SAHLGRENSKA UNIVERSITETSSJUKHUSET VGR

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Benefits and risks of hospital at home compared with in-hospital care according to current Swedish healthcare routine

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[Fördelar och risker med sjukhusvård i hemmet jämfört med inneliggande vård enligt nuvarande vårdrutin i Sverige]

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1 Abstract

Background
Hospital at home (HaH) is a healthcare delivery model that aims to provide hospital-level care in the patient's home as an alternative to traditional in-hospital care. This can imply admission avoidance or early discharge from hospital with continued hospital-level care at home. HaH is being explored for a wide range of conditions, striving for a cost-effective, patient safe, person-centred alternative to in-hospital care with the possibility to stay at home, also in rather severe conditions.

Question at issue
For adult patients with conditions usually hospitalised (according to current standard of treatment in Sweden) - are there clinical benefits and/or risks of hospital care at home compared to in-hospital care concerning mortality, change in health status, emergency department (ED) visits, complications, health related quality of life (HrQoL), readmission, length of stay, or experience by patients, staff, and close relatives? The search was limited to randomised controlled trials (RCTs).

Methods
Three authors performed searches in PubMed, Embase, Cinahl, Web of Science Core Collection and the Cochrane Library in May 2024 with an update in June 2024. They independently assessed the abstracts, and selected in consensus, full-text articles to be considered further by the other authors. Full-text articles were independently assessed for inclusion by four authors with decision in consensus meeting. Included studies were critically appraised, and data extracted. Studies without major risk of bias, if available, formed the basis for conclusions, otherwise conclusions were based on lower quality studies. Meta-analyses were performed if applicable and certainty of evidence was rated according to GRADE.

Results
A total of 15 RCTs described in 16 publications were included and involved the conditions chronic obstructive pulmonary disease (COPD, 5 RCTs), respiratory tract infections (2 RCTs), heart failure (3 RCTs), neutropenia (1 RCT), and elderly patients with acute deterioration requiring hospital-level care (4 RCTs). The proportion of screened patients considered eligible for HaH ranged from 11% to 70%.

Selected patients with acute COPD exacerbation: Three of five included RCTs were assessed to have no major risk of bias. HaH may result in no difference regarding mortality within 3 months follow up compared to in-hospital care (GRADE ⊕⊕OO). For HrQoL and readmission, no significant differences were observed, (low certainty of evidence, GRADE⊕⊕OO). It was not possible to draw any conclusions regarding change in health status, complications, and length of stay (very low certainty of evidence, GRADE ⊕OOO). No data comparing HaH and in-hospital care regarding ED-visits, and experience by patient, staff and relatives were identified.

Selected patients with respiratory tract infection: Two small RCTs with some risk of bias were included. It was not possible to draw any conclusions regarding mortality, change in health status, complications, HrQoL, readmission, and length of stay (very low certainty of evidence, GRADE ⊕OOO). No data regarding ED-visits and experience by patients, staff, and close relatives were identified.

Selected patients with heart failure: Two of three included RCTs were assessed to have no major risk of bias. It was not possible to draw any conclusions regarding mortality, change in health status, ED-visits, complications, HrQoL, readmission, and caregiver experience. The length of stay may be longer for patients treated in HaH (low certainty of evidence (GRADE⊕⊕OO). No data regarding experience by patients and staff were identified.

Selected patients with neutropenia: One study assessed to have major risk of bias was included. The certainty of evidence was considered very low (GRADE ⊕OOO) regarding mortality, complications, HrQoL, readmission and length of stay. No data regarding change in disease, ED-visits, experience by patients, staff, and relatives were identified.

Selected elderly patients with acute deterioration: Five publications of four RCTs were included of which two were assessed to have no major risk of bias. HaH may result in no difference regarding mortality within 1 month follow up compared to in-hospital care (GRADE ⊕⊕OO). It was not possible to draw any conclusions regarding change in health status, ED-visits, complications, HrQoL, patient and caregiver experience, and readmission (very low certainty of evidence, GRADE ⊕OOO). HaH may result in a slightly longer length of stay compared to in-hospital care (GRADE ⊕⊕OO). No data regarding staff experience were identified.

Economic aspects
Initiatives at Sahlgrenska University Hospital to provide HaH have started and efforts were made to compare costs for HaH with in-hospital care in VGR. However, costs for cases that were comparable could not be identified. Regarding the identified literature, seven included RCTs provided estimates of costs. Of these, the three studies without major risk of bias and considered to have adequate quality of cost estimation, report a reduction of costs by HaH an average ranging from 10% to 25%. Note, that the reported confidence intervals are wide, stretching from relevant cost reduction to some cost increases.

