Evaluation of heroin-assisted treatment in Norway

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Foreword

Heroin-assisted treatment (HAT) has been a debated development in drug treatment policy in Norway in recent years. The establishment of two project clinics in Oslo and Bergen in 2022 reflected both a longstanding concern for people with severe opioid use disorder and an openness to exploring an additional treatment approach where conventional opioid agonist treatment had not been sufficient.

This report presents the national evaluation of that project, carried out to inform future decisions about whether, and in what form, HAT should have a place within the Norwegian treatment system.

The evaluation was commissioned by the Norwegian Directorate of Health and conducted by the Norwegian Centre for Addiction Research (SERAF) in collaboration with the Unit for Clinical Research on Addictions (RusForsk, Oslo University Hospital), Bergen Addiction Research (BAR, Haukeland University Hospital), the Centre for Alcohol and Drug Research (CRF, Aarhus University), and the service-user organization ProLAR Nett.

The report examines the organization and implementation of HAT at the two clinics, the characteristics of patients receiving treatment, the outcomes observed, and how the services are experienced by patients, families, clinicians, and other stakeholders. It combines quantitative data on health outcomes, substance use, criminal activity, and costs with qualitative interviews among patients, family members, and staff providing a comprehensive understanding of this complex intervention.

The purpose of this report is to support policymakers and decision-makers in weighing benefits, risks, and costs of HAT; to inform clinicians and managers working with HAT; and to provide user organizations, patients and affected families with a research base for further dialogue. While the report does not offer simple answers, it highlights key findings and considerations relevant to the future of treatment.

We would like to thank all the patients and family members who shared their experiences. We are also grateful to the staff at the HAT clinics, who not only shared their own perspectives but also played an important role in supporting data collection throughout the evaluation.

Contents

Executive summary

Purpose and scope

This evaluation assesses Norway's heroin-assisted treatment (HAT) pilot in Oslo (HABiO) and in Bergen (HABiB) over the first four years (January 12, 2022, to December 31, 2025). It combines clinical records, interviews with clinicians, patients and their family members, repeated questionnaires, and registry data to describe who entered HAT, clinical and social outcomes, service delivery and safety, and a preliminary cost-utility analysis. Full methods and detailed results appear in the main report and appendices.

Overall message

Heroin-assisted treatment provides benefits across multiple domains for a small, complex patient group. However, it is resource intensive and demanding both for both patients and staff. This evaluation recommends that policy decisions should prioritize maintaining clinical quality and safety, improving integration with the wider OAT system, and carefully testing operational changes that improve efficiency without undermining the program's beneficial elements.

Enrollment and population

Between 2022 and 2025, 136 unique patients started in the evaluation project for HAT (Oslo: 89; Bergen: 47). Both clinics operated below stated capacity and retention was moderate: 48% (n=65) had left treatment by the end of 2025, with an average treatment length among discharges of 11 months. Most discharges (61.5%) were voluntary, most often involving a transition to conventional opioid agonist treatment (OAT), while 38.5% were for non-attendance or involuntary discharge. Patients were typically men in their mid-40s with long histories of opioid use, prior OAT attempts, frequent polysubstance use, and substantial social and medical complexity (unstable housing, psychiatric and somatic comorbidity, low employment).

Outcomes and patient experience

Heroin-assisted treatment produced gradual, moderate improvements across multiple domains: better quality of life; reduced somatic symptoms burden, reduced self-reported heroin and polysubstance use; and declines in some criminal behaviors. Benefits accumulated over time and required ongoing engagement. Many patients and families reported clear benefits from reliable medication, increased daily stability, and stronger therapeutic relationships. However, HAT had limited impact on structural determinants such as housing, employment and food security; serious adverse events (non-fatal overdoses, medical and psychiatric complications) remained common, underscoring the need for specialized health services and close clinical supervision.

Service delivery, access and process issues

Referral volumes and enrollment were lower than capacity, indicating that referral pathways, eligibility fit and local demand, not physical capacity, were key constraints. Operational challenges included the need for numerous qualified staff to ensure safe dosing and observation, as well as inconsistent rule enforcement which could cause unrest among patients, provider stigma that inhibited referrals, and midday closures that reduced staffing efficiency.

Economic findings

From a health-economic perspective, HAT appears to be a resource-intensive intervention, with treatment costs of approximately 1 million NOK per patient per treatment-year. The relevant health-economic question, however, is the incremental cost and health gain for HAT patients compared with those patients who do not continue a stable treatment regimen, many of whom also have a high disease burden and substantial service use.

The annualized incremental cost (ICER) of continued HAT was approximately 103,000 NOK per patient per year, while continued treatment retention was associated with an additional health gain of 0.122 QALY, corresponding to 845,087 NOK per quality-adjusted life year gained. This is above the levels used as the threshold value for severe conditions in Norway.

Extended analyses showed substantial reductions in other health-service use, particularly within somatic specialist health services (approximately 108,000 NOK per patient per year). When these are included in the sensitivity analysis, the net incremental cost is almost offset and slightly negative (approximately −6,500 NOK per patient per year), while the health gain is maintained. This suggests that part of HAT's high treatment costs may be offset by reduced use of other health services. Sensitivity analyses also indicated corresponding reductions in crime-related costs, but these estimates are more uncertain and must be interpreted with caution.

Conclusions and recommendations

Heroin-assisted treatment occupies a narrow but important role within Norway's OAT system: it reaches a small group of people with severe, treatment-refractory opioid use disorder and delivers meaningful clinical and social benefits for patients. However, HAT is resource-intensive with high per-patient costs that constrain scalability and long-term sustainability. Given the modest demand and elevated unit costs, we recommend maintaining HAT at the existing two clinics, while implementing targeted efficiency measures.

Key recommendations:

1. Heroin-assisted treatment should continue in the already established clinics.
2. Cost-saving measures within HAT should be explored, without compromising clinical quality or safety.
3. Heroin-assisted treatment should continue to provide comprehensive, high-quality, evidence-based services.
4. Heroin-assisted treatment should be co-organized and integrated with existing opioid agonist treatment services.
5. Explore the development of enhanced addiction services as a broader, dynamic alternative for high-need patient populations

Summary of recommendations

The recommendations in this report are developed with heroin-assisted treatment (HAT) understood as one component of the broader opioid agonist treatment (OAT) system. Conventional OAT, principally methadone and buprenorphine, remains the first-line treatment for most people with opioid use disorder. HAT should be regarded as an extension within this continuum, providing a more intensive and resource-demanding option for a small subgroup of patients with severe, treatment-refractory opioid use disorder who have not had sufficient benefit from standard OAT medications. From this system perspective, decisions about HAT's future must take into account OAT coverage, capacity, and overall treatment priorities.

The evaluation shows that the demand for HAT is modest relative to the total OAT population. International experience from well-served OAT systems suggests that only a small proportion of patients are appropriate candidates for HAT. The evaluation in Norway is consistent with this pattern, indicating that demand for HAT is modest relative to the total OAT population. Policy and service planning for HAT should therefore be calibrated to both the severity of the target group's needs and its limited size. Any expansion or redistribution of HAT capacity should be justified by demonstrable need, realistic enrollment projections, and careful consideration of opportunity costs within the wider OAT system.

The positive results observed in Norway come from a well-resourced HAT model, combining supervised dosing, close clinical observation, multidisciplinary psychosocial support, and high staff-to-patient ratios. These elements underpin both safety and effectiveness. Substantial reductions in staffing, observation, or integrated support would change the nature of the intervention, weaken the evidence base for its benefits, and likely increase risks and downstream costs. At the same time, the current high-cost model is vulnerable, especially given relatively low patient numbers and changing society-level patterns of heroin use. Future decisions therefore involve trade-offs between clinical quality, accessibility, and long-term financial sustainability. The full details of the recommendations can be found in **Section 8**.

Against this background, **the report makes five main recommendations:**

1. Continue HAT in the existing clinics, with attention to operational efficiency

HAT should continue as a publicly funded option within OAT at the two established clinics, as it provides an evidence-based treatment alternative for a small group of patients with severe, treatment-refractory opioid use disorder and contributes to improved outcomes for this group. Stand-alone HAT clinics should, however, be limited to locations with sufficient projected demand, and clear operational thresholds for minimum staffing and caseloads should be set to safeguard safety, quality, and economic sustainability. Therefore, the establishment of new stand-alone clinics in additional cities is unlikely to be justified at present, given the projected number of potential patients in other catchment areas. While this report suggests the continuation of HAT, it also strongly recommends exploring operational changes that would improve costs and long-term viability.

2. Systematically explore cost-saving options within HAT

If HAT becomes a permanent part of the treatment system, its long-term viability will depend on targeted efficiency measures that do not undermine clinical standards or patient-centered care. The current HAT model costs exceed the Norwegian willingness to pay threshold, a standard metric for determining the cost-effectiveness of an intervention.

Therefore, this report recommends exploring cost-saving options to improve operational efficiency. This could include appropriate use of lower-cost medication alternatives for some patients after individual considerations, improving scheduling and time management to reduce peak staffing needs, and shared staffing models with OAT services. Such changes should be piloted carefully and evaluated with evaluation- and research methods against predefined safety, quality, and outcome criteria.

3. Maintain HAT as a comprehensive, high-quality, evidence-based service

Even while pursuing cost-savings, HAT must retain its core components: supervised administration of opioids, sufficient clinical observation and emergency preparedness, and integrated medical, mental health, and social support for patients with complex needs. Under-resourced clinics risk compromised safety, staff burnout, and gaps in care, as well as decreased patient satisfaction and treatment outcomes. Any cost-saving initiatives should explicitly avoid weakening these essential safeguards.

Protecting quality also requires appropriate staff competencies and workforce support. Addressing patients' complex health challenges, clinics should ensure access to clinicians with addiction medicine expertise, trained nursing staff competent in supervised injectable dosing, acute response, and harm reduction, in addition to social services, and regular multidisciplinary input. To provide integrated physical and mental

health care, these competencies should be available as part of HAT or in close collaboration with HAT. Minimum staffing levels should be defined and maintained, with ongoing training and supervision, and clear clinical protocols. Cost-reduction proposals must be evaluated against their impact on these staffing standards and on patient and staff safety.

4. **Improve integration of HAT within existing OAT services**

Shared infrastructure and staffing between HAT and OAT could reduce duplication and running costs, strengthen workforce resilience, and make it easier for patients to move between different treatment options as their needs change. Co-organization between the treatment options may improve operational efficiency and reduce clinic vulnerability if patient enrollment decreases.

5. **In the longer term, explore enhanced addiction services as an alternative to stand-alone HAT clinics**

Looking ahead, the report recommends considering broader "enhanced" outpatient addiction services that serve people with severe, high-risk substance use beyond opioids (e.g. stimulants and polysubstance use), as well as those on daily OAT/HAT who require intensive follow-up. Such services would apply the structured, multidisciplinary HAT model to a wider high-need group and may offer a more flexible, dynamic, and sustainable way to organize intensive addiction care as drug patterns and service needs evolve.

Taken together, these recommendations aim to secure the benefits of the holistic HAT model for those who need it most, while ensuring that it remains safe, well integrated with the wider OAT system, and economically sustainable over time.

1. Introduction

Opioid use disorder (OUD) is often understood as a chronic, recurrent condition associated with a range of physical, social, and psychological problems that place a significant burden on the individual in terms of morbidity and mortality. Due to the chronic course, people with OUD often require long-term involvement with the treatment system. Opioid agonist treatment (OAT) includes the use of opioid agonists, most often methadone and buprenorphine. In general, OAT is associated with a reduced risk of fatal overdoses, infections, and criminal behavior. Although this form of treatment has been successful, standard OAT does not result in satisfactory outcomes for about one in ten people with OUD, which can have fatal consequences.

Heroin-assisted treatment (HAT) includes the daily, supervised use of pharmaceutical heroin (diacetylmorphine) in a clinical setting. A long-acting opioid (traditionally methadone) is used for overnight treatment coverage. Most HAT programs use injectable or tablet diacetylmorphine. Other routes of administration, including inhalation and intranasal administration, are available or have been implemented in some countries. However, the evidence base for these routes is more limited than for injectable and oral/tablet formulations. They may therefore be regarded as less established approaches rather than standard forms of HAT [1, 2].

Heroin-assisted treatment has been implemented in various countries for over 30 years. Results from high-quality randomized controlled trials indicate that HAT can be effective in reducing crime and illicit heroin use, and that patients in the target group tend to remain in HAT longer than in methadone-only OAT [3, 4]. For treatment retention and reduced illicit heroin use, the evidence from randomized controlled trials consistently supports the effectiveness of HAT over oral methadone for a subset of patients [3].

Despite the international evidence supporting HAT, knowledge of how the model functions and how it can be integrated into a national treatment system, such as the Norwegian health care system, is still limited. In 2021, a government-supported five-year HAT project was introduced in Oslo and Bergen. Funding for the Norwegian HAT program supported both the clinical intervention and a comprehensive research evaluation conducted between 2021 and 2026. The Norwegian Centre for Addiction Research (SERAF, UiO) led the research team in collaboration with the Unit for Clinical Research on Addictions (RusForsk, Oslo University Hospital), Bergen Addiction Research (BAR, Haukeland University Hospital), the Centre for Alcohol and Drug Research (CRF, Aarhus University), and the service-user organization ProLAR Nett.

2. Purpose

The primary aim of this project was to evaluate the effects of heroin-assisted treatment (HAT) for patients with opioid use disorder in Norway. This final report summarizes the study's activities and evidence, quantitative outcomes, qualitative findings, and a preliminary societal economic assessment, and sets out clear, practical recommendations for policy and practice based on those results.

The evaluation was commissioned by the Norwegian Directorate of Health in 2021 to inform decisions on whether HAT should be continued as a permanent treatment option, and if so, how the future design, organization and scale of HAT services ought to be configured. As specified in the assignment, the project produced a midway report submitted in 2024 and this comprehensive final report, which synthesizes findings from project inception through the entire evaluation period.

The purpose of the report is to support the Norwegian Directorate of Health and other stakeholders in deciding whether, and, if so, how to continue, adapt, or scale HAT in Norway. Recommendations are framed to balance clinical effectiveness and patient safety with equity, operational feasibility, and economic sustainability.

3. Heroin-assisted treatment in Norway

3.1 The establishment of heroin-assisted treatment in Norway

The public and political debate about heroin-assisted treatment (HAT) first emerged in Norway around 2007. At that time, support for HAT was scarce among parliamentary parties, and HAT was not a visible issue in public debate. This, however, changed markedly during the subsequent decade. By the time the government made its final decision to implement a time-limited HAT project in 2019, HAT had become a highly debated issue, and many political parties and other influential actors had been advocating for HAT for several years [5].

The shift from minimal support in the mid-2000s to the establishment of the first HAT clinics in 2022 did not primarily result from pressure or demands from clinical addiction treatment researchers. Rather, it was driven by influential individual politicians, activists, user organizations, and, later, members of the media and political parties. These stakeholders framed HAT as an important initiative for the most disadvantaged people who inject drugs for whom existing opioid agonist treatment (OAT) was insufficient. At the same time, HAT also seemed to play a broader symbolic role by posing a potential marker of change in the debate on drug policy reform that intensified during the decade leading up to the HAT project's enactment. During that decade the debate on drug policy reform, criticism of the negative consequences of the “punitive” approach towards people who inject drugs, and the demand for a more liberal drug policy had gained increased momentum. This shift in discourse affected the Norwegian drug policy landscape and was likely a crucial prerequisite of the increased political support for HAT [5].

These policy changes were therefore driven more by opinion leaders and political actors than by the existing scientific and locally grounded evidence base. In Norway, individuals with opioid use disorder (OUD) have access to free medical care and social services, and in recent years, treatment has become more accessible, with reduced waiting times and, in many cases, rapid entry into care. In addition, approximately 70-80% of the estimated target population is in OAT; retention is generally high, and most patients remain in treatment over long periods. Patient-reported satisfaction with conventional OAT is overall moderate to high [6].

At the same time, very few people in Norway are currently being arrested or imprisoned for minor drug offences such as use or possession of small quantities of illicit drugs, which reflects changes during recent years in both judicial decision-making and legislation [7]. However, many individuals with drug use disorders are incarcerated for other types of offences unrelated to drug use or possession [8]. Overall, “the war on drugs” has not been a prominent feature of Norwegian drug policy or clinical practice in recent years [9]. Instead, Norway is often characterized as having a relatively balanced

and health-oriented drug policy and ranks among the better-performing countries on the Global Drug Policy Index [10].

Despite increasing political support for HAT in recent years, several addiction treatment and research communities, as well as some user organizations, criticized the use of limited economic resources for establishing a new costly treatment model such as HAT. They argued instead for strengthening existing OAT services, emphasizing their cost-effectiveness and broader patient benefit. On the other side of the debate, several political parties and user organizations supported HAT as a necessary addition to existing treatment options for a small subgroup of the most vulnerable patients with severe OUD who do not benefit from OAT [5].

In the decade prior to the government's enactment of the five-year HAT project in 2019, several assessments and scientific reviews were conducted by health authorities to evaluate the potential introduction of HAT in Norway [11]. These reviews generally concluded that the evidence base at the time was insufficient to support HAT's effectiveness for the intended patient group, and that its introduction would therefore be premature. Later, political support for HAT focused on implementing a time-limited pilot designed to generate knowledge that could guide a decision about a potential permanent establishment. This approach differed from that of some other countries, such as Denmark, where HAT was introduced in 2010 as a permanent OAT service without any preceding pilot phase or formal plan for a research-based evaluation [12]. Since then, several international studies, including randomized controlled trials, systematic reviews, and observational studies, have reported positive effects of HAT for both patients and society [13].

3.2 Treatment for opioid use disorder in Norway

Opioid agonist treatment (OAT) is part of Multidisciplinary Specialized Drug Treatment (TSB) in the specialist health services. Individuals can be referred to OAT by their primary care physician, psychologist, municipal health and social services, or other units within the specialist health services. At the end of 2024, nearly 8,500 people were enrolled in OAT [14]. Norway revised its clinical guidelines for OAT in 2022, with greater focus on user participation, individualized treatment plans, and a broader selection of medications [15]. Current pharmacological options include buprenorphine (available as monotherapy, in depot form, and in combination with naloxone), methadone, levomethadone, and various morphine-based preparations (with 24-hour and 12-hour formulations) [14]. The 24-hour morphine formulation became available during the HAT project period on November 1, 2023.

Heroin-assisted treatment is a very small component of Norway's OAT system, accounting for fewer than 1% of OAT patients [14]. Although prior treatment with OAT is not a formal requirement, HAT is not used as a first-line option; patients are typically expected to have tried other OAT medications and approaches before being considered for HAT. Norwegian HAT is integrated into the specialist health services and is provided by hospital-based units under the regional health authorities, as a defined additional option within the broader framework of OAT.

Overall, HAT patients are similar to the rest of the OAT population in terms of age, gender distribution, prevalence of mental health problems and access to treatment for mental disorders, as well as patterns of additional prescribing of benzodiazepines and provider involvement (responsibility group meetings). However, they differ by having more unstable housing, lower employment and less work-related income, more frequent and persistent substance use, and a higher overdose rate (see **Table 3.A**).

Table 3.A: Comparison of situation and treatment factors among patients in HAT with patients in standard OAT (from Norwegian LAR Status Report 2024)

	Patients in HAT (n=71)	Patients in OAT (n=5551)
Sex	18.6% women 81.4% men	30.4% women 69.6% men
Age	46.9 years	47.8 years
Living situation	65.6% own home 7.1% hospice/lodging house/hotel 7.1% with others 11.1% in institution 2.9% no permanent housing	81.9% own home 2% hospice/lodging house/hotel 3.7% with parents 2.2% with others 1.1% in prison 4.2% in institution 2.5% no permanent housing 2.3% unknown living situation
Main activity	90.0% unemployed 5.7% part-time job	82.6% unemployed 9.0% full-time job 5.4% part-time job 1.1% in education 0.3% part-time job and education 2% unknown
Main income	64.3% disability pension 18.6% AAP (work assessment allowance) 15.7% social assistance 1.4% other/unknown	71.6% disability pension 10.3% AAP (work assessment allowance) 2.4% social assistance 10.1% earned income 4.0% other
Additional prescription of benzodiazepines	42.9% additional prescription 54.3% no additional prescription 2.9% unknown status	41.1% additional prescription 54.8% no additional prescription 4.2% unknown status
Side effects of OAT medication*	0% side effects 50.0% no side effects 45.7% not applicable 4.3% unknown status	8.3% side effects 37.4% no side effects 39.4% not applicable 14.9% unknown
Drug tests	84.3% no regular drug tests 7.1% spot checks 7.1% regular drug tests 1.4% unknown status	49.1% no regular drug tests 26.5% spot checks 20.1% regular drug tests 3.9% unknown status
Treatment goal	94.3% stabilization without requirement of abstinence	26.2% stabilization without requirement of abstinence

	Patients in HAT (n=71)	Patients in OAT (n=5551)
	5.7% rehabilitation with abstinence	68.1% rehabilitation with abstinence 5.7% not clarified
Individual plan	51.4% individual plan 40.0% no individual plan 8.6% unknown status	9.3% individual plan 77.0% no individual plan 13.4% unknown status
Care coordination meeting in the last three months	28.6% care coordination meeting 71.4% no care coordination meeting	27.4% care coordination meeting 69.8% no care coordination meeting 2.9% unknown
Treatment for mental health problems in the last four weeks	14.3% received treatment 85.7% did not receive treatment	15.6% received treatment 79.3% did not receive treatment 5.4% unknown status
Mental health problems in the last four weeks	7.1% depressive symptoms 24.3% anxiety symptoms 7.1% delusions	12.3% depressive symptoms 23.8% anxiety symptoms 6.7% delusions
Substance use in the last four weeks	14.3% no substance use in the last four weeks 21.4% a few isolated episodes 54.3% regular use 10% unknown status	42.1% no substance use in the last four weeks 17.5% a few isolated episodes 26.3% regular use 14.1% unknown status
Overdose in the last year	12.9% overdose	6.3% overdose
Patient satisfaction with treatment	71.4% satisfied 20.0% mixed 8.9% dissatisfied 5.7% unknown	61.3% satisfied 14.6% mixed 3.1% dissatisfied 21.0% unknown
Clinician satisfaction with treatment	77.6% satisfied 20.9% mixed 1.5% dissatisfied	68.8% satisfied 23.0% mixed 2.6% dissatisfied 5.7% unknown
Need for change	95.7% no need for change 2.9% need for change 1.4% unknown status	82.9% no need for change 10.8% need for change 6.3% unknown status

** Includes only OAT units using DIPS Arena or Checkware (n=4031) [14].*

3.3 Heroin-assisted treatment clinics in Oslo and Bergen

In 2018, the Government approved a time-limited pilot to establish heroin-assisted treatment (HAT) clinics in Oslo and Bergen. Although relatively similar in structure, the clinics have some differences in their characteristics. (See **Table 3.B**).

Table 3.B. Norwegian HAT clinic characteristics

	Oslo	Bergen
Clinic opening date	January 2022	March 2022
Catchment area [*]	523,400	465,200
Patients in OAT (excl. HAT) [*]	1,141	1,109
Patients in HAT[1]	47	31
Opening hours	08:15-11:00 (observation until 12:00) 12:00-14:00 closed for patients 14:00-16:00 for injection (until17:00 for tablets)	8:30-11:00 12:00-14:00 closed for patients 14:00-16:00 open for injection (until 17:00 for tablets)
Full-time equivalent staff	19.2	12.9
Weekday staffing	13 clinicians (nurses, physician, social workers, clinic manager, administrative worker)	8-10 clinicians (nurses, physician, clinic manager, psychologist, social worker, administrative worker)
Weekend staffing	6 nurses 1 support worker	5 nurses
Physician coverage	1 physician 100% (5 days per week) On-call weekends	1 physician 40% (1.5 days/week) On-call weekends
Psychologist coverage	None (referral to other units for counselling with psychologist)	20% (1 day/week)

* Bukten, A.L., Lillevold, P.H., Skeie, I., Clausen, T.: SERAF RAPPORT 5/2025 - Statusrapport 2024. In. Oslo: Norwegian Centre for Addiction Research - Senter for rus- og avhengighetsforskning (SERAF); 2025.

[1] Status, 31.12.2025

Establishment of HAT as a new treatment option in Norway

The clinics reported that establishing HAT was a complex process. Introducing diacetylmorphine required a lengthy approval process, development of new procedures in collaboration with hospital pharmacies, and management of initial supply challenges. The clinics also had to secure centrally located, purpose-built facilities that supported efficient patient flow, capacity, safety, and patient satisfaction, while at the same time addressing concerns among neighboring residents. Staffing levels and work schedules were gradually scaled up, with a strong emphasis on multidisciplinary expertise. An initially high volume of referrals led to a temporary intake stop to safeguard patient and

staff safety. The clinics developed a customized electronic medication chart and adjusted documentation routines. Approximately three months were allocated for extensive staff training in HAT-specific procedures, substance use treatment, physical and mental health, communication, safety, and collaboration with other services. The full verbatim summary from the clinics on the establishment of HAT is included in Appendix 1.

Treatment model

Heroin-assisted treatment aims to meet patients' medical needs through the use of pharmaceutical heroin (diacetylmorphine, DAM). Because of DAM's short half-life [16], this treatment model generally requires close follow-up, frequent dosing, and a higher degree of regulation than standard opioid agonist therapy (OAT).

Patients attend the clinic twice daily, every day. Both clinics run two daily patient sessions (morning and afternoon) and are closed to patients in the middle of the day (12:00–14:00). This time is set aside for follow-up, documentation, meetings, and professional development for staff. During opening hours, patients self-administer prescribed injectable or tablet-formulated DAM under supervision and receive, in addition, a long-acting opioid formulation to cover their medication needs overnight, usually methadone or oral extended-release morphine. A typical patient visit includes a brief pre-assessment in the waiting room (including visual medical assessment, dose assessment, and breath test for alcohol), followed by supervised administration in injection booths with guidance on hygiene and safety, and an observation period of at least 20 minutes after dosing. The observation period varies according to clinical judgment. A visit to the clinic may in total take up to two hours per day for the patient.

Social workers are employed at the HAT clinics to provide psychosocial follow-up and help coordinate patients' contact with other public services. Patients are referred to other specialist health services (for example, for specific physical or psychiatric needs) when relevant. The clinics also cooperate with municipal services, for example to facilitate low-threshold leisure activities and paid work.

Photographs from the injection and observation rooms at HABiB and HABiO are shown below in **Figure 3.A**.

Figure 3.A: Injection and observation rooms at HABiB and HABiO

HABiB photo: Vibeke Bråthen Buljovcic; HABiO photo: Ann Oldervoll

Medications

Medication dosing is individualized according to route of administration, with DAM available in both oral and injectable formulations. Injectable formulations may be self-administered intravenously or intramuscularly. To cover medication needs during the night, long-acting opioids are used, most commonly methadone or oral extended-release morphine (12- or 24-hour formulations). Treatment regimens are flexible and can be adjusted over time in line with patients' clinical needs.

