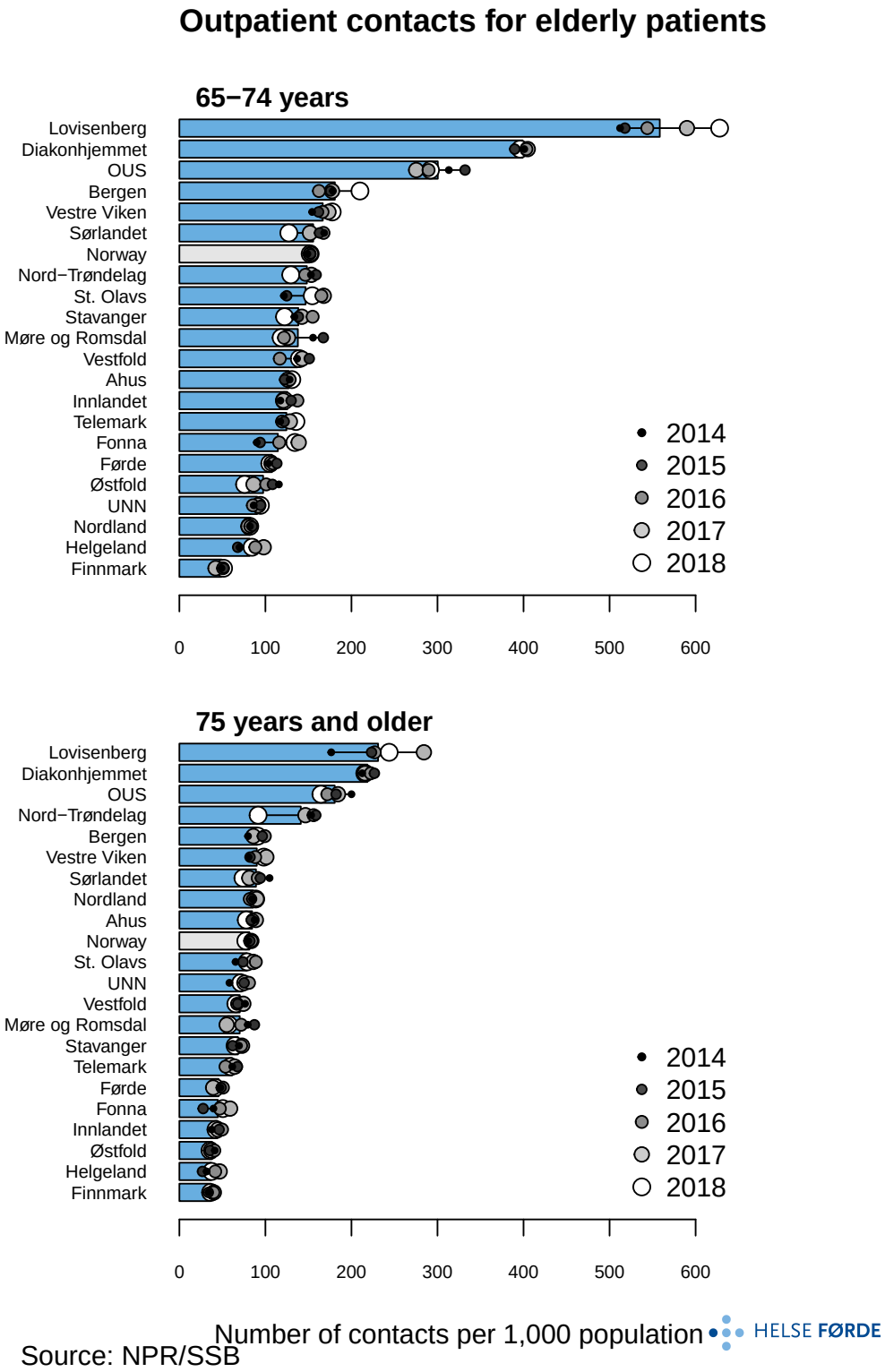

Figure 4.39: Contact rates, two age segments. Outpatient contact rates for treatment in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole, for the age groups 65–74 years and 75 years and older. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Sectors

Elderly patients had the most outpatient contacts in per cent with the mental healthcare for adults sector, ranging from about 95% in Helgeland and Finnmark hospital referral areas to under 50% in the areas of Østfold and Vestre Viken. The highest percentage of outpatient contacts with specialists in private practice under public funding contracts (Avt) was found in the hospital referral areas in Eastern Norway. In the areas of Østfold, Vestre Viken and Diakonhjemmet, more than 40% of elderly patients' contacts were with a specialist in private practice under a public funding contract. For residents of Vestfold, Lovisenberg, Bergen, OUS and Østfold hospital referral areas, 10% or more of elderly patients' outpatient contacts were registered under the interdisciplinary specialised addiction services (TSB) sector. The lowest percentage of outpatient contacts registered under TSB (less than 5%) was found in hospital referral areas under Northern Norway RHA (Finnmark, Nordland, Helgeland) and Western Norway RHA (Førde) (Figure 4.40).

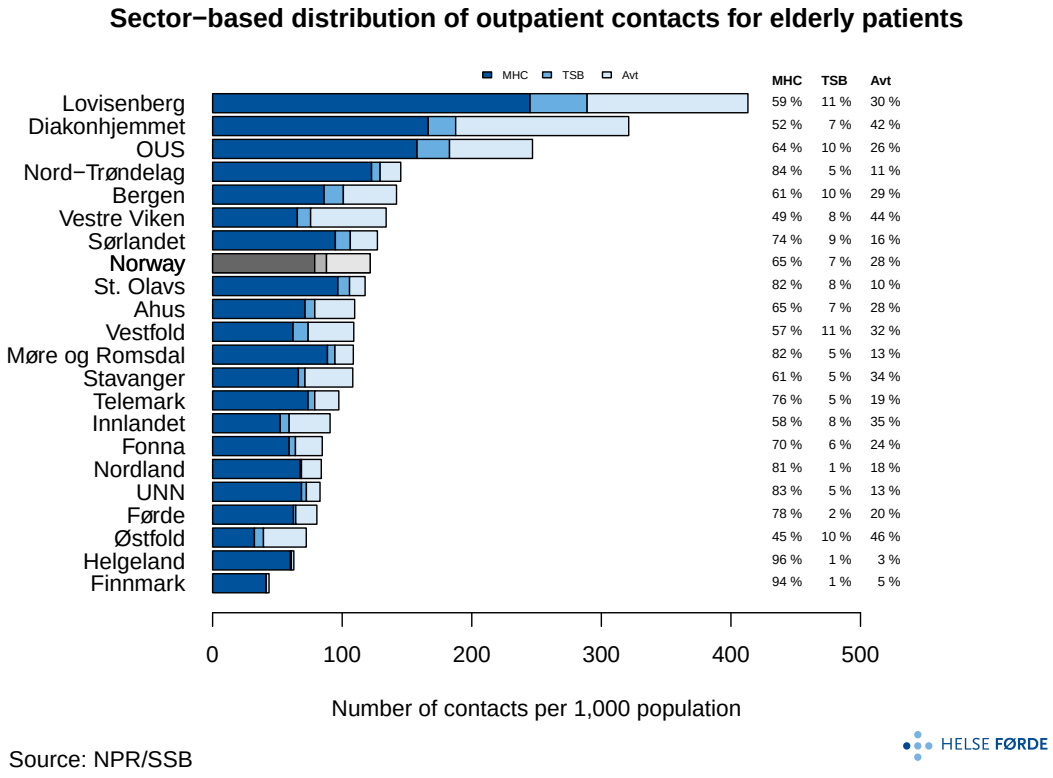

Figure 4.40: Contact rates, broken down by sector. Outpatient contact rate for elderly patients (65 years and older), broken down by hospital referral area and for Norway as a whole, percentage distribution broken down by the sectors mental healthcare (MHC), interdisciplinary specialised addiction treatment (TSB) and mental healthcare specialists in private practice under public funding contracts (Avt). The bars show average values per year for the period 2014–2018. The rates have been adjusted for age and gender.

Substance use disorder

In Norway as a whole, more than 1,000 elderly patients per year with substance use disorder had at least one outpatient contact with mental healthcare services, interdisciplinary specialised addiction services or mental healthcare specialists in private practice under public funding contracts during the period 2014–2018 (Table 4.11). See Appendix B for the definition of substance use disorder.

Patient rates The Oslo region also had the highest number of elderly outpatients with substance use disorders per 1,000 population. The patient rates were 4.8 for Lovisenberg hospital referral area, and

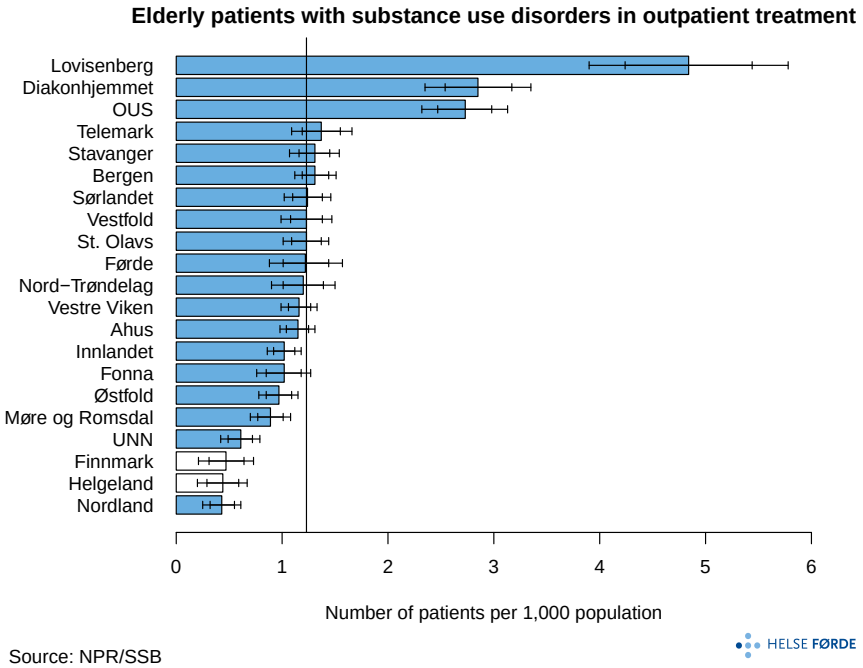

Figure 4.41: Patient rates, elderly patients with substance use disorder receiving outpatient treatment. Number of adults (65 years and older) with substance use disorder per 1,000 population broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender. Finnmark and Helgeland: The calculation is based on fewer than 40 unique patients, and this makes the rate uncertain.

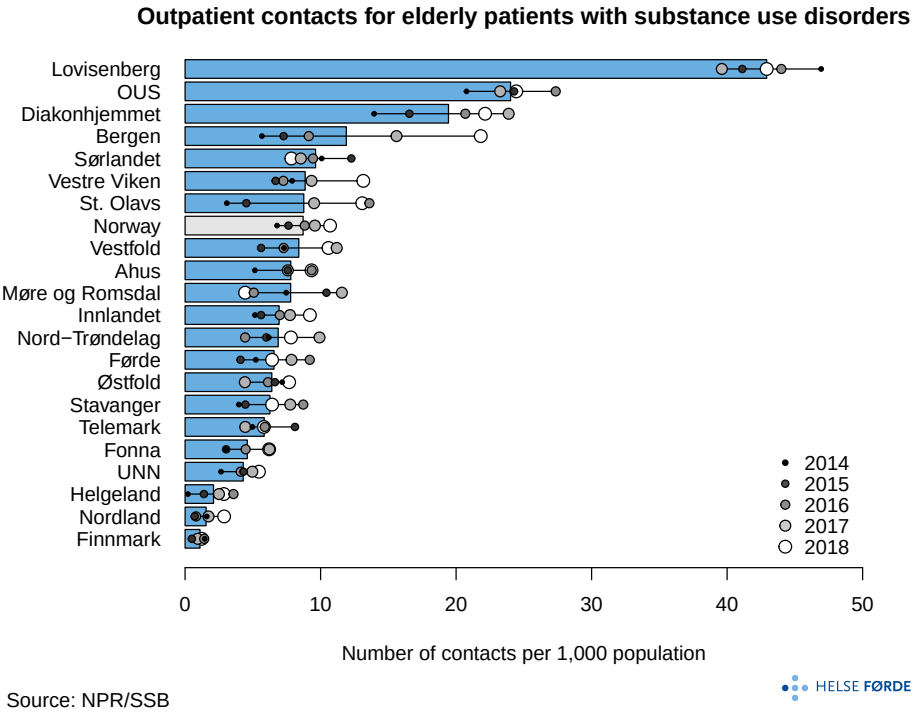

Figure 4.42: Contact rates, elderly patients with substance use disorder receiving outpatient treatment. Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

nearly 3 for the OUS and Diakonhjemmet areas. Many hospital referral areas elsewhere in the country had patient rates of about 1 or under 1 on average per year. The areas with fewest elderly patients with substance use disorder per 1,000 population were found in Northern Norway (Figure 4.41). The patient rate for Norway as a whole increased slightly between 2014 and 2018. There was very high variation in patient rates between hospital referral areas. The rates for some areas were based on relatively small numbers, and random variation could give rise to uncertainty regarding the rates for these hospital referral areas. However, the confidence intervals show that that the variation exceeded random variation (Figure 4.41 and Table 4.17).

Table 4.11: Outpatient treatment of elderly patients with substance use disorder. Includes contacts with mental healthcare and interdisciplinary specialised addiction services. Number of contacts, number of patients and contacts per patient, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to elderly people aged 65 years and older.

Hospital referral area	Number of contacts	Number of patients	Contacts per patient
Bergen	790	87	9.1
OUS	765	87	8.8
Lovisenberg	450	52	8.7
Møre og Romsdal	364	42	8.6
Sørlandet	471	60	7.8
Vestre Viken	710	93	7.6
St. Olavs	441	62	7.2
UNN	145	20	7.1
Vestfold	352	51	6.9
Innlandet	537	79	6.8
Ahus	617	91	6.8
Diakonhjemmet	425	63	6.7
Østfold	344	52	6.6
Nord-Trøndelag	172	30	5.7
Førde	128	24	5.3
Helgeland	32	7	4.9
Stavanger	295	61	4.8
Fonna	139	31	4.5
Telemark	193	45	4.3
Nordland	40	11	3.6
Finnmark	15	6	2.4
Norway	7,425	1,052	7.1

Contact rates For elderly patients with substance use disorder, we found nearly 7,500 outpatient contacts per year for Norway as a whole (Table 4.11). The contact rate for Norway as a whole increased from 6.8 to 11 during the period 2014–2018, averaging 8.7. The contact rate was highest by far for elderly people in the Oslo area, with a rate of 43 per year on average for Lovisenberg hospital referral area. We see, just as with the outpatient contact rate for severe mental disorders, that the highest rates in each health region were found in the hospital referral areas with the biggest cities; in Western Norway in the Bergen area (12), in Central Norway in the St. Olavs area (8.8), and in Northern Norway in the UNN area (4.3). The contact rates were lowest by far in the hospital referral areas under Northern Norway RHA, and we found that the Finnmark area had a contact rate of 1.1 (Figure 4.42). The variation was very high. This finding must be interpreted in light of the fact that the rates are based on a small number of patients (Table 4.17).

The number of *contacts per patient* with substance use disorder was 9.1 for elderly in the Bergen area, while patients in Finnmark had an average of 2.4 contacts per year (Table 4.11).

In Norway, 74% of contacts for elderly patients with substance use disorder as a primary or secondary diagnosis during the period 2014–2018 took place in the sector interdisciplinary specialised addiction treatment (TSB), while 23% of contacts were with mental healthcare services. [21]

Elderly patients from 15 of the hospital referral areas had between 70% and 90% of their outpatient contacts with TSB. In Finnmark hospital referral area, TSB only accounted for 14% of the contacts of elderly patients with substance use disorder, while the rest of the contacts were with the mental healthcare services. This group of patients had relatively few outpatient contacts with specialists in private practice under public funding contracts.

Severe mental disorders

During the period 2014–2018, about 2,100 elderly patients with severe mental disorders per year had at least one outpatient contact with the sectors of mental healthcare services, interdisciplinary specialised addiction services or mental healthcare specialists in private practice under public funding contracts (Table 4.12). See Appendix B for the definition of severe mental disorders.

Patient rates The Oslo region had the highest number of elderly patients with severe mental disorders with 7.6 outpatients per 1,000 population in the Lovisenberg area, more than 5 in the Diakonhjemmet area and 4.0 in the OUS area. The lowest patient rates were found in the hospital referral areas of Helgeland, Østfold and Nordland, which had an average of approximately one patient with a severe mental disorder per 1,000 population per year in contact with the specialist health services. The variation in patient rates was very high, and exceeded what can be explained by chance (Figure 4.43 and Table 4.17).

Contact rates In Norway as a whole, there was an average of just under 20,000 outpatient contacts per year with elderly patients with severe mental disorders (Table 4.12). The number of outpatient contacts per 1,000 population remained stable during the period 2014–2018, with an average rate per year of 23 (Figure 4.44).

Lovisenberg hospital referral area had the highest outpatient contact rate by far for elderly patients with an average of 148 outpatient contacts per 1,000 population per year. The Lovisenberg area also had a clear increase in contact rate per year for this patient group. The contact rates were also relatively high for elderly residents in the areas of Diakonhjemmet (77) and OUS (40). The hospital referral areas with the highest outpatient contact rates for elderly patients with severe mental disorders in the other regions were: Bergen (32) in Western Norway, St. Olavs (27) in Central Norway and UNN (14) in Northern Norway. These are the hospital referral areas that are home to their region's biggest city. Six of the hospital referral areas in Norway had particularly low contact rates at between 6 and 12 outpatient contacts per elderly inhabitant (Figure 4.44). There was very high variation in outpatient contact rates for elderly patients with severe mental disorders.

Contacts per patient Elderly patients in Lovisenberg hospital referral area had nearly 20 contacts per patient per year during the period 2014–2018. The area where elderly patients with severe mental disorders had the fewest contacts was Finnmark (3.0) (Table 4.12).

[21] If we look at substance use disorders as a primary diagnosis separately, we found that 83% of contacts were registered under TSB, and 14% under mental healthcare services.