Ethical aspects
Results are uncertain regarding the key outcomes mortality, complications, and HrQoL. Possible inequalities in access to HaH due to limitations in digital literacy and geographical location as well as increased responsibility of patients' families must be considered. If HaH proves to be more cost-efficient than in-hospital care, eligible patients may be treated according to this model without choice for patients. Given that HaH compared to in-hospital care may require a higher level of patient engagement, and more support of others, it is important to consider the patient's views and autonomy.

Conclusion
Different settings of HaH have been investigated in RCTs including selected patient populations with COPD, respiratory tract infection, heart failure, neutropenia, and elderly patients with acute deterioration. There are few recent studies, and many studies have limitations regarding directness, risk of bias and precision. Based on identified RCTs there may be no difference in mortality during follow up for the population of selected patients with COPD and selected elderly patients with acute deterioration. For the other populations, no conclusions could be drawn for the key outcomes mortality, and complications.

For selected patients with acute COPD exacerbation there may be little or no difference regarding HrQoL and post-discharge readmission rates. HaH may result in a longer length

of stay for elderly patients with acute deterioration and in those with heart failure. For all other outcomes no conclusions could be drawn. The patient's perspective is poorly studied. Economic consequences of HaH for healthcare in VGR were not possible to estimate.

2 Populärvetenskaplig sammanfattning – Plain language summary in Swedish

Bakgrund
Hospital at home (HaH) är en vårdmodell där patienten erbjuds sjukhusvård i sitt hem istället för att vårdas på sjukhuset (inneliggande vård eller slutenvård). Det kan handla om att undvika sjukhusinläggning helt eller att patienten skrivs ut tidigare och får fortsatt vård på sjukhusnivå i hemmet. HaH övervägs för en rad olika tillstånd i strävan efter ett kostnadseffektivt, patientsäkert och personcentrerat alternativ till inneliggande sjukhusvård, även för patienter med relativt allvarliga tillstånd.

Frågeställning
För vuxna patienter med tillstånd som enligt nuvarande behandlingsrutin i Sverige vanligen vårdas inneliggande - finns det kliniska fördelar och/eller risker med HaH jämfört med inneliggande sjukhusvård? Frågan gäller dödlighet, komplikationer, hälsorelaterad livskvalitet, förändring i hälsotillstånd, besök på akutmottagning, återinläggning, vårdtid, samt patient-, personal- och närståendeupplevelse. Sammanställningen begränsades till randomiserade kontrollerade studier.

Metod
Tre författare genomförde sökningar i flera databaser i maj och juni 2024. Med hjälp av etablerade metoder identifierades de vetenskapliga artiklar som kunde bidra till att besvara den aktuella frågan. De enskilda studierna granskades, resultaten summerades och tillförlitligheten av de sammanlagda resultaten bedömdes.

Resultat
Totalt inkluderades 15 studier som handlade om patienter med kronisk obstruktiv lungsjukdom, luftvägsinfektion, hjärtsvikt, nedsatt immunförsvar (neutropeni) och äldre patienter med akut försämrad hälsa. Andelen patienter som bedömdes vara lämpliga för HaH varierade i studierna mellan 11% och 70%.

Utvalda patienter med kronisk obstruktiv lungsjukdom: Utifrån de identifierade studierna är det möjligt att det inte finns någon skillnad mellan HaH och inneliggande sjukhusvård avseende dödlighet vid 3 månaders uppföljning. Det observerades ingen signifikant skillnad i hälsorelaterad livskvalitet eller behov av återinläggning. Det är osäkert ifall det finns någon skillnad mellan HaH och inneliggande sjukhusvård avseende komplikationer, förändringar i hälsotillståndet eller vårdtid. Jämförande data om besök på akutmottagning, samt patient-, personal- och närståendeupplevelse saknades.

Utvalda patienter med hjärtsvikt: Baserat på de identifierade studierna är det osäkert ifall det finns någon skillnad mellan HaH och inneliggande sjukhusvård avseende dödlighet, komplikationer, förändringar i hälsotillståndet, hälsorelaterad livskvalitet, behov av akutbesök eller återinläggning, vårdtid, samt närståendes upplevelse. Data om patientens och personalens upplevelse saknades.

Utvalda äldre patienter med akut försämrad hälsa: Utifrån de identifierade studierna är det möjligt att det inte finns någon skillnad mellan HaH och inneliggande sjukhusvård avseende dödlighet vid 1 månads uppföljning. Det gick inte att dra några slutsatser avseende komplikationer, hälsorelaterad livskvalitet, förändringar i hälsotillståndet,

behov av akutbesök, återinläggning eller patientens och närståendes upplevelse. Vårdtiden är möjligen längre vid HaH än vid inneliggande sjukhusvård. Data om personalens upplevelse saknades.