Staffing

Each clinic has a treatment team consisting of specialists in addiction medicine, nurses and specialist nurses, social workers, and administrative/support staff. Nurses conduct pre- and post-assessments, dispense medications, and provide basic health care (for example health checks, vitamins, etc.). Optional psychosocial follow-up (housing, finances, assistance with work) is provided by social workers. In addition, knowledge of harm reduction principles is important.

The Oslo clinic has 19.2 full-time equivalent positions, and the Bergen clinic 12.9. Staff are mainly employed exclusively in HAT, and there is no shared staffing with conventional OAT (with the exception that one physician at HABiO also works in OAT).

Both clinics regularly organize internal training and teaching sessions for staff, usually during the mid-day closure (12:00–14:00). During these sessions, external stakeholders (researchers, health professionals, etc.) are invited to give presentations or training on topics relevant to the implementation of HAT and clinical work.

Clinic location

The Oslo clinic (HABiO) is located near the OAT clinic at the Ullevål campus of Oslo University Hospital. It is housed in a specially adapted building whose design is based on Behandlingscenter Odense, the largest heroin clinic in Denmark [17].

The clinic is organized with a circular layout: From the entrance, patients proceed to a waiting room and then to an examination room for consultation with a physician. There they receive tablets or, if they are prescribed injectable treatment, they proceed to the injection room, which has five injection booths. After treatment, patients move to the observation room, where breakfast is served, and then leave the clinic after a predefined observation period.

The Bergen clinic (HABiB) is located in the city center (Engenhuset). The clinic moved there after about one and a half years in two different temporary facilities at Skutevicksklinikken, just outside the city center. Engenhuset is a fully renovated six-story building that houses several units of the Clinic for Substance Use and Addiction, including a short-stay inpatient unit, an outpatient clinic, and a research section. Patients have a separate entrance to HABiB.

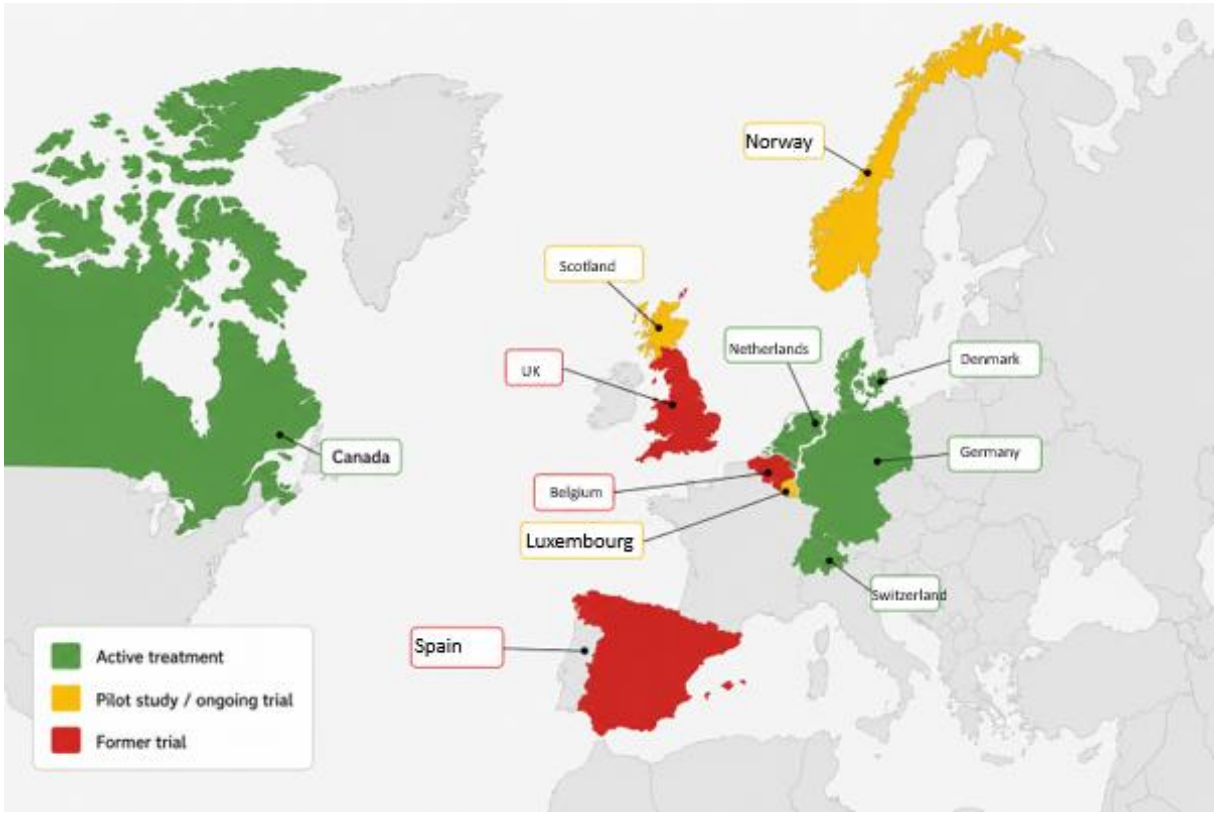
Patients at the Bergen clinic also follow a circular patient flow. From the entrance they go to a waiting room before being called in for a pre-assessment by a nurse or social worker. At this point, patients who are prescribed tablets receive them, while those receiving injectable treatment proceed to a separate injection room with six individual booths. After treatment, patients go to an observation room where coffee is served, and they leave the clinic after completion of a predefined observation period.

4. International context

4.1 Summary of existing programs

Since supervised heroin-assisted treatment (HAT) was first introduced in Switzerland in 1994 [18], it has gradually been adopted in several other countries, including the Netherlands, Germany, Denmark, and Canada. In most places, HAT started as a randomized controlled trial research project. These studies showed positive short- and long-term outcomes, which led to HAT becoming integrated into their established treatment system. More recently, Luxembourg and Scotland have introduced HAT as projects. Today, HAT is available in eight countries, including Norway.

Figure 4.A: International status of heroin-assisted treatment



In Spain, Belgium, and the UK, HAT was implemented through research trials; however, the associated clinics closed once the studies were completed or funding ended. Most HAT programs currently procure diacetylmorphine produced by a single Swiss manufacturer, which limits price competition but ensures medical-grade quality drugs [19].

Substantial heterogeneity between countries makes direct comparison challenging. Heroin-assisted treatment programs differ in organizational, regulatory, and funding structures (e.g., municipal, provincial/regional, or national administration) with varying funding sources and financial constraints. They also vary in the number of clinics, patient capacity, and inclusion criteria. While all programs rely on doctors and nurses, the

availability and roles of social workers, psychologists, and pharmacists differ considerably, and, therefore, also the range of services provided at the clinic.

Programs also differ in their permitted routes of administration. While most countries provide injectable heroin, some additionally offer tablets, inhalable, or intranasal formulations. Bridge medications likewise vary and may include methadone, buprenorphine, or slow-release oral morphine, with different practices regarding supervised dosing and with some allowing for take-home medication (Switzerland and Canada).

Overall, international research shows that HAT successfully reaches patients who have not benefited from other treatment options for opioid use disorder (OUD). Many remain in care for years, and programs report improvements in health, stability, and reduced illicit drug use. Since then, service models, patient profiles, and drug markets have changed substantially. While the trial findings remain valid for their original settings, the current context is more complex, and HAT must adapt its design and delivery to meet evolving needs and risks. HAT provision is shaped by shifting substance use patterns and demographic trends, including an aging patient population and increasing polysubstance use. Across countries, admissions to HAT are generally reported to be below available capacity, but relatively stable over time.

4.2 International expert seminar

In January 2026, the Norwegian Centre for Addiction Research hosted an international seminar on HAT. Experts from Canada, Switzerland, the Netherlands, Denmark, Scotland, England, and Norway shared experiences from their HAT programs and discussed key questions relevant to the Norwegian project. Despite differences between countries, there was broad agreement on several points.

- Heroin-assisted treatment is not a first-line treatment, but a targeted option for patients for whom existing OAT has not provided sufficient benefit.
- Many HAT patients are older, have long treatment histories, and live with multiple health and social problems. High rates of homelessness or unstable housing, psychiatric comorbidity, and extensive contact with the criminal justice system are common.
- Across countries, retention in HAT is typically high, with a substantial share of patients remaining in care for many years.
- At the same time, the HAT population is aging, and services increasingly need to manage complex chronic conditions such as cancer, chronic obstructive pulmonary disease, and dementia. Integrated social support (e.g., housing, income support, family contact, and daily activities) was highlighted as crucial to sustaining gains.

Experts identified several barriers to accessing HAT, including geographical distance and a lack of local sites, especially for people in more rural areas, as well as stigma from healthcare providers and the wider community. Embedding HAT within specialized addiction clinics with multi-disciplinary teams was seen as one way to support integration and long-term sustainability.

4.3 Key lessons from international experience

Discussions during the seminar highlighted several shared lessons:

- Heroin-assisted treatment works best when it is integrated into the wider treatment system, not isolated from other services.
- There is no single "correct" model: some countries use standalone clinics, while others integrate small numbers of HAT patients into existing OAT clinics.
- The name "heroin-assisted treatment" may provide stigma and should be replaced by "diacetylmorphine assisted treatment", "DAM-treatment" or an even more neutral term.
- Patients often follow different paths: some move out of HAT after a period of stability, some transition to other OAT medications, some need HAT long-term.
- Regular reviews (often every six months) are important to decide whether HAT is still the right option for the individual.
- Cost discussions should be careful and broad. While HAT is resource intensive, it can save money by reducing incarceration, hospital admissions and emergency services, overdoses, and criminal behavior.
- A particular treatment is not better simply because it is cheaper; it must work for the patient.

Experts also emphasized that the most important questions are often 'why' and 'what': Why did the person start using heroin? Why does this treatment help now? What would make a change possible? Understanding these perspectives is crucial for designing services that are beneficial to the patient.

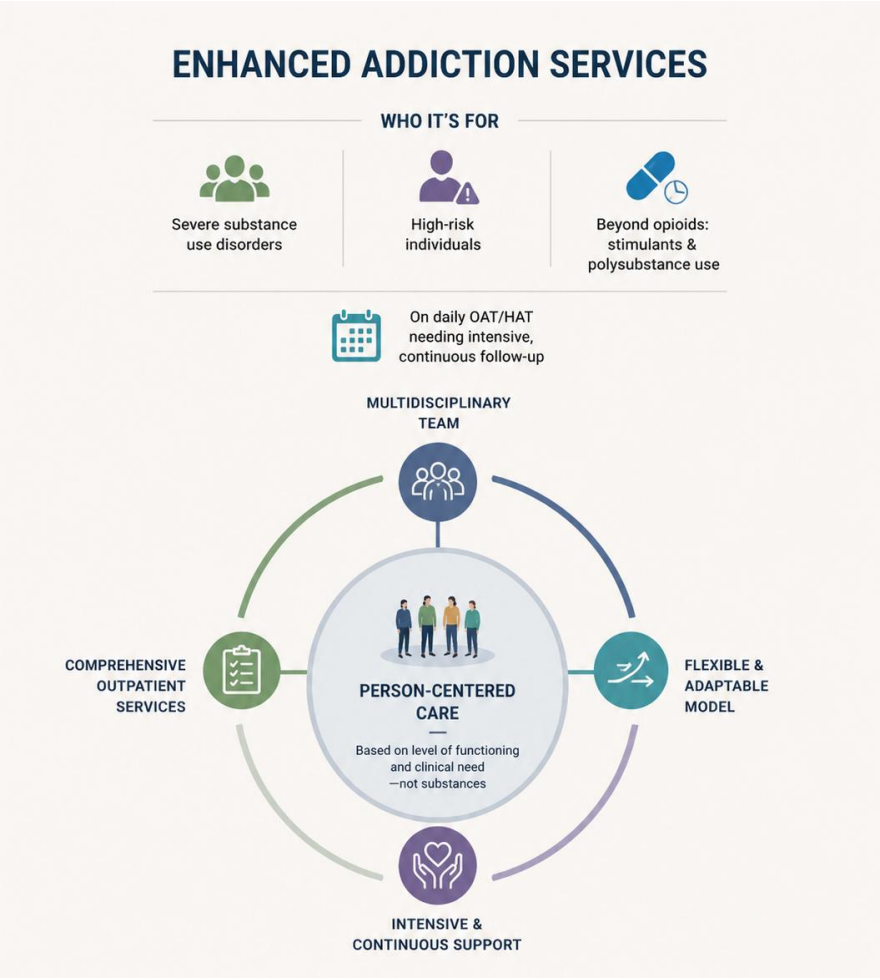
Finally, experts stressed that seemingly small program details can have large effects on outcomes. Clinic design, staff attitudes, flexibility in dosing and scheduling, and the way treatment reviews are conducted all influence whether patients feel respected, safe, and motivated to stay in care.

4.4 Enhanced addiction services

"Enhanced addiction services" is a concept derived from a Scottish treatment model in which HAT is offered as one of several modalities for those with severe substance use disorders. In this context, it denotes comprehensive outpatient addiction services for individuals with severe, high-risk substance use that extends beyond opioids, including stimulants, as well as for patients on daily OAT or HAT who require intensive and continuous follow-up. The service model is thus defined by the person's level of functioning and clinical need rather than by the specific substances used. These services apply the structured, multidisciplinary HAT model to a broader population with complex needs and may offer a more flexible and sustainable framework for delivering intensive addiction care as patterns of drug use and service requirements evolve. (See **Figure 4.B**).

International experience shows that many patients avoid treatment not because they reject help, but because they feel misunderstood, judged, or pressured. Experts stressed that treatment should be experienced as support, not control. A respectful, flexible approach can reduce stigma and improve engagement.

Figure 4.B: Infographic of enhanced addiction services



5. Methods

5.1 Timeline

The primary data collection for this evaluation took place during 2022-2025 and data collection within the project continued with the same methodologies during 2026 (see **Figure 5.A**). The first qualitative interviews were conducted in November 2020 with clinic project leaders. Research planning and questionnaire development began in 2020. Qualitative interviews with patients, staff, and affected family members were conducted during 2022-2025. Patient questionnaires were administered from the opening of the clinics in 2022. Data on referrals, adverse events, and medication were also collected from the opening of the clinics through 2025.

Figure 5.A: HAT evaluation timeline

5.2 Research structure and aims

The evaluation used qualitative, quantitative, and registry-based data. Each thematic area drew on multiple sources (see **Table 5.A**), including in-depth and semi-structured interviews, questionnaires, clinical record data, and registries. The main evaluation themes and their data sources are listed in **Table 5.A**. The corresponding aims are listed in **Table 5.B**. All data were stored securely in Services for sensitive data (TSD) at the University of Oslo.

Table 5.A. Thematic areas and data sources used for the evaluation[1]

Thematic area	Data source
Attitudes/experiences of HAT	In-depth and semi-structured interviews (patients, affected family members, staff)
Health/social/treatment outcomes	Repeated measures questionnaires, clinical records, registries
Serious adverse events	Clinical records
Process evaluation	Interviews (patients, clinic leaders, staff, administrators) and referral records
Cost-utility analysis	Administrative records, registries, repeated measures questionnaires

[1]For more information on analytic approaches, see **Appendices 2-6**.

Table 5.B. Thematic areas and corresponding main aims[1]

Thematic area	Main aims
Attitudes/experiences of HAT	Capture the experiences with HAT as seen from differing perspectives, concerning the benefits and challenges experienced by those who receive HAT, the rewards and challenges experienced by those providing HAT, and the potential indirect impacts of HAT for the caring tasks of patients' family members.
Health/social/treatment outcomes	Describe changes in mental and physical health among patients receiving HAT, and in what way it is associated with outcomes such as quality of life, utilization of health- and social services, social reintegration, criminal behavior, use of illicit drugs, and utilization of medications
Serious adverse events	Report any serious adverse events and incidents at treatment initiation, and during treatment.
Process evaluation	Evaluate the organizational processes involved in the implementation of HAT in Norwegian specialist healthcare services, and the eventual impact from HAT on OUD patients' utilization of conventional OAT.
Cost-utility analysis	Estimate cost–utility using quality-adjusted life years (QALYs) derived from EQ-5D-5L, combined with treatment costs based on program expenditures. Estimate incremental cost-effectiveness ratios (ICERs), expressed as cost per QALY gained, in accordance with Norwegian guidelines for economic evaluation. Evaluate changes in healthcare utilization and crime-related outcomes, incorporating cost offsets using a difference-in-differences approach.

[1]For more information on analytic approaches, see **appendices 2-6**.

5.3 Design

Attitudes and experiences of HAT

A qualitative design was used to examine attitudes and experiences of HAT across patients, clinicians, and affected family members. Data collection combined interviews, workshops, informal conversations, and ethnographic observation.

Patient data included:

- 60 semi-structured, in-depth interviews with 31 individuals at the Oslo and Bergen clinics (March 2022 - June 2024). Participants were interviewed at least once and up to three times to capture change over time.
- Four open patient workshops of approximately 3 hours each (conducted in 2024 and late 2025).
- Approximately 300 hours of field observations (2022-2024).
- 32 brief, structured informal conversations conducted by ProLAR Nett co-researchers (March 2024 - November 2025).

Interviews were conducted one-on-one using an interview guide co-developed with ProLAR Nett. They were audio recorded and transcribed (using AI assistance and manual review). Workshops and co-researcher conversations generated anonymized field notes.

Clinician data consisted of 47 interviews conducted in two phases:

- Early implementation phase (first 14 months): 23 interviews, primarily group interviews involving 31 clinicians with diverse roles.
- Later phase (year four, 2025): 23 individual interviews (onsite and via Teams) focusing on perspectives on ideal HAT practices.

Affected family member data comprised of 18 in-depth interviews with 10 participants. Each participant was interviewed twice at approximately four and 14 months after their relative's enrollment (June 2022 - April 2024). These interviews explored impacts on wellbeing and relationships following entry into HAT.

Across all groups, recruitment prioritized variation in role, clinic site, and timing to capture diverse and evolving experiences.

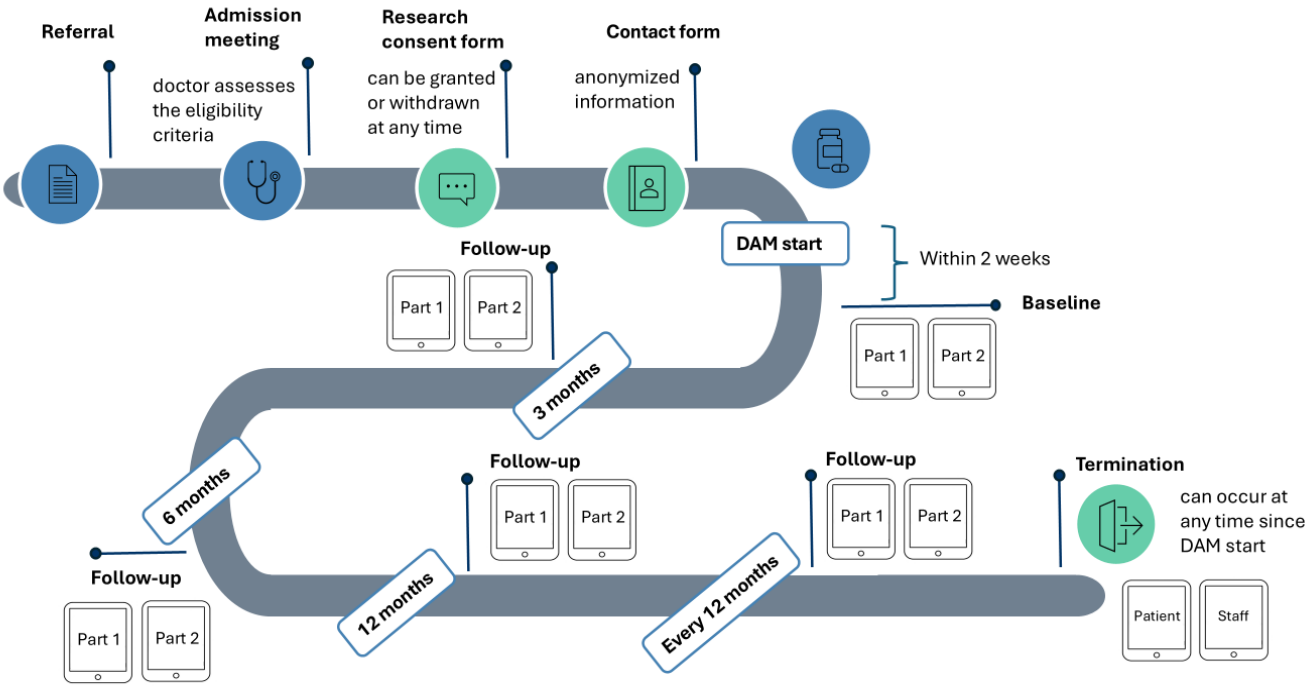
All data were analyzed using thematic analysis to identify recurring themes and construct analytic categories in dialogue with relevant literature. Multiple data sources (interviews, workshops, co-researcher conversations, and field notes) were triangulated to strengthen validity, capture diverse perceptions and experiences of HAT, cross-check emerging findings, and track changes over time. Further details on the qualitative methodology are provided in **Appendix 2**.

Health, social, and treatment outcomes

To examine health, social, and treatment outcomes, we utilized data from questionnaires collected from patients at the clinics at repeated time-points. (See **Figure 5.B**). The questionnaires were administered at baseline (ideally within two weeks of treatment initiation) and at regular follow-up intervals during treatment: 3, 6, 12, 24, 36, and 48 months. Additionally, in cases where a patient discontinued the treatment, both the patient and the relevant staff were asked to complete a separate questionnaire that aimed to identify the reasons for the termination of the treatment.

This repeated-measures design allowed for the monitoring of changes across multiple domains. Questionnaires were completed electronically using tablets. Each questionnaire took approximately one hour to complete; however, participants were given the opportunity to complete the questionnaire in separate parts during multiple visits.

Figure 5.B: Questionnaire study design



In addition, the participants' prescribed medications were extracted from clinical records one month after their enrollment and then every three months during treatment. This data included doses and administration routes for diacetylmorphine (DAM), other opioids, benzodiazepines, and medication for psychiatric and somatic illnesses.

Serious adverse events

Medical records for all consenting study participants were systematically reviewed for pre-specified serious adverse events such as overdose, seizure, allergic reaction, and incidents involving violence, acting out, threats of violence or self-harm. An overdose was defined as low oxygen in the blood (below 90%) or very slow breathing (fewer than eight breaths per minute). Relevant findings were extracted from the medical records and stored securely in TSD.

Process evaluation

For the process evaluation we reviewed referral records (e.g., referral source, acceptance or denial status, and reasons for being denied treatment), conducted interviews with clinic leaders and staff, and integrated relevant insights from site observations and patient workshops. These data were synthesized to assess referral pathways, decision processes, and early implementation dynamics. The main findings from this implementation and process evaluation are in the midway report [20] and have been updated for this report.

5.4 Cost-utility analysis

Background and context

HAT has been developed for individuals with severe opioid use disorder for whom standard opioid agonist therapy (OAT) has not produced sufficient effect. Internationally, this group is described as clinically and economically distinct, with a high burden of disease, substantial comorbidity, and extensive service use [21, 22]. The central health policy question is not only whether HAT is a costly intervention, but whether the additional health gains justify the incremental costs for a small group of individuals with very severe illness.

Health economic framework in Norway

Norwegian priority-setting decisions are based on benefit, resource use, and severity [23, 24]. Health economic evaluations often use QALY and ICER as key measures [25].

Quality-adjusted life years (QALY)

To enable comparison of the effects of different health interventions, health economic analyses often use a common measure of health gain known as QALYs (Quality Adjusted Life Years). QALYs combine length of life and health-related quality of life in a single measure and are recommended for use in health economic analyses and priority-setting in Norway because they provide a common metric for health gains [25]. This makes it possible to assess how limited health care resources can be used most efficiently at the level of the Norwegian health care system.

Incremental cost and health effect (ICER)

To assess whether the health gains from an intervention are reasonably proportionate to the costs, ICER (Incremental Cost-Effectiveness Ratio) is often used, or more simply as incremental cost per additional health gain. ICER expresses how much extra society must pay to achieve one additional quality-adjusted life year (QALY), compared with a relevant alternative. In this report, the analyses should primarily be understood as incremental cost analyses of continued treatment retention in HAT versus transition to other treatment pathways, or unplanned treatment discontinuation.

Threshold values and severity

There is no absolute willingness-to-pay threshold in Norway for one gained quality-adjusted life year (QALY). Norwegian priority-setting principles imply that the acceptable cost per QALY increases with the severity of the condition. For severe conditions, levels around 825,000 NOK per QALY are often cited as a relevant reference point [26]. The HAT population represents a group with both a high burden of disease and substantial comorbidity, which implies high severity in a priority-setting perspective.

Cost offsets

HAT is a resource-intensive form of treatment, but the target group is also characterized by a high disease burden, unstable treatment trajectories, physical and mental comorbidity, and extensive use of health services. An analysis that only includes HAT clinic costs may therefore overestimate net resource use if the treatment simultaneously contributes to reduced use of other services.

In health economic analyses, such reductions are often described as cost offsets. A cost offset does not mean that the treatment becomes cost-free, but that parts of the gross cost may be counterbalanced by reduced resource use and costs elsewhere in the service system. This is particularly relevant in practice-oriented analyses, because HAT can affect not only quality of life, but also contributes to stabilization and reduced need for other acute or resource-intensive services.

International evaluations of heroin-assisted treatment have further shown that effects may extend beyond traditional health outcomes and health service use. Reductions in crime and illegal activities are often highlighted as potential socioeconomic benefits [27-29]. In this report, crime-related cost offsets are therefore examined as sensitivity analyses to the main model.

Data sources and outcome measures

The analysis is based on individual-level data from the pilot project on HAT in Oslo and Bergen in the period 2022–2025. Patients who continued in HAT were compared with patients who discontinued treatment, including individuals who transitioned to OAT or terminated treatment entirely.

The method integrated data primarily from three sources: patient records, national registries, and self-reported questionnaires, in order to measure the following main elements:

Program/direct costs in HAT: These were estimated by allocating the clinics' total operating expenditures to the patient level based on actual treatment exposure and time in treatment. This approach captures the full costs of delivering the intervention under real-world operating conditions.

Health outcomes: Health was measured using EQ-5D-5L and converted to utility values using the Norwegian EQ-5D-5L value set [30]. QALYs were calculated using the area-under-the-curve method between repeated measurements throughout the treatment trajectories [31].

Health service utilization: Individual data from national health registries (the Norwegian Patient Registry [NPR] and the Primary Health Care Registry [KPR]) were used to map utilization of specialist and primary health services before and after HAT treatment, stratified by medical specialty and level of care. In addition, an overall analysis of specialist health service utilization was conducted based on changes over 3-month segments from one year before initiation of HAT to two years after initiation in the period 2022–25. Corresponding cost estimates were calculated using national unit costs [29, 32, 33].