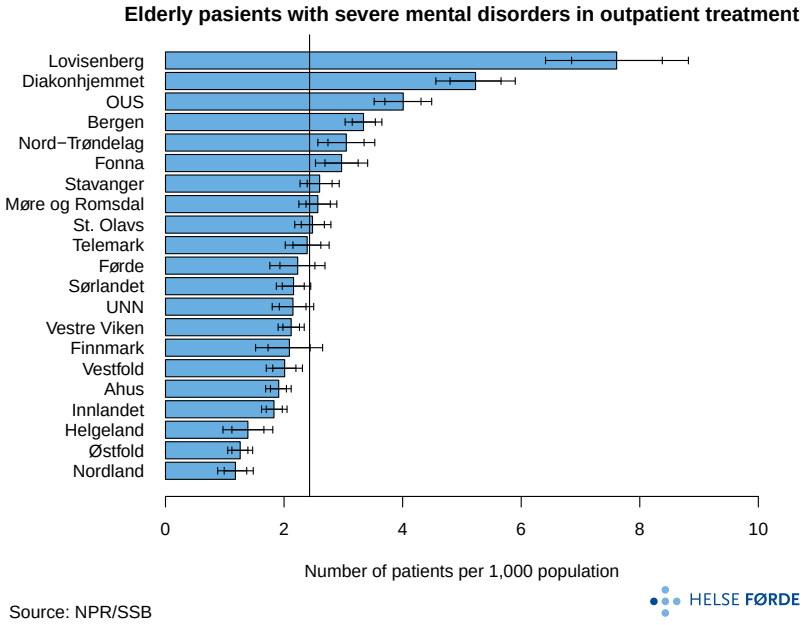

Figure 4.43: Patient rates, elderly patients with severe mental disorders receiving outpatient treatment. Number of elderly patients (65 years and older) with severe mental disorders (SMD) per 1,000 population broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

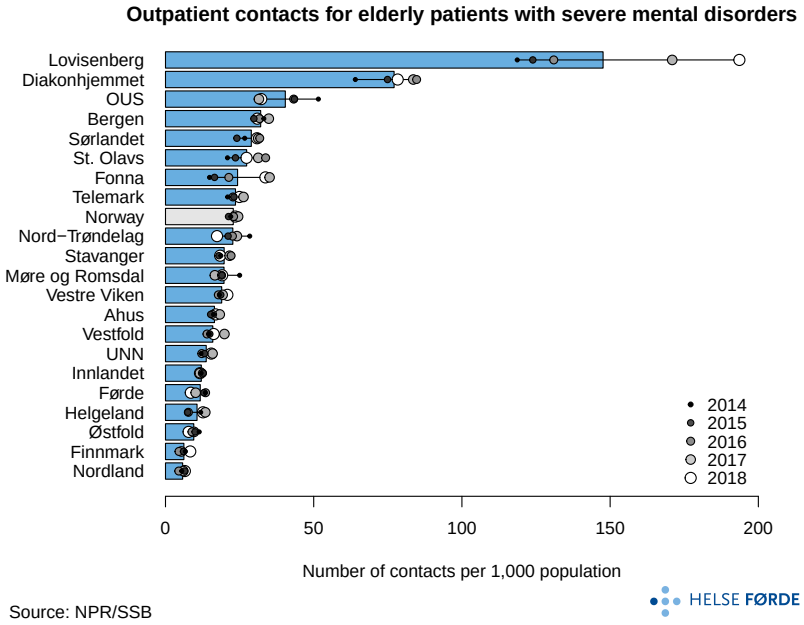

Figure 4.44: Contact rates, elderly patients with severe mental disorders receiving outpatient treatment. Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Table 4.12: Outpatient treatment of adults with severe mental disorders. Includes contacts with mental healthcare and interdisciplinary specialised addiction services. Number of contacts, number of patients and contacts per patient, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to elderly people aged 65 years and older.

Hospital referral area	Number of contacts	Number of patients	Contacts per patient
Lovisenberg	1,560	78	19.9
Diakonhjemmet	1,728	117	14.8
Sørlandet	1,421	106	13.4
St. Olavs	1,369	124	11.0
Telemark	795	80	10.0
OUS	1,314	132	9.9
Bergen	2,143	225	9.5
Vestre Viken	1,542	172	8.9
Ahus	1,299	150	8.6
Fonna	728	89	8.2
Vestfold	668	84	7.9
Østfold	515	68	7.6
Stavanger	914	120	7.6
Helgeland	160	21	7.6
Møre og Romsdal	927	123	7.6
Nord-Trøndelag	571	77	7.4
Innlandet	937	143	6.6
UNN	456	71	6.4
Førde	236	44	5.3
Nordland	145	30	4.9
Finnmark	79	26	3.0
Norway	19,507	2,074	9.4

DPC and RHA areas [22]

Of the ten DPC referral areas with the highest outpatient contact rate for elderly patients, seven were in the South-Eastern Norway health region, two in Western Norway and one in Central Norway. Eight of the ten DPC referral areas with the lowest outpatient contact rate for elderly patients per year during the period 2014–2018 were in the Northern Norway health region (Figures 4.45 and 4.46). There was very high variation in elderly patients' use of outpatient services in mental healthcare and substance abuse treatment, including if DPC referral areas are taken into account (Table 4.16). The highest internal variation in a region was found in South-Eastern Norway RHA's area.

If we look at the outpatient contact rates for elderly patients by region, the highest average rate per year was found in South-Eastern Norway RHA's area (135). Elderly patients from Central Norway RHA's area had an outpatient contact rate of 115 per year, while the average rates for Western Norway RHA and Northern Norway RHA were 107 and 63, respectively, per year. The average outpatient contact rate for elderly patients was markedly lower in the Northern Norway health region compared with other parts of Norway, and lower than the lowest rate found in the Western Norway health region (Figure 4.46).

Northern Norway RHA. Broken down by DPC referral area, the outpatient contact rate varied from 128

[22] Patients are assigned to the DPCs' and RHAs' 'catchment areas' on the basis of which municipality or city district they are resident in, regardless of where they received treatment.

for elderly patients in and around the city of Tromsø (Tromsø og omegn) to 33 in the Øst-Finnmark area (Figure 4.46).

Central Norway RHA. The highest rate we found for elderly patients was in Levanger DPC referral area with 166 outpatient contacts per 1,000 population, the lowest was in the Orkdal area (53) (Figure 4.46).

Western Norway RHA. The highest number of contacts was found in Kronstad DPC referral area with 216 per 1,000 population, and the areas with the lowest numbers were Førde (64) and Indre Sogn (65) (Figure 4.46).

South-Eastern Norway RHA. Outpatient contact rates for elderly patients varied from 413 in Lovisenberg DPC referral area to 52 in the Nordre Østfold area on average per year (Figure 4.46).

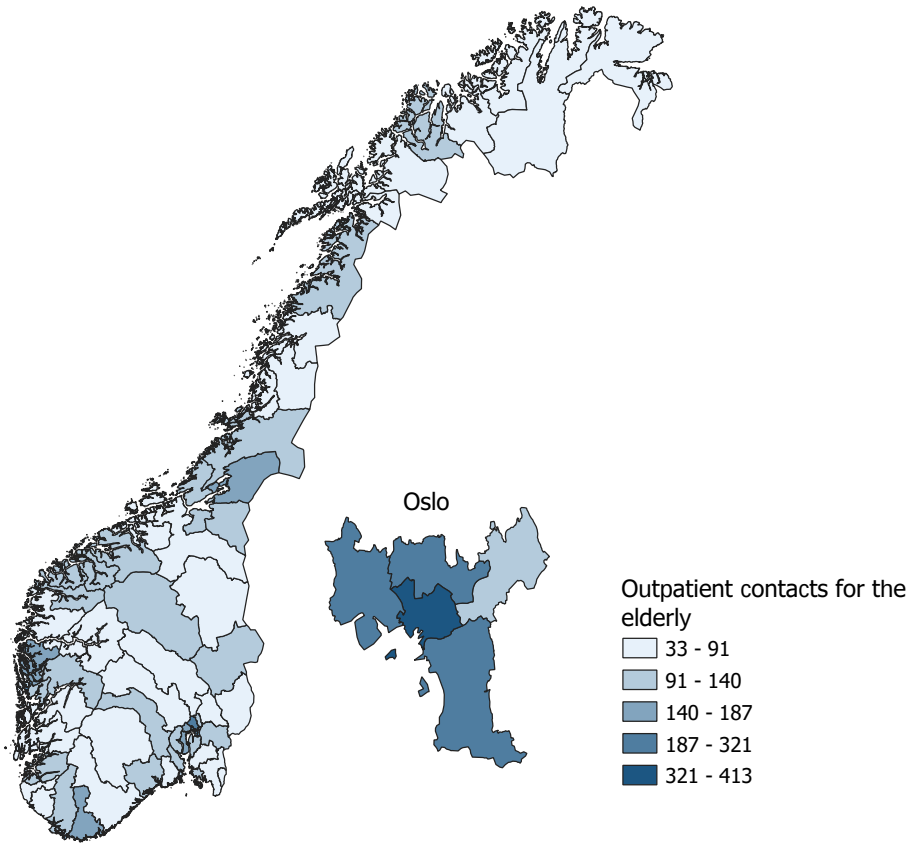

Figure 4.45: Contact rates broken down by DPC referral area and RHA. Outpatient treatment for elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services. Number of contacts per 1,000 population, broken down by DPC referral area. The map shows average values per year for the period 2014–2018. The rates have been adjusted for age and gender.

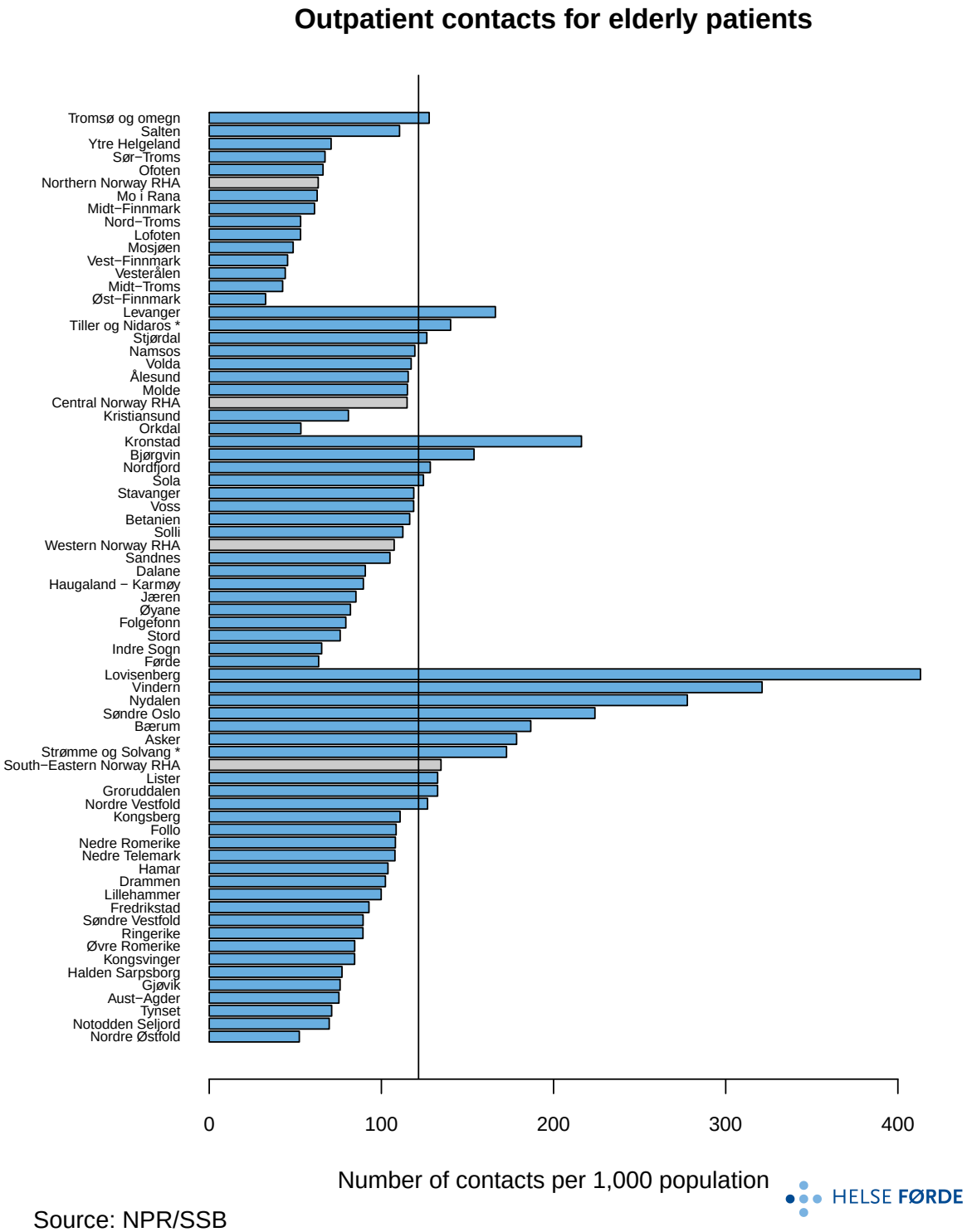

Figure 4.46: Contact rates broken down by DPC referral area and RHA. Outpatient treatment for elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services. Number of contacts per 1,000 population, broken down by DPC referral area and for Norway as a whole. The bars show average values per year for the period 2014–2018. The rates have been adjusted for age and gender. Asterisks indicate that areas have been combined, see Appendix B.

4.3.2 Main findings - outpatient treatment for elderly patients

- There was very high variation in outpatient treatment for elderly patients. The contact rates varied between hospital referral areas from 44 to 413 on average per year. Elderly patients in the Northern Norway health region had a markedly lower outpatient contact rate compared with other parts of Norway, and the region with the highest rate was South-Eastern Norway. Oslo had the highest contact rate, patient rate and number of outpatient contacts per patient. Elderly patients in Lovisenberg hospital referral area had about four times as many outpatient contacts per year as elderly patients in the Finnmark area. The use of specialists in private practice under public funding contracts was also high in Oslo.
- When we studied patients with substance use disorder separately from the rest of the group of elderly patients receiving outpatient treatment, we were left with a small group of patients, but found that the variation in their use of outpatient services was very high. Elderly patients in Lovisenberg hospital referral area had 43 contacts per 1,000 population per year, compared with 1 contact per 1,000 population in the Finnmark area. Both the contact rates and patient rates were clearly highest in Oslo and lowest in Northern Norway. Elderly patients from the Lovisenberg area had nearly four times as many outpatient contacts per patient as those from the Fonna area.
- We also found very high variation when we studied patients with severe mental disorders separately from the rest of the group of elderly patients receiving outpatient treatment, as the contact rate per year varied from 6 to 148 between hospital referral areas. Again, Oslo had the highest patient rates. On average, elderly patients with severe mental disorders resident in the Lovisenberg area had nearly seven times more contacts per patient per year than residents of Finnmark hospital referral area.
- The contact rate was lower for elderly patients (122) than for adults (696) and children and adolescents (517). There was also greater variation between hospital referral areas for elderly patients than for the other age groups.

The elderly patient group totalled just under 15,000 patients, but showed high variation in patient rates between hospital referral areas. Such pronounced and high variation in outpatient treatment of patients with severe disorders gives reason to suspect that services are underused in some parts of Norway, and the variation is deemed to be unwarranted.

4.3.3 Inpatient treatment

Patient rates If we break down the data by hospital referral area, we find that, at an average of 8.2 patients per 1,000 population per year, the patient rate for admissions was significantly higher for elderly patients from Lovisenberg hospital referral area than for patients from other parts of Norway. The Bergen area had a patient rate of 5.7, while many hospital referral areas had rates of between 4 and 5 per year during the period 2014–2018. The lowest patient rate for elderly patients receiving inpatient treatment was found in the hospital referral areas of Vestfold and Ahus (3.6). The variation in patient rates exceeded random variation. However, there was not a great deal of variation between hospital referral areas (Figure 4.47 and Table 4.19).

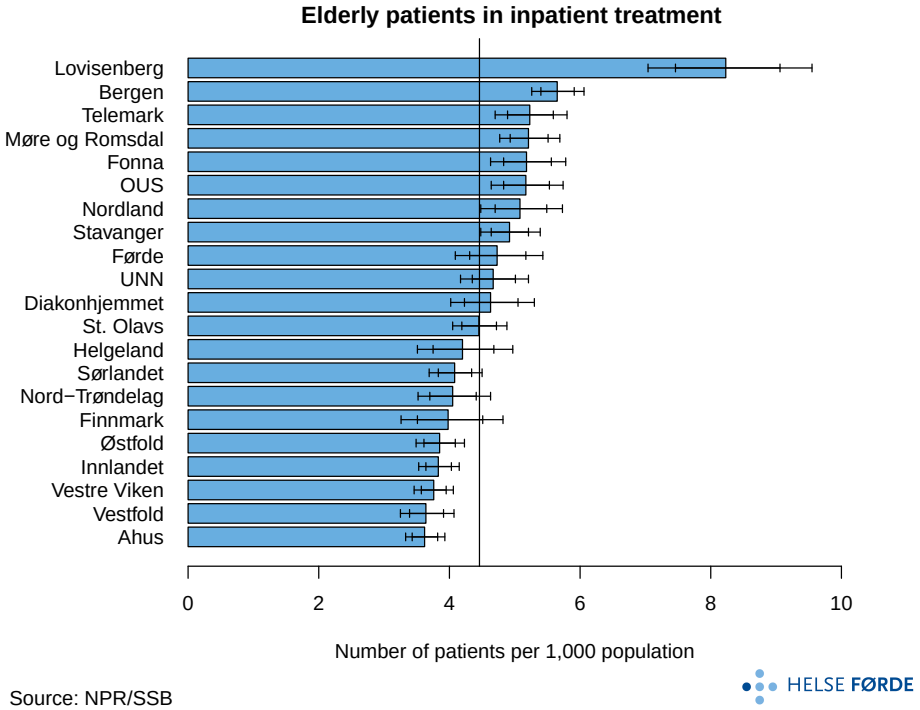

Figure 4.47: Patient rates for inpatient treatment in mental healthcare and interdisciplinary specialised addiction services: Number of elderly patients (65 years and older) per 1,000 population, broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

Admission rates For Norway as a whole, elderly patients had a total of 5,600 admissions per year during the period 2014–2018 in mental healthcare or interdisciplinary specialised addiction services (Table 4.13). The admission rate remained stable during the period, with an average rate of 6.6 admissions per 1,000 population per year.

If we look at the average values for the five-year period, elderly patients in Lovisenberg hospital referral area, at 13, had the most admissions per 1,000 population by far. The admission rate for 2017 pulled the area's average up. The lowest average admission rates we found for elderly patients were in the areas of Ahus (4.7) and Vestfold (4.6) (Figure 4.48). There was moderate variation in admission rates for elderly patients (Table 4.18).