Patienter med luftvägsinfektion och patienter med neutropeni: Underlaget för dessa tillstånd var för begränsat för att dra några slutsatser.

Ekonomiska aspekter
Det har inte varit möjligt att jämföra kostnader för HaH och inneliggande sjukhusvård i VGR. I de inkluderade studierna med god kvalitet noterades att HaH kan minska kostnaderna med mellan 10% och 25%, dock är osäkerheten stor från tydliga kostnadsbesparingar till viss kostnadsökning.

Etiska aspekter
Det råder osäkerhet kring kritiska utfall som dödlighet, komplikationer och hälsorelaterad livskvalitet. Tillgången till HaH kan bli ojämlik, till exempel beroende på patienters digitala förmåga eller bostadsort. Det finns också en risk att beslutet att vårdas med HaH upplevs påtvingat om HaH visar sig vara mer kostnadseffektivt än sjukhusvård. Eftersom HaH kan kräva större engagemang av både patienten och anhöriga, är det viktigt att patientens vilja och autonomi beaktas. Patientaspekter är dåligt studerade.

Slutsats
HaH har studerats i specifika diagnoser som kronisk obstruktiv lungsjukdom, luftvägsinfektion, hjärtsvikt, neutropeni och hos äldre patienter med akut försämrad hälsa. De flesta studier har metodologiska brister eller begränsad överförbarhet till svenska förhållanden. För patienter med kronisk obstruktiv lungsjukdom och för äldre med akut försämrad hälsa är det möjligen ingen skillnad mellan HaH och inneliggande sjukhusvård avseende dödlighet, men för övriga patientgrupper är underlaget mycket svagt avseende kritiska utfall.

Det är möjligt att HaH hos patienter med kronisk obstruktiv lungsjukdom, inte påverkar hälsorelaterad livskvalitet eller behov av återinläggningar. Vårdtiden vid HaH är möjligen något längre än vid inneliggande sjukhusvård för både äldre patienter med akut försämrad hälsa och patienter med hjärtsvikt.

För alla andra utfallsmått var det inte möjligt att dra några slutsatser. Patientens perspektiv är dåligt studerat. Ekonomiska konsekvenser av HaH för sjukvården i VGR har inte varit möjligt att uppskatta.

The above summaries were written by representatives from HTA-centrum. The HTA report was approved by the regional board for quality assurance of activity-based HTA.

Ylva Carlsson
Head of HTA-centrum of Region Västra Götaland, Sweden 2025-06-30

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DDS Doctor of dental surgery
MD Medical doctor
PhD Doctor of Philosophy
RN Registered Nurse
RNRM Registered Nurse Registered Midwifery

3 Summary of findings

Outcome	Number of RCTs without major RoB All RCTs (n= number of patients)	**HaH vs in-hospital care** RCTs without major RoB Relative effect (95% CI)	Absolute effect (95% CI)	Certainty of evidence* GRADE
Selected patients with COPD exacerbation requiring hospitalisation				
Mortality	3 RCTs (n= 351) 5 RCT (n=449)	Peto-OR: 0.95 (0.35 to 2.56), p=ns	RD: 0.00 (-0.04 to 0.03), p=ns	⊕⊕OO[1]
Change in health status	1 RCT (n=150) 1 RCT (n=150)	FEV1 after bronchodilation at 2 weeks and 3 months follow up, p=ns		⊕OOO[2]
Complications	0 RCT 1 RCT (n=44)			⊕OOO[3]
HrQoL	2 RCT n=168 2 RCT (n=168)		Study 1: Proportion of patients with clinically relevant improvement in EQ5D at 90 days follow up I: 44% C:41%, p=ns Study 2: St George's respiratory questionnaire**, mean change from baseline: I: -0.48 (SD 16.92) C: -3.13 (SD 14.02), p=ns	⊕⊕OO[4]
Post-discharge readmission	3 RCT (n=349) 4 RCT (n=393)	OR 0.85 (0.54 to 1.34), p=ns	RD: -0.04 (- 0.14 to 0.06), p=ns	⊕⊕OO[4]
Length of stay	0 RCT 1 RCT (n=44)			⊕OOO[3]
No comparative data on post discharge ED-visits, patient, staff or caregiver experience were identified.				
Selected patients with respiratory tract infections requiring hospitalisation				
Mortality	1 RCT (n=53) 2 RCT (n=67)		I:3/26 (11.5%) C: 4/27 (14.8%), p=ns	⊕OOO[3]
Change in health status	0 RCT 1 RCT (n=9)			⊕OOO[3]
Complications	1 RCT (n=53) 2 RCT (n=67)		Treatment failure I: 8/26 (31%) C: 13/27 (48%), p=ns	⊕OOO[3]
HrQoL	0 RCT			⊕OOO[3]