Crime: Patients reported the type of crime and number of days with crime-related activity during the treatment trajectory, including acquisitive crime, drug-related crime, and violent crime. In the health economic analysis, change in the number of days with crime-related activity during HAT was used as the main measure and then converted to annualized societal costs using conservative cost weights based on Norwegian and international analyses. The cost weights reflect average societal costs related to police, courts, correctional services, and victim-related consequences (see Appendix 4). The results should be interpreted as conservative estimates of potential socioeconomic consequences, not as precise measures of actual crime-related costs.

Details on the cost–utility analyses, cost calculations, and methodological limitations are presented in the technical cost-effectiveness report (see Appendix 4).

5.5 Research group

The research team for the evaluation of the HAT pilot consisted of a collaboration of five entities. These organizations offered a diverse, multi methods approach that utilized various specialties and backgrounds. The Norwegian Centre for Addiction Research (SERAF) at the University of Oslo led the research team in collaboration with the Unit for Clinical Research on Addictions (RusForsk) at Oslo University Hospital, Bergen Addiction Research (BAR) at Haukeland University Hospital, the Centre for Alcohol and Drug Research at Aarhus University (CRF), and the service-user organization ProLAR Nett.

Each group was primarily responsible for different thematic areas while contributing to joint analyses, ensuring a comprehensive and independent evaluation of HAT. The research team included contributions from 14 researchers, five co-researchers, two PhD candidates, three master's students, a project coordinator, and service-user representatives. This includes contributions from full-time, part-time, and in-kind funding.

The research group met monthly to share updates and foster active collaboration. The researchers and the research project coordinator were in frequent contact with the clinic staff, user representatives, and clinic leadership.

5.6 Ethical approval

Ethical approval for the research conducted in this evaluation was granted by the Regional Committee for Medical and Health Research Ethics (REK approval reference #195733, 21.12.2020), the data protection officers at Oslo University Hospital (reference number 22/07474), and Haukeland University Hospital (reference number 3061-3061).

6. Results

This section presents the main results from the evaluation of heroin-assisted treatment (HAT), covering the first four years (from January 12, 2022, to December 31, 2025) of Norway's HAT pilot in Oslo (HABiO) and Bergen (HABiB). It summarizes key findings on enrollment, patient characteristics, the project's effect on health and quality of life, adverse effects, and cost-benefit. Further details are provided in each of the following sub-sections, and the methods are described in **Section 5 Methods** and the **Appendices**.

Summary of results

Enrollment and retention

During the four-year period, a total of 136 patients consented to participate in the evaluation project (in Oslo: 89; in Bergen: 47). Both clinics operated below their operational capacity (Oslo: 65; Bergen: 100).

Retention was moderate: nearly half of all patients who started treatment (48%, n=65) had left by the end of 2025. Among those discharged, the average time in treatment was about 11 months (range 15 days to 3.3 years). Most discharges (61.5%) were voluntary, often transitions to regular opioid agonist treatment (OAT) (88%) or mutual agreement, while 38.5% were due to non-attendance or involuntary discharge.

Patient characteristics

At the start of treatment, patients were primarily a socially and clinically vulnerable group. They were predominantly men in their mid-40s with long histories of opioid use, prior experience with opioid agonist treatment (OAT), frequent polysubstance use, and substantial social disadvantages (including unstable housing, low employment, limited education, and literacy difficulties). Many had chronic somatic and psychiatric comorbidities and complex, long-standing needs.

Experiences

Stakeholders, patients, clinicians and families, reported clear benefits: reliable access to prescribed heroin, stronger patient–staff relationships, greater daily stability and reductions in risky substance use and some criminal behaviors. However, rigid clinic rules, intensive attendance schedules (often twice daily), dosing practices and inconsistent enforcement caused distress, practical burdens, and distrust for some patients. Clinicians valued harm-reduction outcomes but described tensions around dosing risk, behavior management and limited scope beyond medication. Family members reported financial and emotional relief alongside frustration about limited broader social change.

Treatment outcomes

HAT produced gradual, moderate improvements in quality of life, reductions in reported heroin use and declines in some self-reported criminal behaviors. The benefits accumulated slowly and required sustained engagement in treatment. Structural problems, including housing instability, unemployment, food insecurity, and chronic health conditions largely persisted, limiting recovery gains for many. Patients also reported improved social relationships with family members, added structure, greater stability, and more hope in their everyday life after entering HAT.

Adverse events

Serious adverse events were common among HAT patients, mainly consisting of non-fatal overdoses, behavioral issues, and other medical and psychiatric complications.

Service delivery and processes

Referral flows and enrollment declined over time and stayed below clinic capacity, suggesting that referral volume, continuity, and treatment-model fit were key constraints, not physical capacity. Referral sources included OAT services, welfare agencies, low-threshold services and primary care physicians; early admission pauses and evolving capacity (especially in Bergen) affected recruitment. Process issues reported include challenges in rule enforcement consistency, staffing demands for safe dosing and observation, and barriers created by provider stigma among referring clinicians.

Cost-utility findings

From a health economic perspective, HAT appears as a resource-intensive intervention, with a gross cost of approximately 986,000 NOK per patient per treatment year, while at the same time providing measurable health gains in a patient group with a high disease burden.

The most health policy–relevant analysis yielded an estimated incremental cost of 845,087 NOK per quality-adjusted life year (QALY) gained for continued treatment retention in HAT, compared with unplanned discontinuation of treatment. This estimate exceeds levels that are often used as reference values for severe conditions in Norway (approximately 825,000 NOK per QALY).

At the same time, the analyses indicated substantial cost reductions in other health care utilization, particularly within somatic specialist health services (around 108,000 NOK per patient per year), such that continued participation in HAT, in certain scenarios, appeared to be approximately cost-neutral or slightly cost-saving, while maintaining the health gain. Sensitivity analyses further suggested reductions in crime-related costs (around 172,000 NOK per patient per year), but these estimates are more uncertain and must be interpreted with caution.

The analyses also suggest that HAT may function as a pathway to further treatment with more conventional opioid agonist therapy (OAT) for some patients, rather than as an end point in the treatment trajectory. A relevant context here is a recent Norwegian study showing an incremental cost for conventional OAT of 479,000 NOK per QALY compared with no treatment [29].

6.1 Patient enrollment and retention

Main findings and interpretation:

A total of 136 patients participated in the evaluation project of HAT between 2022 and 2025 (in Oslo: 89; in Bergen: 47). Retention was moderate, with an average of 11 months in treatment. On December 31, 2025, there were 76 patients enrolled in treatment.

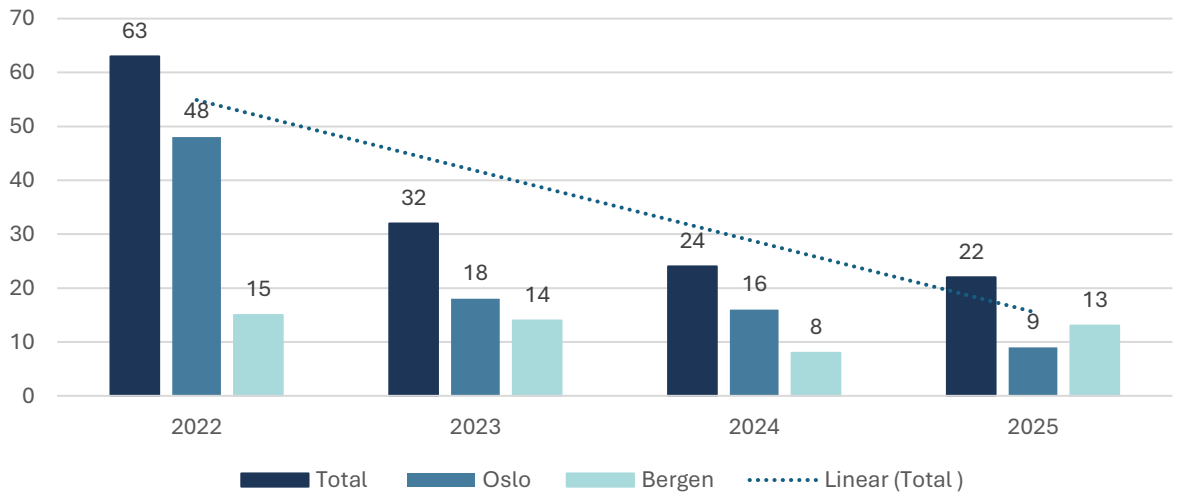
These patterns indicated that fewer patients were enrolled than clinic capacity allowed. The primary constraints were, therefore, not physical capacity but the volume and continuity of appropriate referrals and the degree to which the treatment model met the needs and preferences of the target patient group.

Results:

Enrollment

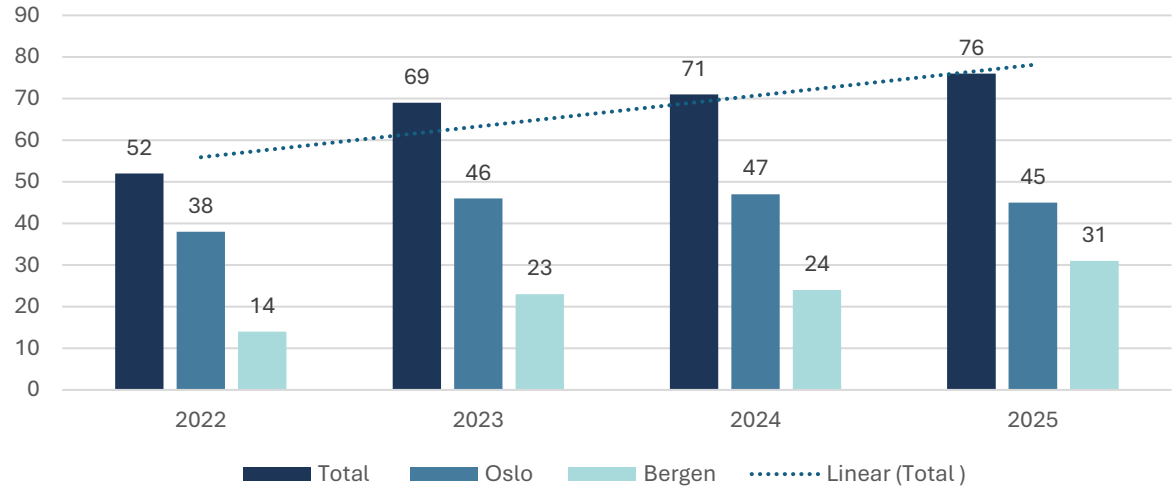
Between January 2022 and December 2025, 136 patients consented to participate in the evaluation project (HABiO, 65%, n=89, HABiB 35%, n=47). Both clinics have shown a declining enrollment trend since opening in 2022. (See **Figure 6.A**). Capacity constraints alone do not explain this trend: current patient numbers remain below the clinics' capacity, suggesting other factors, such as referral rates, patient retention, or relevance may also influence enrollment. However, there has still been a steady increase in the number of patients in treatment at the clinics (see **Figure 6.B**).

Figure 6.A: Total enrollment at HABiO and HABiB



Period of reference: 1st January 2022- 31st December 2025. Consenting participants
Total number of enrollments: 141; number of unique patients: 136

Figure 6.B: Number of patients in treatment at the end of each year



Reference period: January 1, 2022–December 31, 2025. Applies to participants in the evaluation project. Total number of admissions: 141; number of unique patients: 136

Capacity

By the end of 2025, clinic capacity was reported to be 65 patients at HABiO and 100 patients at HABiB. However, at start HABiB operated at a lower patient capacity: initially 15, later increasing to 40, and finally to 100 following two relocations, the last one in November 2024. In Oslo, the capacity for patients increased from the initial 50 to 65, as a growing proportion opted for tablet formulations, which required less time in the clinic for follow-up.

There has been no formal waiting list for recruitment. However, during the first year, temporary intake pauses were implemented by clinic leadership due to a high number of referrals, which may have influenced recruitment during that period (**see Section 6.7**). On December 31, 2025, 76 patients were currently enrolled in treatment, which represents half of the total capacity.

Retention

As of December 31, 2025, 141 treatment episodes had been registered among 136 patients, including 5 second episodes of treatment. Across all episodes, patients contributed a total of 359 person-years of time in treatment. A total of 65 individuals had been discharged from HAT: 61.5% of which were planned discharges (n=40), which can be considered in line with treatment aims, as they were due to transitions to conventional OAT (n=35) or were mutually agreed upon with the treating physician for other types of follow-up. The remaining discharges (n=25) were primarily related to non-attendance or behavioral issues, including incidents of violence. One-year retention was 65.7%, with a median retention time of 2.5 years. Among discharged treatment episodes, the median duration was just under 7 months.

Self-reported selected outcomes, including those reported in Section 6.4 and additional variables (e.g. QoL, substance use, involvement in treatment, pain, anxiety and depression, and craving), were examined across three groups: patients remaining in treatment as of 31.12.25, those with a planned discharge, and those with an unplanned dropout. Because group sizes became small when stratified by retention status, detailed outcome data are not reported, and all findings should be interpreted with caution.

Time in treatment was closely related to retention status. Among those leaving treatment, 47% did so within the first 6 months (60% planned discharge, 40% dropout), 21% left between 6 and 12 months, and 31% after more than 12 months. Among patients with more than 12 months in treatment, unplanned dropout was relatively rare (23%). This pattern suggests that the first 6-12 months represent a critical period for both dropout and planned discharge.

Across the outcomes described above, patients who remained in treatment generally showed gradual improvement over time. Some variables (such as heroin use, craving, and QoL) showed more pronounced improvement, whereas others, such as pain, anxiety, and depression, tended to be more stable. Patients with a planned discharge to OAT typically showed a similar pattern of change and, in some domains, appeared to do as well as or slightly better than those still in treatment. In contrast, the dropout group showed a more unstable course: although many improved initially after treatment initiation, their outcomes fluctuated over time, consistent with a less stable engagement in treatment.

6.2 Patient characteristics

Main findings and interpretation:

At the start of treatment, patients often had complex challenges, including unstable housing, low employment, limited education, and polysubstance use. The findings on patient characteristics indicate that HAT primarily reaches a socially and clinically vulnerable group with extensive prior treatment experience and persistent unmet needs.

Results:

Baseline patient demographics

As of December 31, 2025, a total of 136 patients had started in heroin-assisted treatment and consented to be part of the research study. The majority were men (n=109, 80%), with a mean age at admission of 45.3 years (range 25.4–67.1 years), and only a small difference between men and women (men: 45.1 years; women: 46.0 years). Patients in the Oslo clinic were older than in Bergen (Oslo: 46.6 years; Bergen: 42.8 years) (**Table 6.A**).

At entry, many patients had long-standing and complex social challenges: around half lived in rental housing, while substantial proportions were in temporary accommodations or institutions, and only a small minority owned their homes or lived with family. Educational levels were generally low, and a notable share reported reading and writing difficulties.

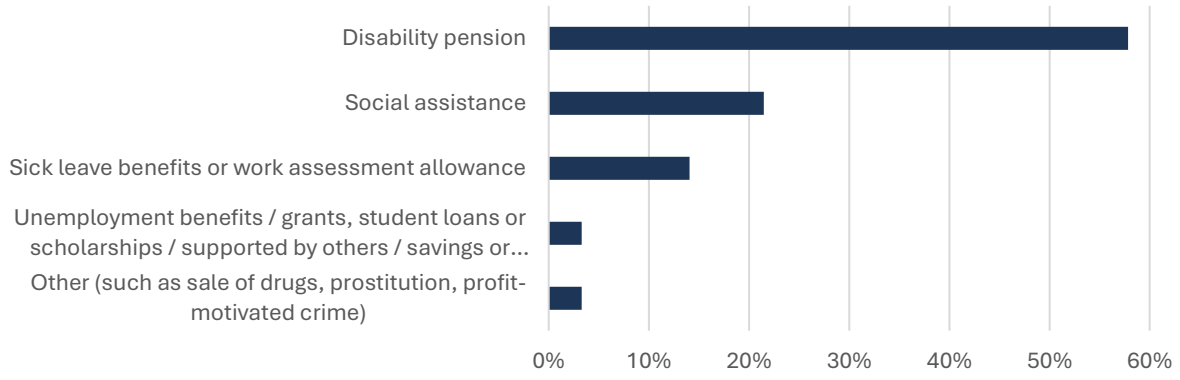
Table 6.A: Patient characteristics at treatment admission (n=136)

Characteristics of research cohort 2022-2025*	N (%)
Born in Norway (n=121)	112 (93%)
Housing (n=123)	
Own home	6 (5%)
Rented housing	63 (51%)
Temporary housing	24 (20%)
Municipal substance use institution / apartment	19 (15%)
Street / outdoors / parking garage	1 (1%)
Living with friends / family / partner	9 (7%)
Other	3 (1%)
Living with other people (yes) (n=122)	36 (30%)
Unstable housing in the previous 30 days (yes) (n=122)	19 (16%)
Highest education level (n=119)	
Did not complete primary school	9 (8%)
Primary school	48 (40%)
Upper secondary school	42 (35%)
Higher education (≤ 3 years / ≥ 4 years)	20 (16%)
Self-reported reading and writing difficulties (yes) (n=120)	29 (24%)
Full-time job / Part-time job / In education / Part-time job and in education (yes) (n=122)	6 (5%)
Previous treatment (yes) (n=121)	116 (96%)
Involuntary discharge for previous OAT treatment (yes) (n=116)	22 (19%)

**Valid answers for each variable are reported in parenthesis*

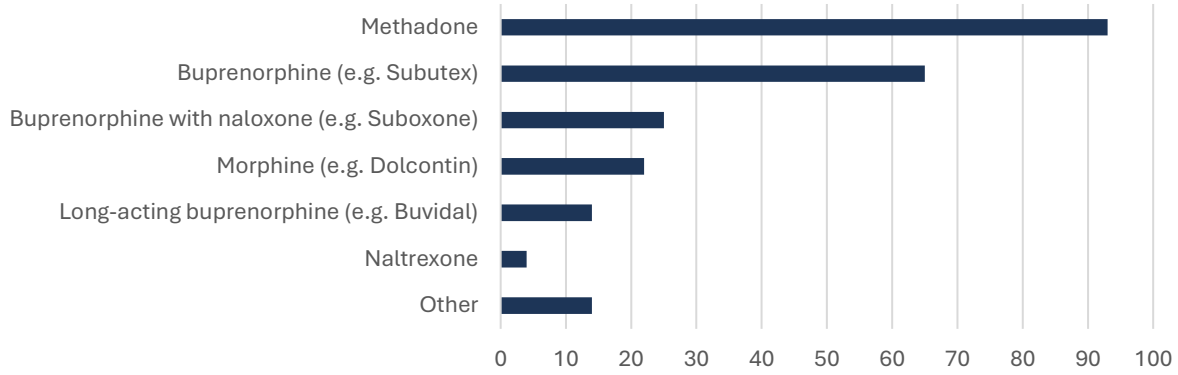
At the start of treatment, very few were in paid work, with most relying on disability benefits or social assistance for their primary income. (See **Figure 6.C**).

Figure 6.C: Percentage of responses for primary source of income (n=121)



Almost all patients had previous experience with OAT, and on average they had tried two different kinds of medications. (See **Figure 6.D**).

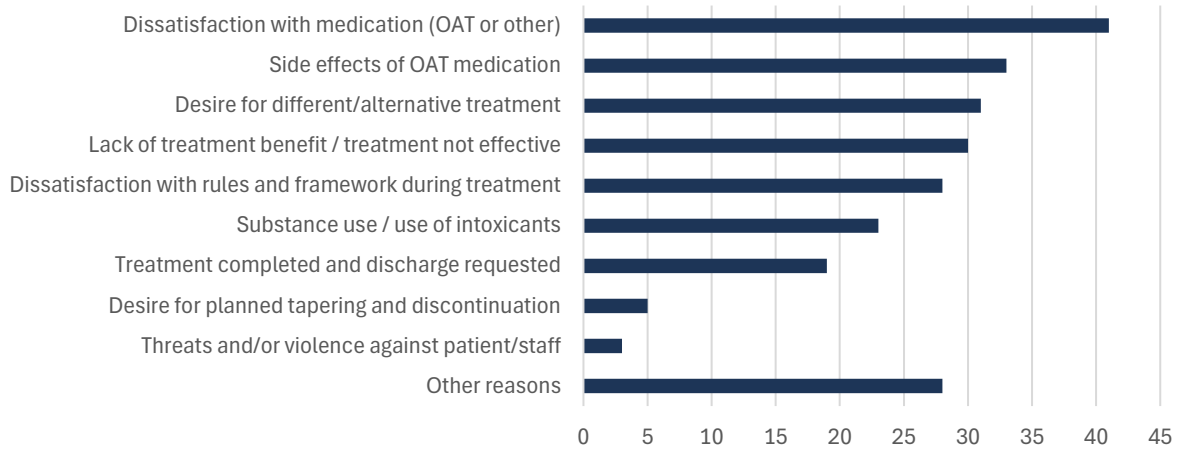
Figure 6.D: Response to «Which medications have you been prescribed? »*



** Multiple answers possible, per number of positive responses*

Prior to starting HAT, most individuals had chosen to stop OAT themselves, commonly due to dissatisfaction with the medication, side effects, or limited perceived benefit. (See **Figure 6.E**).

Figure 6.E: Response to «What was the reason for your previous treatment termination?" *



** Multiple answers possible, per number of positive responses*

6.3. Attitudes and experiences among patients, clinicians, and affected family members

Main findings and interpretation:

Attitudes and experiences of HAT among patients, clinicians, and family members reflected clear benefits for stability and safety but also distress and distrust linked to rigid rules and dosing practices.

These findings suggest that HAT can create meaningful safety, stability, and relief for patients, clinicians, and families, but that its impact is constrained by a rigid and sometimes mistrusted treatment framework. Balancing structure and safety with greater flexibility and responsiveness to patient and family needs appears crucial for maximizing benefits.

Results:

Patients:

Frequent, respectful engagement between patients and staff helped patients feel recognized as legitimate citizens rather than marginalized "drug users." When everyday interactions between patients and clinicians allowed room for informal conversation beyond clinical issues of addiction and rule enforcement, such frequent interactions could reduce stigma and support a sense of social legitimacy. When interactions were characterized by control or authority, they risked reinforcing stigma and marginalization.

Daily clinic attendance and rule adherence could be experienced as stabilizing structures that supported the rehabilitation and organization of everyday life beyond addiction, particularly when clinical demands were experienced as legitimate and workable within patients' own routines and goals of treatment. When these expectations were perceived as misaligned with patients' understandings of autonomy or everyday viability, the same clinical demands could be experienced as restrictive and demanding rather than supportive.

Access to medical heroin, positive patient–clinician relations, and the supportive environment of the clinic and wider treatment were experienced as the main benefits of HAT among patients in the early phase of the clinics. The most challenging aspects raised in this phase were the intense treatment schedule and its limitations in available overnight medication, the clinics' strict rules, the increased downtime after starting HAT, and concerns about the long-term continuation of HAT.

From the patients' descriptions of changes in their everyday life after entering treatment, it was also clear that their quality of life improved in certain areas. By receiving essential medication in a safe setting, along with psychosocial support, their everyday lives became safer, more predictable and stable, and they faced less pressure to commit crimes to obtain money for illicit drugs.

Feedback from patient workshops highlighted concerns about increasingly rigid rule enforcement over time, as well as differences in staff practices (e.g., enforcement of rules or dosing practices) that some patients experienced as unfair. These concerns pointed to the importance of consistency and flexibility in rule enforcement to maintain trust and support the benefits of treatment. Some patients also emphasized that the intensity of the treatment, requiring twice-daily attendance to receive medication, could delimit opportunities for other activities or following up on family obligations, thus preventing social reintegration.

Clinicians:

HAT clinicians experienced three aspects of providing HAT as particularly rewarding, and three as the most challenging. The rewarding aspects were observing harm reduction outcomes, providing holistic care, and having a positive clinic milieu and patient–clinician relationships. The challenging aspects were dosing and overdose risk, rule enforcement and aggression management, and the difficulty of initiating treatment beyond medication and harm reduction.

The rewarding and challenging aspects of providing HAT overlapped and were at times contradictory, thus reflecting the duality and tensions in clinicians' work to provide HAT. The challenges were reported to vary between patient subgroups, according to their degree of instability. The most unstable patients were seen as more demanding in regard to the challenging aspects of HAT. Clinicians expressed uncertainty about HAT's utility for a small group of the most unstable patients.

In the clinicians' opinion, by the fourth project year, the ideal philosophy of HAT would have been an individualized and patient-centered approach with a holistic perspective and interdisciplinary collaboration, delivered as a flexible service that acknowledged substance use as part of the patients' everyday reality. These insights signal a need for policy changes and resource allocation that translate aspirational values into concrete operational standards and commissioning frameworks that make patient-centered care archivable in practice.

Additionally, clinicians noted that provider stigma among some primary care physicians acted as a barrier to access HAT, with patients not being referred either because their situation was not deemed severe enough or, conversely, because they were considered too chaotic to adhere to the highly structured schedule at the HAT clinics.

Affected family members:

Affected family members (AFM) of HAT patients described a mix of relational, economical, and emotional relief for themselves resulting from their relative's entry into HAT.

Their positive experience of HAT was often combined with reluctance towards HAT and occasional disappointment about its content or limited outcome for their family members. Affected family members were still unanimous in perceiving HAT as clearly better than being out of treatment, for both their own and the patient's well-being.

The strict HAT treatment regimen was perceived by AFM as limiting their relatives' opportunities to participate in family gatherings that were crucial for relationship building and social reintegration. (See **Table 6.B**).

Table 6.B: Affected family members' perceived impacts of HAT

Type of impact	On AFMs	On relatives in HAT	On the AFM–relative relationship
Advantages	Reduced emotional and economic tolls	Stabilized state and improved everyday situation	Positive interactions enabled and improved relations
Challenges	Reluctance concerning relative's need for and treatment with medical heroin	Restrictions imposed on opportunities beyond treatment and a lack of expected positive changes	Restrictions imposed on family relationship-building and contingent treatment outcomes

6.4 Health, social, and treatment outcomes

Main findings and interpretation:

Heroin-assisted treatment delivered moderate benefits across multiple physical and mental health domains, but these gains typically emerged gradually over time. Heroin-assisted treatment was associated with reduced self-reported crime (victim and perpetrator roles), heroin use, and poly-substance use.

Many challenges persisted during treatment, including food insecurity, chronic physical and mental health problems, low employment, and the need for sustained engagement to maintain gains.

The results suggest that HAT patients experienced moderate benefits while in HAT. However, the remaining concerns underscore the need for sustained engagement and integrated medical and social support.