Day rates Elderly patients in Norway spent an average of 181 days in an institution per 1,000 population per year during the period 2014–2018. Figure 4.49) shows that the day rate was highest in the biggest urban areas. The day rates varied from 353 in Lovisenberg hospital referral area to 111 in the Vestfold

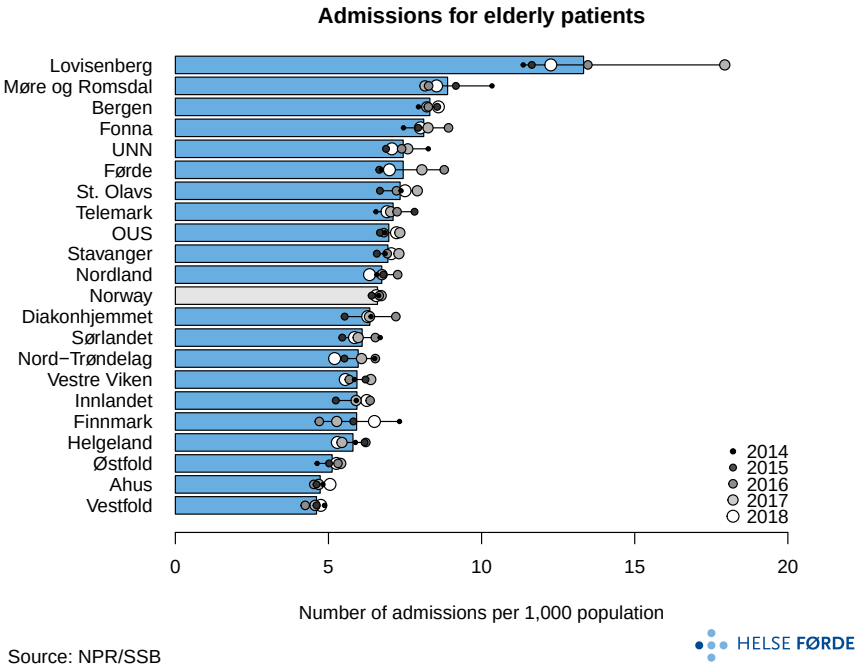

Figure 4.48: Admission rates for inpatient treatment of elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services: Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

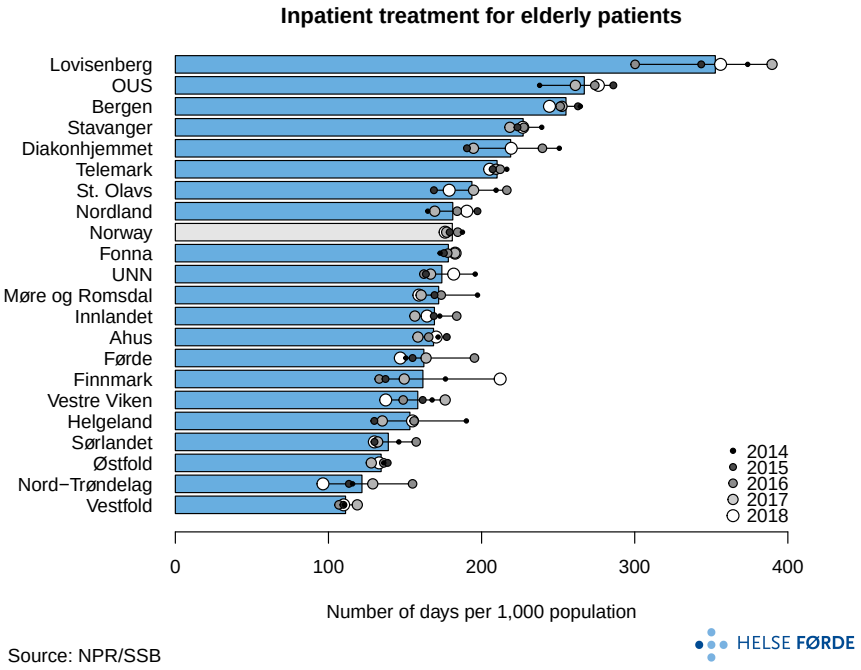

Figure 4.49: Day rates for elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services: Number of days per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

area. The national rate remained stable during the period, while we found the highest variation between years in the Lovisenberg area, and a clear increase in the day rate for the Finnmark area in 2018.

Duration of admissions (days per admission) We found the longest admissions in the Oslo region, in the hospital referral areas of OUS, Ahus and Diakonhjemmet, all of which had an average of well over 30 days per admission. The average duration of the admissions of elderly patients from Møre og Romsdal and Nord-Trøndelag hospital referral areas was just under 20 days per admission (Table 4.13).

Table 4.13: Inpatient treatment of elderly patients in mental healthcare and interdisciplinary specialised addiction services. Number of patients, days, admissions and days per admission, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to elderly people aged 65 years and older.

Hospital referral area	Number of patients	Number of days	Number of admissions	Days per admission
OUS	171	8,915	230	38.8
Ahus	281	13,066	370	35.3
Diakonhjemmet	102	4,807	141	34.2
Stavanger	228	10,479	322	32.6
Bergen	383	17,305	561	30.8
Telemark	175	7,017	238	29.5
Innlandet	299	13,212	464	28.5
Finnmark	51	2,068	76	27.3
Nordland	130	4,618	172	26.9
Lovisenberg	85	3,708	139	26.8
Vestre Viken	305	12,901	483	26.7
Helgeland	65	2,345	89	26.4
St. Olavs	222	9,650	367	26.3
Østfold	205	7,190	275	26.2
Vestfold	152	4,655	193	24.1
UNN	154	5,761	246	23.4
Sørlandet	199	6,791	298	22.8
Fonna	156	5,372	244	22.0
Førde	97	3,288	152	21.7
Nord-Trøndelag	102	3,071	151	20.3
Møre og Romsdal	250	8,180	426	19.2
Norway	3,813	154,398	5,634	27.4

Where did elderly patients receive inpatient treatment?
Of all admissions for elderly patients, 92% took place at an institution in the hospital referral area in which the patient was resident (Figure 4.50). Elderly patients from Helgeland, Finnmark and Lovisenberg hospital referral areas were particularly likely to receive inpatient treatment outside their area. The fact that elderly patients from these areas had a high percentage of admissions outside the hospital referral area where they lived can be due to the division of functions both within Northern Norway RHA (see Chapter 4.2.3) and in Oslo. The Department of Geriatric Psychiatry at Diakonhjemmet Hospital also treats elderly patients from the Lovisenberg area.

When admissions were broken down by private and public institutions, we found that most of the elderly patients' mental healthcare or substance abuse treatment admissions were with public service providers, i.e. in institutions operated by the health trusts. For Norway as a whole, this accounted for

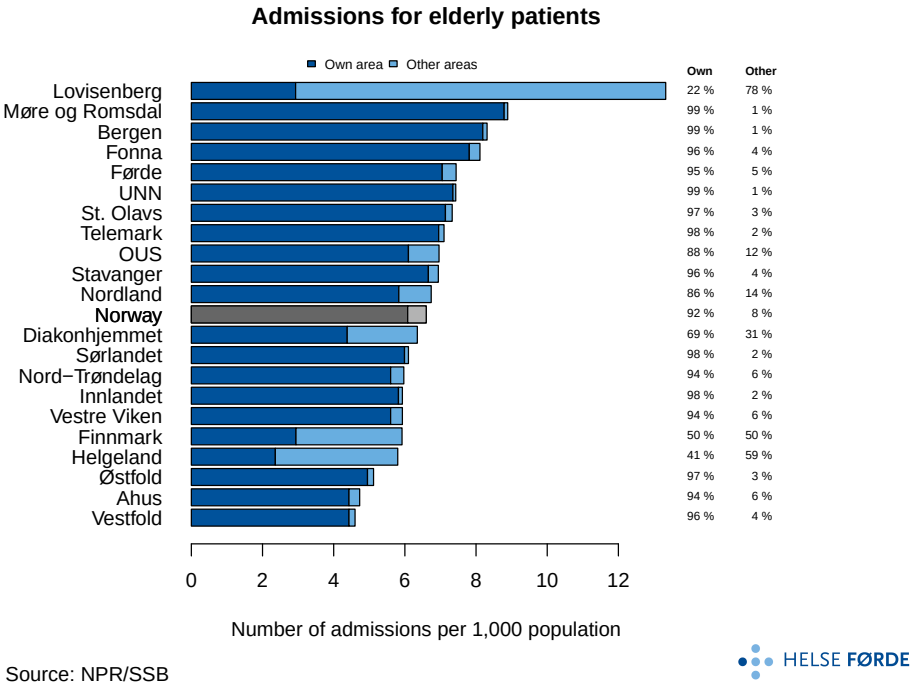

Figure 4.50: Admission rates, broken down by treatment in own or other hospital referral area: Number of admissions per 1,000 population (65 years and older), broken down by hospital referral area and for Norway as a whole. The bars show the average value per year for the period 2014–2018 with the percentage distribution broken down by where the patients received treatment. The rates have been adjusted for age and gender.

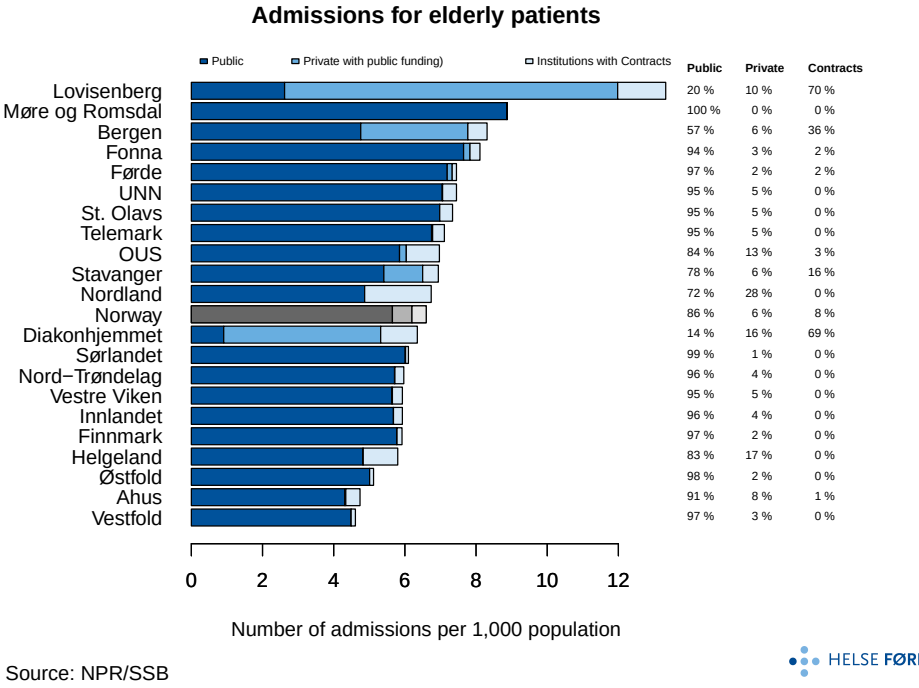

Figure 4.51: Admission rates, broken down by treatment in public or private institution: Number of admissions per 1,000 population (65 years and older), broken down by hospital referral area and for Norway as a whole. The bars show the average value per year for the period 2014–2018 with the percentage distribution broken down by where the patients received treatment. The rates have been adjusted for age and gender.

86% of all admissions (Figure 4.51). As for adult patients, the areas where we found some admissions with private service providers operating under public funding contracts were Bergen and Stavanger, in addition to Lovisenberg and Diakonhjemmet. For the latter, the findings indicate that elderly patients were treated in the health trusts' own institutions or institutions with a corresponding public funding agreement. The highest percentages for institutions with service procurement contracts were found in Nordland, Helgeland and the hospital referral areas in the Oslo region. When we looked at elderly patients with substance use disorder separately, we found that none of the admissions for patients from Møre og Romsdal hospital referral area were in institutions with service procurement contracts, while elderly patients with substance use disorder from the Bergen area had 47% of their admissions in such an institution.

Substance use disorder

Patient rates During the period 2014–2018, just under 600 elderly patients with substance use disorder per year in Norway had at least one admission in mental healthcare or interdisciplinary specialised addiction services (Table 4.14). The Oslo region had the highest number of elderly patients with substance use disorder per 1,000 population in inpatient treatment with patient rates of 2.8 (Lovisenberg area), 1.4 (OUS area) and 1.2 (Diakonhjemmet area). Other parts of the country had relatively few elderly patients with substance use disorder receiving inpatient treatment, with patient rates lower than 1 patient per 1,000 population. The patient rates' wide confidence intervals show that the patient samples were small and that there could be a significant element of random variation. Nevertheless, we see that the Oslo region consistently had higher patient rates than other parts of Norway (Figure 4.52).

The *admission rate* for elderly patients with substance use disorder was consistently low for Norway as a whole during the period 2014–2018, with an average of only one admission per 1,000 elderly population per year (Figure 4.53). The admission rate for elderly patients with substance use disorder was considerably higher in the Oslo region than in the rest of Norway. In Lovisenberg hospital referral area, elderly patients with substance use disorder had an average of 4.2 admissions per 1,000 population per year. The admission rates for elderly patients in the OUS and Diakonhjemmet areas were 2.1 and 1.9, respectively, on average per year. There was high variation between hospital referral areas' admission rates for elderly patients with substance use disorder (Table 4.18).

Duration of admissions Elderly patients with substance use disorder from three hospital referral areas in the Northern Norway health region had the longest admissions during the period 2014–2018, and the Helgeland area averaged more than 40 days per admission. We found that Central Norway RHA had the shortest admissions. On average, elderly patients' admissions in this region lasted for 20 or fewer days per admission (Table 4.14).

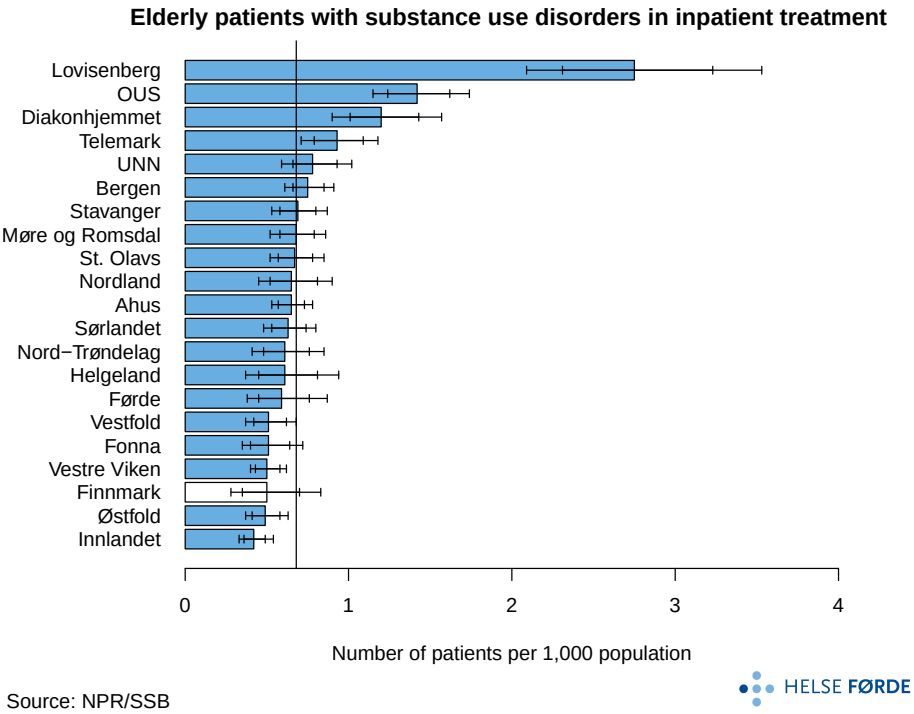

Figure 4.52: Patient rates, elderly patients with substance use disorder receiving inpatient treatment. Number of adults (65 years and older) with substance use disorder per 1,000 population broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender. Finnmark: The calculation is based on fewer than 40 unique patients, and this makes the rate uncertain.

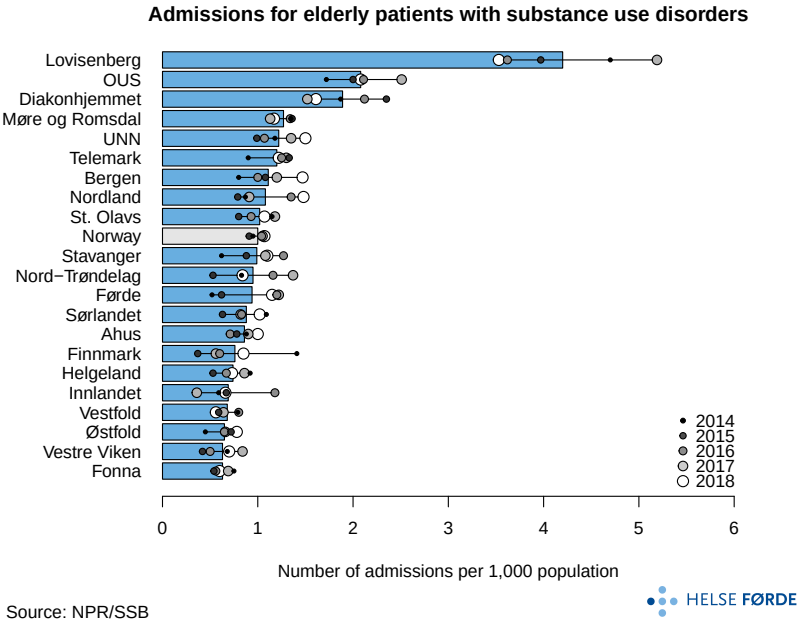

Figure 4.53: Admission rates, elderly patients with substance use disorder receiving inpatient treatment. Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Table 4.14: Inpatient treatment for elderly patients with substance use disorder. Includes admissions in mental healthcare and interdisciplinary specialised addiction services. Number of patients, days, admissions and days per admission, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to elderly people aged 65 years and older.

Hospital referral area	Number of patients	Number of days	Number of stays	Days per stay
Helgeland	9	472	11	42.1
Finnmark	7	315	10	30.8
Nordland	17	849	28	30.5
Innlandet	33	1,627	53	30.5
Vestre Viken	40	1,417	50	28.3
Lovisenberg	29	1,220	46	26.5
Diakonhjemmet	26	1,090	42	26.2
Telemark	31	1,046	40	26.2
Stavanger	32	1,193	47	25.6
UNN	26	1,038	41	25.3
Fonna	15	471	19	25.1
OUS	46	1,621	67	24.3
Bergen	50	1,705	74	23.2
Ahus	51	1,525	68	22.5
Førde	12	426	19	22.4
Østfold	26	785	35	22.3
Vestfold	21	613	28	22.1
Nord-Trøndelag	15	492	24	20.9
Sørlandet	31	835	43	19.5
St. Olavs	34	977	51	19.1
Møre og Romsdal	32	841	60	14.1
Norway	584	20,556	854	24.1

Severe mental disorders

During the period 2014–2018, about 1,140 elderly patients with severe mental disorders per year in Norway had at least one admission in mental healthcare or interdisciplinary specialised addition services (Table 4.15).