Outcome	Number of RCTs without major RoB All RCTs (n= number of patients)	**HaH vs in-hospital care** RCTs without major RoB Relative effect (95% CI)	Absolute effect (95% CI)	Certainty of evidence* GRADE
	1 RCT (n=12)			
Post-discharge readmission	0 RCT 1 RCT (n=14)			⊕OOO[3]
Length of stay	0 RCT 1 RCT (n=14)			⊕OOO[3]
No data on post discharge ED-visits, patient, staff, or caregiver experience were identified.				
Selected patients with heart failure requiring hospitalisation				
Mortality	2 RCT (n=132) 3 RCT (n=203)	Peto-OR 1.05 (0.4 to 2.76), p=ns	RD: 0.01 (-0.11 to 0.13), p=ns	⊕OOO[2]
Change in health status	1 RCT (n=28) 1 RCT (n=28)	Comparison of NYHA classification at different times of follow up, p=ns		⊕OOO[5]
Post-discharge ED-visits	0 RCT 1 RCT (n=28)			⊕OOO[6]
Complications	1 RCT (n=101) 1 RCT(n=101)	No significant difference, results not fully reported		
HrQoL	0 RCT 3 RCT (n=181)			
Caregiver experience	1 RCT (n=82) 1 RCT (n=82)	Significantly higher relative stress score on admission in HaH. Between group comparison at discharge not reported.		⊕OOO[2]
Post-discharge readmission	1 RCT (n=101) 2 RCT (n=181)		I: 8/48 (17%) C: 18/53 (34%), p=ns	⊕OOO[7]
Length of stay	1 RCT (n= 101) 2 RCT (n=181)		Mean difference (95% CI), days: 9.1 (5.62 to 12.58), p=0.001	⊕⊕OO[8]
No data on patient or staff experience were identified.				
Selected patients with neutropenia requiring hospitalisation				
Mortality	0 RCT 1 RCT (n=117)			⊕OOO[3]
Complications	0 RCT 1 RCT (n=117)		Major medical complications I: 9% of episodes C: 8% of episodes	⊕OOO[3]
HrQoL	0 RCT 1 RCT (n=117)			⊕OOO[3]

Outcome	Number of RCTs without major RoB All RCTs (n= number of patients)	**HaH vs in-hospital care** RCTs without major RoB		Certainty of evidence* GRADE
		Relative effect (95% CI)	Absolute effect (95% CI)	
No studies regarding change in health status, post-discharge ED-visits, patient, staff or caregiver experience, readmission after discharge, or length of stay until discharge from randomised treatment were identified.				
Selected elderly patients requiring hospitalisation due to acute deterioration				
Mortality	2 RCT (n= 1123) 4 RCT (n=1415)	Peto OR 0.96 (0.50 to 1.86)	RD: -0.00 (-0.03 to 0.02), p=ns	⊕⊕OO[9]
Change in health status	0 RCT 1 RCT (n=257)			⊕OOO[10]
Post-discharge ED-visits	1 RCT (n=91) 2 RCT (n=111)		I:3/43 (7%) C: 6/48 (13%), p=ns	⊕OOO[5]
Complications	2 RCT (n=1146) 4 RCT (n=1452)		Unexpected adverse events, p=ns	⊕OOO[11]
HrQoL	0 RCT 2 RCT (n=1030)			⊕OOO[6]
Patient experience	1 RCT (n= 91) 2 RCT (n=112)		Picker patient experience questionnaire score[#], median (IQR): I: 14 (2) C: 14 (3) p=ns	⊕OOO[6]
Caregiver experience	0 RCT 2 RCT (n=160)			⊕OOO[6]
Post-discharge readmission	1 RCT (n= 91) 3 RCT (n= 397)	Peto OR 0.30 (0.10 to 0.93)		⊕OOO[10]
Length of stay	2 RCT (n=1146) 4 RCT (n=1431)		Mean Difference 1.14 (0.22 to 2.05), p<0.05	⊕⊕OO[9]
No studies regarding staff experience were identified.				

n= number of patients, ** St George's respiratory questionnaire ranges from 0 to 100 with higher scores indicating more limitations [#] Picker questionnaire score ranging from 0-15 with higher numbers indicating better outcome, C: comparison, COPD: Chronic obstructive pulmonary disease, ED: emergency department, FEV_1: Forced expiratory volume 1 second, HaH: Hospital at home, HrQoL: Health-related quality of life, I: intervention, IQR: Interquartile range, NYHA: New York Heart Association classification, OR: Odds-ratio, ns: non-significant, RCT: randomized controlled trial, RD: risk difference, RoB: risk of bias,

* Certainty of evidence
High certainty ⊕⊕⊕⊕: We are very confident that the true effect lies close to that of the estimate of the effect.