Results:

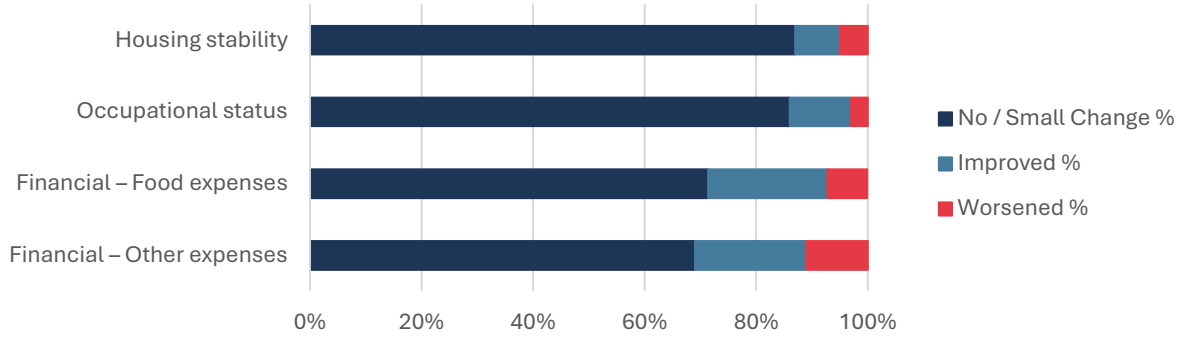
Housing, employment, and finances

From the first to the last available measurement for each patient, housing stability remained largely unchanged for most participants: 13% experienced a change in housing stability status during treatment, with 8% improving and 5% becoming unstable.

Nearly all patients were unemployed at baseline and remained so during follow-up. Fourteen percent changed their occupational status: 3% transitioned from employment or education to neither, and 11% reported being employed (part-time or full-time) or in education at their last available assessment.

Using “having enough money for monthly food expenses” as a proxy for financial resources, 71% reported no or only a small change in their financial situation, while 29% experienced a relevant change: 7% worsened and 22% improved their financial situation. This pattern was similar when considering “money available for other expenses and activities”: 11% experienced a decline in financial resources, while 20% reported an improvement. **Figure 6.F** summarizes the results in this section.

Figure 6.F: Changes in housing stability, employment status, and financial situation from baseline to last available assessment

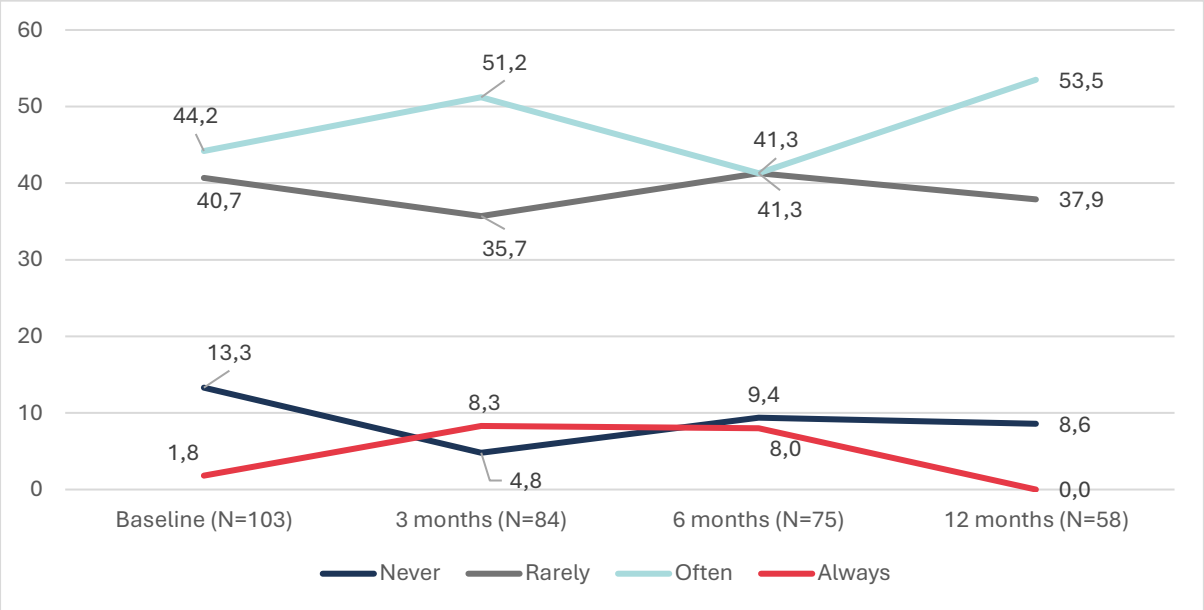


More information is provided in ***Appendix 3***.

Hunger and food security

Hunger remained a persistent issue among HAT participants during the first year of treatment. At enrollment, 44% reported feeling hungry "*often*", increasing to 54% at 12 months, with a temporary peak observed at three months. (See **Figure 6.G**).

Figure 6.G: Proportion of participants in each hunger category (never, rarely, often, always) across four timepoints during the first year of HAT (%)



The strongest protective factor was stable access to food: Participants who reported that they "*often*" or "*always*" had access to food were substantially less likely to experience frequent hunger.

When we accounted for other factors, participants who reported using amphetamines had higher levels of hunger than those who did not report amphetamine use.

Self-reported crime

At baseline, 68% of individuals reported having been victims of a crime in the previous three months. At the last available measurement, 37% had changed status: 13% from not having been a victim to having been a victim, while 24% changed from being a victim to not in the preceding three months.

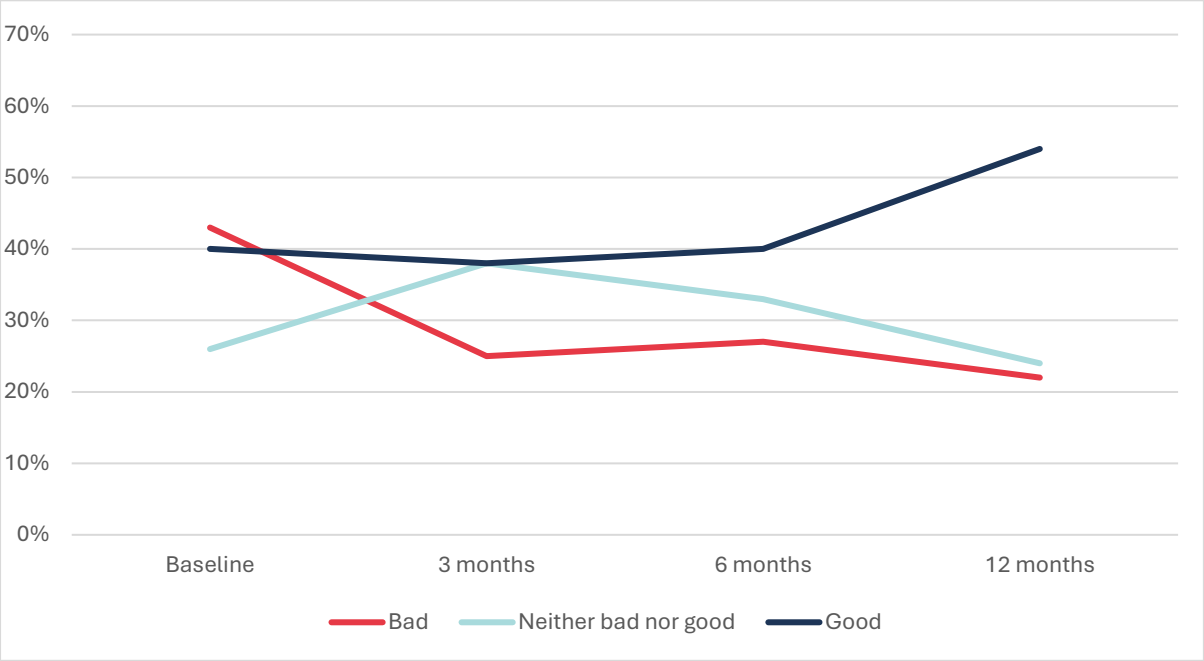
At the baseline, 46% reported having committed a crime in the previous three months. At the last measurement, 37% had changed status. Of these, 8% changed from not having committed a crime to having done so, while 29% changed from having committed a crime to not reporting any crime in the preceding three months.

Mental health

We found a gradual improvement in self-reported mental health from baseline over the observational period, with a statistically significant shift in response distribution at the 12-month mark (p=0.017). (See **Figure 6.H**). The distribution of responses indicating 'good' mental health increased, with a 35% improvement at 12 months, alongside a corresponding decline of 48% in 'bad' mental health. For self-rated anxiety and depression, we found no change in severity of self-rated symptoms. (See **Figure 6.I**). A decline of 48% in the proportion of responses reporting severe symptoms at 12 months was aligned with a simultaneous increase of 17% reporting moderate symptoms. Age and previous suicide attempts were significant predictors of both outcomes; gender influenced only anxiety and depression, whereas clinic site influenced only mental health ratings.

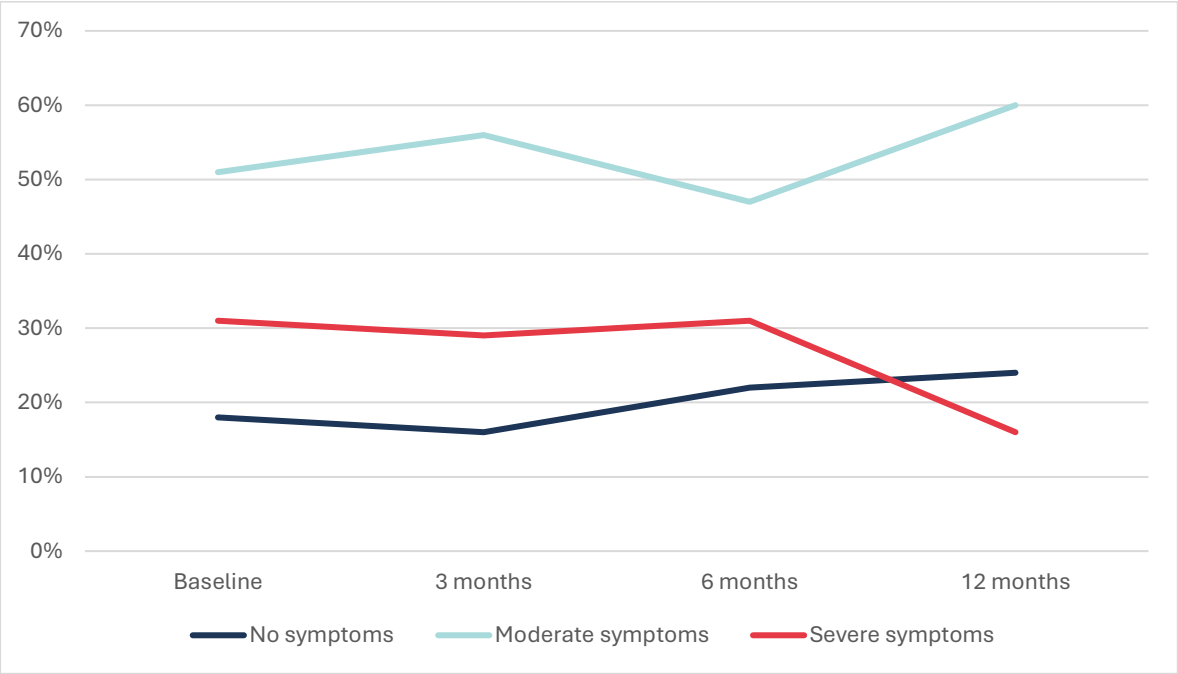
Heroin-assisted treatment appears to gradually improve patients' self-reported mental health over time, possibly by enhancing overall psychological well-being. Self-rated symptoms of anxiety and depression may not be affected by this treatment, indicating that psychiatric conditions can persist in HAT for those struggling with them. This highlights the importance of specific psychiatric assessments and targeted interventions for at least a subset of patients, underscoring the need for integrated treatment approaches within HAT programs that address both substance use and co-occurring psychiatric disorders.

Figure 6.H: Proportion of responses on self-reported *mental health* over a 12-month observational period for patients in heroin-assisted treatment



From 2022-2024. n=79, 3-point Likert-scale.

Figure 6.I: Proportion of responses on self-reported *anxiety and depression* over a 12-month observational period for patients in heroin-assisted treatment



From 2022-2024. N=79, 3-point Likert-scale.

Quality of life

Over time, participants in HAT showed gradual improvements in quality of life. Measured scores rose slowly but consistently month by month, indicating that benefits tend to accumulate rather than appear immediately after treatment starts. Most people (82%) followed relatively favorable levels, maintaining higher quality of life, while a smaller group began with low scores but showed clear improvement over time. In practical terms, this means that HAT can help stabilize and improve day-to-day wellbeing, but the gains often require sustained engagement with the service.

Social connections and the sense that life is meaningful were important contributors to better quality of life, yet their effects were not straightforward. Participants who reported meaningful social support generally had higher wellbeing, and spending time with others was linked to better social outcomes. However, support alone did not eliminate severe problems for everyone: some with strong social ties still belonged to groups with declining or initially low wellbeing, suggesting that support must be combined with other targeted care.

By contrast, ongoing mental health problems (e.g., anxiety and depression) and chronic physical symptoms were consistently associated with worse quality of life and with being in less favorable outcome groups, highlighting the need for integrated mental and physical healthcare alongside HAT.

Physical health

Somatic health was assessed using two complementary self-report measures of somatic burden: (1) severity and functional impact of symptoms during the past three months, and (2) presence of persistent chronic conditions.

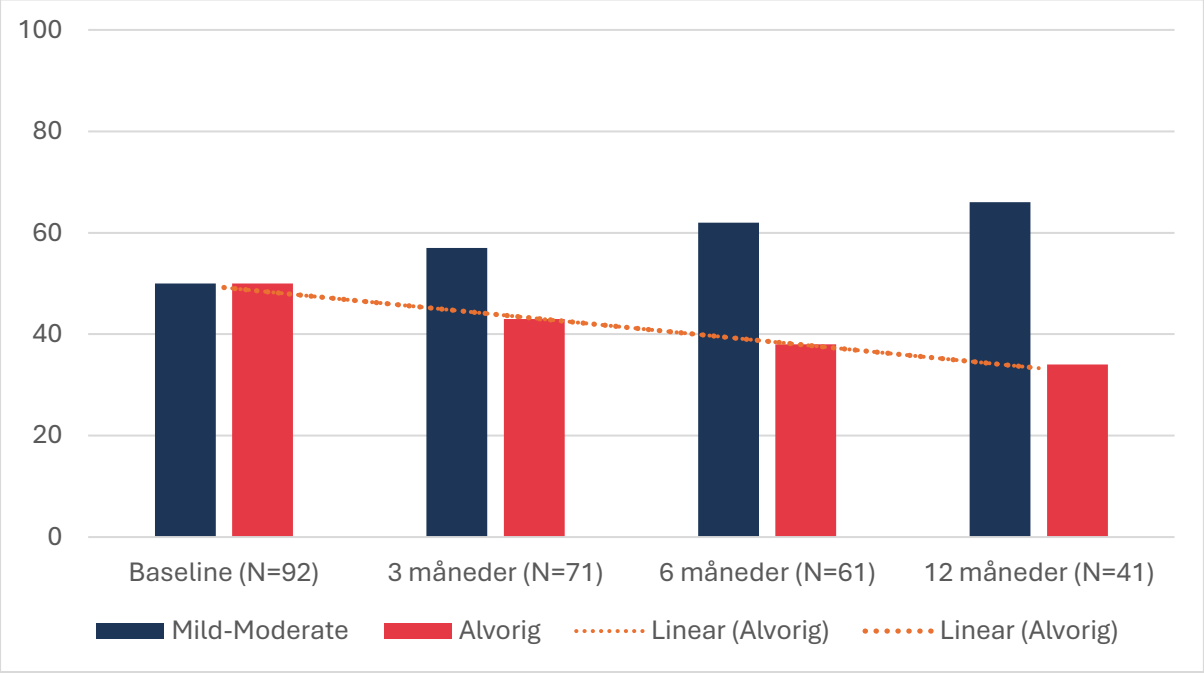
Participants showed a positive trajectory over the course of treatment, with a decrease in mean scores for acute physical complaints and a reduction in the proportion classified as having a high symptom burden. The proportion classified as having a “severe” physical symptom burden decreased from one in two participants (53%) at intake to approximately one in three after 12 months (39%) and 24 months (35%), while the proportion with a low symptom burden increased correspondingly from fewer than one in two (47%) at baseline to nearly two in three (63%) after 24 months (see **Figure 6.J**).

At baseline, participants reported a substantial somatic burden across both acute and chronic symptom domains. Overall, participants reported an average of 8.5 acute symptoms (SD = 3.5) and a median of 9 (6 - 11). Participants also reported a high chronic somatic burden, with an average of 4 chronic health complaints (SD = 3) and a median of 4 conditions (2 – 6), indicating a highly burdened population with multiple concurrent chronic health problems.

The greatest current symptom burden was reported for sleep problems, with nearly half of participants rating these as “quite” or “very” troublesome (48.7%). Dental and gum problems were the second most prevalent high-burden symptom, affecting approximately 2 in 5 participants (41.9%), followed by joint pain, reported by approximately 1 in 3 participants (33.3%). Memory problems (27.1%), digestive complaints (26.5%), and constipation (23.7%) were also frequently reported (see **Supplementary Figure A** in **Appendix 3**).

Acute symptom burden was calculated by summing severity ratings across somatic symptoms to generate an overall somatic symptom burden score. Higher scores indicated greater perceived symptom burden during the past three months. A linear mixed-effects model, accounting for both group-level trends and individual variation over time, showed a statistically significant improvement in somatic symptom burden during the treatment period ($p < .001$).

Figure 6.J: Patient-reported acute physical symptom severity at baseline and 12 months of heroin assisted treatment



From 2022-2024. Note: Data are preliminary. "Acute physical symptoms" refers to common medical issues reported within the three months prior to each assessment. Linear declines represent a consistent trend across follow-up phases. Due to ongoing recruitment, sample sizes at later intervals reflect time-in-program rather than necessarily reflecting participants’ dropouts.

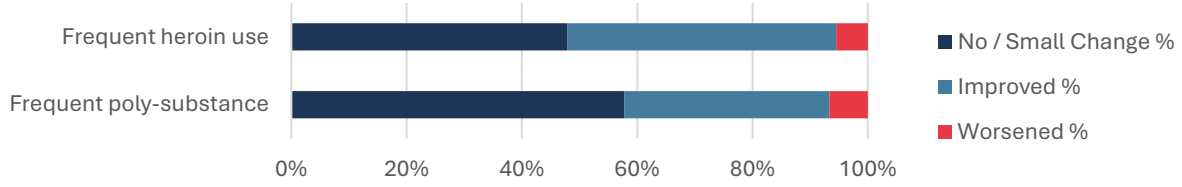
Self-reported drug use

At first measurement, 71% reported frequent heroin use, defined as using heroin on more than 12 days in the previous month. At the last measurement, 52% had changed status: 5% moved from not being frequent heroin users to being frequent users, while 47% changed from frequent to nonfrequent use. (See **Figure 6.K**).

Self-reported mean number of days of heroin use also decreased over time. The mean number of days with heroin use in the previous month was 19.9 days at the first measurement and 10.3 days at the last measurement. The mean change was 9.6 fewer days (SD 12.8). (See **Figure 6.L**). Reported frequent use of cocaine and non-prescribed benzodiazepines changed minimally over time, and the respective mean number of days of use also did not vary.

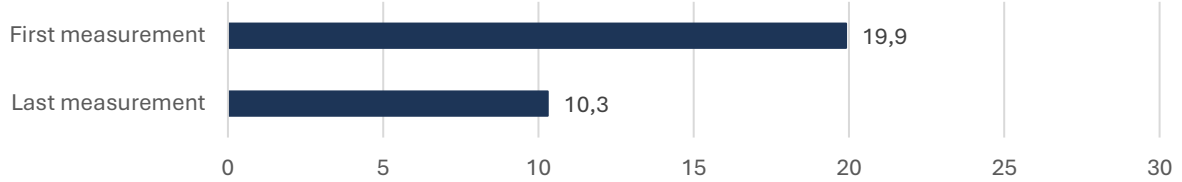
Regarding frequent poly-substance use, defined as using two or more substances (including heroin) on more than 12 days in the previous month, 59% met this criterion at baseline. At the last measurement, 42% had changed status: 7% moved from not being to being frequent poly-substance users, while 35% changed from frequent to non-frequent poly-substance use.

Figure 6.K: Changes in self-reported heroin and poly-substance use from first to last measurement



*More information is provided in **Appendix 3**.*

Figure 6.L: Self-reported mean days of heroin use (previous month)



*More information is provided in **Appendix 3**.*

Medication

Most patients received diacetylmorphine (DAM) twice daily. Dosing was primarily by intravenous or intramuscular injections, while the proportion of doses given orally increased gradually over the study period. Diacetylmorphine doses were generally stable but ranged for some due to titration and missed doses. All patients received an additional slow-release opioid as overnight bridge medication, most often Dolcontin or Methadone. In Bergen, a subset received small "bonus doses" of DAM as contingency-based rewards. Comorbid somatic and psychiatric conditions were common, and many patients were prescribed concomitant medications, including benzodiazepines, somatic treatments, psychotropics, and antiviral therapy for hepatitis C and HIV. More details on medications can be found in **Appendix 3.**

6.5 Serious adverse events

Main findings and interpretation:

Serious adverse events were common among HAT patients. Most patients experienced one or more serious adverse events, including non-fatal overdoses, allergic reactions, seizures, violence, threats, acting out and self-harm.

Patients receiving HAT have severe, high-risk poly-substance use, which makes them more prone to experience serious adverse events. Thus, HAT should be provided within specialized addiction treatment services, by appropriately trained staff, in a setting that ensures a high level of safety and clinical supervision.

Results:

Among the participants, 78% (104 individuals) experienced a total of 633 serious adverse events. Eighteen participants each had more than 10 events; of these, two patients had more than 20 events, and another two had more than 30 events.

Of all serious adverse events, 36% (n=230) were non-fatal overdoses, 6% (n=40) were seizures, 6% (n=36) were allergic reactions, 13% (n=83) involved violence, acting out, threats, or self-harm, and 39% (n=244) were categorized as “other,” including somatic and psychiatric illness, dizziness, severe intoxication, or problematic behavior.

6.6 Process and implementation evaluation

Main findings:

From the start, HAT has been successfully implemented thorough preparation, staff training, and strong organizational support from other sections of the hospitals in which the clinics are located.

Over the first four years, 280 referrals were received to HAT, mainly from existing OAT services, with additional referrals from the Norwegian Labor and Welfare Administration, low-threshold addiction services, and primary care physicians.

Interpretation:

These findings suggest that while HAT has been successfully established as a new service, it initially operated under structural constraints that may have limited its ability to subsequently reach its full potential and scalability during the five-year project period. The combination of initial procedural immaturity, unstable facilities, and staffing shortages, means that access to HAT remained more restricted than intended in the beginning (Eide et al., 2024). This may have influenced the resulting number of total referrals and patients included at the end of the five-year period.

Heroin-assisted treatment quickly attracted extensive news media coverage in the initial phase, making the treatment well-known among the general public and potential target groups. Heroin-assisted treatment also received substantial interest in the target population and referrals increased shortly after the clinics opened in 2022, particularly through established welfare and treatment services (especially OAT), which led to periods during which operations were suspended during the first and, to some extent, the second year of operation. The high amount of referrals after clinic opening suggests that the target population is familiar with existing systems and in need of more intensive treatment options. However, referrals to HAT declined during the latter phase of the project. The extent to which information about HAT and what it entails as a treatment option was available to the broader public services and organizations that could have referred potential patients to HAT is unknown. Referrals received during the periods when admissions were suspended were not placed on a 'waiting list', and patients had to be referred again once referrals were accepted once more. Feedback from patients suggests that information about this was lacking and that they were not re-referred. Dissemination of information about the treatment was essential to counter the stigma and rumors circulating about the treatment, as well as to reach out to the target groups and those who were viable for inclusion in HAT.

Another factor that affected HAT and, potentially, referrals to HAT was the reform of the national OAT guidelines in 2022, which substantially expanded the range of available OAT medications. This expansion included 12- and 24-hour morphine formulations that may have constituted an attractive alternative to high-intensity HAT by allowing a more

individualized treatment approach within conventional OAT. This structural change during the HAT project period may therefore have influenced both the number of referrals to HAT and its perceived attractiveness, in the context of the increased range of alternatives within OAT.

Results:

Factors impacting the implementation and enrollment

From the start, HAT implementation was supported by good preparation time, staff training, support from hospital leadership, and collaboration with experienced Danish HAT clinics. Patient enrollment was managed with attention to staff well-being, patient safety, and the treatment environment. During interviews with clinicians and workshops with patients in the latter phase of the project, the issue of "referral stigma" came up occasionally. This stigma referred to hesitance to refer a person to HAT because the treatment was seen as "too demanding" or not suitable for people with chaotic everyday lives. This might have resulted in that potential candidates were not referred.

1) The development of clinical procedures and routines: Introducing HAT to patients with poly-substance use required intensive early work to develop, test, and revise procedures. Routines are now more established, but adjustments and discussions are still ongoing. Throughout, members of the research evaluation team and clinicians had close contact, regular meetings, and exchanged information. The team also provided clinicians with results as they became available, which may have been useful for considering various clinical procedures.

2) Clinic facilities: Both clinics faced delays and uncertainty about suitable premises. HABiO obtained a purpose-built temporary facility with high capacity. HABiB used two temporary facilities with lower and changing capacity before they moved into a permanent and customized facility in November 2024.Early facility problems negatively affected staff working conditions.

3) Staffing: Both clinics struggled to recruit enough nurses and sometimes doctors, leading at times to restricted patient intake. Regulations on overtime and working hours created dissatisfaction and weekend staffing issues; HABiO hired security guards on weekends, and Bergen gradually expanded its staff to accommodate this.

4) Finances and budget limitations: Rising costs of salaries, diacetylmorphine and other goods were not matched by increased government funding during the project period. This resulted in caps on the number of patients during parts of the period.

5) Integration of research into the clinic: Research and data collection were built into daily work, adding tasks for a small group of staff but generally viewed positively. At HABiO, selected nurses and social workers shared responsibility for collecting baseline and follow-up data as part of routine practice. Collaboration and planning of integration of

research into clinical procedures were initiated already at the planning stage of the project, involving both clinic leaders, staff, and the research team.

6) Referrals: From the beginning of 2022 and through 2025, the two clinics received 280 referrals concerning 224 patients (Oslo: 180; Bergen: 100). A total of 39 patients had two referrals, and eight had three or more referrals. Overall, 75% of referred patients were male (75% in both Oslo and Bergen), and the mean age was 45 years (Oslo: 45; Bergen: 44).

Most referrals were secondary, meaning patients were already in conventional OAT (62% overall: 53% in Oslo; 77% in Bergen). Overall, 38% of referrals were denied (in Oslo: 39%; in Bergen: 36%), and the mean age of patients in these referrals was 44 years, with 73% being male.

The main referral source was the conventional OAT service at the same hospital (49% overall: 34% in Oslo; 76% in Bergen). Other important referrers were the Norwegian Labor and Welfare Administration (11% overall and in both cities), low-threshold addiction services (11% overall: 17% in Oslo; 0% in Bergen), and primary care physicians (9% overall: 18% in Oslo; 6% in Bergen).