The highest *patient rates* per year for elderly patients with severe mental disorders were found in some of Norway's biggest cities (Figure 4.54). Each year, 3.0 elderly patients per 1,000 population from Lovisenberg hospital referral area were admitted, while several hospital referral areas had a patient rate of about one. The lowest rate was found in the Nordland area (0.9). There was high variation in patient rates (Table 4.19). The wide confidence intervals means that the patient rates were calculated based on a small number of patients. The figure (Figure 4.54) nevertheless shows that the variation in patient rates exceeds what can be explained by chance.

The *admission rate* for elderly patients with severe mental disorders for Norway as a whole remained stable during the period 2014–2018 (Figure 4.55). On average, elderly patients with severe mental disorders had 2 admissions per 1,000 population per year.

The Lovisenberg area, which had the highest average rate per year (4.3), had a markedly higher admission rate in 2017 (5.3). The hospital referral areas of Østfold, Vestfold and Nordland had the lowest patient rates and admission rates, and Nordland had a admission rate of 1.2. There was high variation in admission rates for patients with severe mental disorders (Table 4.18).

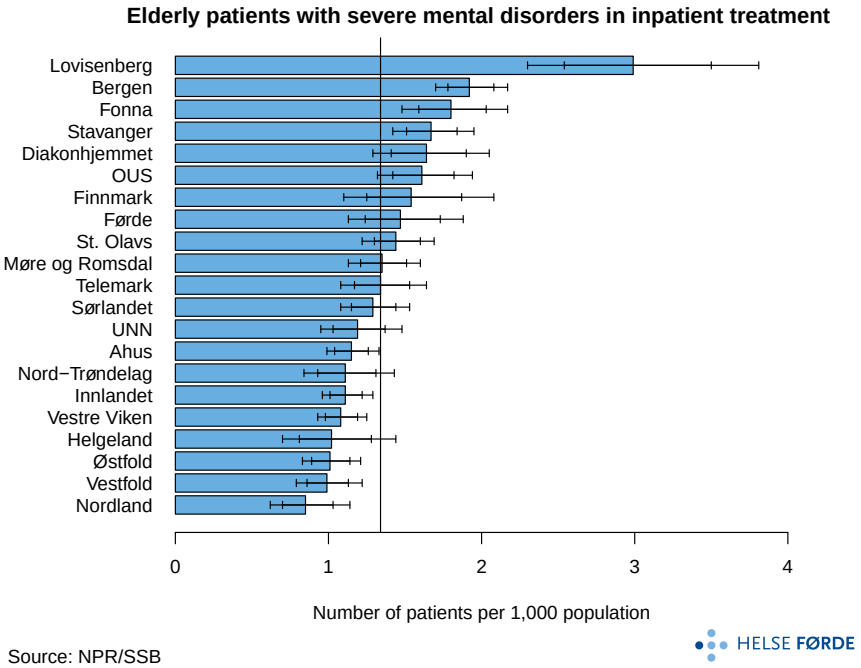

Figure 4.54: Patient rates, elderly patients with severe mental disorders receiving inpatient treatment. Number of elderly patients (65 years and older) with severe mental disorders (SMD) per 1,000 population broken down by hospital referral area. The bars show the average values per year for the period 2014–2018, with pertaining 95% and 99.8% confidence intervals. The vertical line indicates the average for Norway as a whole. The rates have been adjusted for age and gender.

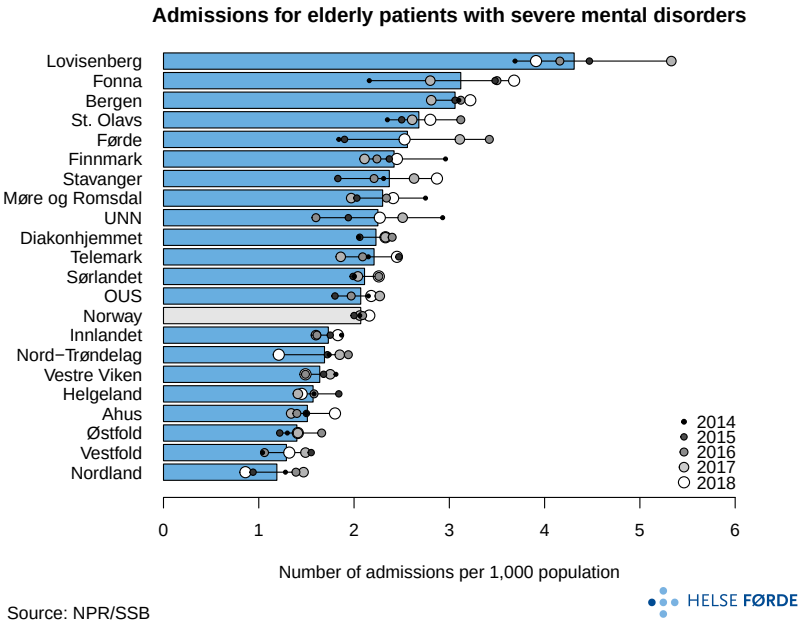

Figure 4.55: Admission rates, elderly patients with severe mental disorders receiving inpatient treatment. Number of admissions per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Table 4.15: Inpatient treatment of elderly patients with severe mental disorders. Includes admissions in mental healthcare and interdisciplinary specialised addiction services. Number of patients, days, admissions and days per admission, broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to elderly people aged 65 years and older.

Hospital referral area	Number of patients	Number of days	Number of stays	Days per stay
OUS	54	3,733	69	54.1
Diakonhjemmet	36	2,364	50	47.7
Ahus	90	5,505	118	46.6
Stavanger	77	4,598	110	41.7
Vestre Viken	88	5,056	134	37.7
Østfold	54	2,770	76	36.5
Vestfold	41	1,888	54	34.8
Bergen	130	7,119	205	34.7
Innlandet	87	4,656	135	34.4
Lovisenberg	31	1,549	45	34.1
Telemark	45	2,523	74	34.0
St. Olavs	72	4,217	133	31.7
Finnmark	20	918	31	29.8
Nord-Trøndelag	28	1,272	43	29.7
Nordland	21	783	30	26.5
Helgeland	16	618	24	26.0
Fonna	54	2,426	93	26.0
Sørlandet	63	2,598	104	25.1
Møre og Romsdal	64	2,722	109	25.0
UNN	39	1,835	74	24.9
Førde	30	1,193	52	22.9
Norway	1,141	60,345	1,764	34.2

Duration of admissions Elderly patients with severe mental disorders from the Diakonhjemmet and OUS areas in Oslo had markedly longer admissions, with up to 54 days per admission. Elderly patients from Førde hospital referral areas had the shortest admissions, averaging 23 days per admission per year during the period 2014–2018 (Table 4.15).

DPC referral areas and RHA areas

Elderly patients from the DPC referral areas of Lovisenberg (13) and Ålesund (11) had by far the most admissions in institutions per 1,000 population per year during the period 2014–2018 (Figures 4.56 and 4.57). Five of the ten DPC referral areas with the highest admission rates were in the Western Norway health region. The lowest admission rate found was for elderly patients from Mosjøen DPC referral area (3.5). There was moderate variation between DPC referral areas (Table 4.18)

If we look at the admission rates by region, we found that the average admission rate for elderly patients from Western Norway RHA's area was 7.7 admissions per 1,000 population per year. The corresponding rates for elderly patients from other health regions were 7.4 for Central Norway, 6.4 for Northern Norway and 6.1 for South-Eastern Norway (Figure 4.57).

Northern Norway RHA. Elderly patients from Tromsø og omegn DPC referral area had the highest admission rate (8.4), while the area with the lowest rate for elderly patients was Mosjøen (3.5) (Figure 4.57).

Central Norway RHA. Ålesund DPC referral area stood out with the highest average number of admissions

in institutions (10.8) per 1,000 population per year for elderly patients. The Namsos area had a admission rate of 5.8 (Figure 4.57).

Western Norway RHA. Admission rates varied from 9.4 in Førde DPC referral area to 4.4 in the Indre Sogn area (Figure 4.57).

South-Eastern Norway RHA. Lovisenberg DPC referral area (13) had the highest admission rate for elderly patients by far, while elderly patients from the Follo area had the lowest number of admissions in an institution per 1,000 population (3.9) (Figure 4.57).

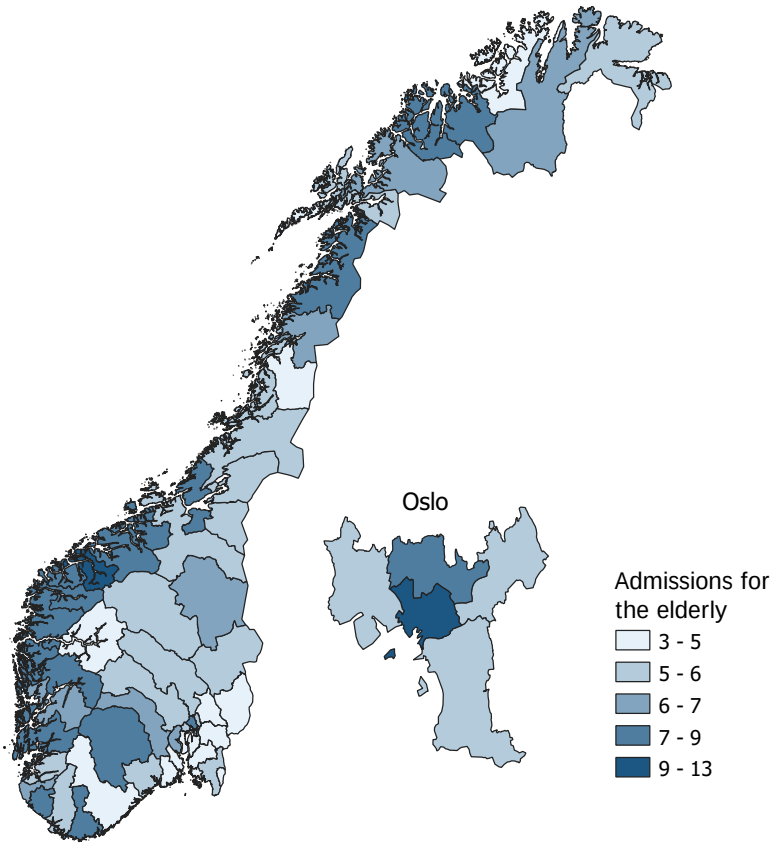

Figure 4.56: Admission rates broken down by DPC referral area and RHA. Inpatient treatment for elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services. Number of admissions per 1,000 population, broken down by DPC referral area. The map shows average values per year for the period 2014–2018. The rates have been adjusted for age and gender.

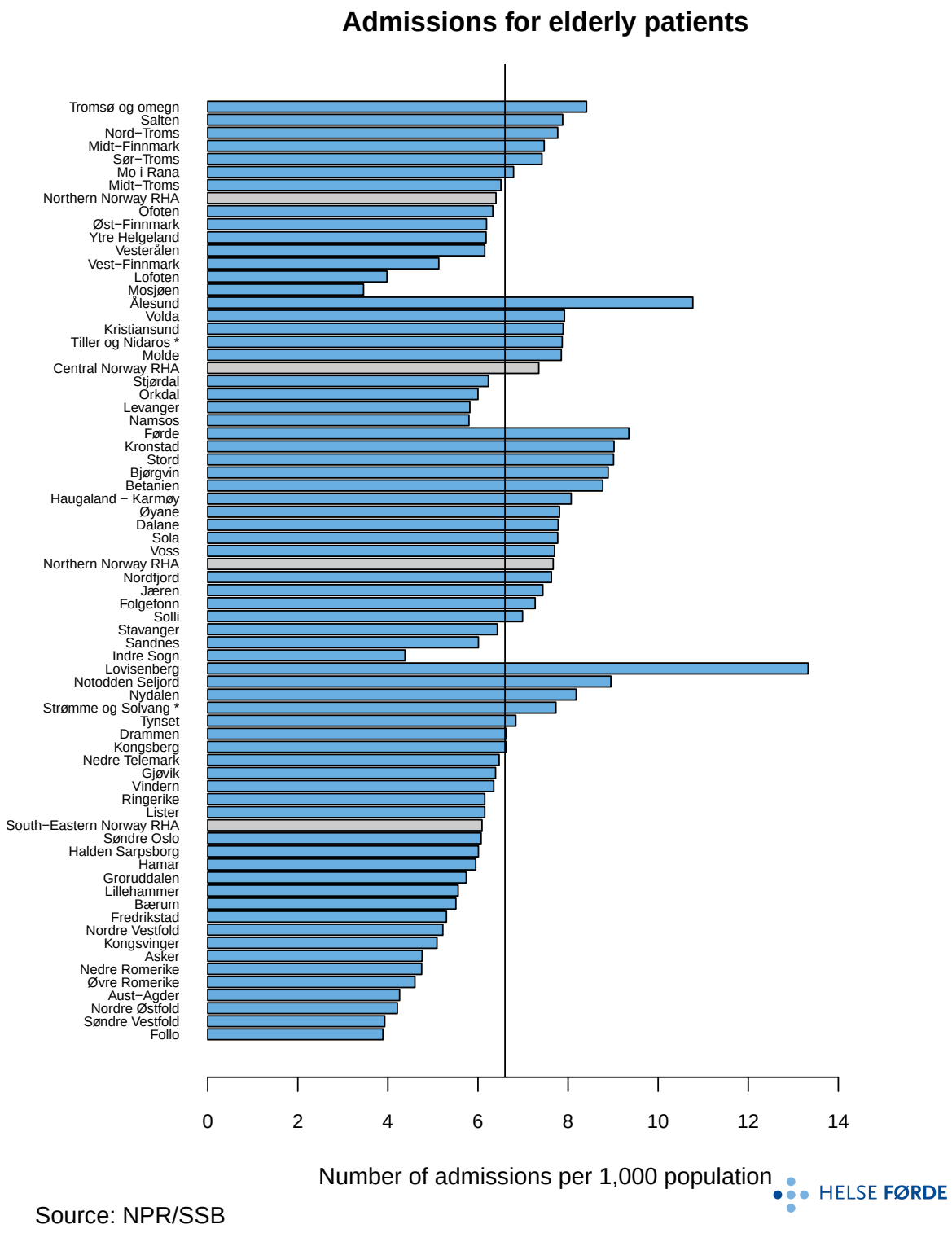

Figure 4.57: Admission rates broken down by DPC referral area and RHA. Inpatient treatment for elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services. Number of admissions per 1,000 population, broken down by DPC referral area and for Norway as a whole. The bars show average values per year for the period 2014–2018. The rates have been adjusted for age and gender. Asterisks indicate that areas have been combined, see Appendix B.

4.3.4 Main findings - inpatient treatment for elderly patients

- The variation in admission rates was moderate for elderly patients as a group. Admission rates varied from 5 to 13 on average per year between hospital referral areas, with Western Norway RHA having the highest admission rates. The admission rate is the number of admissions per 1,000 population. Elderly patients from the OUS area had twice as long admissions as those from Møre og Romsdal.
- When we studied patients with substance use disorder separately from the rest of the group of elderly patients receiving inpatient treatment, we found high variation in admission rates. Few elderly patients with substance use disorder received inpatient treatment except in the Oslo region, and the variation should be interpreted with this in mind. The hospital referral areas' admission rates varied between 0.6 and 4.2 on average per year.
- We also found high variation between hospital referral areas when we studied patients with severe mental disorders separately from the rest of the group of elderly patients receiving inpatient treatment, with admission rates varying from 1 to 4 per year. The average length of admissions in the OUS area was more than twice that in the Førde area.

We have concluded that the variation in elderly patients' use of inpatient treatment for severe mental disorders was high and unwarranted. There was high variation in admission rates for patients with substance use disorder as well, but the scope of inpatient treatment was limited. The admission rates could therefore have a greater element of random variation, which increases the level of uncertainty associated with the rates. Inpatient treatment in mental healthcare and substance abuse services for elderly patients is an area where there are strong grounds for suspecting that the population is not receiving equitable services.

4.3.5 Overall assessment for elderly patients

The differences between the Oslo region and the rest of Norway as regards the prevalence of mental illness or substance use disorders are not known to be greater among the elderly than among adults (Folkehelseinstituttet, 2018b). However, there was considerably higher variation in the use of specialist health services in the area of mental healthcare and substance abuse treatment among the elderly. The variation was very high for outpatient treatment, with the highest use found in South-Eastern Norway and the lowest in Northern Norway. Elderly patients from Oslo received more comprehensive services than elderly patients from other parts of Norway. This variation between different parts of Norway appeared not to be due to differences in patients' needs alone, but also to differences in the available services (see also Chapter 5.2). We have therefore deemed the variation between hospital referral areas in elderly patients' use of mental healthcare, interdisciplinary specialised addiction services and mental healthcare specialists in private practice under public funding agreements, to be unwarranted. This conclusion applies to elderly patients as a group, as well as to elderly patients with severe mental disorders and with substance abuse disorder considered separately.

4.4 Assessment of variation

We have used several methods in our assessment of the variation in the use of these health services between the hospital referral areas and DPC referral areas, as there is no one recommended method. We have looked at the ratios between the highest and lowest rates (FT), between the second highest and second lowest rates (FT2), and between the third highest and third lowest rates (FT3), in addition to the coefficient of variation (CV), the systematic component of variation (SCV), the volume (the number of patients, outpatient contacts, admissions etc. on which our analyses are based), and stability in the rates per year, and we have exercised discretion. The methods are described in Chapter 4.6 of the Orthopaedic Healthcare Atlas for Norway. [23]

However, the analyses in this healthcare atlas differ from those in the Orthopaedic Healthcare Atlas in that confidence intervals are only used for patient rates. The reason for this is that the variables for outpatient and inpatient treatment are dependent, meaning that a patient can have more than one outpatient contact or admission per year. Dependent events have been taken into account when calculating SCV (Cain & Diehr, 1992), and in order to exclude extreme values, we have calculated the SCV after excluding the highest and lowest rates from the analyses (McPherson et al., 1982). It is these SCV values that are shown in Tables 4.16, 4.17, 4.18 and 4.19, together with other statistics on which the assessments are based.

When using SCV, we can categorise the scale of variations as follows: SCV < 3 low, insignificant, 3–5.4 moderate, 5.4–10 high, > 10 very high. These categories have been used in several studies, including (Murphy et al., 2017). We have taken these categories into account and used adjectives from *low* to *very high*, but we have also considered whether the values arrived at by means of the other methods point in the same direction before concluding.