Moderate certainty ⊕⊕⊕O: We are moderately confident in the effect estimate. The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different to the estimate of the effect.

Low certainty ⊕⊕OO: Confidence in the effect estimate is limited. The true effect may be substantially different from the estimate of the effect.

Very low certainty ⊕OOO: We have very little confidence in the effect estimate. The true effect is likely to be substantially different from the estimate of effect.

[1] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious imprecision, and one step for indirectness and some concern regarding study limitations.
[2] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious indirectness, two steps for very serious imprecision, also some concern regarding study limitations.
[3] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious indirectness, one step for serious study limitations, two steps for very serious imprecision.
[4] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious indirectness, one step for serious imprecision, also some study limitations but not enough to downgrade.
[5] Starting from ⊕⊕⊕⊕ for RCTs, downgraded two steps for very serious imprecision, and one step for some study limitations and some indirectness.
[6] Starting from ⊕⊕⊕⊕ for RCTs, downgraded two steps for very serious imprecision, and one step for study limitations, also some indirectness.
[7] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious indirectness, and two steps for very serious imprecision.
[8] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious indirectness, and one step for serious imprecision.
[9] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious imprecision, and one step for study limitations, also some indirectness.
[10] Starting from ⊕⊕⊕⊕ for RCTs, downgraded one step for serious study limitations, one step for indirectness, and one step for serious imprecision.
[11] Starting from ⊕⊕⊕⊕ for RCTs, downgraded two steps for very serious indirectness, two steps for very serious imprecision, and some study limitations.

4 Abbreviations

AA	Admission Avoidance
ED	Emergency Department
ESD	Early Supported Discharge
CGA	Comprehensive Geriatric Assessment
COPD	Chronic obstructive pulmonary disease
HaH	Hospital at home
HF	Heart failure
HrQoL	Health-related quality of life
RCT	Randomised controlled trial
SR	Systematic review
SU	Sahlgrenska University Hospital
VGR	Region Västra Götaland

5 Background

As part of an initiative to enhance healthcare quality and accessibility, Region Västra Götaland (VGR) is exploring the Hospital-at-Home (HaH) model. HaH is an innovative healthcare delivery model that provides hospital-level care in patients' homes, as an alternative to traditional in-patient hospitalisation. The model typically involves multidisciplinary healthcare teams providing tailored medical and nursing care, supported by advances in remote monitoring technologies and patient-centred approaches, supervision and treatment tailored to the individual needs of the patient (Shi et al., 2024; Chua et al., 2022; Wang et al., 2024).

With ageing populations, a rising prevalence of chronic diseases, and resource constraints increasing the pressure on healthcare systems, HaH is being considered as a strategy to maintain safety and possibly improve patient care with individualised treatment, while optimising healthcare resources. HaH is suggested to have benefits such as decreased risk for institutionalisation among older adults (Goodwin et al., 2011); less exposure to and consequently lower risks for hospital-acquired infections (Cheng et al., 2009); and increased autonomy and dignity for patients (Denecke et al., 2023). HaH aims to reduce hospital bed occupancy by either avoiding hospital admissions or enabling early supported discharge (Shepperd et al., 2021b). The cost efficiency of HaH is still being debated (De Sousa Vale et al., 2020; Goossens et al., 2020; Jain, 2024).

HaH is being explored for a wide range of conditions such as chronic obstructive pulmonary disease (COPD), heart failure, infections, cancer, multimorbidity in elderly patients, and palliative care. In an outlook on other university hospitals in the Nordic countries, the following can be highlighted: Oslo University Hospital has implemented a comprehensive strategy over the past 4-5 years with well-defined modules, including hospital-at-home services and digital home follow-up care. Skåne University Hospital has established a care model called "SUS at home" over the past few years, currently with the capacity to enrol 30 patients per day for acute internal medicine inpatient care at home. To date, over 2000 patients have been treated through that program. Karolinska University Hospital also offers a range of HaH models. VGR benefits from Palliative teams operated by the hospital (collaborating with municipal home care). The implementation of HaH may vary between regions with regards to provider (region or municipality), classification (inpatient, outpatient or home care), level of care (primary or specialised), responsibility (nurse or doctor) etc. Note that this spectrum includes settings that do not correspond to the question at issue in this report defined below.