Forty-four per cent of all referrals and 42% of subsequent denials occurred in the first year. The average annual denial rate was 38%, varying between 36% and 43%. The most common denial reason was “admission pause” (clinics at capacity), accounting for 16% of denials overall (23% in Oslo, 3% in Bergen); 71% of these occurred in the first year and the rest in the second. Other frequent reasons were: not in the target group (15% overall: 11% Oslo; 22% Bergen), other treatment (e.g., OAT) considered more suitable (14% overall: 20% Oslo; 3% Bergen), risk of violence (13% overall: 14% Oslo; 4% Bergen), and the availability of new medications in OAT (11% overall: 7% Oslo; 19% Bergen). (See **Appendix 5**).

6.7 Cost-utility analysis

Main findings:

Heroin-assisted treatment (HAT) appears to be a resource-intensive intervention that at the same time yields measurable health gains in a patient group with a high burden of disease. One year in treatment in HAT was estimated at approximately NOK 986,000 per patient.

The incremental cost and health gain associated with continued treatment retention in HAT, compared with patients who did not receive continued structured treatment, corresponded to NOK 845,087 per quality-adjusted life year (QALY) gained. This estimate is above the threshold value commonly applied for severe conditions in Norway (NOK 825,000).

Further analyses showed substantial reductions in the use of other health services, particularly within somatic specialist health services (NOK 108,000 per patient per year). Sensitivity analyses also suggested reductions in crime-related costs (NOK 172,000 per patient per year).

Taken together, the results indicate that parts of HAT's high treatment costs may be offset by broader health and societal savings, such that the overall cost of continued treatment, compared with no treatment, in some scenarios appears to be approximately cost-neutral, while the health gains are maintained.

Gross costs

From 2020 to 2025, the total operating costs for HAT in Oslo and Bergen amounted to NOK 232,654,770 (see **Table 6.C**). Costs increased gradually in line with the establishment of the clinics, increased capacity, and more stable operations. Personnel costs accounted for the main share of program costs, while medications and other operating expenses represented smaller, but still significant, cost components.

The figures represent total clinic-level costs and cannot be directly interpreted as costs per patient. The clinics were in gradual build-up over the analysis period, while patient volume and treatment activity increased. The costs therefore reflect resource use at the system level and the scale of the overall initiative over time.

To estimate treatment costs at the individual level, total clinic costs were allocated to the patient level based on actual treatment activity, observed treatment trajectories, and number of treatment days (see **Table 6.C**). This yielded an estimated annual gross cost of approximately NOK 986,000 per patient-year in HAT.

Table 6.C: Annual program costs, treatment activity, and costs per treatment day in Norwegian HAT, by clinic

Clinic	Year	N patients	Total Costs (NOK)	Patient-days	Cost per day (NOK)
Bergen	2022	13	17,109,131	2,310	7,407
Bergen	2023	26	23,712,415	6,905	3,434
Bergen	2024	29	26,098,658	8,246	3,165
Bergen	2025	35	28,997,801	9,205	3,150
Oslo	2022	47	24,995,168	8,644	2,892
Oslo	2023	56	33,360,833	16,600	2,010
Oslo	2024	62	37,896,279	16,874	2,246
Oslo	2025	56	40,484,485	17,298	2,340
Total	2022–2025	**136***	**232,654,770**	**86,082**	**2,703**

* The total number of patients represents unique individuals in the dataset. Patients may be included in multiple calendar years and are therefore not summed across years. Patient-days represent the actual observed treatment days. The cost per treatment day is calculated by allocating total clinic costs to the total number of observed patient-days.

Step-1 Cost Analysis with QALY and ICER

Gross costs describe what it costs to deliver HAT, but they do not by themselves indicate the treatment's cost-effectiveness. The next step in the analysis was therefore to examine how costs and health benefits developed throughout the treatment trajectories, measured by quality-adjusted life years (QALYs) and incremental cost-effectiveness ratios (ICER).

The accumulated analysis of costs and health gains included patients with at least two EQ5D-5L measurements throughout their treatment trajectory (N=116). Initially, patients who continued in HAT were compared with patients who terminated treatment midway (see **Table 6.D**).

Table 6.D: Quality-adjusted life years (QALYs) and direct/program costs for patients in HAT 2022-2025, by Continued vs. Discontinued treatment

Group	N	Cost (NOK)	SD	QALY	SD	Days in treatment
Continued	68	2,574,079	1,290,495	1,190	0.822	946.5
Discontinued	48	1,059,652	881,910	0.307	0.478	387.9

The accumulated analysis revealed that patients who continued in HAT had approximately 1.5 million NOK higher observed costs, but also 0.883 more QALYs than patients who discontinued HAT treatment. This corresponded to an ICER of 1.71 million NOK per QALY (see **Table 6.E**).

Table 6.E: Derived accumulated ICER (from Table 6.D)

Δ-Cost (NOK)	Δ-QALY	ICER
1,514,427	0.883	1,714,495 NOK/QALY

Annualized Analyses

The high ICER must be understood considering that the group continuing in HAT had nearly 2.5 times longer treatment duration than the group that discontinued treatment. Consequently, an annualized analysis was conducted where costs and health benefits were converted into annual rates for a more direct comparison of treatment trajectories with varying durations (see **Table 6.F**). The patients were simultaneously divided into three clinically relevant groups:

1. Those who continued treatment
2. Those with planned termination
3. Those with unplanned termination

Table 6.F: Average QALY and follow-up time for patients in HAT 2022-2025, by (1) Continued treatment, (2) Planned termination, (3) Unplanned termination

Group	N	QALY	SD	Median	Follow-up in years
Continued treatment in HAT	68	1.214	0.82	1.211	2.625
Planned termination	32	0.347	0.523	0.25	1.13
Unplanned termination	16	0.234	0.357	0.055	0.951

In the subsequent three-group analysis, comparing Group 1 (Continued treatment) with Group 3 (Unplanned termination) yielded an ICER of 845,087 NOK per QALY. This comparison should be interpreted as a practice-oriented analysis of the additional cost and health benefit of continued treatment retention in HAT compared to the absence of continued structured treatment, rather than a pure "no treatment" scenario. The estimate lies above the threshold frequently discussed for severe conditions in Norway (825,000 NOK). The analysis is highly relevant for health policy because it illustrates what may be lost when a highly burdened patient group does not remain in structured treatment.

Results from comparing Group 1 with Group 2 (Planned termination) simultaneously suggest that HAT often serves as a gateway to further conventional opioid substitution treatment (OAT), as most patients with planned termination were transferred to such conventional substitution treatment. Continued treatment emerged here as dominant, meaning it was associated with slightly higher health benefits at a slightly lower net cost in the annualized analysis. This may indicate that transitioning to further treatment does not necessarily represent a failed treatment outcome, but in some cases, a transition to more stable conventional treatment (see **Table 6.G**).

Table 6.G: Annualized ICER for three groups of patients in HAT, Norway, 2022-2025

Comparison	Δ-Cost (NOK=\)	Δ-QALY	ICER
Continued treatment vs. Planned termination	−33,749	0.069	Dominant
Continued treatment vs. Unplanned termination	103,344	0.122	845,087 NOK/QALY

Healthcare Cost Reductions and Adjusted Cost-Effectiveness

The annualized ICER estimates describe the relationship between direct treatment costs and health benefits in HAT, but do not capture potential changes in resource use in other parts of the healthcare system. The next analytical step therefore examines whether continued treatment retention in HAT was simultaneously associated with reduced healthcare consumption, and how such observed cost reductions may affect the overall cost picture and cost-effectiveness.

Observed reductions in other healthcare consumption are presented as scenario and sensitivity analyses. The purpose is to investigate whether parts of HAT's direct treatment costs can be offset by lower resource use elsewhere in the healthcare system.

Primary Healthcare Services

Primary healthcare includes primary care physicians, physiotherapy, and emergency room visits. The average annualized cost changes per patient were small, and thus primary healthcare had limited impact on the overall cost-effectiveness estimates (see **Table 6.H**).

Table 6.H: Average annualized primary healthcare offsets (average NOK per patient per year)

Comparison	Primary Care Physician	Physiotherapy	Emergency Room	Total Primary Healthcare
Continued vs. Planned termination	1,192	478	773	2,443
Continued vs. Unplanned termination	493	6	1,283	1,782

Specialist Healthcare Services

Specialist healthcare comprises somatic healthcare services (SOM), mental healthcare (PHV), and interdisciplinary specialized addiction treatment (TSB/SUD), aggregated across care levels (inpatient, day treatment, and outpatient).

Table 6.I displays average annualized cost changes per patient. Positive numbers denote cost reductions in favor of continued HAT compared to other patient groups, while negative numbers indicate higher relative costs in the continued group for that specific service category. Overall, specialist healthcare services appear more economically

significant than primary care, due to both the cost levels and a substantially larger potential for reduction.

Table 6.I: Average annualized cost reductions in specialist healthcare by treatment trajectory, NOK per patient per year

Comparison	SOM	PHV	TSB/SUD	Total specialist healthcare
Continued vs. Planned termination	24,583	-2,567	-1,266	20,750
Continued vs. Unplanned termination	80,912	-3,352	30,542	108,102

The comparison between Group 1 (Continued treatment) and Group 3 (Unplanned termination) is deemed particularly relevant, as it represented the closest practical comparison to the absence of continued structured treatment in Step-1. For this group, the annualized reduction in specialist healthcare costs was 108,102 NOK per patient per year. The largest component was somatic healthcare services (80,912 NOK), which may indicate that continued HAT contributes to stabilization and a reduced need for somatic specialist care. Mental healthcare showed small negative estimates, implying limited cost reductions or a sustained need for mental health support. TSB, however, showed clear reductions compared to unplanned termination (30,542 NOK), though not compared to planned termination.

Overall Reduction in Specialist Healthcare Costs

Furthermore, an overall analysis of changes in healthcare consumption for the entire cohort (N=136) in HAT over time was conducted. Analyzing the period from one year prior to HAT initiation to two years post-initiation revealed an aggregate reduction in specialist healthcare costs over time.

The annualized reduction in total specialist healthcare costs was approximately 105,788 NOK per patient per year. This reduction was driven particularly by somatic healthcare services (64,935 NOK) and TSB (43,774 NOK), while mental healthcare showed a minor increase (2,921 NOK).

Table 6.J: Overall annualized change in specialist healthcare costs from one year prior to two years after HAT initiation (NOK per patient per year)

Category	1 year before HAT	2 years after HAT start	Change	Annualized change
SOM	19,447	3,213	-16,234	-64,935
PHV	969	1,699	730	2,921
TSB	23,215	12,272	-10,943	-43,774
Total specialist healthcare	43,632	17,185	-26,447	-105,788

Scenario and Sensitivity Analyses of Cost Reductions in Healthcare Services

To investigate how observed reductions in other healthcare utilization could impact cost-effectiveness, sensitivity analyses were conducted based on the annualized Step-1 estimates. These serve as scenario analyses of how reduced costs in other parts of the healthcare system affect overall cost-effectiveness.

Table 6.K: Adjusted annualized ICER with observed cost reductions in healthcare services

Comparison	Δ-Cost before reduction	Reduction specialist care	Reduction primary care	Net Δ-cost	Δ-QALY	Interpretation
Continued vs. Planned termination	-33,749	20,750	2 443	-56,942	0.069	Dominant
Continued vs. Unplanned termination	103,344	108,102	1,782	-6,540	0.122	Dominant / Slightly cost-saving

Net Δ-cost = Step-1 Δ-cost minus specialist offset minus primary care offset. When net Δ-cost is negative and ΔQALY positive, continued HAT is dominant in this scenario analysis.

The net incremental cost was calculated by subtracting the observed cost reductions in specialist and primary health services from the annual incremental cost estimated in Step 1. When the net incremental cost is negative while the health gain is positive, the intervention is described in health economic terms as dominant, meaning it is associated with better health and lower total costs than the alternative.

In the comparison between continued HAT and unplanned discontinuation, the annual incremental cost in Step 1 was 103,344 NOK per patient per year, while the incremental health gain was 0.122 QALY. When the observed cost reductions in specialist health services (108,102 NOK) and primary health services (1,782 NOK) are included, the net

incremental cost becomes slightly negative (−6,540 NOK per patient per year). In this scenario, continued HAT thus appears to be approximately cost-neutral or slightly cost-saving, while maintaining the health gain compared with patients who did not continue a stable treatment regimen.

At the same time, the results must be interpreted with caution. The analyses are observational and cannot demonstrate definite causal effects, but they suggest that parts of HAT's high treatment costs may be offset by reduced use of other health services, particularly somatic specialist health services.

Summary of cost analysis including reductions in health care utilization

The various cost estimates in the analysis capture different aspects of the same treatment and should not be understood as directly comparable figures.

The annual treatment cost of approximately 986,000 NOK per patient indicates the total gross cost of one year of HAT daily treatment, calculated by allocating clinic costs to actual treatment activity and patient days. This figure shows how resource-intensive HAT is, but by itself does not say anything about the cost-effectiveness of the treatment.

The ICER estimate describes the incremental cost and health gain associated with continued treatment retention in HAT compared with patients without continued structured treatment who also have a high disease burden and substantial use of health services. The annual incremental cost between the groups was approximately 103,000 NOK per patient per year, while continued HAT was associated with an additional annual health gain of 0.122 QALY. An ICER of 845,087 NOK per QALY thus describes the cost of one additional quality-adjusted life year in HAT, and not the total cost of the treatment. A relevant context is a recent Norwegian study showing an ICER for conventional OST (opioid substitution treatment) of 479,000 NOK per QALY compared with no treatment [29].

The observed reductions in other health care utilization (approximately 108,000 NOK per patient per year) represent a third level in the analysis and describe potential savings in other parts of the health care system, particularly somatic specialist services. When these cost reductions are subtracted from the annual incremental cost of approximately 103,000 NOK, the net incremental cost is almost offset. In the sensitivity analysis, continued treatment retention in HAT thus appears to be approximately cost-neutral or slightly cost-saving, while maintaining the health gain. This does not mean that HAT is cheap or free, but that parts of the high treatment cost may be offset by reduced use of other health services.

Sensitivity analysis: Crime-related costs

While the preceding analyses examined whether parts of the treatment costs of HAT could be offset by reduced use of health services, the next stage of analysis broadens the perspective to crime-related costs as a possible wider societal consequence of treatment.

Because the crime data are self-reported, show substantial variation, and involve small subgroups, the crime component is presented only as a sensitivity analysis. The emphasis is on an aggregate analysis of the entire cohort and represents average annual changes per patient, not accumulated total changes for the entire cohort (see **Table 6.L**).

Table 6.L: Total crime-related cost reductions

Variable	Mean	SD
Baseline crime days	7.18	13.27
Last observation	3.07	11.15
Change	−4.10	15.96
Annualized change in crime days	−49.24	191.56
Annualized change in costs (NOK)	−172,324	670,448

The aggregate analysis included 136 patients and showed an average annual reduction of approximately 49 crime-related days per patient per year. This corresponded to an estimated average annual cost reduction of 172,000 NOK per patient. At the same time, the variation was large, indicating heterogeneous trajectories and substantial variation within the patient group, which further supports cautious interpretation. The results are therefore not incorporated into the main ICER estimates in the same way as the reductions in health care utilization but are presented as a sensitivity analysis of possible broader societal consequences.

Taken together, the analysis suggests that reduced crime-related activity may represent substantial societal cost reductions associated with HAT, but the estimates are uncertain and should be understood as sensitivity analyses of possible broader societal consequences rather than precise estimates of economic effects.

Societal economic considerations and implications

Individuals who seek HAT, as documented in this report, often have substantial burdens across many areas of life. Prior to starting treatment, they have a high disease burden, extensive somatic and mental health problems, frequent non-fatal overdoses, and other drug-related acute events. Many also have unstable housing, low functional capacity, and significant involvement in crime. This entails high personal costs in the form of reduced health, quality of life, and functioning, as well as substantial societal costs related to health care utilization, acute events, and crime.

For individuals with opioid use disorder, there is already an established and effective treatment in the form of opioid agonist therapy (OAT), mainly based on methadone or buprenorphine. Opioid agonist treatment has documented positive effects for both the individual and society and is, for most patients, an adequate treatment option. HAT, by

contrast, is designed for the smaller group (approximately 3–5 percent) with particularly severe and complex opioid use disorder, for whom standard OAT has not provided satisfactory benefit. HAT is therefore targeted toward patients with a high disease burden, substantial comorbidity, and extensive treatment needs.

The report also shows that HAT is a resource-intensive service, with estimated treatment costs of approximately 986,000 NOK per patient per treatment year, based on total operating costs allocated to actual treatment activity in the period 2022–2025. This raises a central question: Is the cost of HAT societally justifiable considering the health gains the treatment provides? What does society gain from the resources invested, and how does HAT compare with other treatment alternatives? The cost–utility analysis presented here is intended to shed light on these questions.

The cost–utility analyses show that patients who remain in HAT over time achieve measurable health gains, assessed in terms of quality-adjusted life years (QALYs). The most health policy–relevant analysis compared patients who continued in structured HAT treatment with patients who did not maintain a stable treatment regimen after unplanned discontinuation. The annualized analysis showed an estimated incremental cost of 845,087 NOK per additional QALY gained, above the thresholds often used as reference levels for severe conditions in Norway. At the same time, the analysis is based on practice-based Norwegian data from actual treatment courses and represents the most detailed empirical evidence currently available for Norwegian HAT.

Further analyses showed substantial reductions in use of other health services, particularly somatic specialist health services, amounting to approximately 108,000 NOK per patient per year. When such observed cost reductions are included in the sensitivity analyses, continued HAT appears to be approximately cost-neutral or slightly cost-saving, while preserving the health gain. Self-reported data also suggested significant reductions in crime-related costs, with estimates well above 100,000 NOK per patient per year, although these analyses are more uncertain and must be interpreted with greater caution.

Overall, the results point toward HAT being societally acceptable from a health economic perspective for a small and highly burdened patient group, particularly when broader health and societal consequences are considered. The evaluation therefore supports continuation of the established HAT clinics in Oslo and Bergen.

At the same time, both costs, patient volume, and organizational considerations suggest that the service should be further developed within the framework of the existing clinics rather than through broad geographical expansion. Small patient groups may lead to higher costs per patient and reduced cost-effectiveness.

The analyses of three patient trajectories also show important differences in treatment outcomes. Patients who continued in HAT achieved gradual and stable health gains over

time. Another group completed HAT as planned and transitioned to standard OAT, which should be understood as a desired treatment outcome rather than treatment failure. For these patients, HAT can function as a bridge to more stable substitution treatment with lower treatment intensity and lower cost. A recent Norwegian study estimated that one year in standard OAT yields measurable health and societal benefits at an incremental cost of approximately 480,000 NOK per QALY gained compared with no drug treatment, i.e., lower than the estimate for HAT [29]. The evaluation shows that HAT reaches its target population and that most patients continue in treatment, either in HAT or in standard OAT. These two groups are those who derive the greatest health gains from HAT.

The smallest group in the dataset consisted of patients who tried HAT but did not find it suitable or did not achieve the desired stability, and who discontinued treatment without continued structured follow-up. Many of these individuals, at least for a period, dropped out of drug treatment entirely. This is unfortunate both for the individuals themselves, who lose the potential health gains that treatment can provide, and for society. This last group, those who attempt HAT but do not achieve their treatment goals, would also benefit from treatment, either as short-term stabilization or longer-term stabilization after repeated attempts, which could also yield health gains over time. However, it is difficult to determine in advance who will end up in which of these groups.

6.8 Summary of key results

Summary of key results
Patient enrollment and retention
A total of 136 patients participated in the evaluation of heroin-assisted treatment (HAT) in the period 2022 - 2025 (89 patients in Oslo and 47 in Bergen). Retention was moderate, with an average time of 11 months in treatment. As of December 31, 2025, there were 76 patients enrolled in treatment.
Patient characteristics
At the start of treatment, patients often had complex needs, including unstable housing, low employment, limited education, and polysubstance use. The findings from this section indicate that HAT primarily reaches a socially and clinically vulnerable group with extensive prior treatment experience and persistent unmet needs.
Attitudes and experiences among patients, clinicians and affected family members
Attitudes and experiences of HAT among patients, clinicians, and family members reflected clear benefits for stability and safety but also distress and distrust linked to rigid rules and dosing practices.
Health, social, and treatment outcomes
Heroin-assisted treatment delivered moderate benefits across multiple physical and mental health domains, with gains typically emerging gradually over time. Heroin-assisted treatment was associated with reduced self-reported crime (victim and perpetrator roles), heroin use, and poly-substance use.
Serious adverse events
Serious adverse events were common among HAT patients. Most patients experienced one or more serious adverse events, including non-fatal overdoses, allergic reactions, seizures, violence, threats, acting out and self-harm.

Process and implementation evaluation
Referral and enrollment declined and stayed below capacity, indicating that referral volume, continuity, treatment–service fit, and process barriers (including staffing demands and referring-clinician stigma) were more limiting than physical capacity.
Economic evaluation
Heroin-assisted treatment was a resource-intensive intervention (approximately one million NOK per patient per treatment year) but was also associated with measurable health gains. The comparison between patients who continued in HAT and patients without a continued stable treatment plan resulted in an estimated incremental cost of NOK 845,087 per quality-adjusted life year gained, which is slightly above the reference cost level for severe conditions in Norway. At the same time, sensitivity analyses indicated substantial reductions in the use of other health services and in crime-related costs in favor of the group that continued in HAT.

7. Comprehensive perspectives

As an addition to the research evaluation results (covered in **Section 6**), this section includes current perspectives that were collected exclusively for the purpose of this report. This includes a final comment from the clinic leadership (**7.1**), staff opinions (**7.2**), and a statement from the patient representative group (**7.3**). An additional note from the neighborhood perspective in Bergen can be found in **Appendix 6.**

Many stakeholders now have direct or indirect experience of this treatment, and their views provide important insight into how HAT works in everyday clinical practice. At the same time, these perspectives largely reflect patients who remain in long-term treatment, who, as the data show, differ in important ways from those who leave earlier and show less stability and improvement. The user and stakeholder perspectives presented below should therefore be interpreted considering the findings for the whole patient group, including those who have left treatment. Furthermore, this chapter helps illustrate why one cannot assume that solutions such as lower staffing or a less safety-focused model would produce the same results as those documented in the research.

7.1 Clinic leadership

In April 2026, the leaders at each clinic were asked to write a brief final comment on behalf of their clinics. These are their responses, translated from Norwegian:

Clinical perspective from HABiO

Usually, ending heroin use, or, where relevant, discontinuing other substitution treatment, is required before recovery-oriented work can begin. In HAT, the patient is medicated with heroin (DAM) in adequate doses within safe conditions. The idea is that change toward a better life with better health can also begin while heroin use is ongoing.

Establishing, designing, and operating this treatment has been rewarding; we witness improved lives, health, relationships, and a reduction in symptoms. The ethical questions involved in helping the patient's situation are many and complex.

Who are the patients?

The patients referred to heroin-assisted treatment are patients with complex problems. They have a severe, long-standing dependence disorder, primarily involving heroin, as well as somatic and psychosocial challenges that should be treated.

For some patients, HAT appears to function as a stabilizing element in a long-term treatment course in which, for example, abstinence and participation in ordinary or adapted working life appear to be achievable goals. Other patients in our target group may, for various reasons, have more limited treatment potential; for these, the main focus of treatment becomes harm reduction, while the clinic is also a suitable arena for, among

other things, relevant social-work and somatic interventions. The majority of patients can be said to fall on a spectrum between these extremes, and as clinicians we experience that the treatment can be meaningful and appropriate across the whole spectrum.

Correct medication as the foundation

Correct medication is a prerequisite for stabilization and further follow-up in HAT. The practice for the main medication with diacetylmorphine (DAM) has largely been stable, with some adjustments in dose level. Evening medication, by contrast, has evolved over time, from initial use of methadone, via 12-hour morphine, to 24-hour morphine now being the dominant preparation.

From a clinical perspective, there is a need for flexibility in the choice of evening medication so that treatment can be tailored individually. At the same time, 24-hour morphine appears to be a particularly well-suited option in HAT. The preparation is associated with low risk and high patient satisfaction and has established itself as a preferred first choice.

There is also good experience with patients who attend once daily for DAM administration, combined with long-acting opioid coverage for the rest of the day, for example with 24-hour morphine. This model is less intrusive in the patient's everyday life and can contribute to more efficient use of resources in the service.

Experience indicates that stable and tailored pharmacological treatment is a fundamental prerequisite for being able to provide holistic follow-up. This also facilitates stabilization in other areas of life.

Somatic follow-up

Patients in HAT have a high prevalence of somatic health problems. Systematic assessment is included at start-up and during further follow-up at the clinic. Follow-up comprises clinical assessments, sampling, and simple examinations. Patients are referred to specialist and primary health services as needed. The clinic works actively to establish and maintain contact with the primary care physician and other health services.

The clinic has a central role in medication administration. Many patients receive and take somatic medications daily at the clinic, including treatment for cardiovascular disease, anticoagulation, and antiviral treatment for HIV and hepatitis. This contributes to increased adherence and better treatment quality. There is particular focus on infectious diseases and wound problems related to injecting.

The low threshold and frequent contact provide good opportunities to detect health challenges. Many patients need reminders and practical assistance to attend appointments outside the clinic.

Good acute medical competence is needed within the staff group, particularly in handling overdoses and other acute events at the clinic.

Psychosocial follow-up

We consider the psychological and social framework of treatment to be essential for succeeding in the work with the individual patient as well as the group. It is an intensive treatment in which our attitudes, conduct, language, understanding, and competence form the basis for creating a safe and predictable framework. We must strive to create a safe treatment environment in which patients feel seen and respected. Recruiting staff with the right personal suitability has therefore been emphasized. We find that social-work interventions concerning work, finances, housing, and relationships are central to helping the patient remain in treatment more easily. It is also important to work toward good relationships with collaborating partners. Supportive conversations and close follow-up during treatment can be necessary. Time as a resource in treatment makes it possible to build long-term and trusting bonds and gives patients room to take small but significant steps toward change. Patients who wish to can receive talking therapy and are then referred internally within our own section. This is valuable to be able to offer patients who want it.

Premises, location, and neighborhood

The project in Oslo had adapted premises established from the start. There has been a focus on safety and good patient flow in the design, to create predictability for both staff and patients. Large areas are necessary when many patients are present in the premises at the same time each day. There is considerable wear and tear on premises used for this intensive treatment, and it is important to have funds available to repair and improve them as needed.

The pilot project in Oslo was located at Oslo University Hospital, which has led to good dialogue with hospital security. There have not been major problems related to buying or selling in the area or other challenges. The pilot project has done a fair amount of work to involve us in activities around the building as well. In the event of incidents in the hospital area, there is cooperation between HABiO and security to reduce problems. Challenges are linked to individual patients and not the patient group. Locating the pilot project in the hospital area, close to OAT, somatic services, and security, is considered an advantage.

Clinical perspective from HABiB

Stabilization in HAT

Our experience indicates that for most patients it takes time to become stabilized in HAT. The framework of HAT, such as attendance times, supervised intake, and observation after intake, is challenging for many. The fact that health personnel assess whether the level of intoxication patients experience is sufficient or too high is a demanding transition for patients who previously adjusted this themselves. Some want a higher degree of intoxication than is medically safe, which is discussed regularly.