The confidence interval (CI) indicates how much random variation can be expected, and describes the uncertainty that stems from natural variation in the surrounding world. In figures showing patient rates, we have included the confidence interval for the rate for each hospital referral area. In such cases, the rate for Norway as a whole (the national rate) is indicated by a vertical line to make it easier to compare hospital referral areas and assess variation. This must not be interpreted to mean that the national rate is the correct level and that it is wrong to be significantly above or below it. The national rate is only used as an aid to assessing the scale of variation and whether it is greater than we would expect based on chance. The rates for hospital referral areas with a large population and a high number of patients will not be affected much by random variation, so the confidence interval of such rates will be quite narrow. The rates for areas with a smaller population and fewer patients will be more susceptible to chance, and will therefore have a wider confidence interval.

In order to be able to conclude as to whether the variation in use of the services is unwarranted, we have considered patient rates and the scope of outpatient treatment each patient has received, and we have sought knowledge about the prevalence of illness or service needs in different parts of Norway from other sources. In some cases, we have high variation in usage rates between hospital referral areas, but a small sample. Such cases will not have the same significance as they would if we also had a large sample.

[23] https://helseatlas.no/sites/default/files/rapport_ortopedi.pdf

Table 4.16: Statistical basis for assessment of variation in outpatient treatment. Average number of outpatient contacts per year for Norway as a whole, average annual contact rate for Norway with lowest and highest rates, ratios (FT), coefficient of variation (CV) and systematic component of variation (SCV) for the period 2014–2018. The rates have been adjusted for age and gender.

Outpatient	Number of contacts	Contact rate	Lowest rate	Highest rate	FT	FT2	FT3	CV	SCV
Children and adolescents	583,778	517.0	428.6	725.5	1.7	1.5	1.5	16.3	3.4
Boys	288,218	498.4	402.4	706.9	1.8	1.6	1.5	17.5	3.8
Girls	295,560	536.6	422.5	748.0	1.8	1.5	1.4	15.4	3.3
0-5 years	318,897	92.2	37.4	211.7	5.7	3.2	2.2	39.6	10.3
6-12 years	34,083	523.8	377.0	750.2	2.0	1.7	1.5	17.8	3.9
13-17 years	230,798	1005.5	731.5	1468.9	2.0	1.6	1.5	17.0	3.2
Adults	2,246,603	696.4	460.7	1229.1	2.7	1.9	1.7	25.6	3.7
Adults SUD	299,349	92.8	27.1	212.5	7.8	5.9	3.7	60.5	21.5
Adults SMD	308,145	95.5	42.6	261.9	6.1	2.3	2.0	47.1	6.2
Adults DPC	2,246 603	696.4	361.6	1229.1	3.4	3.2	2.3	25.2	4.9
18-30 years	789,023	871.4	589.2	1163.0	2.0	1.5	1.3	15.5	2.2
31-50 years	1,081 669	751.1	464.7	1431.9	3.1	2.0	1.8	30.7	4.6
51-64 years	375,911	426.0	199.2	1201.2	6.0	2.4	2.4	50.9	7.1
Elderly	103,709	121.6	43.6	413.1	9.5	5.1	3.4	67.4	19.3
Elderly SUD	7,425	8.7	1.1	42.9	39.0	15.5	9.3	96.8	17.6
Elderly SMD	19,507	22.9	5.8	147.6	25.5	12.4	4.2	112.9	41.5
Elderly DPC	103,700	121.6	32.8	413.1	12.6	7.5	6.3	57.9	19.3
65-74 years	73,956	151.5	48.9	558.4	11.4	4.9	3.7	71.5	19.4
75+ years	29,744	81.4	36.6	231.0	6.3	5.9	4.8	63.4	23.6

Table 4.17: Statistical basis for assessment of variation in outpatient treatment. Average number of patients per year for Norway as a whole, average annual patient rate with lowest and highest rates, ratios (FT), coefficient of variation (CV) and systematic component of variation (SCV) for the period 2014–2018. The rates have been adjusted for age and gender. * These rates have been calculated on the basis of a small number of patients, which may increase the element of random variation.

Outpatient	No. of patients	Patient rate	Lowest rate	Highest rate	FT	FT2	FT3	CV	SCV
Children and adolescents	49,000	43.5	36.2	58.3	1.6	1.5	1.3	12.2	3.5
Adults	180,897	56.1	47.6	83.1	1.7	1.4	1.3	13.7	1.8
Adults SUD	25,027	7.8	4.4	16.6	5.0	2.5	2.3	39.5	7.0
Adults SMD	19,586	6.1	4.4	10.8	2.4	1.5	1.4	20.6	2.0
Elderly	14,970	18.2	12.2	36.0	2.9	2.5	1.8	31.1	5.6
Elderly SUD*	1,052	1.2	0.4	4.8	11.3	6.5	5.8	74.2	14.9
Elderly SMD	2,074	2.4	1.2	7.6	6.4	4.2	2.9	54.1	11.0

Table 4.18: Statistical basis for assessment of variation in inpatient treatment. Average number of admissions per year for Norway as a whole, average annual admission rate for Norway with lowest and highest rates, ratios (FT), coefficient of variation (CV) and systematic component of variation (SCV) for the period 2014–2018. The rates have been adjusted for age and gender.

Inpatient treatment	No. of admissions	Admission rate	Lowest rate	Highest rate	FT	FT2	FT3	CV	SCV
Children and adolescents	2,581	2.3	0.9	5.8	5.4	3.4	2.8	42.8	13.6
Adults	50,800	15.8	9.2	25.3	2.8	2.0	1.5	22.3	4.7
Adults SUD	19,802	6.2	4.2	11.4	2.7	2.0	1.7	25.4	4.5
Adults SMD	15,151	4.7	3.1	9.4	3.0	2.4	1.9	32.2	8.0
Adults DPC	50,800	15.8	9.2	32.0	3.5	2.8	2.6	26.6	6.3
18-30 years	15,923	17.6	8.9	29.2	3.3	2.0	1.7	25.1	4.9
31-50 years	23,367	16.2	9.7	28.8	3.0	2.2	1.7	26.1	5.6
51-64 years	11,510	13.1	8.5	23.3	2.7	2.3	1.9	26.8	6.1
Elderly	5,634	6.6	4.6	13.3	2.9	1.9	1.6	26.8	3.9
Elderly SUD	854	1.0	0.6	4.2	6.7	3.3	2.9	68.0	8.1
Elderly SMD	1 764	2.1	1.2	4.3	3.6	2.4	2.2	33.5	7.2
Elderly DPC	5,634	6.6	3.5	13.3	3.9	2.8	2.4	25.6	4.1

Table 4.19: Statistical basis for assessment of variation in inpatient treatment. Average number of patients per year for Norway as a whole, average annual patient rate for Norway with lowest and highest rates, ratios (FT), coefficient of variation (CV) and systematic component of variation (SCV) for the period 2014–2018. The rates have been adjusted for age and gender. * These rates have been calculated on the basis of a small number of patients, which may increase the element of random variation.

Inpatient treatment	No. of patients	Patient rate	Lowest rate	Highest rate	FT	FT2	FT3	CV	SCV
Children and adolescents	1,770	1.6	0.7	4.0	6.1	3.5	2.7	45.8	18.0
Adults	27,685	8.6	6.0	13.0	2.2	1.6	1.4	17.3	2.8
Adults SUD	11,562	3.6	2.3	6.6	2.8	1.6	1.6	23.7	3.5
Adults SMD	7,920	2.5	2.0	3.5	1.7	1.7	1.5	17.8	2.0
Elderly	3,813	4.5	3.6	8.2	2.3	1.6	1.4	21.8	3.0
Elderly SUD*	584	0.7	0.4	2.8	6.5	2.9	2.4	64.7	5.0
Elderly SMD	1,141	1.3	0.9	3.0	3.5	1.9	1.8	33.0	4.8

Chapter 5

Discussion

5.1 Main findings

The Healthcare Atlas for Mental Healthcare and Substance Abuse Treatment contains information about many aspects of the population's use and variation in the use of mental healthcare services, mental healthcare specialists in private practice under public funding contracts and interdisciplinary specialised addiction services during the period 2014–2018. We would like to draw attention to the following main findings:

- The variation in the use of outpatient and inpatient services for substance use disorder and severe mental disorders in adults was high and unwarranted. We found extensive use of outpatient services for these groups of patients in some hospital referral areas. The variation in inpatient treatment was high for patients with severe mental disorders, but more moderate for patients with substance use disorder. These services were not equitably distributed in Norway.
- As regards elderly patients, there was high and unwarranted variation in their use of both outpatient and inpatient services. Moreover, elderly patients from areas with low use of outpatient treatment also made low use of inpatient treatment. The variation in the use of these services was high and unwarranted both when we studied elderly patients as a group, and when elderly patients with substance use disorder and with severe mental disorders were studied separately.
- Oslo had the highest use of outpatient services among adult patients, and this tendency was even stronger for elderly patients. The use of specialists in private practice under public funding contracts, which is higher in Oslo compared with the rest of Norway, contributed to the high variation in outpatient contact rates between hospital referral areas.
- There was little variation in the use of outpatient services by children and adolescents, but a high variation in admissions. However, admissions were not used much for children and adolescents.

5.2 Discussion of the results

Is the need for services the same regardless of where patients live?

It is a goal for a healthcare atlas to provide analyses that can form a basis for concluding on whether the use of health services is equitably distributed regardless of where in Norway patients live. This also entails an assessment of whether the need for services is evenly distributed. For many somatic conditions, it is assumed that the prevalence is the same and that the resulting health service needs will be relatively similar throughout Norway, provided that we control for the age and gender distribution of the population. However, our knowledge about the prevalence of mental disorders and substance use disorder is limited (Folkehelseinstituttet, 2018b). Our data provide knowledge about the patients who were in contact with the mental healthcare services, mental healthcare specialists in private practice under public funding contracts, and interdisciplinary specialised addiction services during the period 2014–2018. However, we do not know how many patients were treated by the municipal health service or did not receive treatment at all.

In order to be able to express an opinion as to whether the variations in the use of specialist health services by patients with mental disorders and/or substance use disorders are unwarranted, we have looked at other potential sources of knowledge about the population's need for such services. The need for health services will depend on both what type of disorder a patient suffers from and factors relating to the individual's health and social circumstances. There is assumed to be a direct link between age and use of health services and between health-related factors and use of health services, while the connection between socio-economic circumstances and use of health services is of a more indirect nature (NOU, 2019). In our analyses, we have used rates adjusted for gender and age to be able to compare the use of health services across hospital referral areas, but we have not controlled for socio-economic circumstances.

There are indications that substance abuse problems are more prevalent in the cities than in the rest of the country. In the Public Health Report (Folkehelseinstituttet, 2019) the Norwegian Institute of Public Health refers to surveys showing that problems related to alcohol use appear to be more prevalent in the cities than in the rest of Norway. Studies from the 1990s showed differences between the capital Oslo and the county of Sogn og Fjordane. The report states that there are no more recent studies, but that the possibility that regional variations continue to exist cannot be ruled out.

Cities and towns have tended to attract people with a high consumption of intoxicating substances, resulting in a greater need for health and social services compared with rural municipalities. Nevertheless, several municipalities are catching up with Oslo in terms of such problems (NOU, 2008).

Needs can vary within cities as well. For Oslo, for example, indications of this include a higher concentration of council housing in city districts that belong to Lovisenberg hospital referral area. Benefit recipients often live in such housing. There are also differences, in some cases considerable differences, in life expectancy between city districts in Oslo.[24] Inhabitants of the districts of Sagene, Grünerløkka, Gamle Oslo, Grorud and St. Hanshaugen have a life expectancy that is four to eight years shorter than that of the districts with the longest life expectancy. Shorter life expectancy is an indication of poorer health, for whatever reason, and a greater need for health and social services.

The models for income distribution between regional health authorities are based on age, health and social criteria. The model described in Official Norwegian Report NOU 2008:2 (NOU, 2008), which was in effect during the years for which we have analysed data, includes a needs index for mental healthcare and one for interdisciplinary specialised addiction treatment. Our findings are not directly comparable

[24] The Norwegian Institute of Public Health. Municipal health statistics bank. http://khs.fhi.no/webview/, as of 9 May 2019

with these indices. For example, the needs index for mental healthcare combines all age groups and covers both inpatient and outpatient treatment. It may nevertheless be interesting to see whether the results reflect the indices – whether we find higher usage in the areas where the need is believed to be greatest.

Regional health authorities have used the 2008 model (NOU, 2008) as a basis for developing their own set of criteria and needs-based distribution keys per health authority. South-Eastern Norway RHA has found the need for mental healthcare and interdisciplinary specialised addiction services to be greatest in Oslo. St. Olavs Hospital Trust and Helse Bergen health trust also have higher needs indices than the other health trusts in their respective regions (personal communication). Our results showed the highest use of outpatient services in urban areas.

As part of the proposal for a new income model for the regional health authorities, a joint needs index for mental healthcare for adults (18 years and older) and interdisciplinary specialised addiction treatment has been drawn up (NOU, 2019). It shows that Northern Norway RHA has a somewhat higher need for such services than the other regions.

Our findings showed that both adult and elderly patients in the Northern Norway health region had a lower outpatient contact rate (contacts per 1,000 population) than in other parts of the country, and that the variation was very high for substance use disorder. The low number of outpatients (per 1,000 population) and of outpatient contacts per patient help to explain the low use of outpatient services in the Northern Norway health region. Northern Norway Regional Health Authority's development plan for mental healthcare and TSB (Helse Nord RHF, 2016) states, among other things, that all health trusts shall develop outpatient capacity in interdisciplinary specialised addiction treatment in order to conform to the norm for the rest of Norway. In other words, the region has a known underuse of outpatient services for patients with substance use disorder, and this is in keeping with the findings from our analyses.

We also found relatively low use of outpatient services for adults with severe mental disorders in the Northern Norway health region. On the other hand, Finnmark and UNN hospital referral areas had somewhat higher use of admissions for adults with substance use disorders and adults with severe mental disorders compared to other parts of Norway. In recent years, there has been a deliberate restructuring from inpatient to outpatient treatment in Norway, and all the health regions reduced their number of inpatient beds during the period 2014–2018. Measured per 1,000 population, Northern Norway RHA and Western Norway RHA had more inpatient beds in mental healthcare for adults in 2018 than South-Eastern Norway RHA and Central Norway RHA.[25] Some patients have to travel long distances, and several short admissions could to a certain extent compensate for low use of outpatient services, but we could not see that this was realised to a sufficient extent for UNN and Finnmark hospital referral areas.

Based on our knowledge about the use of and need for the services in question, we have concluded that the variations in overall use of outpatient and inpatient treatment for substance use disorder and severe mental disorders in adults were high and unwarranted.

It has been an express goal that 5% of children and adolescents should receive mental healthcare services (Norges forskningsråd, 2009). In our analyses, the percentage varied between hospital referral areas, from just under 4% to 6.5% on average per year. The hospital referral areas with the highest percentages were Helgeland and Førde. These areas also had higher patient rates for outpatients than other hospital referral areas. The variation in both patient rates and contact rates for children and adolescents was nevertheless low.

[25] https://statistikk.helsedirektoratet.no/bi/Dashboard/09a57907-d4b8-411f-ad76-513364f54c52?e=false&vo=viewonly

However, there was considerable variation in admission rates for children and adolescents between hospital referral areas. We must take into consideration when assessing this variation that the number of children and adolescents receiving inpatient treatment was low, and that random variation can have a greater impact on rates than for larger samples. The number of inpatient beds in child adolescent mental healthcare remained relatively stable during the period 2014–2018, and Northern Norway RHA had more beds per 1,000 population than the other regions. The higher treatment capacity could also partly explain the relatively high number of admissions in this region.[26] Some patients have to travel long distances, and this could be a reason for short admissions instead of outpatient contacts. However, we cannot disregard the possibility that there may be differences in needs in the child and adolescent group in different parts of the country that have an effect on the use of services. The 2019 model for distribution of income between regional health authorities (NOU, 2019), includes a needs index for child and adolescent mental healthcare. The model specifies a somewhat higher need for services in the Northern Norway health region compared with children and adolescents in other health regions, which is compatible with our findings of higher patient rates and admission rates. Nevertheless, the region's use of inpatient treatment is not unambiguously higher compared to the rest of Norway, as we identified hospital referral areas in other parts of the country with longer admissions. The knowledge available is not sufficient to allow us to draw any definite conclusions as to whether the variation in services for children and adolescents is unwarranted.

Equitable provision of services?

The treatment provided for patients with mental disorders or substance use disorder will have an effect on the use of the health services. For example, we can mention two factors that probably have a bearing on the findings in our analyses: geriatric psychiatry units and the Faster Return to Work scheme.

Well-developed services have for a long time been available for elderly patients at geriatric psychiatry departments at Diakonhjemmet Hospital and Oslo University Hospital. These services are available to persons resident in Oslo from the age of 65 years. These units serve both patients who are diagnosed with a mental disorder in later life and elderly patients with mental disorders that arose at an earlier stage in life. Such a stable service will generate referrals and activity. In other parts of the country, services are usually offered to elderly patients who are newly diagnosed with a disorder. The lower level of activity in other parts of Norway compared with Oslo can also be explained by differences in how these services are organised. In cases where geriatric psychiatry is co-located with somatic departments, the activities will be registered under the somatic sector and will not be included in our analyses. Others have organised these services in a way that involves extensive use of guidance of the municipal health service (personal communication). Northern Norway RHA's development plan for mental healthcare and TSB mentions that the regional health authority intends to develop capacity and expertise in geriatric psychiatric disorders (Helse Nord RHF, 2016). This initiative supports our impression that there is an underuse of services by elderly patients both in this region and in other parts of Norway, and that the variation in psychiatric treatment of elderly patients is unwarranted.

The Faster Return to Work scheme was a nation-wide project whose objective was to reduce sickness absence by helping people on sick leave or at risk of being put on sick leave to return to work sooner. This scheme came in addition to the ordinary treatment that patients received from the health trusts. During the period 2014–2017, the Faster Return to Work scheme provided treatment for people with mild mental disorders. The scheme was replaced with effect from 2018. Data from the regional health authorities (personal communication) shows that the scheme was more used in South-Eastern Norway than in the other regions. Lovisenberg Diaconal Hospital as well as private clinics provided comprehensive

[26] See footnote 25.

services to patients. These services will be included as outpatient contacts in our analyses, and probably contributes to the high outpatient contact rate for adults aged 30–64 years from Lovisenberg hospital referral area.

Consultations with specialists in private practice under public funding contracts can, in combination with public treatment providers' outpatient services, supplement the outpatient services provided for patients with mental disorders or substance use disorder. We can thus envisage more equitable access to services regardless of where in Norway the patients live. For adults, this seems to be the case in some hospital referral areas. For elderly patients, on the other hand, we found that the hospital referral areas in Oslo with the highest outpatient contact rate for public service providers also had the highest use of specialists in private practice under public funding contracts per 1,000 population. We also found that patients in Oslo had more outpatient contacts per patient, both for patients treated by specialists in private practice under public funding contracts and by public service providers, compared with elderly patients from other parts of Norway. In other words, it may seem that patients from hospital referral areas with well-developed public services also make use of private services. These differences contribute to the high variation between hospital referral areas in elderly patients' use of outpatient services for mental disorders or substance use disorder.