Hospital at Home in Region Västra Götaland (VGR)
VGR explores the potential of HaH as part of its broader strategy to optimise healthcare delivery. By moving acute hospital care to patients' homes, HaH aims to reduce unnecessary hospital admissions, shorten lengths of stay and improve overall patient experience.

For example, one initiative at Sahlgrenska university hospital (SU), to some extent corresponding to HaH are the mobile speciality units "Närsjukvårdsteams". These teams can be contacted during business hours by different actors, including hospital wards, emergency departments, ambulances, the Health Service's emergency call center (SvLc), home care services, primary care centres, and outpatient clinics.
They can assess a patient's care needs to decide whether the patient can receive hospital care at home or if in-hospital care is needed. Assessments are typically prompted by a potential acute or sub-acute condition and can eliminate the need for hospital-based assessments, a form of admission avoidance. They can also act on care plans already initiated in the hospital, e.g. in an in-patient ward or in the emergency department. Teams being able to act on existing care plans initiated by the hospital can shorten patients' in-hospital stay and is referred to as early supported discharge.

To receive hospital care at home, patients must be medically stable, or—if in a palliative setting—prefer care at home despite medical instability. They must be able to manage in their own home independently (or with assistance from municipal authorities or family members) and be able to communicate any potential deterioration in their health.

There are no established standards for which diagnoses are included, nor for the number of home visits required per patient. The teams provide care until hospital-level care is no longer necessary, or until the patient's condition allows for transfer of responsibility to primary care or other outpatient services. More information on HaH initiatives at SU is provided in Appendix 7.

It is important to note that the present HTA does not assess this existing approach of "närsjukvårdsteams" in VGR. As previously described, these teams focus on admission avoidance and provide assessments and care at home for a broader, and currently somewhat less care-intensive patient population - not limited to individuals with conditions usually hospitalised.

Present recommendations from medical societies or health authorities

The Healthcare Act (2017:30) stipulates that regions are obligated to "organise health and medical care activities so that care can be provided close to the population" (7 Chapter, 2a §). The National Board of Health and Welfare supports in various ways the development of working methods that favour close care, such as mobile teams and hospital care at home that aim to meet the needs of residents and that take advantage of new medical and technological opportunities. The board describes HaH as a possibility for providing person-centred care close to the patient with the possibility to stay at home, also in rather severe conditions. For HaH to be cost and resource efficient, it must not require more healthcare professionals per patient than the standard in-patient hospital care. The National Board of Health and Welfare is currently working on an overview of healthcare models including HaH currently used in Sweden (Socialstyrelsen, 2023).

6 Health Technology at issue: Hospital-led Hospital at Home care with home visits

The HaH healthcare approach is an emerging type of acute care for selected clinical scenarios (Zychlinski et al., 2024). In HaH, health professionals provide patients with hospital-level care in their place of residence for a limited period (Denecke et al., 2024). There are hospital-based as well as community-based HaH programmes (De Sousa Vale et al., 2020). This HTA focuses exclusively on versions where the hospital is in charge.

There are many variants of HaH with two main enrolment strategies: Admission Avoidance (AA) and Early Supported Discharge (ESD). AA patients are enrolled in HaH before being hospitalised, e.g. through an ED or primary care visit. The mobile teams described above, assessing patients at home, embody a particularly proactive form of AA. ESD patients are discharged home early with continued support after hospitalisation.

The first enrolment step in both AA and ESD is patient evaluation on medical and social criteria. Criteria vary between HaH programmes and diagnoses, e.g. whether or not a family member or caregiver must be available to support the patient (De Sousa Vale et al., 2020). Patients who meet the criteria receive information, training, and/or equipment

to handle their condition at home until the acute phase is over and/or until the next scheduled appointment. Scheduled appointments can take place remotely, in hospital, or through home visits from a medical team. Patients can reach out for advice by phone at any time and, if needed, be readmitted to the hospital (Denecke et al., 2023).

7 Focused question

This Health Technology Assessment (HTA) focuses only on versions of HaH which operate using home visits and where the hospital is in charge. Approaches primarily relying on digital monitoring instead of home visits are not included. This HTA report evaluates the HaH model by examining its application across various medical conditions and patient groups. Unlike traditional reviews focusing on a specific disease or treatment, this HTA analyses HaH as a broader care model, exploring its implementation for any condition except psychiatric ones. The intention is to identify the range of clinical scenarios where HaH has been studied and to assess the question:

For adult patients with conditions usually hospitalised (according to current standards of treatment in Sweden), are there clinical benefits and/or risks when receiving hospital care at home - compared to in-hospital care?