The transition from uncertainty about the access to and strength of heroin to a stable dose of heroin contributes to a normalization of everyday life but also brings other challenges for the patient. They have more time. This time gives room to reflect on their life, opportunities that have been lost, and what they have lost. Loneliness contributes to keeping them attached to acquaintances in the drug scene that they wish to get away from. Several express that they want something meaningful to do.

Once patients are stabilized in HAT, we strive for a normalization of their everyday life. Arrangements are made for attendance once or twice a day; for transition to heroin tablets if patients want oral treatment but are not ready for an OAT medication. If a patient wishes or needs to travel away, the patient is converted to an OAT medication they can take with them.

Integrated treatment

Offering integrated treatment and follow-up of conditions such as diabetes, epilepsy, psychotic disorders, HIV, hepatitis C, and infections has contributed to stabilization of chronic conditions and a reduced number of hospital admissions. This type of integrated treatment is offered individually and based on the patient's ability to follow up on other treatments. In addition, patients are reminded of appointments with the dentist, primary care physician, and specialist health services to increase the likelihood that scheduled appointments are used.

There is good internal cooperation within the Clinic for Substance Use and Addiction. The co-location at Engenhuset means that HAT patients can be admitted to the short-stay unit while still receiving HAT treatment. In addition, cooperation between OAT and HAT is seamless, which ensures rapid transfer when a change of treatment is desired.

Ethical considerations

Ethical discussions and assessments of what constitutes sound and good health care are recurring issues. Assessing discharge due to adverse events, inadequate cooperation with the patient, and reduced functioning after starting HAT are difficult professional and ethical deliberations. For some patients the treatment is harm reduction and stabilization, while for others treatment has contributed to the patient achieving a

changed life situation. Improved housing and finances, participation in activities, employment, completion of psychiatric and somatic assessment and treatment, and transition to ordinary OAT are changes we have seen after starting HAT.

Patient meetings

One house meeting has been held every six months, where patients are informed about changes and updates and can raise issues they wish to highlight. Patients have chosen a representative among themselves who can relay and raise matters outside these meetings.

Premises

HABiB moved into new, attractive, and well-adapted premises at Engenhuset in November 2024. Engenhuset has a central location in central Bergen, which makes it easier for patients in surrounding districts and neighboring municipalities to reach the clinic by public transport. Since moving in, regular meetings have been held with various representatives from the Engenhuset neighborhood; this is described in a separate section. HABiB has received only a few reports of concern regarding observations of patients or incidents since moving in. Routines have been established to avoid littering and the gathering of people in the vicinity of HAT.

Moving to Engenhuset has made a significant difference for staff in terms of the physical work environment, safety, and patient flow. Immediately after moving in, patients conveyed that the premises were nice and good to be in, and that it felt calmer. The number of patients has gradually increased, and as of April 2026 there are 36 patients at HABiB. The premises were designed on the assumption that the number of patients at HABiB was estimated at 50–100.

“Huset Bergen” is within a short walking distance of HABiB, which has been very positive for patients, who now have a place to be between HAT opening hours. Several of the patients are also in voluntary and/or paid work at Huset Bergen.

Staffing

Since the midway evaluation, changes have been made to the staffing plan and working hours to optimize the use of resources. At HABiB, the nurses and social educators work long shifts to avoid overlapping and an accumulation of staff when patients are not at the clinic. Staff say that they find this beneficial in terms of the shift schedule and the possibility of longer periods off, and useful in that the staff group is not replaced during the day.

Medication management is resource-intensive in terms of staffing. Assessing patients and adjusting doses according to established routines requires experienced nurses and social educators who know both the patient and the medication, which makes HAT especially vulnerable to absences.

HABiB has an attending senior physician 1½ days per week. More on-site physician presence in the outpatient clinic is desirable but has so far not been possible due to recruitment. Reduced on-site physician coverage is compensated by availability by telephone and by routines, including for adjusting doses after an overdose.

Stigma

Stigma related to HAT remains a highly relevant issue, which for many patients contributes to uncertainty about being in treatment. There are patients who do not want their closest family members to know that they are in HAT, because they are worried about how relatives will handle it. Several patients have also reported that they have been advised against starting in HAT by acquaintances in the drug scene who are not themselves in HAT.

7.2 Summary of the perspectives

Staff, patients and user representatives, neighbors and researchers all contribute distinct perspectives on heroin-assisted treatment, and the recommendations are shaped by how these perspectives are brought together, rather than by any single group's view. In this evaluation, the research uses perspectives from patients, user organizations, clinicians, and neighbors as essential, but not exclusive, sources of knowledge, and combines them with systematic analyses of clinical data and interviews to reach a balanced overall assessment. This section highlights these various perspectives, which are elaborated on in **Appendix 6.**

Staff

Staff who responded to a brief 2026 survey (**see Appendix 6**) generally describe the HAT clinics as well organized, with routines and workflows that function well. They value small, stable teams and seeing patients twice daily, which supports trust, early detection of health changes, and close follow-up of somatic problems. Many report positive patient outcomes and the opportunity for long-term, trusting relationships. At the same time, staff highlight concerns about the mismatch between peaks in workload and staffing, especially after about 15:30 and on weekends, when fewer staff are on duty, but challenging patient situations are more likely.

Staff are divided about integrating HAT into standard opioid agonist treatment. Some were worried that co-locating HAT and OAT patients could destabilize certain individuals, normalize heroin use for others, and raise conflict levels due to different medication regimens and criteria. Many were in principle open to some form of integration, but only if HAT's intensive follow-up is preserved, physical separation within shared premises is ensured, and staffing, training, and medical presence are strengthened. Several staff stress that HAT and OAT rest on different operating models and competencies, and that HAT is characterized by a relationship-based model. On this basis, many argue that HAT should remain a clearly defined, distinct service, even if organizationally linked to a broader OAT structure.

Patients and user organization

Patients and the user organization ProLAR Nett strongly endorse HAT. Based on multiple workshops, interviews, and ongoing involvement over five years, ProLAR Nett reports clear health improvements and higher satisfaction compared with ordinary OAT. They report that almost all patients in HAT reportedly say that the treatment has saved their lives or made it possible to leave a destructive pattern of illegal opioid use. ProLAR Nett therefore strongly endorses continuing HAT in Bergen and Oslo and suggests drawing on international experience to improve organization and practice. ProLAR Nett and a patient representative propose several concrete changes which are described in detail in **Appendix 6.b**.

Neighborhood

The residents who took part in the neighborhood forum in Bergen contributed to a summary of their meeting (**See Appendix 6.c**). Residents around Engenhuset in central Bergen felt they were not adequately informed or involved when the building was developed into a health center with short-stay beds, outpatient services, research, and HAT. Their past negative experiences with a municipal OAT center and nearby hostels shaped their concerns, including theft, open drug use and dealing, disturbances. At a first neighborhood meeting in 2021, the residents' association (Sydnes Vel) perceived major gaps between their expectations and those of the health enterprise, especially regarding information, responsibility, and assessment of neighborhood impacts, and they felt questions about impact assessments and handling of potential problems were not sufficiently answered.

In autumn 2024, a contact group was established in which the City of Bergen, represented by the coordinator for efforts against open drug scenes, and the user-run service HUSET Bergen also became regular participants, in addition to the residents' association and the Clinic for Substance Use and Addiction. Bergen Police District took part in some of the meetings. The meetings have served as a forum for systematic sharing of experiences and information and have, among other things, addressed whether and to what extent there has been visible drug use, drug dealing, risky traffic behavior, threats, theft, and intoxicated individuals in the neighborhood's common areas since the previous meeting. According to the participants in the contact group, no such drug scene has been established in the area. Although some patients stay in the immediate vicinity, most travel home or to other places between visits to the clinic. Participants in the contact group describe the cooperation as good. See **Appendix 6** for the full summary.

8. Recommendations

The recommendations in this report were developed with heroin-assisted treatment (HAT) considered as part of the broader opioid agonist treatment (OAT). Conventional OAT, particularly methadone and buprenorphine delivered through pharmacies, clinics, and primary care, remains the established first-line treatment for most people with opioid use disorder (OUD). HAT serves a specialized extension within this continuum, offering a more resource- and treatment-intensive option for the small subgroup of patients (~3%) with treatment-refractory OUD who derive insufficient benefit from standard OAT. Framing recommendations within this system perspective is essential, as decisions about HAT provision are directly affected by OAT coverage, capacity, and overall treatment priorities.

The findings from this report demonstrate that demand for HAT is modest relative to the total OAT population. In well-developed systems (OAT coverage 70–80% with high-quality services), HAT typically addresses a small proportion of patients (3.2-3.3%), who have treatment-refractory opioid use disorder and severe, and often long-term health and societal needs. Consequently, policy and service decisions should be calibrated to relative patient severity and population proportions. Any expansion or redistribution of HAT capacity must be justified by demonstrable need, realistic enrollment projections, and consideration of opportunity costs elsewhere in the OAT system.

Operational design and resourcing are central to preserving the clinical benefits demonstrated in the pilot and evaluation, while ensuring long-term sustainability. The positive outcomes associated with HAT arise from a well-resourced program combining supervised dosing, close clinical monitoring, multidisciplinary psychosocial support, and high staff-to-patient ratios. Reductions in these core components would alter the intervention and weaken its evidence base. Lower staffing, abbreviated observation, or removal of integrated supports can be expected to diminish effectiveness and increase downstream harms and costs. However, the current high-cost model presents challenges, particularly given relatively low patient volumes and evolving patterns of heroin use.

This creates inherent tradeoffs in clinic size, service configuration, and treatment organization. Small stand-alone clinics can provide individualized care and continuity but are vulnerable to staffing constraints, security and supply challenges, and high per patient costs. Co-organized services may capture economies of scale, improve operational resilience and enable shared infrastructure, but require measures to preserve individualized care.

The following recommendations aim to balance these considerations by protecting the clinical integrity and safety of HAT while ensuring alignment with the broader OAT system and identifying pragmatic pathways to improve cost-efficiency, sustainability, and

access. Each proposal should therefore be read considering the twin priorities of maintaining evidence-based standards and improving operational practices.

Recommendation 1

Heroin-assisted treatment should continue in the already established clinics. However, given the high treatment cost, staffing and operational models should be reviewed and optimized.

Heroin-assisted treatment (HAT) should be maintained as an integrated, publicly funded option within opioid agonist treatment (OAT), delivered in the two established clinics (HABiO and HABiB).

As an evidence-based treatment for people with severe, treatment-refractory opioid use disorder, HAT complements existing OAT services by reaching a sub-group that does not sufficiently benefit from conventional treatment. Continuing HAT preserves clinical choice, supports harm-reduction outcomes, and strengthens the health system's capacity to respond to complex needs. The overall findings of this evaluation support its continuation.

However, given the high costs of HAT, and its position above the current willingness-to-pay threshold, this evaluation recommends that staffing and operational models be reviewed and optimized to improve efficiency. (See **Recommendation 2**).

Additional considerations

Limit stand-alone HAT clinics to locations with sufficient projected demand

Because HAT requires a high staff-to-patient ratio and specialist competencies, stand-alone clinics are only viable where sufficient patient demand exists. In settings with low demand, such clinics risk unsustainable costs, fragile service delivery, and reduced continuity of care.

The current clinics in Oslo and Bergen serve approximately 3% of OAT patients in their catchment area, and patient numbers remain below clinic capacity. This suggests that opening additional stand-alone HAT clinics in other cities is unlikely to be a viable option. New clinics should only be established where a defined minimum threshold is reached, or where services are co-located and co-organized with existing OAT or addiction services to capture sufficient patient volume (see **Recommendation 4**).

Establish operational thresholds for safe and efficient care

Operational thresholds should be defined to ensure patient safety and appropriate staff-to-patient ratios. Minimum safe staffing and infrastructure during clinic hours should cover clinical decision-making, safe dosing and monitoring, secure dispensing, psychosocial care, and documentation. A pragmatic operational baseline, therefore, consists of a minimum staffing requirement to operate safely and maintain treatment quality. This could include:

- One physician with addiction medicine expertise
- Two to three nurses (for pre-dose assessment, dispensing, and observation)
- A social worker
- A psychologist
- Appropriate administrative, security, and cleaning support

Staffing levels must be scaled for clinic opening hours and for planned and unplanned annual leave coverage. A clinic operating within this model can safely manage a moderate caseload.

During this evaluation, the clinics employed 19.2 (Oslo) and 12.9 (Bergen) full-time equivalent staff for approximately 40-50 patients, corresponding to a staff-to-patient ratio of 1:2 or 1:3. Below these volumes, per-patient staffing requirements and per-patient costs increase substantially.

Continue evaluation and monitoring

The clinics should continue systematic monitoring and evaluation to capture relevant changes. This applies to changes in substance-use patterns, the occurrence of new substances, and variations in demand for treatment. Continued regular evaluation is therefore essential, because it can confirm effectiveness and safety, reveal changed needs or new harms, and provide the knowledge base needed to adapt services, allocate resources, and inform policymaking going forward.

Develop contingency plans for potential clinic closure and patient transition

Given the high needs and clinical vulnerability of HAT patients, robust contingency planning is essential if one or both HAT clinics are closed or substantially reorganized. Any decision to close or restructure services must include structured, proactive measures ensuring a safe and timely transition to appropriate alternative treatment, such as standard OAT. Abrupt discontinuation or poorly managed transitions would disproportionately harm a very vulnerable group, increasing risk of overdose, withdrawal, and loss of dignity, and would fail to prevent avoidable harm.

Such plans should include:

- Early identification and individual review of all affected patients, with person-centered transition plans jointly developed by patients and clinicians.
- Guaranteed continuity of opioid agonist medication, with no treatment interruptions, alongside proactive management of dose adjustments and potential side effects.
- Coordination follow-up across relevant services, including other addiction treatment services like OAT, primary care, mental health services, and social

welfare services, to ensure continued support for comorbid medical, psychological, housing, and financial needs.

- Clear, timely, and transparent communication with patients, outlining expected timelines, available treatment options, and the support offered during the transition period.

Continue evaluation and monitoring

Clinics should continue systematic monitoring and evaluation to detect relevant shifts, such as changes in drug-use patterns, emergence of new substances, and fluctuations in treatment demand. Regular evaluation is therefore essential because it verifies effectiveness and safety, detects changing needs or harms, and provides the evidence needed to adapt services, allocate resources, and inform policy decisions.

Rationale

- Heroin-assisted treatment delivers measurable reductions in illicit drug use and acquisitive crime, alongside improvements in mental health, physical health, and overall quality of life among patients with severe, treatment-refractory opioid use disorder.
- Heroin-assisted treatment accommodates clinical heterogeneity by providing an appropriate option for patients who require supervised diacetylmorphine, with benefits reported from patients, clinicians, and affected family members.
- The current model has high per-patient costs. Reviewing and optimizing staffing models, administrative processes, and co-organization with OAT services could reduce unit costs and improve sustainability.

Recommendation 2

Explore cost-saving options within heroin-assisted treatment

Should HAT transition from a time-limited pilot to a routine service, long-term sustainability will require pragmatic, evidence-informed efficiency measures that preserve clinical quality, safety, and effectiveness. High unit costs, high levels of staffing, and relatively low patient volumes create financial and operational vulnerability. Current HAT costs exceed the national willingness–to-pay threshold, and cost-saving options should therefore be critically examined to improve long-term viability.

Cost-containment options should be investigated systematically, in ways that are clinically justified, piloted locally, and evaluated against pre-specified safety and outcome metrics. Final decisions on implementation should be made within a broader hospital and health-system priority-setting framework.

Additional considerations:

Consider lower-cost medication alternatives

For patients whose clinical needs permit oral dosing, licensed morphine formulations may provide effective overnight or daytime coverage at lower acquisition and handling costs than diacetylmorphine. This may also reduce pharmacy complexity and simplify storage and security requirements. Patient involvement must be ensured in all clinical decisions regarding administration routes and medication.

Explore improved options for scheduling and time management

From experiences from international HAT clinics, there exist potential options for improving staffing and patient scheduling. For example, introducing appointment slots (e.g., staggered arrival windows or consolidated pill dispensing times for tablet users) can reduce peak staffing demands and shorten patient wait times.

The two-hour midday closure leaves the clinics overstaffed and produces prolonged, unproductive downtime, creating an operational inefficiency, especially in Oslo where all staff work shifts of the same length, creating significant staff overlap in the middle of the day. Although this midday closure is intended to ensure sufficient break between heroin doses, alternative options to a complete clinic closure should be explored. Possible responses could include redistributing staff schedules, using the period for scheduled patient appointments (such as wound care, blood tests, or social service assistance), sharing staff across nearby services, or developing structured activities for patients during the midday pause. These changes could improve efficiency and the clinical use of staff time.

Examine alternative staffing models

Use of shared staff across OAT and HAT services with rotation of staff could potentially lower personnel costs while maintaining quality and clinical sustainability, given that all staff receive the necessary training.

Rationale

- Estimated costs of approximately one million NOK per patient per year. The cost per QALY exceeds what is considered acceptable in the Norwegian health system and may limit clinic sustainability.
- The present staffing model (about 1 staff member for every 2.5 patients) produces a high staff-to-patient ratio.
- While HAT may yield system-level savings (such as reduced health service utilization), the current organizational model is fragile, and targeted efficiency measures may improve economic sustainability without sacrificing core benefits.

Recommendation 3

Heroin-assisted treatment should continue to provide comprehensive, high-quality, evidence-based services

Heroin-assisted treatment must remain a comprehensive, high-quality, evidence-based service, even while the program explores operational efficiencies. Because HAT involves specialized care, supervised opioid administration, and the management of complex medical, psychiatric, and social needs, any cost-saving measures must preserve core clinical standards and the safety structures essential to its effectiveness.

A central finding from this evaluation is that HAT functions as **more than medication** provision alone. Access to psychosocial and medical follow-up, including other relational forms of support, constitutes core components of the service and contributes to patient engagement, retention and positive treatment outcomes. Thess components should be maintained even under efficiency improving measures. The findings from this evaluation reflect outcomes achieved under a well-resourced model; changes to the scope of service or resourcing will therefore alter the basis on which these results can be interpreted.

Protecting quality also requires appropriate staff competencies and workforce support. Clinics should ensure access to clinicians with addiction medicine expertise, trained nursing staff competent in supervised injectable dosing and acute response, social services, and regular multidisciplinary input. To provide integrated physical and mental health care, these competencies should be available as part of HAT or in close collaboration with HAT. Minimum staffing levels should be defined and maintained, with ongoing training and supervision, and clear clinical protocols. Cost-reduction proposals must be evaluated against their impact on these staffing standards and on patient and staff safety.

Structured staff training and opportunities for specialization appear essential for maintaining service quality. The patient–clinician relationship in addiction treatment is a crucial determinant of patient satisfaction with treatment and its outcomes. Clinical tasks and skills training do not guarantee that clinicians can engage with patients therapeutically or build trusting relationships. Training clinicians to manage their role and power as ‘gatekeepers’ to medication and services could include ongoing self-evaluations of their practices regarding restricting patient access to the services provided, and awareness-raising about how they manage this power. It also may be important to train clinicians to apply more streamlined enforcement of clinic rules, to avoid unequal patient treatment based on issues unrelated to medical considerations or individual treatment adjustments.

Rationale

- Complex needs require specialist care. Patients commonly present with severe comorbidity such as mental illness, chronic physical conditions, and unstable housing at higher levels than patients in conventional OAT. Thus, they need coordinated medical, psychiatric, social, and harm reduction interventions that go beyond medication.
- Heroin-assisted treatment involves supervised administration of opioids and care for patients who have not achieved stabilization of their opioid use disorder on conventional medications, most of whom use multiple substances. Strict clinical protocols, observation capacity, emergency response capability, and trained staff are non-negotiable to prevent harm and maintain therapeutic benefit.
- Small or under-resourced clinics could risk compromised safety, staff burnout, limited hours of service, and gaps in continuity of care. Particularly because of injectable HAT, minimum infrastructure (i.e., observation rooms and supervised administration booths), clinical staff (addiction-trained physicians and specialist nurses), and administrative support are required to meet clinical and regulatory obligations reliably.
- Efficiency measures should be carefully selected to avoid reduction in quality and patient safety. Policies that reduce core capabilities (e.g., cutting observation time, diluting staff expertise or removing psychosocial support) undermine effectiveness and may increase downstream costs in emergency care, hospitalization, and criminal justice contact.

Recommendation 4

Co-organize and integrate heroin-assisted treatment with existing opioid agonist treatment

Co-organization of HAT within established OAT services could expand access, improve workforce flexibility, reduce per-patient operating costs through shared infrastructure, and simplify clinical pathways and referrals. **This recommendation emphasizes the integration of staffing between HAT and OAT.** Integration could preserve the specialized care HAT requires while improving efficiency and strengthening continuity of care for patients who move between treatment modalities while maximizing efficiency and resilience.

Additional considerations

Plan any restructuring collaboratively, communicate changes transparently, and implement them with active staff involvement, support and structured feedback mechanisms

Co-organization may reduce stigma for patients entering HAT, as attending a shared OAT facility normalizes the treatment and avoids the visibility of attending a standalone HAT-specific clinic. However, co-organization and/or co-location also require careful management of patient flow and expectations. Some OAT patients may feel uncomfortable sharing space with a more clinically unstable group, and both groups may perceive not receiving an equal amount of care. Planning should ensure equitable access and perceived fairness, while acknowledging intrinsic differences between the treatment models. In addition, staff from both HAT and OAT may be skeptical about reorganization, so any restructuring should therefore be planned collaboratively, communicated transparently and implemented with staff support and feedback.

Further, cross-training of staff across HAT and OAT could reduce the knowledge gap and stigma that sometimes exists between clinicians working in different treatment modalities. However, not all OAT staff may be interested in working with HAT. Therefore, involving staff collaboratively in planning any reorganization is essential to secure buy-in, address concerns, and design staffing arrangements that respect individual preferences and service needs.

Rationale

- Co-organization of staff would improve transitions of care to different OAT medication options, improving the opportunity for individualized care at different stages in a patient's recovery.
- Shared clinical teams would promote consistent clinical operations while improving workforce resilience. Cross cover and rotating rosters create a larger

pool of qualified staff, reduce single site staffing shortages and burnout, enable more efficient use of specialist skills, and simplify training and supervision.

- Co-organization (shared premises) of HAT and OAT could reduce duplication of infrastructure costs, resulting in less capital and running costs per patient, enabling an efficient allocation of resources.
- Having HAT alongside conventional OAT simplifies transitions through treatment, reduces logistical barriers for patients, and supports continuity when clinical needs change, factors that could promote engagement and retention**.**
- In this real-world health economic evaluation, HAT appears to exceed the current Norwegian willingness-to-pay thresholds for severe conditions. Use of specialist health services emerges as the most important source of cost savings, and a simultaneous reduction in crime-related activity is considered an additional saving in a sensitivity analysis. Taken together, HAT appears to be a cost-effective treatment for an otherwise burdened patient group that does not achieve sufficient effect from conventional treatment.

The staffing model accounts for a substantial portion of the total budget. Staffing integration with OAT may provide a viable option for reducing costs while maintaining HAT as a treatment option.

Recommendation 5

Explore the creation of enhanced addiction services for a broader patient population as an alternative to stand-alone HAT clinics

Looking ahead, consider the establishment of specialist **enhanced outpatient addiction services.** Enhanced addiction services would provide strengthened daily treatment for people with high severity substance use disorders beyond opioid use disorder, including stimulants (crack, cocaine) and polysubstance use, as well as individuals on daily dispensing of medication in OAT/HAT who require high intensity support. The service could concentrate multidisciplinary clinical resources, offer flexible delivery models (extended hours, outreach, and supervised dosing where clinically required), and provide tailored psycho-social and somatic care for patients who do not respond to standard treatment.

This recommendation differs from co-organization of HAT within OAT (**Recommendation 4**) by consolidating intensive treatment across medication types and delivery models, (not only HAT) improving access and continuity for a broader group of high need patients, i.e. the patients are included on basis of their function and clinical needs, rather than the types of substances used. This recommendation does not suggest replacing existing HAT provision but rather building on its principles to create a more scalable and inclusive service model that can adapt to changing drug-use patterns and service needs over time. **An enhanced addiction service could offer pragmatic, equitable access, and treatment components embodied by HAT to other patient populations.** This resource-intensive service model would serve more patients than the current HAT model and hence be a viable option for reaching a wider range of potential patients with the need for intensive follow-up. This model would also allow treatment to more easily pivot to the current treatment needs of patients and integrate systems for referrals and follow-up. There are undoubtedly practical limitations to this recommendation that must be addressed by relevant stakeholders, and which are beyond the scope of this report.

Rationale

- A single, high intensity unit can assemble addiction physicians, psychiatric nurses, psychologists, people with competency in social work and principles of harm reduction, and other medical professions to deliver evidence-based interventions efficiently and to manage the patients' complex comorbidity. This coalition would also improve the prolonged viability of the treatment model of HAT.
- An enhanced addiction service would reduce the risk of patients falling through gaps in care when their clinical needs change. Patients who no longer meet HAT criteria or who are stepping down from intensive treatment would have access to a range of intensity levels within a single service, supporting more gradual and

clinically appropriate transitions, and reducing the risk of abrupt treatment discontinuation, relapse, and overdose.

- Evaluation feedback indicates that HAT's benefits extend beyond the medication to structured routine, intensive observation, and integrated supports. Applying this model to other high-need populations could produce similar gains in stability, health, and social functioning.
- Defining the service model by the person's level of functioning and clinical needs, rather than by the specific substances used, will apply the structured, multidisciplinary HAT model to a broader population with complex needs and may offer a more dynamic and sustainable framework for delivering intensive addiction care as patterns of drug use and service requirements evolve. Such a model will be more economically sustainable and enable establishment outside the largest cities.

Summary of key recommendations

The key recommendations are summarized here and expanded below, including considerations and key rationale.

Summary of key recommendations
1. Heroin-assisted treatment should continue in the already established clinics. However, given the high treatment cost, staffing and operational models should be reviewed and optimized.
2. Cost-saving measures within HAT should be explored, without compromising clinical quality and safety.
3. Heroin-assisted treatment should continue to provide comprehensive, high-quality, evidence-based services.
4. Heroin-assisted treatment should be co-organized and integrated with existing opioid agonist treatment services.
5. Explore the development of enhanced addiction services as a broader, dynamic alternative for high-need patient populations.

9. Discussion

The evaluation shows that HAT occupies a small but valuable place within the Norwegian health service for substitution treatment of opioid use disorder. The service reaches a small group of people with severe opioid use disorder who have not benefited sufficiently from other treatment, and it produces meaningful clinical and social gains, including better physical and mental health, reduced use of illegal drugs, and less acquisitive crime. At the same time, the current model is highly resource-intensive, with substantial costs per patient and lower demand than expected. Taken together, this limits the scope for extensive national scale-up and raises legitimate questions about long-term sustainability.