Before starting treatment, the specialist health service shall assess whether patients are entitled to healthcare on the basis of certain criteria.[27] South-Eastern Norway RHA's group audit entity found that when 23 referrals were assessed by nine outpatient clinics in the region, they only reached the same rights assessment conclusion in seven out of the 23 cases.[28] If patients experience systematic differences in rights assessments between outpatient clinics, this could contribute to unwarranted variation in the use of services.

According to the study conducted by Clark et al. (2018), higher treatment intensity and more consultations over a shorter period of time are factors associated with a positive treatment outcome. Bruijniks et al. (2020) found better treatment outcomes for patients with depression who had two sessions per week compared with those who had one session per week. The way in which outpatient treatment is organised could therefore have a bearing on the treatment outcome. During our work on the healthcare atlas, we have looked at the intensity of outpatient treatment in Norway and found that, measured as an average over 30-day periods, it was often 3.5–4.5 for adult patients and 2.7–3.8 for elderly patients. In our model, patient groups are not particularly differentiated, and they are not linked to treatment outcomes. It might be interesting to study the intensity for specific patient groups in more detail and look at how the services are organised in relation to treatment outcomes.

The results in this healthcare atlas provide a basis for reflection on the population's use of specialist health services in the area of mental healthcare and substance abuse treatment, and on variations between different parts of Norway in the use of services. Knowledge from the healthcare atlas can, in combination with other sources, serve as a point of departure for further analyses in order to understand the variations and their consequences for the patients, the health service and society as a whole. In order to be able to give a good answer to the question of whether Norway has equitable provision of health services regardless of where we live, we need more knowledge about the patients' need for these health services and the overall provision of services by the specialist health service as well as municipal services.

[27] www.helsedirektoratet.no/veiledere/prioriteringsveiledere/
[28] www.helse-sorost.no/om-oss/styret/konsernrevisjonen

5.3 Data

The main source of the data on which the analyses in this healthcare atlas are based is the Norwegian Patient Registry (NPR), a national health register that contains information about all patients treated by the Norwegian specialist health service. NPR was primarily developed for administrative purposes. In the atlas, we use the information to assess whether there is variation in the population's use of specialist health services in different parts of Norway.

In order to enable comparison of the use of specialist health services between hospital referral areas, it is crucial that the measures of activity represent comparable entities. Different registration practices make this a challenge. The possibility of using the same measure of activity over several years is of corresponding importance to our analyses. The year 2017 was a trial year for the introduction of activity-based funding of mental healthcare. The introduction of activity-based funding brought changes to the coding system. This made it particularly challenging to arrive at a way of calculating outpatient contacts. We concluded that we would count all direct outpatient contacts, with separate analyses of indirect contacts, regardless of the different funding schemes. SAMDATA's report on status and trends in the specialist health service, *Status og utviklingstrekk for spesialisthelsetjenesten* (Helsedirektoratet, 2019b) shows that in mental healthcare for adults, the number of outpatient contacts with reimbursement is lower than the number you arrive at by counting all the contacts. In other words, different ways of counting outpatient contacts can yield somewhat different volumes, which could add nuance to the conclusions regarding variation.

The introduction of a new patient record system in some health trusts during this period and an increase in child and adolescent mental health services provided by the municipal health service could both be factors in the decrease in the outpatient contact rate for children and adolescents in 2018.

In 2018, NPR accepted the activity data deliveries of 89% of specialists in private practice under public funding contracts who are subject to a reporting obligation. This percentage was lower for previous years (Helsedirektoratet, 2019a). In other words, the figures on which our analyses are based could be affected by some under-reporting.

The period covered by the data we have analysed was a transition period in more than one way. There were clear changes during the period 2014–2018 in the *types* of indirect contacts registered, and these changes may be due to changes in the funding and coding rules that took effect in 2017. In addition, the type of contact was registered for far more contacts in 2018 than in 2016. Some *types* of indirect contact can now be considered treatment, and not simply administrative activities. In later analyses, once the coding practice has become more established, it may be an option to differentiate between different categories of indirect contacts; administrative and examination/treatment. Video or telemedicine treatment will probably become more common in the years ahead, and may even become an important part of patient treatment. We see that this form of consultations can be particularly useful for patients who have to travel long distances to see a treatment provider. There was a strong increase in video and telephone consultations during the coronavirus epidemic in spring 2020, and both treatment providers and patients gained useful experience of using this tool. [29]

A lot of effort is going into improving and harmonising coding practices in mental healthcare and substance use disorder treatment to allow comparison of activities carried out in different places. We cannot rule out the possibility that our data set could contain some coding errors, which means that the data will not provide an entirely accurate picture of what activities have actually taken place. In order to minimise the challenge represented by incorrect coding, we have taken time to adjust and check the quality of the data set received from NPR, and we have looked for coding errors and differences

[29] www.dagensmedisin.no/artikler/2020/05/20/var-i-gang-med-video-lenge-for-korona.-slapp-store-etterslep-i-behandlingen/

in coding practices. Coding errors in the data set can be considered random errors equally distributed throughout the country, which will not have any significant impact on our conclusions concerning variation. Differences in coding practices between hospital referral areas, on the other hand, could skew the data on which the analyses are based.

Chapter 6

Summary and conclusion

We found high variation between different parts of Norway in the population's use of mental healthcare and interdisciplinary specialised addiction services during the period 2014–2018.

For adults, who made up the biggest patient group, there was high variation between different parts of Norway in the patients' use of these services. This was particularly clear when patients with substance use disorder and patients with severe mental disorders were studied separately. Both groups showed high variation in the use of outpatient treatment. For inpatient treatment, the variation was less marked for patients with substance use disorder, while there was high variation among those with severe mental illness. We have deemed the variation between hospital referral areas to be unwarranted.

The analyses showed that the variation in use of these health services was very high among the elderly. The use of both outpatient and inpatient treatment varied greatly between different parts of Norway. The variation was high both for elderly patients as a group and when patients with substance use disorder or severe mental disorders were considered separately. The scope of inpatient treatment for substance use disorder was small. We have no indications that the high variation in the use of services was due to the patients' needs alone, and we have deemed it to be unwarranted.

For children and adolescents as a group, there was little variation in the use of outpatient services between different parts of the country. However, we found differences in the number of outpatient contacts per patient. There was high variation in inpatient treatment, but the number of patients receiving such treatment was limited.

The results in this healthcare atlas provide a basis for reflection on the population's use of specialist health services in the area of mental healthcare and substance abuse treatment, and on variations between different parts of Norway in the use of these services. Knowledge from the healthcare atlas can, in combination with other sources, serve as a point of departure for further analyses in order to understand the variations and their consequences for the patients, the health service and society as a whole.

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Appendices

Appendix A

Supplementary figures and tables

Children and adolescents

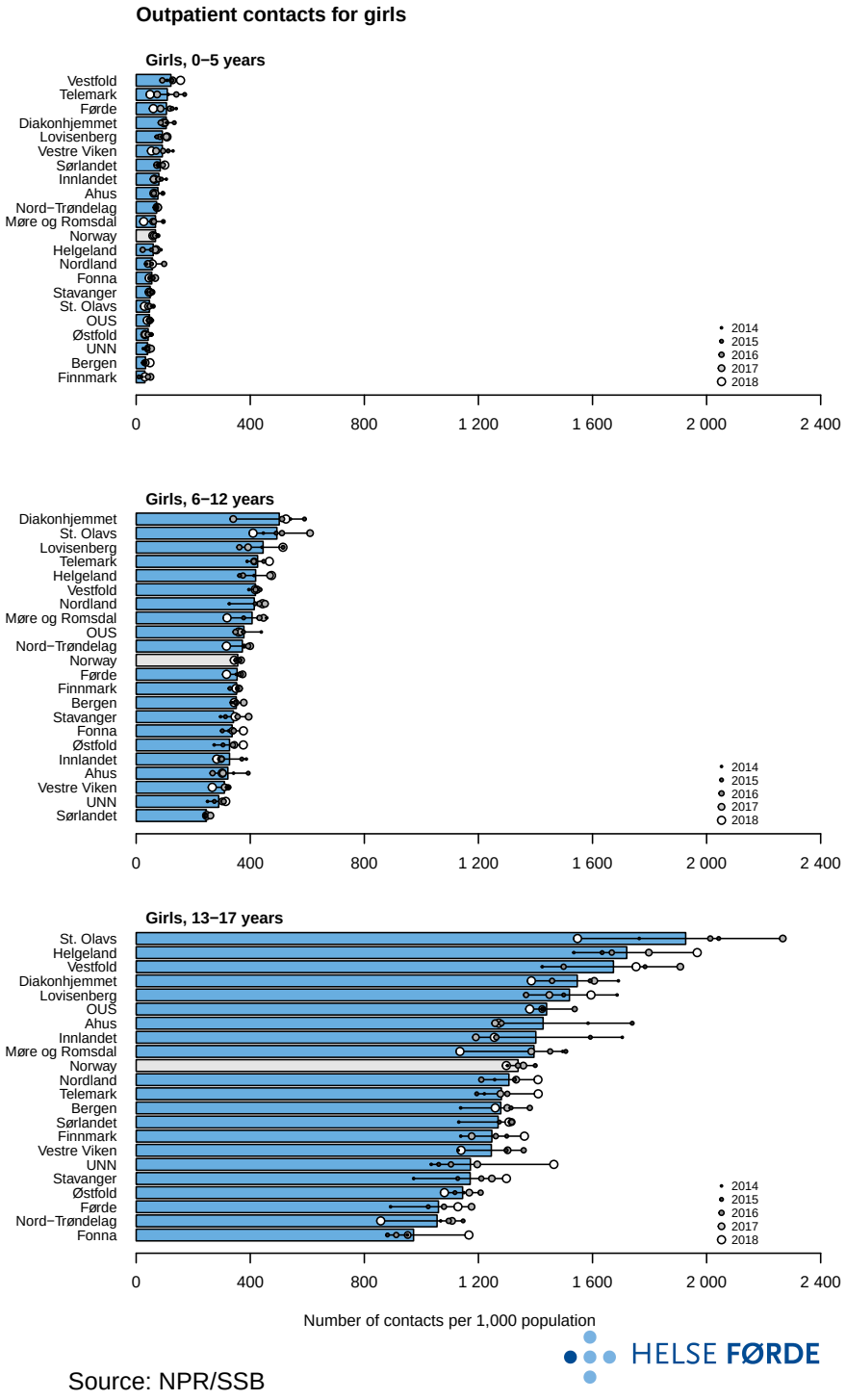

Figure A.1: Contact rates for girls, age group breakdown. Outpatient contact rates for treatment in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole, for the age groups 0–5 years, 6–12 years and 13–17 years. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age.

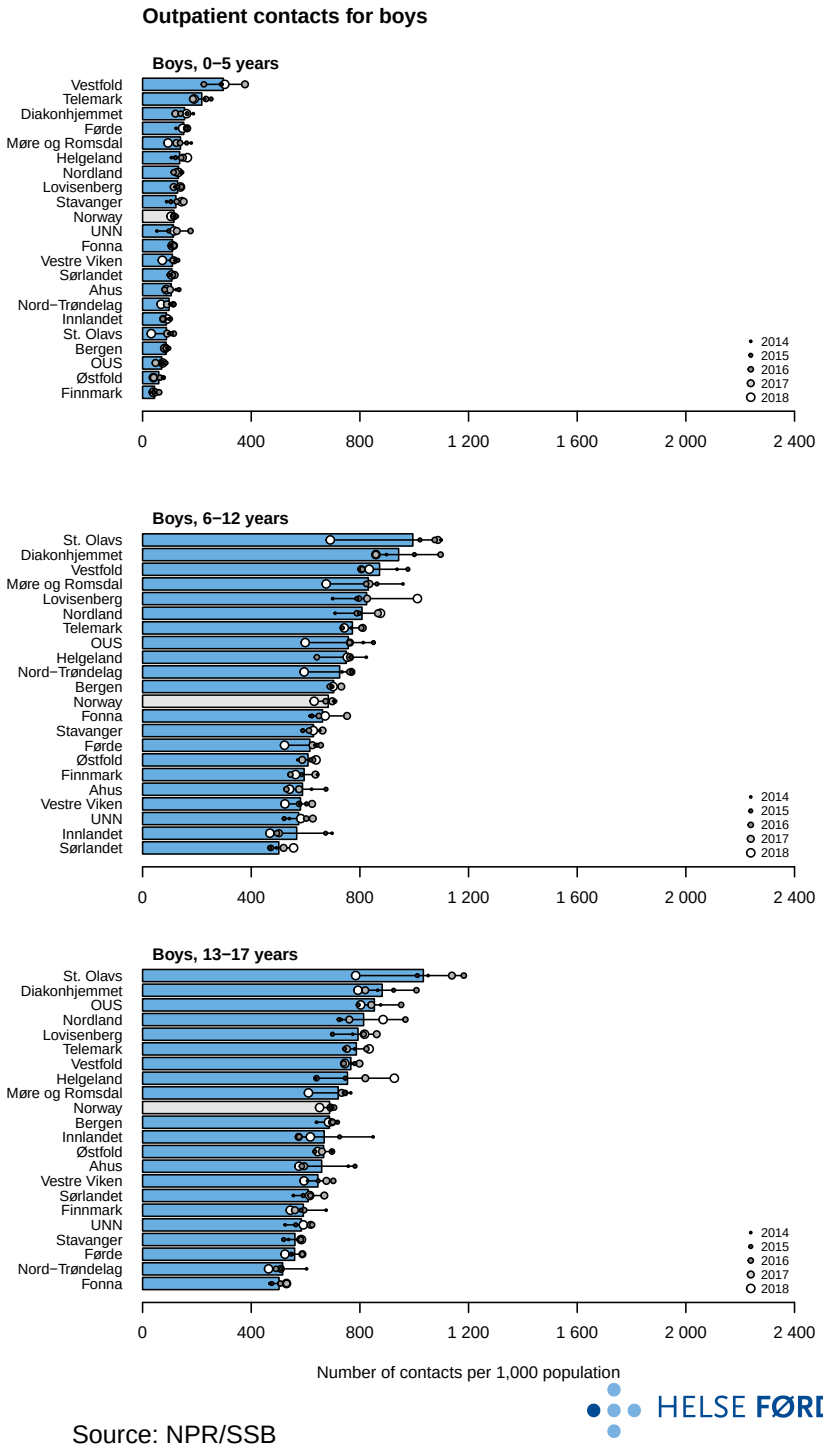

Figure A.2: Contact rates for boys, age group breakdown. Outpatient contact rates for treatment in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole, for the age groups 0–5 years, 6–12 years and 13–17 years. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age.

Table A.1: Direct and indirect contacts in outpatient treatment. **Children and adolescents** (0–17 years) in mental healthcare and interdisciplinary specialised addiction services. All contacts include direct and indirect contacts. The number of contacts and the percentage of all contacts is stated for direct and indirect contacts. The figures for hospital referral areas and for Norway as a whole represent average values per year for the period 2014–2018.

	All contacts	Direct contacts		Indirect contacts	
Hospital referral area		No. of contacts	%	No. of contacts	%
Ahus	92,321	60,522	65.6	31,799	34.4
Diakonhjemmet	20,496	14,948	72.9	5,548	27.1
Helgeland	14,090	10,373	73.6	3,717	26.4
Bergen	73,414	48,302	65.8	25,113	34.2
Finnmark	13,319	7,581	56.9	5,738	43.1
Fonna	24,883	18,324	73.6	6,558	26.4
Førde	17,254	11,690	67.8	5,564	32.2
Nord-Trøndelag	19,301	14,178	73.5	5,123	26.5
Møre og Romsdal	44,804	34,054	76.0	10,751	24.0
Stavanger	53,428	39,040	73.1	14,388	26.9
Innlandet	61,569	38,765	63.0	22,804	37.0
Lovisenberg	13,377	9,336	69.8	4,040	30.2
Nordland	22,224	16,895	76.0	5,329	24.0
OUS	46,054	29,198	63.4	16,855	36.6
Østfold	41,594	28,835	69.3	12,759	30.7
Sørlandet	47,258	30,315	64.1	16,943	35.9
St. Olavs	64,367	48,075	74.7	16,292	25.3
Telemark	31,593	21,136	66.9	10,456	33.1
UNN	25,117	17,732	70.6	7,385	29.4
Vestfold	50,537	32,916	65.1	17,620	34.9
Vestre Viken	81,230	51,563	63.5	29,666	36.5
Norway	858,229	583 778	68.0	274,451	32.0

Adults

Table A.2: Outpatient treatment of **adults** in mental healthcare and interdisciplinary specialised addiction services. The number of contacts per patient divided between mental healthcare (MHC) and interdisciplinary specialised addiction services (TSB), and specialists in private practice under public funding contracts (Avt.), broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to adults aged 18–64 years.

	Contacts per patient	
Hosp. ref. area	MHC and TSB	Avt.
Bergen	15.9	10.8
Lovisenberg	12.9	16.3
OUS	12.0	15.2
Diakonhjemmet	11.3	15.6
Vestfold	13.2	11.1
Stavanger	13.1	11.3
Ahus	12.0	13.9
Sørlandet	13.0	9.1
St. Olavs	12.0	11.2
Vestre Viken	10.7	13.6
Innlandet	10.6	11.2
Telemark	11.2	9.1
Møre og Romsdal	11.0	9.7
UNN	10.4	13.1
Helgeland	10.4	15.0
Nordland	9.7	11.7
Fonna	10.9	7.0
Nord-Trøndelag	10.0	9.2
Østfold	9.1	11.3
Førde	8.6	7.7
Finnmark	8.3	7.4
Norway	12.0	12.3

Table A.3: Direct and indirect contacts in outpatient treatment. **Adults** (18–64 years) in mental healthcare and interdisciplinary specialised addiction services. All contacts include direct and indirect contacts. The number of contacts and the percentage of all contacts is stated for direct and indirect contacts. The figures for hospital referral areas and for Norway as a whole represent average values per year for the period 2014–2018.