PICO	
P	Adult[1] patients with conditions[2] usually hospitalised according to current healthcare routine in Sweden. P1: Studies with population of patients with specific conditions (e.g. heart failure, COPD, neurological disease, infection). P2: Studies including patients with differing specified conditions
I	Hospital at home[3] - a care model providing healthcare with visits in the patient's home for patients who otherwise would need hospitalisation.
C	In-hospital care (without study-specific set up)
O	Mortality (primary outcome) Change in health status (according to validated scale) Emergency department visits Complications (excluding mortality) (including infections) Health related quality of life (based on validated scales) Patient experience/satisfaction (including sense of security) (based on validated scales) Staff experience (based on validated scales) Experience of close relatives (based on validated scales)

	Readmission (after discharge from hospital at home or in-hospital care) Length of stay (of hospital at home or in-hospital care)

[1] During the in- exclusion process, the focused question was limited to an adult population after registration of the first protocol in Prospero, but prior to quality assessment of studies and data extraction.
[2] Studies regarding the following populations will be excluded:
Studies with broad patient populations without condition-specific inclusion criteria, studies regarding patients with psychiatric diseases requiring hospitalisation, and studies with patients living in residential care.
[3] The hospital is in charge, i.e. studies where the general practitioner (GP) is in charge for the care at home will be excluded.

Randomised clinical trials (RCTs) published in English, Swedish, Danish or Norwegian were included. Relevant systematic reviews were included for commenting and discussion.

For P1, analyses are presented separately for the different specific patient groups. A sub-group analysis based on the geographical distance from the hospital could be considered.

The relevance of outcomes included in the PICO was confirmed by two patient representatives.

8 Method

Systematic literature search (Appendix 1)

In May and June 2024 three authors (TS, ACE, YH) performed systematic searches in Medline (OvidSP), Embase (OvidSP), Web of Science Core Collection, the Cochrane Library and Cinahl (EBSCOHost). Websites of Scandinavian national and regional HTA-organisations were visited. Reference lists of relevant reports were also scrutinised for additional references. Search strategies, eligibility criteria and a graphic presentation of the selection process are presented in Appendix 1. These authors conducted the literature searches, and at least two authors, independently of one another, screened the obtained abstracts to decide eligibility for full-text retrieval. All abstracts were screened using the Rayyan tool (Ouzzani et al., 2016). Any disagreements were resolved in consensus. All full-text reports were read by at least four authors, independently of one another, and it was finally decided in a consensus meeting which reports should be included in the assessment.

For decisions regarding the relevance of identified articles, from a clinical perspective in today´s VGR healthcare system, the project teams seeked additional advice from clinical experts e.g. in the fields of COPD, heart failure, and orthopaedic surgery.

This project was registered prior to start of data extraction in PROSPERO the 31st of October 2024 (registration number CRD42024568119).

Critical appraisal and certainty of evidence

At least four authors independently appraised the included studies using checklists for RCTs used by HTA-centrum, Sahlgrenska University Hospital, modified from checklists developed by the Swedish Agency for Health Technology Assessment and Assessment of Social Services. Consensus discussions were then performed to agree on the assessment of directness, study limitations (risk of bias), and precision, in the categories + (no or minor problems), ? (some problems), and – (major problems).

The certainty of evidence was assessed according to GRADE (Atkins et al., 2004), with reasons for downgrading described. Summary results per outcome and the associated certainty of evidence are presented in a Summary-of-findings table (page 11).

Data extraction

For included studies, data were independently extracted by two authors, with discrepancies resolved in consensus.

The following definitions regarding outcome variables were used:

Length of stay was defined as duration from randomisation until discharge from HaH or in-hospital, respectively. (Note, that several publications instead used a definition of length of stay limited to the duration for which the patient is in the hospital facilities for both groups).

Readmission was limited to the time after discharge from HaH or in-hospital care. i.e. need for in-hospital care during the period of HaH was not considered, as a comparison to the in-hospital group during this period is not applicable.

For patient or caregiver-reported outcomes only data based on validated scales were included in the analysis.

Meta-analyses

If two or more studies provided poolable data regarding a comparison and outcome, random effects meta-analyses were performed using Revman version 5.4 (The Nordic Cochrane Centre, The Cochrane Collaboration, Copenhagen, Denmark). Meta-analyses based on studies without major risk of bias were the basis for the conclusions. For dichotomous outcomes, odds-ratio and risk difference were presented. In case of few events (less than 5 events in either treatment group), Peto odds ratio was used. Forest plots including available data from all studies irrespective study quality are provided for an overview.