This two-sided picture of clear benefits for a small and marginalized group combined with relatively high costs is central to how the recommendations have been formulated. It argues for continued operation of HAT at the existing clinics, while calling for targeted measures to improve cost-effectiveness. The recommendations rest on an understanding of HAT as an extension of the established OAT system, reserved for those with the greatest need for intensive treatment.

At the same time, the report argues that the current HAT model can serve as a platform for more flexible, high-intensity services for a broader group of patients with complex needs, not all of whom would receive diacetylmorphine. This forward-looking perspective reflects changing patterns of substance use and entails using the experience and competence developed through HAT to drive further service innovation, rather than viewing HAT solely as a bounded, time-limited pilot.

The recommendations are therefore shaped by a clear “push–pull” dynamic. On one hand, clinicians and user representatives emphasize a strong professional and ethical rationale for continuing HAT, based on observed improvements in quality of life, stability, and health. On the other hand, the high treatment costs, the moderate but measurable health gains measured in quality-adjusted life years (QALYs), and the modest demand underline that HAT is a resource-intensive service for a small and particularly burdened share of the OAT population.

Furthermore, we expect that heroin injecting may become a declining pattern of use in the years ahead, and that the need for heroin-assisted treatment for this specific group will therefore diminish. At the same time, we cannot rule out that other synthetic opioids may take on a more prominent role as the principal substances among people who inject opioids, including fentanyl analogues, nitazenes, and newer groups such as orphines. For people who continue to inject opioids, whether heroin or other opioids, it is reasonable to assume that HAT could provide benefits similar to those we observe and expect for people who inject heroin. If future opioid use increasingly involves other routes of administration, such as inhalation or oral use, we consider that other forms of treatment

and approaches will have greater potential to reach and meet these users' needs than injection-based treatment.

The European opioid market is evolving rapidly, with an expected increase in and diversification of potent synthetic opioids, and services must therefore remain flexible, adaptable, and responsive to changes in the drug situation.

In response to these competing considerations, the report recommends maintaining HAT where it is already established, while systematically exploring organizational changes that could make the model more sustainable. This could include closer collaboration with OAT, co-location with other services, more flexible use of staff, and other organizational solutions that can reduce costs without weakening safety or treatment effect. In this sense, the recommendations represent a pragmatic compromise: continuing HAT as a specialized and effective service for a small and particularly burdened patient group, while adapting the organization to preserve clinical gains and safety, use resources better, and, in time, assess whether some elements of the model may be transferable to other patient groups with similarly complex treatment and follow-up needs.

10. Strengths and limitations

This evaluation has several important strengths, but also limitations that affect how the findings should be interpreted. Overall, the report provides both a broad and detailed picture of heroin-assisted treatment (HAT) in Norway, while recognizing gaps that future work will need to address.

A major strength is the breadth and depth of the qualitative material. We conducted more than 100 interviews with patients, family members, clinicians, and other stakeholders, and combined these with additional sources such as observations and document reviews. We also met with international HAT experts to learn from experiences from different settings. This created a rich, diverse dataset that allowed us to view HAT from several angles, compare perspectives, and cross-check key themes. The variety of sources strengthens the credibility of the findings about how HAT is organized and experienced in everyday practice.

However, the qualitative material is not without limitations. Patient interviews are likely affected by selection bias: people who dropped out early or under difficult circumstances were interviewed less often, and their reasons for leaving are therefore underrepresented. This may tilt the material toward somewhat more positive accounts and may miss problems that led some patients to leave HAT. In addition, participants knew that the evaluation could influence future decisions about HAT. This may have shaped how they presented their experiences, for example by emphasizing certain problems or benefits. That said, the material contains extensive commentary from patients, relatives, and staff, and the same benefits and challenges appear across different types of data, suggesting that strategic self-presentation did not have major influence on the findings.

For health, social, and treatment outcomes, a key strength lies in the systematic use of standardized measures that were collected over time. This longitudinal design makes it possible to see not only whether changes occur in areas such as drug use, quality of life, crime, and housing, but also how quickly these changes emerge and how they differ between people. However, the study includes a limited number of patients, and HAT patients represent a selected group of people with severe OUD. The findings should therefore be interpreted as specific to this group and cannot necessarily be generalized to all people with OUD. Missing data and irregular follow-up for some participants introduce uncertainty, especially if those with the most unstable lives are less likely to complete later assessments. This could lead to an overestimation of favorable outcome estimates.

The safety analysis of serious adverse events is strengthened by the systematic review of medical records for all patients in the study. This provides a comprehensive overview of what serious adverse events occurred, how often, and how clinics responded, which is

crucial for assessing the risks associated with HAT. However, medical records rarely contain detailed information about the circumstances before each event. As a result, the evaluation can describe what happened and how it was handled but has limited ability to identify specific triggers or risk factors, or to say how such events might have been prevented. Additionally, some events, both severe and less severe, might, for different reasons, not have been reported in the clinical fields.

Finally, the cost-utility analysis provided an initial picture of the costs of HAT, but there were also limitations. The study used a relatively small, non-randomized observational sample, so causal inference is limited and group comparisons may be affected by selection into treatment and heterogeneity in the comparator group. Quality-of-life data were unavailable after HAT discontinuation, adding uncertainty to QALY estimates. Despite these limitations, this analysis has several important strengths. It is based on individual-level longitudinal data from a national pilot program, integrates multiple data sources, and captures outcomes across both health and societal domains using a transparent analytical framework consistent with Norwegian methodological guidance. More on methodological limitations for the cost-utility analysis can be found in **Appendix 4**.

Taken together, the evaluation offers a robust and multifaceted description of how HAT works in Norway today, while also being transparent about where the evidence is weaker and where further research is needed.

11. Future research

Heroin-assisted treatment (HAT) is an evolving field, and the Norwegian pilot has been implemented in a changing landscape. To remain relevant and evidence-based, further research needs to look beyond the initial evaluation questions and address how HAT should be adapted, targeted, and integrated into a dynamic treatment system.

First, the target group for HAT is likely to change overtime. The current model focuses largely on a small, highly marginalized population with long histories of opioid use disorder and prior treatment attempts. In parallel, patterns of opioid and drug use are shifting, including increased use of stimulants, including crack cocaine. Future research should therefore examine whether the existing inclusion criteria remain appropriate, and whether there are specific subgroups for whom HAT, or a HAT-inspired treatment model, might be particularly beneficial. Longitudinal and registry-based studies can help identify which patient characteristics predict good, stable outcomes and which are associated with limited benefit or early discontinuation of treatment.

Second, the range of available drugs and formulations in opioid agonist treatment is expanding, and HAT cannot be viewed in isolation from developments in conventional opioid agonist treatment (OAT). New and existing medications (e.g., long-acting buprenorphine, various morphine formulations, inhalable and intranasal options) change the comparative value and role of diacetylmorphine in the treatment system. Future research should include pragmatic comparative effectiveness studies that assess different care models: for example, pathways in which patients move between conventional OAT, HAT, and other intensive or low-threshold treatment services.

Third, there is a need to test experimental models of service organization and delivery. The current Norwegian HAT model is intensive, clinic-based, and highly staffed, which provides safety but is resource-intensive and sometimes experienced as rigid. Future studies could explore alternative configurations, such as closer integration or co-location with OAT services, or shared staffing models. Implementation and feasibility studies, including mixed-methods designs, can help determine which configurations maintain safety and effectiveness while improving flexibility, patient satisfaction, and economic sustainability.

This health economic analysis provides an initial, practice-oriented estimate of the costs, health gains, and societal consequences of HAT in the Norwegian context. Further research should prioritize more complete follow-up of quality of life and health service use over time, as well as a broader societal perspective that includes expanded measures of crime, welfare benefits, housing stability, employment attachment, and social functioning. In the longer term, HAT should also be directly compared with conventional OST (opioid substitution treatment) in Norway, including costs, treatment retention, quality of life, and health service use, while at the same time examining

organizational solutions that can reduce costs without compromising safety or treatment effect. There is also a need for more robust analytical designs that better capture differences between patient groups, including approaches based on linked registry data and target trial emulation. This will strengthen the causal interpretation of both costs and treatment outcomes.

Evaluations should broaden the societal perspective by including more comprehensive data on crime, use of welfare programs, and social functioning. It is particularly important that future economic analyses explicitly assess alternative, potentially less resource-intensive service models, such as co-location or integration with conventional OST services, to examine whether comparable health gains can be achieved at lower cost.

Finally, future research should place greater emphasis on outcomes that matter to patients, their families, and local communities. This includes not only traditional indicators (such as mortality, substance use, crime, and hospitalizations), but also recovery-oriented measures such as social participation, perceived autonomy, meaningful relationships, stigma, and experiences of coercion or trust in services. Embedded qualitative research that follows the narratives of patients, families, and close social networks over time can provide insight into how HAT influences broader life trajectories, and how treatment models can support long-term recovery in a broad sense.

In sum, the next phase of research should treat HAT not as a fixed intervention, but as a flexible component within a wider and changing treatment ecosystem. Understanding which patients benefit, under what conditions, with which combinations of medications and service models, will be crucial for designing a clinically effective, acceptable, and sustainable role for HAT in the years ahead. If the current trend of declining applications to HAT continues, the relevance of the treatment model may diminish, while new methods for new patient groups will need to be developed in the future.

12. Conclusion

This evaluation shows that heroin-assisted treatment (HAT) in Norway fills a limited, but important role within the wider opioid agonist treatment (OAT) system. It reaches a small group of people with severe, long-standing opioid use disorder, extensive treatment histories and complex social and health problems who have not benefited sufficiently from conventional OAT. For this group, HAT provides meaningful benefits: reductions in heroin use, lower self-reported crime, and gradual improvements in quality of life, physical and mental health, safety and stability. Patients, clinicians, and family members describe HAT as clearly better than being out of treatment, and as a source of structure, stability, support, and harm reduction for people in very vulnerable life situations.

At the same time, the evaluation highlights important limitations and trade-offs. Demand for HAT is modest, and the current clinics operate below capacity. Based on self-reported data, many structural challenges (such as poverty, food insecurity, unstable housing, unemployment and serious comorbidity) remain largely unchanged during treatment and require coordinated responses beyond the treatment medication itself. The treatment model is also demanding; attendance up to twice daily can limit participation in work, education, family life, and social reintegration. Patients report that strict rules and rigid dosing practices can strain trust and make it difficult to tailor care to individual needs. Clinicians experience tension between providing flexible, person-centered care and maintaining safety in a high-risk environment. Additionally, serious adverse events are common among patients in HAT, thus underscoring the need for this treatment to be provided within specialized addiction treatment services, by appropriately trained staff, in a setting that ensures a high level of safety and clinical supervision.

Per-patient costs were substantial, and the estimated cost per QALY exceeds Norway's willingness-to-pay threshold for severe conditions. While HAT demonstrates clear clinical benefit, it is also a high-cost intervention. Decisions regarding implementation should therefore consider both cost-effectiveness and broader ethical considerations, including equity, severity of illness, and the availability of effective alternatives for this patient group.

Taken together, the findings support continuing HAT as a specialized option within OAT, while cautioning against large-scale expansion. Future efforts should focus on strengthening integration with traditional treatment services to establish a more sustainable organizational model and improve cost effectiveness. Expanding the HAT model within an enhanced treatment model would make it possible to reach a broader group of people with complex needs and create a more dynamic, responsive and sustainable way to deliver intensive addiction care as drug-use patterns and service needs change. HAT should therefore be regarded not as a standalone fix but as one element of an evidence-based continuum of care that can offer different levels and types of support as patients' needs evolve.

13. Project publications

This section presents the scientific publications resulting from the HAT evaluation project. Together, these publications document the project's main empirical findings, methodological work, and conceptual contributions.

Publications by year:

2023

Ellefsen, Rune. (2023). Narkotikapolitikk i endring: Heroinklinikkenes oppkomst i Norge. *Nordic Studies on Alcohol and Drugs*, 41(3):307-325.

Ellefsen, Rune, Linda Elise Couëssurel Wüsthoff, Espen Ajo Arnevik. (2023) Patients' satisfaction with heroin-assisted treatment: a qualitative study. Harm Reduction Journal, 20(73).

Melis, Francesca, Morten Hesse, Desiree Eide, Birgitte Thylstrup, Christian Tjagvad, Julie Elizabeth Brummer, Thomas Clausen. (2023). Who receives heroin-assisted treatment? A comparison of patients receiving opioid maintenance treatment in Denmark. Drug and Alcohol Dependence, 254:111051.

2024

Brummer, Julie, Birgitte Thylstrup, Francesca Melis, Morten Hesse. (2024) Predictors of retention in heroin-assisted treatment in Denmark 2010–2018 – A record-linkage study. Journal of Substance Use and Addiction Treatment, 165.

Ellefsen, Rune, Silvana De Pirro, Vegard Haukland, Linda Elise Couëssurel Wüsthoff, Espen Ajo Arnevik. (2024). "It's a delicate balance": clinicians' experiences of providing heroin-assisted treatment. *Harm Reduction Journal,* 21, 230.

Kyrkjebø-Urheim, Tiril, Christina Andersen, Rune Ellefsen. (2024). Pasienters opplevelse av livskvalitet i heroinassistert behandling. Sykepleien Forskning, 19(97141):e-97141.

Myklebust, Lars Henrik, Desiree Eide, Espen Ajo Arnevik, Omid Dadras, Silvana. De Pirro, Rune Ellefsen, Lars Thore Fadnes, Morten Hesse, Timo Kvamme, Francesca Melis, Ann Oldervoll, Birgitte Thylstrup, Linda Elise Couëssurel Wüsthoff, Thomas Clausen. (2024) Evaluation of heroin-assisted treatment in Norway: protocol for a mixed methods study. BMC Health Services Research, 24(1): 398.

2025

Ellefsen, Rune, Silvana De Pirro, Linda Elise Couëssurel Wüsthoff. (2025). Relational hope and despair: Heroin-assisted treatment as experienced by the patients' family members. *Drugs: Education, Prevention and Policy*, 1–14.

Haukland, Vegard. (2025). Beyond a spoiled identity: Destigmatization through everyday interactions in heroin-assisted treatment. *Drugs: Education, Prevention and Policy*, 1–15.

Melis, Francesca, Charlotte Castel, Desiree Eide, Thomas Clausen. (2025). Health-related quality of life trajectories of patients in heroin-assisted treatment. Drug and Alcohol Dependence, 275.

Melis, Francesca, Timo L. Kvamme, Christian Tjagvad, Desiree Eide, Birgitte Thylstrup, Thomas Clausen, Morten Hesse. (2025). Health-related quality of life measures as predictors for recurrent hospitalization and mortality among patients in heroin-assisted treatment. *Quality of Life Research*.

Melis, Francesca, Thomas Clausen, Charlotte Castel, Omid Dadras, Silvana De Pirro, Lars Henrik Myklebust, Ann Oldervoll, Linda Elise Couëssurel Wüsthoff, Desiree Eide. (2025) Patient Characteristics from Norway's First Heroin-Assisted Treatment Clinics. Substance Use & Addiction Journal, 46(1):13-24.

Myklebust, Lars Henrik, Desiree Eide, Linda Elise Couëssurel Wüsthoff, Francesca Melis, Ann Oldervoll, Silvana De Pirro, Thomas Clausen. (2025). Changes in Self-Reported Mental Health, Anxiety, and Depression among Patients in Heroin-Assisted Treatment: Findings from a Norwegian Trial Project. European Addiction Research. 31(4):286-296.

2026

Gaulen, Zhanna, Marja Leonhardt, Linda Elise Couëssurel Wüsthoff. (2026). Hunger and Food Access in Norwegian Heroin-Assisted Treatment: a 12-month longitudinal study. *Under review.*

Leonhardt, Marja, Rune Ellefsen, Vegard Kokabzadeh Haukland, Linda Elise Couëssurel Wüsthoff, Linda Eline. (2026). Providers' perspectives on what heroin-assisted treatment ought to be: A qualitative study. BMC Health Service Research. https://doi.org/10.1186/s12913-026-14746-1

Melis, Francesca, Desiree Eide, Thomas Clausen. (2026) Beyond health: trajectories and predictors of multidimensional quality of life during heroin-assisted treatment. *Under review.*

Appendices

Appendix 1

Establishment of HAT as a new treatment option in Norway

Planning the launch of HAT was based on estimated figures for the expected number of patients and experience from the HAT clinics in Denmark.

Visits to observe the HAT clinics in Denmark were essential for gaining familiarity with the treatment. COVID-19 restrictions at the time limited the opportunity to travel to and observe established clinics. Particularly regarding the design of the clinics, it would have been advantageous to visit other clinics early in the planning phase to adapt the premises. The "Danish model" was adapted to the specialist health services in Norway and formed the basis for our professional design of the service.

A gradual scale-up of patient numbers was planned to gain experience and build competence. It was necessary to adapt the scale-up to a pace at which patient and staff safety was judged to be maintained.

Treatment with diacetylmorphine

Diacetylmorphine is a medication that had not previously been used as a substitution treatment in Norway, and there was therefore no experience with its use. There was a lengthy application process before the medication was approved for use in Norway.

Routines needed to be established in cooperation with the hospital pharmacies for ordering, delivery, and storage of diacetylmorphine. We experienced delivery challenges in the start-up phase, but through cooperation between the clinics, these were resolved without consequences for patient treatment.

The design and establishment of clinic routines for the treatment were largely based on those used in the Danish clinics.

Establishment of premises and location

Easy accessibility by public transport is a prerequisite for the location. Establishing the premises caused concern among neighbors, who expressed fear of a drug scene being established in the neighborhood. Establishing adapted premises took somewhat longer than expected. HABiB has moved twice, and based on experience from the first premises, adaptations were made to the design to better facilitate operations. The design of the premises appears important for achieving good patient flow, which is necessary for having a larger proportion of patients in treatment at the same time, as well as good patient satisfaction and safety.

Staffing factor and work schedules

This was difficult to calculate before starting up because of uncertainty about the number of patients who would be referred. Too many staff would give staff a great deal of downtime and long days at work; too few staff would be challenging both for patient safety and for the working environment. We therefore started with reduced staffing relative to the expected number of patients and increased it as the need became apparent. During the first summer, this meant that we had an intake stop to safeguard patient safety and the working environment.

Good cooperation with employee representatives in the planning phase was crucial for finding good solutions for work schedules. Necessary adjustments and changes were made to the staff schedule, staffing, and working hours during the project period.

Staff composition and recruitment

The composition of staff was intended to ensure multidisciplinary competence, equivalent to specialist addiction treatment (TSB). In addition, it was to ensure competence in acute services, somatic medicine, psychiatry, and addiction in order to care for patients with a high degree of comorbid conditions.

In recruitment, a varied background of experience was therefore prioritized when hiring nurses and social educators. A senior physician in addiction medicine was employed. A social worker was prioritized as a dedicated resource in both clinics to ensure and provide social-work follow-up. The need for a psychologist was prioritized differently across the clinics, but both clinics secured access to psychological competence.

Medical record system

In close cooperation with IT, a customized medication chart adapted to HAT was developed. There was a need for adaptation within current guidelines for patients with multiple attendances per day. A great deal of work went into adapting use within the medical record system, which did not fit the existing structure in specialist addiction treatment (TSB).

Collaboration structures with other services

We established contact with existing collaborating partners and service providers. We requested to attend meetings with collaborating partners to provide information about HAT, the treatment, the target group, and the referral procedures.

Training

About three months were set aside for basic training and moving into the clinic.

With different levels of experience and backgrounds, there was a need to get to know one another, build culture, develop shared competence, and establish a common basis of

understanding. Teaching, courses, e-learning courses, and observations were used in the training.

The training plan included the following: HAT-specific training (diacetylmorphine, injection guidance, acute training in the treatment of overdoses, seizures, anaphylaxis, and CPR); training in the use of the hospital's medical record and IT systems; substance dependence and heroin dependence; addiction treatment and OAT treatment; somatic conditions; mental disorders; infection control; suicide; services from other agencies and voluntary organizations; use of experiential competence; ethics; communication (MI – motivational interviewing); MAP (managing aggression problems); and children as caregivers.

Appendix 2

Attitudes and experiences of patients, clinicians, and affected family members

Data collection:

The qualitative data consists of semi-structured, in-depth interviews, informal conversations, ethnographic field observations, and workshops.

- **In-depth interviews with patients (n=60):** A total of 31 patients were recruited and interviewed at the clinics in Oslo and Bergen between March 2022 and June 2024. Patients were interviewed at least once and up to three times over the course of two years, depending on their availability, to capture changes in perspective and experiences. The interviews were semi-structured and conducted one-on-one by researchers or co-researchers who were representatives from user organizations. The interview guide was developed with representatives from the user organization ProLAR Nett. All interviews were audio-recorded and transcribed, either manually or with the assistance of an artificial intelligence transcription service (Whisper, OpenAI). Automated transcripts were manually reviewed and edited to ensure accuracy.
- **Workshops with patients (n=4):** To cover additional experiences and perspectives from heroin-assisted treatment (HAT) patients in the period after interviews were completed, four open patient workshops were organized. These had a duration of about three hours and were conducted in both Bergen and Oslo in 2024 (the third clinic year) and at the end of 2025 (the fourth clinic year), in collaboration with ProLAR Nett. Anonymized field notes were produced from all the workshops.
- **Field observations (about 300 hours):** Ethnographic fieldwork was carried out by researchers at both clinics between 2022 and 2024, resulting in written field notes with key observations of methodological and analytical relevance. The observations initially guided the development of interview guides, supplemented the interview data by situating patients' accounts within the everyday routines, organizational practices, and interactional dynamics of the clinics. This material further provided contextual information that supported the interpretation of life inside the treatment setting.
- **Co-researchers' informal conversations with patients (n=32):** Conversations were conducted by co-researchers from ProLAR Nett in both clinics between March 2024 and November 2025, covering the period after in-depth interviewing was completed. These conversations were planned and conducted in cooperation with researchers at RusForsk to complement the other qualitative data. A small set of fixed questions was used repeatedly to address patients' everyday experiences in treatment and to capture potential changes in the

treatment. Short, anonymized minutes were written after each conversation and shared with the research team.

- **Interviews with clinicians (n=47):** Interviews with clinicians were first conducted during the initial phase of HAT and during HAT's latter phase. First, two separate rounds of interviews (mostly group interviews) were conducted within the first 14 months of HAT's operation. This involved 23 qualitative interviews with 31 clinicians (21 nurses, including two social educators with nursing tasks, four medical doctors, three social workers, a psychologist, and two clinic leaders) in Oslo and Bergen. The aim of these initial interviews was to capture emergent experiences of key challenges and benefits of HAT, as seen from a clinical perspective. Secondly, 23 additional individual interviews were conducted with clinicians (11 nurses, three social workers, two physicians, two clinic managers and five former employees) during HAT's fourth operational year. The aim of these interviews was to investigate clinicians' perspectives on the ideal concept of HAT by examining their descriptions of the ideal treatment practices, which reflect a treatment philosophy among them. Nineteen interviews were conducted at the clinic sites in Bergen and Oslo, while five interviews with former HAT employees were conducted via Teams.
- **Interviews with affected family members (n=18)**: Between June 2022 and April 2024, 18 in-depth qualitative interviews were conducted with 10 family members of patients in HAT. Two rounds of interviews were conducted at four and 14 months after the interview participant's family member was enrolled in HAT. The aim was to capture the experiences and views on HAT as seen from the perspective of patients' family members, including how HAT impacted these family members and their relationship with the patient.

Analysis:

Thematic analysis was employed to analyze the interview data, to identify and sort recurring themes, and to construct categories within these themes, in dialogue with relevant scholarly literature and research and with continuous attention to the study aim. Other data were used for triangulation and for screening ongoing and developing experiences of HAT and changes in HAT over time. The complementing sources of qualitative data strengthened analysis in terms of validation; the credibility of findings was controlled by cross-checking several data sources.

Appendix 3

Health, social, and treatment outcomes

Data collection

As described in **Section 5.3**, patients completed baseline and later follow-up questionnaires at multiple time points throughout their treatment. Although these time points were defined by the research protocol, some flexibility in data collection was allowed in practice. While almost all the patients consented to take part in the research, participation was voluntary, and there were no mandatory questions. As a result, there was some variation in the completeness of the data collected. Data on medication was collected through the medical files at one month after first DAM administration, thereafter every three months throughout the treatment period.

Analysis

The primary aim of the analysis in this report was to retain as much of the reported data as possible. Changes were assessed between the first and last available measurements; the table below also includes the average number of months between these time points.

Supplementary Table A below presents information on the number of patients and the timing of measurements in relation to their first day of heroin administration (see also **section 6.4**). While clinical staff supported the data collection at the clinics, no question in the questionnaire was mandatory, and each variable had different response rates.

Supplementary Table A: Self-reported measures

The table presents the number of patients included for a specific question, information on the timing of the first and last measurement for that group, reported as the number of months since the first day of diacetylmorphine (DAM), and the changes in treatment status between the two measurement points.

	N patients	First meas.*	Last meas.*	Change from positive to negative	Change from negative to positive	No change
Stable living situation in previous 30 days	102	1.46	23.4	5 (5%)	8 (8%)	89 (87%)
Occupation[1]	101	1.45	23.6	3 (3%)	11 (11%)	87 (86%)
Money for food[2]	98	2	23.8	7 (7%)	21 (22%)	70 (71%)
Money for other expenses[2]	90	2.24	22.8	10 (11%)	18 (20%)	62 (69%)
Victim of crime[3]	102	1.44	23.3	13 (13%)	25 (24%)	64 (63%)
Perpetrator of crime[4]	102	1.44	23.3	8 (8%)	30 (29%)	64 (63%)
Frequent heroin use[5]	73	1.76	17.0	4 (5%)	34 (47%)	35 (48%)
Frequent cocaine use[5]	26	3.75	13.5	1 (4%)	2 (8%)	23 (88%)
Frequent non-prescribed benzodiazepine use[5]	56	2.45	17.5	9 (16%)	9 (16%)	38 (68%)
Frequent polysubstance user[6]	90	2.02	22.6	32 (35%)	6 (7%)	52 (58%)
Days of heroin use (last 30 days)	73	1.96	16.6	19.9	10.3	12.8
Days of cocaine use (last 30 days)	25	3.73	13.8	4.48	4.76	6.72
Days of non-prescribed benzodiazepine use (last 30 days)	73	2.56	20.3	18.5	18.3	11.2

**Measurement. Average number of months after first day of DAM*
[1] (none vs any) full-time job, part-time job, in education, part-time job and in education
[2]Measured on a 1–5 scale (1 = never, 5 = very often). "Change" is defined as a shift of at least 2 scale points; "no change" includes changes of 0 or1 points.
[3]theft, physical violence, psychological violence/threats
[4]Revenue generating crime (Includes theft, fraud, burglary, receiving stolen goods), Drug crime (includes selling, smuggling, manufacturing, excludes personal use and possession), violent crime, traffic violations, and other crimes.
[5]More than 12 days in the previous 30 days
[6]Use of 2 or more substances each for more than 12 days in the previous 30 days
SD = standard deviation for mean

Medication:

By one month after the start of treatment, 97% of patients received DAM both in the morning and afternoon, while a very few received DAM only in the morning (n=2, 1.5%) or only in the afternoon (n=2, 1.5%). For some participants (0–6 across registrations), another opioid (methadone, 12-hr (Dolcontin), or 24-hr (Contalgin) slow-release oral morphine (SROM) was occasionally administered in the morning or afternoon in place of DAM. Across registrations, the median DAM dose for intravenous administrations was 250 mg in the morning and 260 mg in the afternoon, ranging from 0-500 mg and 0-600 mg, respectively. For intramuscular administrations, the median dose for morning and afternoon doses were 300 mg, ranging from 0-500 mg and 0-800 mg, respectively. For oral administrations (tablets), the median morning and afternoon doses were 550 mg and 600 mg, ranging between 0 and 1,200 mg. Dosing was generally stable during the week preceding each registration, but could vary due to missed doses or dose titrations (either up or down).