Hospital referral	All contacts	Direct contacts		Indirect contacts	
area		No. of contacts	%	No. of contacts	%
Finnmark	29,056	21,857	75.2	7,199	24.8
UNN	84,986	66,688	78.5	18,298	21.5
Nordland	54,151	44,055	81.4	10,095	18.6
Helgeland	35,521	28,792	81.1	6,728	18.9
Nord-Trøndelag	57,867	44,209	76.4	13,659	23.6
St, Olavs	178,019	139,824	78.5	38,195	21.5
Møre og Romsdal	112,756	88,230	78.2	24,527	21.8
Førde	36,443	28,856	79.2	7,588	20.8
Bergen	292,038	248,245	85.0	43,794	15.0
Fonna	78,100	56,794	72.7	21,306	27.3
Stavanger	195,259	143,518	73.5	51,741	26.5
Østfold	136,703	102,330	74.9	34,373	25.1
OUS	173,028	144,273	83.4	28,754	16.6
Lovisenberg	167,249	136,742	81.8	30,507	18.2
Diakonhjemmet	91,155	71,913	78.9	19,242	21.1
Ahus	248,356	195,589	78.8	52,767	21.2
Innlandet	195,649	157,191	80.3	38,458	19.7
Vestre Viken	226,995	190,112	83.8	36,883	16.2
Vestfold	155,649	120,134	77.2	35,515	22.8
Telemark	100,682	76,198	75.7	24,484	24.3
Sørlandet	181,653	141,155	77.7	40,498	22.3
Norway	2,831,314	2,246,703	79.4	584,611	20.6

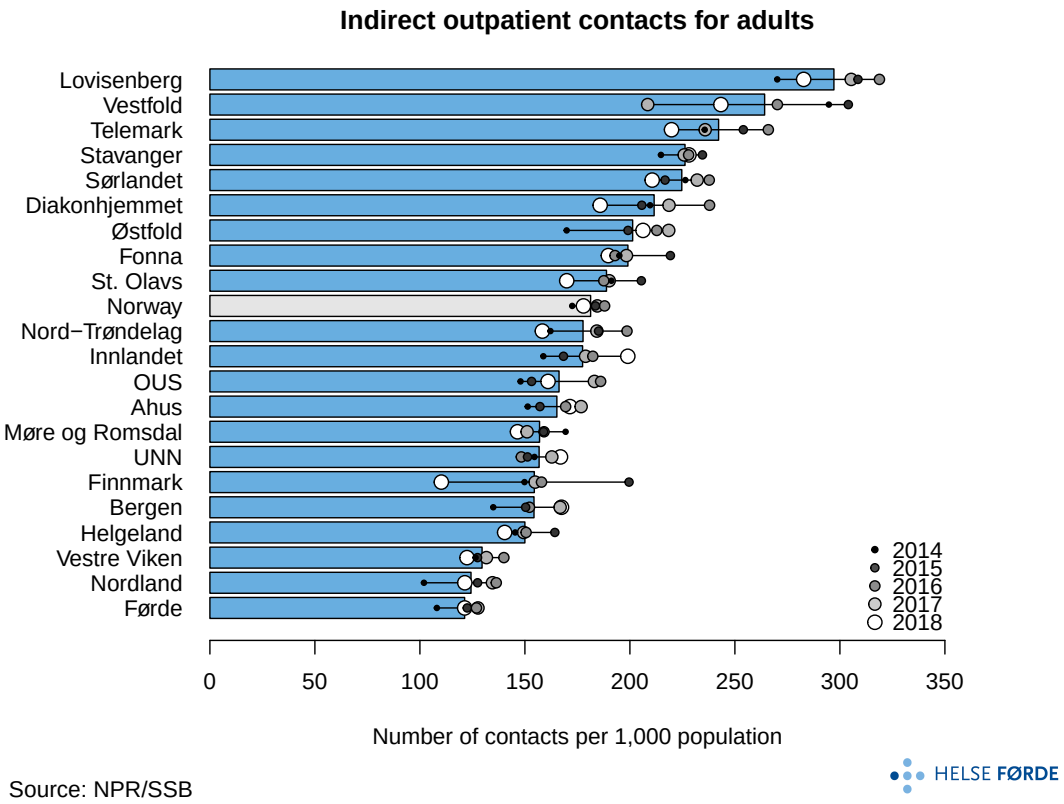

Figure A.3: Contact rates for indirect contacts in outpatient treatment of adults (18–64 years) in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Elderly patients

Table A.4: Outpatient treatment of **elderly** patients in mental healthcare and interdisciplinary specialised addiction services. The number of contacts per patient divided between mental healthcare (MHC) and interdisciplinary specialised addiction services (TSB), and specialists in private practice under public funding contracts (Avt.), broken down by hospital referral area and for Norway as a whole. The figures represent average values per year for the period 2014–2018 and apply to elderly people aged 65 years and older.

	Contacts per patient	
Hosp. ref. area	MHC and TSB	Avt.
Lovisenberg	10.8	13.2
Diakonhjemmet	8.7	13.3
OUS	8.9	12.2
Vestre Viken	7.1	11.6
Bergen	7.2	8.9
Ahus	6.7	11.1
Sørlandet	6.6	7.6
St. Olavs	6.2	8.6
Nord-Trøndelag	6.0	10.8
Innlandet	4.9	10.7
Vestfold	5.1	9.1
Østfold	4.8	7.7
Stavanger	4.8	9.9
UNN	5.3	8.2
Telemark	5.1	7.2
Møre og Romsdal	5.1	8.0
Førde	5.1	5.0
Helgeland	5.0	6.9
Fonna	4.4	7.0
Nordland	3.7	8.0
Finnmark	3.0	5.4
Norway	6.1	10.0

Table A.5: Direct and indirect contacts in outpatient treatment. **Elderly** patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services. All contacts include direct and indirect contacts. The number of contacts and the percentage of all contacts is stated for direct and indirect contacts. The figures for hospital referral areas and for Norway as a whole represent average values per year for the period 2014–2018.

Hospital referral	All contacts	Direct contacts		Indirect contacts	
area		No. of contacts	%	No. of contacts	%
Finnmark	899	552	61.4	347	38.6
UNN	4,445	2,743	61.7	1,703	38.3
Nordland	2,432	2,130	87.6	302	12.4
Helgeland	1,247	957	76.8	289	23.2
Nord-Trøndelag	6,296	3,677	58.4	2,619	41.6
St,Olavs	8,368	5,888	70.4	2,479	29.6
Møre og Romsdal	7,752	5,124	66.1	2,628	33.9
Førde	2,173	1,595	73.4	578	26.6
Bergen	11,485	9,515	82.8	1,970	17.2
Fonna	3,547	2,540	71.6	1,006	28.4
Stavanger	8,524	5,020	58.9	3,503	41.1
Østfold	6,135	3,851	62.8	2,284	37.2
OUS	11,916	8,090	67.9	3,825	32.1
Lovisenberg	6,273	4,377	69.8	1,896	30.2
Diakonhjemmet	9,644	7,146	74.1	2,499	25.9
Ahus	14,375	8,602	59.8	5,773	40.2
Innlandet	8,869	7,047	79.5	1,821	20.5
Vestre Viken	14,012	10.844	77,4	3,167	22.6
Vestfold	7,307	4,539	62.1	2,768	37.9
Telemark	5,337	3,260	61.1	2,077	38.9
Sørlandet	8,220	6,211	75.6	2,009	24.4
Norway	149,254	103,709	69.5	45,545	30.5

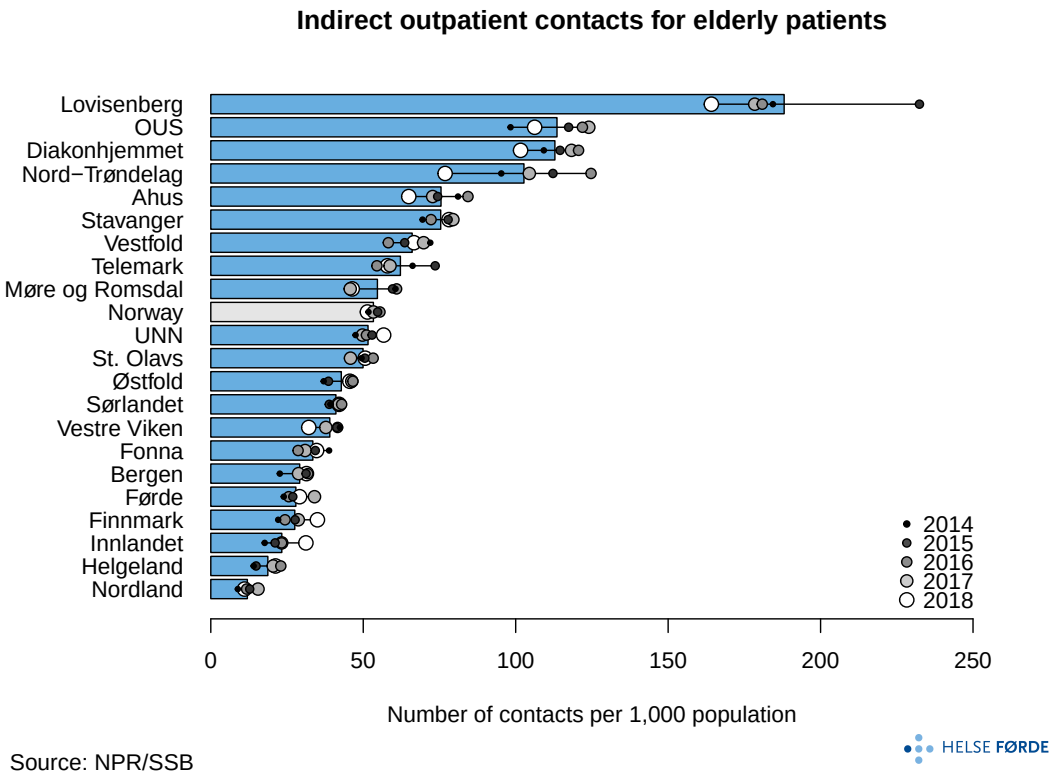

Figure A.4: Contact rates for indirect contacts in outpatient treatment of elderly patients (65 years and older) in mental healthcare and interdisciplinary specialised addiction services: Number of contacts per 1,000 population, broken down by hospital referral area and for Norway as a whole. The bars show the average values per year for the period 2014–2018, and the dots represent the rates for each year. The rates have been adjusted for age and gender.

Appendix B

Method

Data sources

The Norwegian Patient Registry Information about the activities of the mental healthcare and interdisciplinary specialised addiction services (TSB) is based on data from the Norwegian Patient Registry (NPR) for the period 2014–2018.

Statistics Norway The population data are from Statistics Norway's (SSB) tables 07459 and 10826.

Sample

Patients who were in contact with one or more of the sectors mental healthcare for children and adolescents, mental healthcare for adults, interdisciplinary specialised addiction treatment and mental healthcare specialists in private practice under public funding contracts during the period 2014–2018 were included in the sample.

For the main analyses, the patients were divided into three age segments: children (0–17 years), adults (18–64 years) and the elderly (65 years and older). The patient's age was defined as age on the date of contact.

For the adult and elderly age groups, we took a closer look at two patient groups' use of health services, namely patients with *Severe mental disorders (SMD)* and patients with *Substance use disorder (SUD)*.[30]

Severe mental disorders (SMD) were defined using the following ICD-10 codes: F20–29 (Schizophrenia, schizotypal and delusional disorders), F30.1 (Mania without psychotic symptoms), F30.2 (Mania with psychotic symptoms), F30.8 (Other manic episodes), F30.9 (Manic episode, unspecified), F31 (Bipolar affective disorder), F32.3 (Severe depressive episode with psychotic symptoms) or F33.3 (Recurrent depressive disorder, current episode severe with psychotic symptoms). Patients who had at least one contact during the period 2014–2018 with at least one of the above as a primary or secondary diagnosis were categorised as patients with severe mental disorders.

Substance use disorder (SUD) was defined using the ICD-10 codes F10, F11, F12, F13, F14, F15, F16, F18 and F19 (Mental and behavioural disorders due to psychoactive substance use, except tobacco). Patients who had at least one contact during the period 2014–2018 with at least one of the above as a primary or secondary diagnosis were categorised as patients with substance use disorder.

[30] Using diagnosis codes for primary or secondary diagnoses will allow us to identify patients with severe mental disorders or substance use disorder in both groups.

The number of unique patients per year and hospital referral area was calculated (see Table 3.1 for hospital referral areas). Since some patients will move between hospital referral areas in the course of a year, it is possible for the same patient to be counted more than once – once in each hospital referral area. The number of unique patients per year for Norway as a whole will therefore be somewhat lower than the sum we would arrive at if we added up the number of unique patients for all the hospital referral areas.

Hospital referral area

The healthcare atlas assesses variation in the use of health services between hospital referral areas. The hospital referral areas correspond to the health trusts' catchment areas as of 2018, which is the final year from which we used data, see Table 3.1 and Appendix C.

The patients were assigned to hospital referral areas on the basis of their place of residence (municipality or city district) at the time of their contact with the health services. Analysing the use of health services on the basis of hospital referral areas shows the population's use of health services regardless of where in Norway the treatment was provided, which can give the health authorities information about how the RHAs fulfil their responsibility to provide healthcare.

Some analyses were based on **DPC referral areas**; areas that correspond to the district psychiatric centres' catchment areas (Appendix D).

Hospital referral areas and DPC referral areas were defined on the basis of SAMDATA's definitions, with some adjustments.[31] For Trondheim and Kristiansand, we did not have sufficiently detailed data to assign patients in accordance with the actual DPC referral areas. For Trondheim, the DPC referral areas did not correspond with the city districts, and we have combined DPC Tiller and DPC Nidaros into a single DPC referral area. Half of the outpatients from Malvik municipality are treated at DPC Nidaros, while the other half are treated at DPC Stjørdal. Inpatient treatment takes place at St. Olavs Hospital. In our analyses, Malvik has been assigned to DPC Nidaros's area. We did not have data at city district level for Kristiansand, and we combined DPC Strømme and DPC Solvang into one DPC referral area.

We lacked information about some patients' municipality of residence. If it was known which municipality they lived in at the time of another admission or contact, we assigned the patient to the municipality registered for the admission closest in time to the admission/contact in question. If we lacked information about municipality of residence for all of a patient's admissions, the patient was excluded from the data.

For some admissions, we lacked information about which city district the patient was resident in. In such cases, patients were assigned to city districts based on the size of their population. Foreign patients were excluded from the analyses. We have assigned people in the same way where data received from SSB did not specify city districts. This only applies to a small percentage of the population and would not have had a significant impact on the final result.

Outpatient treatment

The basis for our calculation of outpatient contacts was all contacts where a patient was admitted and discharged on the same day, regardless of stated level of care. We did not take levels of care into consideration, as we have found that there may be considerable differences between treatment centres in coding of day patient and outpatient treatment (Byhring et al., 2019). Outpatient treatment therefore includes both outpatient consultations and day treatment, which may provide a satisfactory picture of activities at the overall level. Direct and indirect outpatient contacts were analysed separately.

[31] https://www.helsedirektoratet.no/tema/statistikk-registre-og-rapporter

Direct outpatient contacts (outpatient contacts) concern either assessment/observation or treatment where the patient and/or parents/guardians/next of kin were physically present. Direct outpatient contacts are all outpatient contacts minus indirect contacts.

Indirect contacts refer to contacts where the patient or the next of kin were not physically present. Phone calls, videoconferencing or meetings between healthcare professionals, among other things, fall into this category. Indirect contacts were defined as episodes for which the variable 'type of contact' has the value 'Indirect patient contact' or where the variable 'polIndir' has a value (is not empty). For mental healthcare and TSB, contacts with tariff codes P13, P14, P23, P24, P31 and special codes B0009, B0010, B0011, B0017, which replaced the P codes with effect from 2018, were also defined as indirect contacts. Contacts with specialists in private practice under public funding contracts for which tariff codes 26, 31a–f, 33a–b, 60a–b, 70a–b, 80a–b were registered, were considered indirect contacts.

Intensity of outpatient treatment: Higher treatment intensity and more consultations over a shorter period of time are factors associated with a positive treatment outcome (Clark et al., 2018). Outpatient treatment intensity is related to the way in which services are organised and can be calculated in several different ways. We took all registered direct outpatient contacts relating to the patient as our point of departure for calculating intensity. We added up each registered outpatient contact (including the initial contact) for the same patient for a 30-day period. The average of this sum was calculated for all contacts per year and per hospital referral area in order to measure the intensity of treatment.[32]

Outpatient: Patient with at least one outpatient contact in one of the four sectors of interdisciplinary specialised addiction treatment (TSB), mental healthcare for adults (MHC-A), mental healthcare for children and adolescents (MHC-CA) or mental healthcare specialists in private practice under public funding contracts (Avt.) during the period 2014–2018.

Inpatient treatment

When calculating **admissions**, we took as our point of departure all admissions with a duration of more than zero days registered in mental healthcare for adults, mental healthcare for children and adolescents, or interdisciplinary specialised addiction treatment.

Patients admitted for inpatient treatment can be transferred to other department or institutions. The extent to which patients are transferred can vary between different parts of Norway. When calculating the number of admissions and the length of admissions, we have added together admissions where less than eight hours elapsed between discharge and the patient's next admission. In other words, an admission may comprise a single admission or several admissions that appear to be part of the same course of treatment.[33] The length of admissions is counted from admission until the patient is discharged. Admissions exceeding 365 days have been excluded from the main analyses. The rates per year are registered to the year in which the patient was discharged.

As regards where each patient was treated (public provider, private provider under a public funding contract or private provider under a service procurement contract): the longest admission counts. In the event of admissions of equal length, the first admission counts.

Inpatient: Patient with at least one admission in mental healthcare for adults, mental healthcare for children and adolescents, or interdisciplinary specialised addiction treatment during the period 2014–2018.

[32] All contacts with a duration of 1–15 minutes were excluded. In cases where F50 was the primary diagnosis, only one contact per day was included.

[33] See the method for adding up admissions in the article by Hassani et al. (2015). Adding together admissions give us fewer and longer admissions than some other analyses.

Sectors
The information from NPR about activity in the services is broken down by sector in accordance with where the activity is registered as having taken place. For the purposes of this healthcare atlas, activity in mental healthcare and interdisciplinary specialised addiction services includes the following sectors:

- Interdisciplinary specialised addiction treatment (TSB)
- Mental healthcare for adults (MHC-A)
- Mental healthcare for children and adolescents (MHC-CA)
- Mental healthcare specialists in private practice under public funding contracts (Avt.) covers both medical doctors who specialise in psychiatry and specialist psychologists.

The above sectors are organisational entities. It is not necessarily a patient's condition that determines where he or she is treated. One example of this is that patients with substance use disorder can receive treatment from TSB or MHC-A. The way in which the relevant regional health authority organises its services will determine where treatment is provided and registered.

MHC-CA mostly deals with young people up to the age of 18. In order to facilitate the best possible transition from MHC-CA to MHC-A, patients can, if necessary, continue to receive treatment from MHC-CA until they are 23 years old.

Public and private service providers in the specialist health service
By *public* specialist health services we mean health services provided by the health trusts or district psychiatric centres (DPC). *Private service providers* in the specialist health service fall into one of three categories: *private service providers with public funding contracts*, *private service providers with service procurement contracts* and *mental healthcare specialists in private practice under public funding contracts*. Information about how treatment breaks down by public or private institutions was obtained from Statistics Norway.[34] Mental healthcare specialists in private practice under public funding contracts are designated sector 7 in the data from NPR. Both the public specialist health service and private service providers under public funding contracts are obliged to submit information about their treatment of patients to NPR. The healthcare atlas will therefore be able to provide an overview of the treatment provided by the public authorities through the funding schemes. Health services that are fully privately funded are not included.

Small numbers and protection of privacy

Due to privacy considerations we have, as a rule, not published figures and rates based on fewer than six patients.

Gender and age adjustments

People's use of specialist health services varies with age and gender. The use of many somatic health services typically increases with increasing age, while the use of health services for patients with mental illness and substance use disorder is higher in the younger age groups. The population composition is taken into consideration when rates are standardised. This enables the use of health services by the population of one area to be compared with that of another area even when the population sizes and age and gender composition are different (Statistisk sentralbyrå, 1997). The rates in the report have been adjusted for gender and age, except in Table 4.1. The denominator includes the number of inhabitants in the age segment we are studying. The program R was used for standardisation in the analyses (R Core Team, 2018).

[34] https://www.ssb.no/innrapportering/naeringsliv/helseforetak

Directly standardised rates

The gender and age adjustment was done by dividing both genders into five-year age bands where possible, based on the volume and width of each age segment. The number of age groups is therefore different for each age segment. For each gender, we used nine age groups for adults, and three age groups for the elderly and for children and adolescents. First we calculated *gender- and age-specific rates* for each gender and age group i in each hospital referral area k. K is the number of hospital referral areas, while I is the number of gender and age groups.

Each gender- and age-specific rate was then weighted based on the proportion that each group makes up of the population of Norway as a whole based on the standard population: the population of Norway as of 1 January 2016. Finally, the weighted rates for all the gender and age groups were added up. See below.

For each area $k, k = 1, 2, \ldots K$, we find the number of cases and the population:

O_{ikt} Number of cases in gender and age group i, $i = 1, 2, \ldots, I$, for area k, in the course of year t, $t = 2014, \ldots, 2018$.

N_{ikt} Population in gender and age group i, $i = 1, 2, \ldots, I$, for area k, 1 January of year t, $t, t = 2014, \ldots, 2018$.

We used the following variables from the standard population (the population of Norway as of 1 January 2016) to calculate the weights:

N_i Population in Norway as a whole in gender and age group i, $i = 1, 2, \ldots, I$, on 1 January 2016.

N Total population in Norway as of 1 January 2016.

The total number of cases during the period 2014-2018, for gender and age group i in area k, is given by

$$O_{ik} = \sum_t O_{ikt}$$

The sum of population per year during the period 2014-2018, *(person years*) in area k, for gender and age group i, is given by

$$N_{ik} = \sum_t N_{ikt}$$

The standardised rate R_k per 1,000 population for area k is then given by

$$R_k = \sum_{i=1}^{I} \left[\left(\frac{O_{ik}}{N_{ik}} \right) \left(\frac{N_i}{N} \right) \right] \cdot 1\,000$$

Appendix C

Definition of hospital referral areas

Table C.1: Overview of which municipalities constitute the different hospital referral areas/health trusts' catchment areas

Short name, hospital referral area[35]	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 Deatnu 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

Table C.1: Overview of which municipalities constitute the different hospital referral areas/health trusts' catchment areas

Short name, hospital referral area[35]	**Municipalities**
Nord-Trøndelag	5004 Steinkjer, 5005 Namsos, 5020 Osen, 5034 Meråker, 5035 Stjørdal, 5036 Frosta, 5037 Levanger, 5038 Verdal, 5039 Verran, 5040 Namdalseid, 5041 Snåase–Snåsa, 5042 Lierne, 5043 Raarvikhe – Røyrvik, 5044 Namsskogan, 5045 Grong, 5046 Høylandet, 5047 Overhalla, 5048 Fosnes, 5049 Flatanger, 5050 Vikna, 5051 Nærøy, 5052 Leka, 5053 Inderøy
St. Olavs	5001 Trondheim, 5011 Hemne, 5012 Snillfjord, 5013 Hitra, 5014 Frøya, 5015 Ørland, 5016 Agdenes, 5017 Bjugn, 5018 Åfjord, 5019 Roan, 5021 Oppdal, 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, 1567 Rindal, 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 Gaular, 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

Table C.1: Overview of which municipalities constitute the different hospital referral areas/health trusts' catchment areas

Short name, hospital referral area[35]	**Municipalities**
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
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
OUS	030103 Sagene, 030108 Nordre Aker, 030109 Bjerke, 030113 Østensjø, 030114 Nordstrand, 030115 Søndre Nordstrand and 030117 Marka city districts in Oslo
Lovisenberg	030101 Gamle Oslo, 030102 Grünerløkka, 030104 St. Hanshaugen and 030116 Sentrum city districts in Oslo
Diakonhjemmet	030105 Frogner, 030106 Ullern, and 030107 Vestre Aker city districts in Oslo
Ahus	0121 Rømskog, 0211 Vestby, 0213 Ski, 0214 Ås, 0215 Frogn, 0216 Nesodden, 0217 Oppegård, 0221 Aurskog-Høland, 0226 Sørum, 0227 Fet, 0228 Rælingen, 0229 Enebakk, 0230 Lørenskog, 0231 Skedsmo, 0233 Nittedal, 0234 Gjerdrum, 0235 Ullensaker, 0236 Nes, 0237 Eidsvoll, 0238 Nannestad, 0239 Hurdal, and 030110 Grorud, 030111 Stovner and 030112 Alna city districts in Oslo
Innlandet	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

Table C.1: Overview of which municipalities constitute the different hospital referral areas/health trusts' catchment areas

Short name, hospital referral area[35]	**Municipalities**
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 Holmestrand, 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 Tvedestrand, 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

[35]The full names of the hospital referral areas are provided in Table 3.1

Appendix D

Definition of DPC referral areas

Table D.1: Overview of which municipalities and city districts constitute the DPC referral areas

Names of DPC and RHA	Names of municipalities and city districts
Northern Norway RHA	
Midt-Finnmark	2011 Kautokeino, 2020 Porsanger, 2021 Karasjok, 2022 Lebesby, 2023 Gamvik
Vest-Finnmark	2004 Hammerfest, 2012 Alta, 2014 Loppa, 2015 Hasvik, 2017 Kvalsund, 2018 Måsøy, 2019 Nordkapp
Øst-Finnmark	2002 Vardø, 2003 Vadsø, 2024 Berlevåg, 2025 Deatnu, Tana, 2027 Nesseby, 2028 Båtsfjord, 2030 Sør-Varanger
Midt-Troms	1919 Gratangen, 1920 Lavangen, 1922 Bardu, 1923 , Salangen, 1924 Målselv, 1925 Sørreisa, 1926 Dyrøy, 1927 Tranøy, 1928 Torsken, 1929 Berg, 1931 Lenvik
Nord-Troms	1940 Kåfjord, 1941 Skjervøy, 1942 Nordreisa, 1943 Kvænangen
Ofoten	1805 Narvik, 1851 Lødingen, 1852 Tjeldsund, 1853 Evenes, 1854 Ballangen
Sør-Troms	1903 Harstad, 1911 Kvæfjord, 1913 Skånland, 1917 Ibestad
Tromsø og omegn	1902 Tromsø, 1933 Balsfjord, 1936 Karlsøy, 1938 Lyngen, 1939 Storfjord
Lofoten	1857 Værøy, 1859 Flakstad, 1860 Vestvågøy, 1865 Vågan, 1874 Moskenes
Salten	1804 Bodø, 1837 Meløy, 1838 Gildeskål, 1839 Beiarn, 1840 Saltdal, 1841 Fauske, 1845 Sørfold, 1848 Steigen, 1849 Hamarøy, 1850 Tysfjord, 1856 Røst
Vesterålen	1866 Hadsel, 1867 Bø, 1868 Øksnes, 1870 Sortland, 1871 Andøy
Mo i Rana	1828 Nesna, 1832 Hemnes, 1833 Rana, 1836 Rødøy
Mosjøen	1824 Vefsn, 1825 Grane, 1826 Hattfjelldal

Table D.1: Overview of which municipalities and city districts constitute the DPC referral areas

Names of DPC and RHA	Names of municipalities and city districts
Ytre Helgeland	1811 Bindal, 1812 Sømna, 1813 Brønnøy, 1815 Vega, 1816 Vevelstad, 1818 Herøy, 1820 Alstahaug, 1822 Leirfjord, 1827 Dønna, 1834 Lurøy, 1835 Træna
Central Norway RHA	
Levanger	5004 Steinkjer, 5038 Verdal, 5041 Snåase – Snåsa, 5053 Inderøy, Levanger kommune , 5037 Levanger
Namsos	5005 Namsos, 5020 Osen, 5039 Verran, 5040 Namdalseid, 5042 Lierne, 5043 Raarvikhe – Røyrvik, 5044 Namsskogan, 5045 Grong, 5046 Høylandet, 5047 Overhalla, 5048 Fosnes, 5049 Flatanger, 5050 Vikna, 5051 Nærøy, 5052 Leka
Stjørdal	5034 Meråker, 5035 Stjørdal, 5036 Frosta, 5032 Selbu, 5033 Tydal
Orkdal	5011 Hemne, 5012 Snillfjord, 5013 Hitra, 5014 Frøya, 5016 Agdenes, 5021 Oppdal, 5022 Rennebu, 5023 Meldal, 5024 Orkdal, 5025 Røros, 5026 Holtålen, 5027 Midtre Gauldal, 5029 Skaun
Tiller and Nidaros	5015 Ørland, 5017 Bjugn, 5018 Åfjord, 5019 Roan, 5028 Melhus, 5030 Klæbu, 5054 Indre Fosen og bydelane 500101 Midtbyen, 500102 Østbyen, 5031 Malvik, 500103 Lerkendal og 500104 Heimdal i Trondheim
Kristiansund	1505 Kristiansund, 1554 Averøy, 1560 Tingvoll, 1566 Surnadal, 1567 Rindal, 1571 Halsa, 1573 Smøla, 1576 Aure
Molde	1502 Molde, 1535 Vestnes, 1539 Rauma, 1543 Nesset, 1545 Midsund, 1546 Sandøy, 1547 Aukra, 1548 Fræna, 1551 Eide, 1557 Gjemnes, 1563 Sunndal
Volda	1511 Vanylven, 1514 Sande, 1515 Herøy, 1516 Ulstein, 1519 Volda, 1520 Ørsta
Ålesund	1504 Ålesund, 1517 Hareid, 1523 Ørskog, 1524 Norddal, 1525 Stranda, 1526 Stordal, 1528 Sykkylven, 1529 Skodje, 1531 Sula, 1532 Giske, 1534 Haram
Western Norway RHA	
Førde	1401 Flora, 1412 Solund, 1413 Hyllestad, 1416 Høyanger, 1428 Askvoll, 1429 Fjaler, 1430 Gaular, 1431 Jølster, 1432 Førde, 1433 Naustdal, 1438 Bremanger
Indre Sogn	1417 Vik, 1418 Balestrand, 1419 Leikanger, 1420 Sogndal, 1421 Aurland, 1422 Lærdal, 1424 Årdal, 1426 Luster
Nordfjord	1439 Vågsøy, 1441 Selje, 1443 Eid, 1444 Hornindal, 1445 Gloppen, 1449 Stryn
Betanien	120104 Fyllingsdalen and 120105 Laksevåg city districts in Bergen

Table D.1: Overview of which municipalities and city districts constitute the DPC referral areas

Names of DPC and RHA	**Names of municipalities and city districts**
Bjørgvin	1252 Modalen, 1253 Osterøy, 1256 Meland, 1260 Radøy, 1263 Lindås, 1264 Austrheim, 1265 Fedje, 1266 Masfjorden, 1411 Gulen and city districts 120101 Arna and 120108 Åsane in Bergen
Kronstad	120102 Bergenhus, 120106 Ytrebygda and 120107 Årstad city districts in Bergen
Solli	1241 Fusa, 1242 Samnanger, 1243 Os, 1244 Austevoll, and 120103 Fana city district in Bergen
Voss	1233 Ulvik, 1234 Granvin, 1235 Voss, 1238 Kvam, 1251 Vaksdal, 1232 Eidfjord
Øyane	1245 Sund, 1246 Fjell, 1247 Askøy, 1259 Øygarden
Folgefonn	1224 Kvinnherad, 1227 Jondal, 1228 Odda, 1231 Ullensvang
Haugaland – Karmøy	1106 Haugesund, 1134 Suldal, 1135 Sauda, 1145 Bokn, 1146 Tysvær, 1149 Karmøy, 1151 Utsira, 1160 Vindafjord, 1211 Etne, 1216 Sveio
Stord	1219 Bømlo, 1221 Stord, 1222 Fitjar, 1223 Tysnes
Dalane	1101 Eigersund, 1111 Sokndal, 1112 Lund, 1114 Bjerkreim
Jæren	1119 Hå, 1120 Klepp, 1121 Time, 1122 Gjesdal
Sandnes	1102 Sandnes, 1129 Forsand, 1130 Strand, 1133 Hjelmeland
Sola	1124 Sola, 1127 Randaberg, 1141 Finnøy, 1142 Rennesøy, 1144 Kvitsøy, and 110306 Hillevåg and 110307 Hinna city districts in Stavanger
Stavanger	110301 Hundvåg, 110302 Tasta, 110303 Eiganes and Våland, 110304 Madla and 110305 Storhaug city districts in Stavanger
South-Eastern Norway RHA	
Fredrikstad	0106 Fredrikstad, 0111 Hvaler
Halden Sarpsborg	0101 Halden, 0105 Sarpsborg, 0119 Marker, 0128 Rakkestad
Nordre Østfold	0104 Moss, 0118 Aremark, 0122 Trøgstad, 0123 Spydeberg, 0124 Askim, 0125 Eidsberg, 0127 Skiptvet, 0135 Råde, 0136 Rygge, 0137 Våler, 0138 Hobøl
Nydalen	030103 Sagene, 030108 Nordre Aker, 030109 Bjerke and 030117 Marka city districts in Oslo
Søndre Oslo	030113 Østensjø, 030114 Nordstrand, 030115 Søndre Nordstrand city districts in Oslo
Lovisenberg	030101 Gamle Oslo, 030102 Grünerløkka, 030104 St. Hanshaugen and 030116 Sentrum city districts in Oslo
Vindern	030105 Frogner, 030106 Ullern and 030107 Vestre Aker city districts in Oslo

Table D.1: Overview of which municipalities and city districts constitute the DPC referral areas

Names of DPC and RHA	Names of municipalities and city districts
Follo	0211 Vestby, 0213 Ski, 0214 Ås, 0215 Frogn, 0216 Nesodden, 0217 Oppegård
Groruddalen	0233 Nittedal og 030110 Grorud, 030111 Stovner and 030112 Alna city districts in Oslo
Nedre Romerike	0121 Rømskog, 0221 Aurskog-Høland, 0226 Sørum, 0227 Fet, 0228 Rælingen, 0229 Enebakk, 0230 Lørenskog, 0231 Skedsmo
Øvre Romerike	0234 Gjerdrum, 0235 Ullensaker, 0236 Nes, 0237 Eidsvoll, 0238 Nannestad, 0239 Hurdal
Gjøvik	0502 Gjøvik, 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
Hamar	0403 Hamar, 0412 Ringsaker, 0415 Løten, 0417 Stange, 0426 Våler, 0427 Elverum, 0428 Trysil, 0429 Åmot
Kongsvinger	0402 Kongsvinger, 0418 Nord-Odal, 0419 Sør-Odal, 0420 Eidskog, 0423 Grue, 0425 Åsnes
Lillehammer	0501 Lillehammer, 0511 Dovre, 0512 Lesja, 0513 Skjåk, 0514 Lom, 0515 Vågå, 0516 Nord-Fron, 0517 Sel, 0519 Sør-Fron, 0520 Ringebu, 0521 Øyer, 0522 Gausdal
Tynset	0430 Stor-Elvdal, 0432 Rendalen, 0434 Engerdal, 0436 Tolga, 0437 Tynset, 0438 Alvdal, 0439 Folldal, 0441 Os
Asker	0220 Asker, 0627 Røyken, 0628 Hurum
Bærum	0219 Bærum
Drammen	0602 Drammen, 0625 Nedre Eiker, 0626 Lier, 0711 Svelvik, 0713 Sande
Kongsberg	0604 Kongsberg, 0621 Sigdal, 0624 Øvre Eiker, 0631 Flesberg, 0632 Rollag, 0633 Nore og Uvdal
Ringerike	0532 Jevnaker, 0605 Ringerike, 0612 Hole, 0615 Flå, 0616 Nes, 0617 Gol, 0618 Hemsedal, 0619 Ål, 0620 Hol , 0622 Krødsherad, 0623 Modum
Nordre Vestfold	0701 Horten, 0704 Tønsberg, 0715 Holmestrand, 0716 Re, 0729 Færder
Søndre Vestfold	0710 Sandefjord, 0712 Larvik
Nedre Telemark	0805 Porsgrunn, 0806 Skien, 0811 Siljan, 0814 Bamble, 0815 Kragerø, 0817 Drangedal, 0819 Nome
Notodden Seljord	0807 Notodden, 0821 Bø, 0822 Sauherad, 0826 Tinn, 0827 Hjartdal, 0828 Seljord, 0829 Kviteseid, 0830 Nissedal, 0831 Fyresdal, 0833 Tokke, 0834 Vinje

Table D.1: Overview of which municipalities and city districts constitute the DPC referral areas

Names of DPC and RHA	Names of municipalities and city districts
Aust-Agder	0901 Risør, 0904 Grimstad, 0906 Arendal, 0911 Gjerstad, 0912 Vegårshei, 0914 Tvedestrand, 0919 Froland, 0926 Lillesand, 0928 Birkenes, 0929 Åmli, 0935 Iveland, 0937 Evje og Hornnes, 0938 Bygland, 0940 Valle, 0941 Bykle
Lister	1003 Farsund, 1004 Flekkefjord, 1032 Lyngdal, 1034 Hægebostad, 1037 Kvinesdal, 1046 Sirdal
Strømme og Solvang	1001 Kristiansand, 1002 Mandal, 1014 Vennesla, 1017 Songdalen, 1018 Søgne, 1021 Marnardal, 1026 Åseral, 1027 Audnedal, 1029 Lindesnes

Appendix E

Resource group

Healthcare Atlas for Mental Healthcare and Substance Abuse Treatment

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