One month after initiation, 56% (n=75) of participants administered DAM intravenously, 36% (n=47) intramuscularly, and 7% (n=9) orally (tablets). After one year, 45% (n=34) used intravenous, 42% (n=32) intramuscular, and 13% (n=10) oral administration; after two years, 46% (n=26) used intravenous, 30% (n=17) intramuscular, and 25% (n=14) oral administration. One month after start-up, 11% (n=14) changed administration route several times per week; this proportion increased to approximately 18% (n=19) during the subsequent three months. The most frequently interchangeable routes were intravenous and intramuscular.

All patients received an additional long-acting opioid formulation as overnight bridge medication. One month after initiation, 34% (n=45) received methadone, 17% (n=23) Contalgin (24-hour SROM), 41% (n=55) Dolcontin (12-hour SROM), 5% (n=7) Levopidon (levomethadone hydrochloride), and 2% (n=3) other (unspecified) opioids. Across registrations, the median methadone dose was 40 mg (range 0–120 mg), the median Contalgin dose 330 mg (range 0–960 mg), the median Dolcontin dose 260 mg (range 0–

700 mg), the median Levopidon dose 20 mg (range 0–30 mg), and the median dose for “other” opioids 0 mg (range 0–700 mg).

At the HABiB clinic, some patients received “bonus doses” of DAM on a regular basis (one to three times per week) over defined periods as reinforcement for achieving predefined goals. Over the years, up to 20 of the 47 patients treated at the clinic received such bonus doses, most commonly once weekly; nine patients received bonus doses up to twice weekly, and three patients up to three times weekly. The median bonus dose was 40 mg (range 20–80 mg).

Many patients were also prescribed regular medications for comorbid conditions. One month after initiation, 38% (n=50) received such medications, increasing to 57% (n=44) after 1 year. The most prevalent were benzodiazepines (42% (n=21) at one month and 25% (n=11) at one year) and medications for somatic illnesses (e.g., anticoagulants, antidiabetics, antihypertensives, or vitamins), prescribed to 40% (n=20) at one month and 68% (n=30) at one year. Medications to prevent or manage DAM-related allergic reactions were also common, 18% (n=9) at one month and 9% (n=4) at one year). Other regularly prescribed medications included antipsychotics, antidepressants, antiepileptics, and laxatives. A few patients received analgesic medications (both opioid and non-opioid, including anti-inflammatory drugs and paracetamol). Some patients also received treatment for hepatitis C and HIV.

Appendix 4

Economic analysis

Costing

Healthcare utilization was assigned unit costs derived from Norwegian national sources, including data from the Norwegian Directorate of Health and SAMDATA reports. Costs were adjusted to 2023 NOK using the consumer price index. Primary care costs were estimated using full societal costs, including both patient co-payments and public reimbursement components, consistent with a societal perspective. (See **Supplementary Table B**).

Supplementary Table B: **Unit cost mapping for healthcare services (Norway, 2023 NOK)**

Domain	Service type	Unit	Unit cost (NOK)	Description	Source / justification
Primary care	Primary care physician consultation	Per contact	1,000	Approximate full-service cost incl. reimbursement, co-payment and overhead	HELFO tariff system + estimated full cost
Primary care	Emergency primary care (out-of-hours)	Per contact	3,350	Approximate full-service cost incl. consultation, staffing and infrastructure	Municipal cost estimates
Substance use disorder (SUD/TSB)	Inpatient care	Per inpatient day	8,500	Specialist inpatient care for substance use disorders	SAMDATA / Norwegian Directorate of Health
Substance use disorder (SUD/TSB)	Day care	Per contact	2,000	Day treatment / day care contact	SAMDATA / Norwegian Directorate of Health
Substance use disorder (SUD/TSB)	Outpatient care	Per contact	1,200	Outpatient consultation	SAMDATA / Norwegian Directorate of Health

Domain	Service type	Unit	Unit cost (NOK)	Description	Source / justification
Mental health care (PHV/PSY)	Inpatient care	Per inpatient day	7,500	Psychiatric inpatient care	SAMDATA / Norwegian Directorate of Health
Mental health care (PHV/PSY)	Day care	Per contact	1,800	Day treatment / day care contact	SAMDATA / Norwegian Directorate of Health
Mental health care (PHV/PSY)	Outpatient care	Per contact	1,100	Outpatient consultation	SAMDATA / Norwegian Directorate of Health
Somatic specialist care (SOM)	Inpatient care	Per inpatient day	9,500	Somatic inpatient care	SAMDATA / Norwegian Directorate of Health
Somatic specialist care (SOM)	Day care	Per contact	2,200	Somatic day treatment / day care contact	SAMDATA / Norwegian Directorate of Health
Somatic specialist care (SOM)	Outpatient care	Per contact	1,300	Somatic outpatient consultation	SAMDATA / Norwegian Directorate of Health

Note. Unit costs represent approximate average costs per contact or inpatient day and were applied as cost weights to estimate differences in healthcare utilization across groups. Primary care costs reflect approximate full-service costs rather than reimbursement-only values.

Crime-related costs were estimated using conservative unit cost assumptions derived from Nordic and European literature. These estimates reflect average societal costs per criminal event, including costs related to policing, judicial processing, and victim-related consequences.

Given the uncertainty associated with these estimates, results should be interpreted as conservative approximations of societal costs and may underestimate the true economic impact of criminal activity. (See **Supplementary Table C**).

Supplementary Table C: Unit cost mapping for crime-related outcomes (Norway, 2023 NOK)

Outcome	Unit	Unit cost (NOK)	Applied value	Description	Source / justification
Criminal activity (any type)	Per day with criminal activity	3,000–5,000	3,500	Average societal cost per day of criminal activity, including policing, justice system, and victim-related costs	International literature + conservative Norwegian adaptation
Property crime	Per event/day	2,000–4,000	3,000 (implicit)	Includes theft, burglary, and related offenses	Cost-of-crime literature (European estimates)
Drug-related crime	Per event/day	1,500–3,500	2,500 (implicit)	Includes possession, dealing, and related offenses	European cost estimates
Violent crime	Per event/day	10,000+	Not separately modelled	High-cost but low-frequency events	International cost-of-crime studies

Note. A conservative average cost of NOK 3,500 per day of criminal activity was applied in the main analysis. This reflects a blended estimate across different crime types and was used as a cost weight to translate changes in frequency of criminal activity into societal costs. The estimate is conservative and does not fully capture high-cost events or broader downstream societal impacts.

Methodological considerations for the cost-utility analysis

Several limitations should be considered. First, the sample size is relatively small, and the analysis is based on observational data without randomization, limiting causal inference. Group comparisons may also be influenced by selection mechanisms, as the comparator group is heterogeneous and reflects real-world treatment pathways.

Second, quality-of-life data were not available following discontinuation of HAT, introducing uncertainty in the estimation of QALYs for this group.

Third, crime-related outcomes are based on self-reported data and may be subject to reporting bias. Moreover, frequency-based measures capture intensity but not necessarily the severity or societal impact of individual events.

Fourth, the estimation of crime-related costs relies on conservative unit cost assumptions derived from the literature, introducing additional uncertainty.

Fifth, the difference-in-differences approach assumes parallel trends between groups in the absence of treatment effects. This assumption cannot be formally tested with the available data and should therefore be interpreted with caution.

Sixth, the estimation of healthcare cost offsets is based on a predefined time window (one year prior to treatment initiation and two years following initiation). While this allows for the capture of longer-term changes in healthcare utilization, it may also introduce uncertainty related to the timing and persistence of treatment effects. Cost reductions may evolve gradually over time, and the chosen time window may both underestimate short-term effects and dilute longer-term impacts. Sensitivity to alternative time windows could, therefore, not be assessed within the current study.

Despite these limitations, this study has several important strengths. It is based on individual-level longitudinal data from a national pilot, integrates multiple data sources, and captures outcomes across both health and societal domains using a transparent analytical framework consistent with Norwegian methodological guidance.

Finally, as the analysis is based on a pilot, program costs may be higher than would be expected under a fully scaled and operationalized service model.

The step-by-step ICER analysis including cost offsets is detailed in **Supplementary Table D.**

Supplementary Table D: Incremental cost-effectiveness analysis with sequential cost offsets

Component	Value	Calculation / interpretation
Base-case analysis		
Incremental program cost (ΔCost)	NOK 721 665	Continued HAT minus discontinued HAT
Incremental QALY gain (ΔQALY)	0.73	Continued HAT minus discontinued HAT
ICER, base case	**NOK 988 582 per QALY**	**721 665 / 0.73**
Healthcare cost offsets		
Specialist healthcare offset	NOK -79 592	Difference-in-differences estimate
Primary healthcare offset	NOK +6 165	Difference-in-differences estimate
Total healthcare offset	NOK -73 427	-79 592 + 6 165
Incremental cost after healthcare offsets	NOK 648 238	721 665 – 73 427
ICER after healthcare offsets	**NOK 888 000 per QALY**	**648 238 / 0.73**
Healthcare and crime cost offsets		
Crime-related cost difference	NOK +42 700	DID, smaller reduction in crime-related costs in the continued HAT group
Final incremental cost	NOK 690 938	648 238 + 42 700
Final ICER	**NOK 946 000 per QALY**	**690 938 / 0.73**

Selected self-reported outcomes, including those reported in Section 6.4, as well as some additional measures (for example quality of life (QoL), substance use, involvement in treatment, pain, anxiety and depression, and craving), were examined across three

groups: patients still in treatment as of December 31, 2025, patients with a planned discharge, and patients with an unplanned dropout. Because the group sizes became small when stratifying by treatment status, detailed outcome data are not reported, and all findings should be interpreted with caution.

Appendix 5

Referrals to HAT

The clinics have registered all referrals to HAT, including who provided the patient referral and whether the referral was primary or secondary. A primary referral means that it has come from an external source, while secondary means that the patient was already in conventional OAT. The clinics also registered whether the referrals were accepted or denied, and the reason for the denial. For the categorization of referrers and the reason for denials see **Supplementary Tables E** and **F**.

During the period from the opening of the clinics in the beginning of 2022 through the end of the evaluation period in December 2025, 280 referrals concerning 224 patients were received by the clinics (180 in Oslo and 100 in Bergen). Overall, 75% of the referrals were for male patients, with 75% in both Oslo and Bergen. The mean age of the referred patients was 45 years, with a mean age of 45 in Oslo and 44 in Bergen. (See **Supplementary Table E**).

Most of the referrals (62%) were categorized as secondary, i.e., the patient was already in conventional OAT (53% of referrals in Oslo; 77% of referrals in Bergen). In all, 38% of referrals were denied, with 39% of referrals in Oslo and 36% of referrals in Bergen. Among patients with denied referrals, 73% were male and the mean age was 44 years. (See **Supplementary Table E**).

Most of the referrals came from the conventional OAT service at the same hospital, i.e., 49% in total, 34% in Oslo and 76% in Bergen. The second most common referrer was the Norwegian Labor and Welfare Administration with 11% in total, and 11% in both Oslo and Bergen. Low-threshold addiction services were the third most common referrer, accounting for an average of 11% of referrals. This proportion was entirely due to Oslo (17%), with no such referrals in Bergen. Primary care physicians contributed 9% of referrals, with 18% of referrals in Oslo and 6% of referrals in Bergen. (See **Supplementary Table G**).

Forty-four percent of all referrals and 42% of denials came during the first year. The average yearly denial rate was 38%, ranging from 36% to 43%. (See **Supplementary Table F**).

The most common reason for denial was “admissions pause,” meaning that the clinic had temporarily stopped taking new patients. This accounted for 16% of denials overall, 23% of denials in Oslo and 3% in Bergen. Seventy-one percent of denials labelled “admission pause” came during the first year and the rest during the second year, indicating that the clinics received more referrals than they could process during the start-up phase. Other common reasons for denial were not being in the target group (15%: Oslo 11%; Bergen 22%), other treatment such as conventional OAT being considered more suitable (14%: Oslo 20%; Bergen 3%), risk of violence (13%: Oslo 14%;

Bergen 4%), and new medications becoming available in conventional OAT (11%: Oslo 7%; Bergen 19%).

Main points:

- During the first four years of the clinics being open 280 referrals were received.
- Most referrals came from OAT, followed by the Norwegian Labor and Welfare Administration, low-threshold addiction services and their general practitioners.
- Forty-four percent of referrals and 42% of denials came during the first year.
- The most common reason for denial was "admission pause" (first and second clinic year), followed by "not being in the target group", "other treatment considered more suitable (i.e., OAT)", "risk of violence" and "other medications becoming available in OAT".

Supplementary Table E: Age, sex, type of referrals and inclusion, total and between clinics

	HAT total (n=280)		**HABiB (n=100)**		**HABiO (n=180)**	
	Mean	SE (Range [min-max])	Mean	SE (Range [min-max])	Mean	SE (Range [min-max])
Age	44.87	0.601 [22-68]	43.80	0.970 [26-68]	45.46	0.763 [22-68]
	n	%	n	%	n	%
Sex (M)	210	75.0	75	75.0	135	75.0
Type of referrals (Secondary)	173	61.8	77	77.0	96	53.3
Included (No)	107	38.2	36.0	36.0	71	39.4
	HAT-total (n=280)		**HAT-Included (n=173)**		**HAT – not included (n=107)**	
	Mean	SE (Range [min-max])	Mean	SE (Range [min-max])	Mean	SE (Range [min-max])
Age	44.87	0.601 [22-68]	45.29	0.710 [25-68]	44.19	1.077 [22-68]
	n	%	n	%	n	%
Sex (M)	210	75.0	132	76.3	78	72.9

HAT: heroin-assisted treatment; HABiB: clinic in Bergen; HABiO: clinic in Oslo; SE: standard error

Supplementary Table F: Overview of yearly received treatment referrals and denials

	Referrals HAT Total (n=280)		Denials HAT Total (n=107)		
	n	Total referrals (%) (yearly referrals / total referrals)	n	Yearly denial rate (%) (yearly denials/ yearly referrals)	Total denials (%) (yearly denials/ total referrals)
SUM 2022	124	44.3	45	36.3	42.1
SUM 2023	46	16.4	18	39.1	16.8
SUM 2024	55	19.6	24	43.6	22.4
SUM 2025	55	19.6	20	36.4	18.7
Total 2022-2025	**280**	**100**	**107**	**38.2**	**100**

Supplementary Table G: Referrers

	HAT-total (n=280)		HABiB (n=100)		HABiO (n=180)	
	n	%	n	%	n	%
Specialist health services - addiction (incl. OAT) – Another Health Trust	7	2.5			7	3.9
Specialist health services addiction (excl. OAT)	4	1.4	1	1.0	3	1.7
Specialist health services OAT	138	49.3	76	76.0	62	34.4
Specialist health services, physician at HAT	2	0.7			2	1.1
Specialist health services psychiatric department (incl PSYCH in prison)	10	3.6	1	1.0	9	5.0
Specialist health services somatic department	6	2.1	3	3.0	3	1.7
Ambulatory services psychiatry (FACT, APAS)	6	2.1			6	3.3
Municipal Addiction Services	5	1.8			5	2.8
Low-threshold OAT (LAR, LASSO)	9	3.2	1	1.0	8	4.4
Low-threshold Addiction Service (municipal, private/NGO)	31	11.1			31	17.2
Primary care physician	24	8.6	6	6.0	18	10.0
Norwegian Labor and Welfare Administration	31	11.1	11	11.0	20	11.1
User Organization (FHN)	3	1.1			3	1.7
Patient self-referral	4	1.4	1	1.0	3	1.7
Total	280	100	100	100	180	100

Supplementary Table H: Reason for denial

	HAT-Total denials: 107/280		HABiB denials: 36/100		HABiO denials: 71/180	
	n	Valid %	n	Valid %	n	Valid %
Other treatment more suitable (OAT)	15	14.0	1	2.8	14	19.7
Severe mental disorder	5	4.7			5	7.0
Risk of violence	14	13.1	4	4.0	10	14.1
Severe somatic disorder	2	1.9			2	2.8
Not in the target group (low heroin use, inhalation, young age, pain management, another health trust)	16	15.0	8	22.2	8	11.3
Medicinal Reason -> New medications in OAT	12	11.2	7	19.4	5	7.0
Other	5	4.7	1	2.8	4	5.6
Not attended for assessment interview	7	6.5	7	19.4		
Reduced cognitive function	1	0.9	1	2.8		
Patient's own request (OAT, addiction)	7	6.5	6	16.7	1	1.4
Admission pauses	17	15.9	1	2.8	16	22.5
Risk of violence and Severe mental disorder	2	0.7			2	2.8
Considered not to be able to attend HAT (physically or mentally)	4	1.4			4	5.6
TOTAL	107	100	36	100	71	100

Appendix 6

6.a Staff

In April 2026, staff were sent a short questionnaire about attitudes and experiences with HAT, developed specifically for this report. The questionnaire was sent to all staff via management, and 27 responded. This part is methodologically separate from the findings presented in Chapter 6.3 and was prepared as part of the concluding evaluation.

The summary below synthesizes the responses from staff at the two HAT clinics. It highlights recurring themes related to organization, daily routines, staffing and workload, safety, resource use, integration with other opioid agonist treatment (OAT), what works well, the main challenges, and prioritized wishes for change. The findings are presented thematically and reflect the combined assessments of several respondents at both clinics.

Overall impression

Staff responses consistently show positive assessments of the clinics' organization, daily routines, and patient safety, while there are clear concerns related to staffing patterns, peaks in workload, operational inefficiency, and the practical consequences of integrating HAT into ordinary OAT. Respondents highlighted both what they experienced as most meaningful (relational work and seeing patient progress) and most burdensome (recurring stress, patient conflicts, and uncertainty about resources). There was broad support for continuing HAT, but more divided opinions about possible co-location or merging HAT and OAT practically or administratively.

Key strengths

Clinic organization and routines

Most reported that the clinics are well organized and that daily routines and workflow function well. Staff valued the continuity of working in small, stable teams and meeting patients twice daily. This promotes relationship-building, early detection of health changes, and good follow-up of physical illnesses.

Patient outcomes and experience of meaningful work

Many staff described clear, concrete benefits for patients (such as better quality of life, reduced crime or risk behavior, and increased stability). The opportunity to follow patients closely over time and build trust was repeatedly highlighted as the most rewarding part of the work.

Safety and competence

A majority experienced patient safety and staff safety as well taken care of. Respondents expressed confidence in colleagues' competence and felt that the clinic's core tasks are handled in a professionally responsible manner.

Main concerns and operational challenges reported by staff

Persistent mismatch between peaks in workload/intensity and staffing: afternoons (after about 3:30 p.m.) and weekends were often described as vulnerable periods, with fewer staff on duty while more demanding patient situations tend to arise. Several respondents called for additional staffing late in the day and on weekends.

Uneven distribution of tasks and workload: staff pointed out that some colleagues take on a larger share of the workload than others. Staffing models and staff schedule planning were highlighted as areas with potential for improvement.

Absence and sick leave increased pressure on those at work: particularly in periods of high intensity, staff experienced that absence and sick leave amplified the burden on the rest of the staff.

“Downtime” between dosing sessions: periods with little direct patient-facing activity between dosing times were reported. Staff suggested that this time could be used for more systematic follow-up of physical illnesses, documentation, or another patient follow-up.

Assessments of integrating HAT into OAT

Concerns about co-locating HAT and OAT patients: some staff expressed concern that co-locating HAT and OAT patients could have unintended consequences, including by being destabilizing for some patients, contributing to the normalization of heroin use, or increasing the level of conflict related to different medication regimens and intake criteria.

Divided opinions about integration: many were in principle open to some form of integration, but conditional on careful planning in which HAT's close follow-up is preserved, physical separation is ensured (for example, a shared building but separate clinic areas), and staffing, training, and medical availability are strengthened. Some pointed to possible gains such as shared use of resources, better medical presence, and smoother transition arrangements for patients.

Risks and professional objections: several staff expressed concern about increased clinical complexity, increased safety risk, and more administrative work, with a loss of the close, trauma-informed approach that characterizes HAT today. Several emphasized that OAT and HAT require different operating models and competencies and argued that HAT

should be continued as a separate service – possibly as a clearly defined unit within a larger OAT structure.

6.b Patients and service users

ProLAR Nett, as a user organization, took part both in planning the HAT pilot project before start-up and in the accompanying research throughout the subsequent five-year pilot project.

The following assessments and recommendations are provided by ProLAR Nett and a user (patient) representative. They are based on four workshops with patients in Oslo and Bergen, regular conversations with patients, patient interviews, and other engagements with heroin-assisted treatment:

Dispense diacetylmorphine (DAM) tablets through local pharmacies, as with ordinary OAT medication.

Possibility of having the HAT physician act as the patient's primary care physician: this physician would often have more relevant competence and be less reluctant to prescribe Schedule A/B medications when clinically indicated. This would counteract the current situation where some patients receive benzodiazepines from their primary care physicians while others, for example, receive only antipsychotics or antihistamines for insomnia and anxiety.

Fewer staff: it appears that considerably fewer staff work in injection rooms, where they handle a more unpredictable patient group than in HAT. Costs could potentially be reduced by co-locating OAT and HAT in the same building, possibly physically separated. Similar arrangements exist in both the Netherlands and Germany.

Less unequal treatment, while still maintaining individualized care: everyone has different needs and life situations, but they should have the same rights.

Less resistance to “intoxication”/sedation after dosing: it is experienced as burdensome to have to “fight” the effect of the medication, simply because nurses have learned in their training that intoxication is harmful. That should not be the starting point for HAT programs. If half an hour of “intoxication” in the morning gets the patient through the rest of the day without having to take additional opioids, it has a therapeutic and preventive effect. It should be easier to titrate up to a dose that provides such a therapeutic effect.

There should be staff with lived experience at the clinics, who can “build bridges” between patients and clinicians.

Use a name such as “diacetylmorphine-assisted treatment” instead of “heroin,” to avoid the tabloid and negative associations and the stigma that follow the term “heroin.”

Work actively toward the user groups – preferably together with volunteer patients – to spread information and recruit people who still use street heroin.

Crush the tablets in front of the patient so they can be sure they receive the correct dose, and to prevent errors in dosage.

ProLAR Nett's summary and concluding comments

We see a clear improvement both in health and in satisfaction with this treatment compared with ordinary OAT treatment.

Virtually everyone in treatment expresses that this saved their life or made it possible to change a destructive life on illegal drugs. Through interviews and workshops, we have seen this from our perspective, and we can most strongly recommend that the treatment be continued for this patient group. We also believe it is possible to change practice for the better by following international developments in HAT, from which lessons can be drawn about good practices and different ways of organizing the treatment.

Over these years we have also seen drawbacks in the operational organization that we have experienced as negative or inappropriate, which may have affected demand and placed the project in an unfortunate frame, owing to internal clinic rules and methods. We will return to this on a later occasion. In our experience, researchers have seen this as well.

We nevertheless want to be clear that the HAT project has saved lives and will be able to do so in the years to come. We strongly recommend continuation in Bergen and Oslo.

6.c Neighborhood input in Bergen

Neighborhood comments

Bergen

The following section presents a verbatim summary of comments from residents involved in the neighborhood forum in Bergen. The contributing participants have reviewed and approved its inclusion in this report:

Experiences with the establishment of HAT – Engenhuset

Engenhuset is in the center of Bergen at Nøstet and Engen. Since the 18th century, the area has housed various health institutions, both somatic and psychiatric hospitals [34]. The neighborhood consists of small houses, larger apartment complexes, as well as a daycare center, university, nursing and retirement homes, and businesses.

Establishment of the Health House and involvement of the neighborhood

When Engenhuset was established, which includes among other things a short-stay inpatient ward, outpatient clinic, research, and a heroin-assisted treatment clinic, the neighbors – represented by the Sydnes Residents' Association (Sydnes Vel) – expressed that they were not sufficiently notified or informed about the change in use of the building, including planning, design, or decision-making processes related to the establishment of Engenhuset. Engenhuset has previously housed a conventional opioid agonist treatment center operated by the municipality of Bergen. At the same time, there were several boarding houses in the area. The experiences from this period have given residents negative impressions, particularly related to theft, open use, and the sale of drugs, as well as disturbances and noise.

The first organized neighborhood meeting was held in autumn 2021 with participation from the Clinic for Substance Use and Addiction, the residents' association, and residents. In the meeting, the residents' association experienced that there were considerable differences in expectations between the health trust and the residents, particularly regarding information needs, allocation of responsibilities, and assessments of the consequences for the neighborhood. Questions related to impact assessments and the handling of potential neighborhood challenges were raised, without the residents' association feeling that adequate clarifications were provided in the meeting. In the period afterwards, communication between the residents' association and the management of the health trust was limited. Later (in 2026), the residents' association established a dialogue with the management of the health trust, with an expressed ambition to hold a new public meeting to clarify more fundamental questions about the establishment of Engenhuset, including also the division of responsibilities between the health trust, the municipality, and the police.

Liaison group - dialogue on ongoing operations and incidents in the neighborhood

In autumn 2024, a contact body was established in which the City of Bergen, represented by the coordinator for efforts against open drug scenes, and the user-run service, HUSET Bergen, also became permanent participants, in addition to the residents' association and the Clinic for Substance Use and Addiction. The Bergen Police District participated in some meetings. The meetings have served as an arena for systematic sharing of experiences and information and have, among other things, addressed whether and to what extent there have been experiences of visible drug use, drug dealing, risky traffic behavior, threats, theft, and intoxicated people in the shared areas of the neighborhood since the previous meeting. At the meetings, the municipality's coordinator for open drug areas provided information on the situation related to drug use and open drug areas in Bergen in general. Civic participation and inclusion have been a topic. A recurring concern in the neighborhood has been that HAT patients might use the area as an informal place to stay between treatment times, with a risk of increased disturbances and the establishment of a drug scene. According to the actors in the liaison group, a drug scene has not been established in the area. Although some patients spend time in the immediate vicinity, most travel home or to other places between visits to the clinic. The participants in the liaison group describe the collaboration as good. Measures that have been implemented include dialogue between staff and patients about considerate behavior in and around Engenhuset, distribution of contact information to relevant actors, as well as continuation of neighborhood walks and bridge-building activities through HUSET Bergen. It has been agreed to continue the meetings at approximately six-week intervals, currently planned until June 2026.

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