Other systematic reviews

Other systematic reviews (SR) identified in the literature search and considered relevant for the question at issue were included for commenting. These SRs were assessed by two project members using Quickstar - a stepwise tool developed by The Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU) for assessment of risk of bias/systematic errors in SRs. The tool consists of six steps and assessment of an SR is stopped as soon as the criteria for a specific level are not met. The steps are: 1. Definition of PICO and literature search; 2. Inclusion/exclusion according to PICO, listing of included studies; 3. Risk of bias assessments; 4. Evidence synthesis/meta-analyses; 5. Certainty of evidence consideration; 6. Documentation of excluded studies, conflicts of interest, and an a priori published SR protocol.

Ongoing research

A search in Clinicaltrials.gov (18 Oct 2024), in search field Other terms, using the search terms: *"hospital at home" OR "hospital in the home" OR "in-home hospital" OR "home hospital" OR "home based hospital" OR "hospital care at home" OR "hospital care in the home" OR "advanced care at home" OR "advanced care in the home" OR "home hospitalisation" OR "home hospitalization" OR "hospital level care" OR "virtual ward" OR "virtual wards" OR "early discharge" OR "early supported discharge"* | *Interventional studies* identified 233 trials.

Protocol updates and deviations

During the in- exclusion process after registration of the first protocol in Prospero, but

prior to quality assessment of studies and data extraction, the focused question was adjusted

- to limit the patient population to an *adult* population (decision by those who nominated the project)
- to clarify that the population is limited to patients usually hospitalised *according to current healthcare routine in Sweden*.
- to clarify that the HaH intervention as defined in this HTA requires physical healthcare personnel *visits in the patient's home*
- to clarify that the comparison of in-hospital care should be in line with *current routine in Sweden without study-specific set up*.

In line with standard process at the HTA centrum, patient or caregiver-reported outcomes were included in the analysis only if the data was based on validated scales. This limitation was erroneously omitted in the PICO definition.

9 Results

Search results and study selection (Appendix 1)

The literature search identified 2776 records after removal of duplicates and citation searching. After reading the abstracts 2592 records were excluded. Two reports were not retrieved, and 161 reports were excluded after full-text reading. Sixteen reports were finally included in the assessment (Appendix 2). In addition, five systematic reviews (SR) were assessed and commented upon (Appendix 9).

Included studies

The literature search resulted in identification of studies in the following specific patient groups (P1):

- Chronic obstructive pulmonary disease (COPD) (five studies published between 2000 to 2018),
- respiratory tract infection (two studies published 2013 and 2014),
- heart failure (three studies published 2008 and 2009),
- neutropenia (one study published 2011).

Regarding the broader population (P2):

- studies mostly regarding an elderly population with acute deterioration (five articles based on four studies published between 2005 and 2021).

The assessments regarding directness and study quality (risk of bias) of these studies are summarised in Appendix 5. Overall, it is noted that there is a paucity of recent randomised controlled trials published in the field.

Several studies e.g. regarding patients who had suffered a stroke or patients after orthopaedic surgery were excluded as the comparator of in-hospital care did not correspond to current routine healthcare for these patient groups in Sweden.

In addition, several articles were excluded as the HaH model did not imply that the responsibility for treatment resided with the hospital or that healthcare personnel visited the patients in their homes.

9.1 Patients with specific conditions (P1)
9.1.1. Patients with COPD usually hospitalised

Background – patients with COPD usually hospitalised
COPD is a chronic disease that cannot be cured. The prevalence of COPD in Sweden is approximately 7% for the overall population and 8.6% for those older than 40 years (Backman et al., 2020). The incidence of hospitalisation in COPD in Sweden in 2023 was 86.3 per 100 000 inhabitants (Socialstyrelsen, 2024a).

Criteria for hospitalisation of patients with COPD at Sahlgrenska University Hospital in Gothenburg, Sweden, are insufficient response to given treatment, long lasting flare of COPD, frequent visits to the emergency department within a short time span, deranged arterial blood gas, development of oxygen-demanding hypoxia, emergence of oedema, pneumothorax, large pneumonia. Mean length of stay in hospital, at Sahlgrenska University hospital, for patients with COPD as main diagnosis in 2023, was 6.4 days.

Included studies regarding selected patients with COPD
Five RCTs were included (Cotton et al., 2000; Davies et al., 2000; Echevarria et al., 2018; Nissen et al., 2007; Ojoo et al., 2002). The patients with COPD in the included RCTs were strictly selected based on standard criteria for COPD, a definition of COPD exacerbation, criteria for spirometry values, mini mental state scores, vital parameters, blood gas and white blood count.

The design of the HaH intervention consisted of equipping patients with drugs such as bronchodilators, steroids, antibiotics, oxygen if needed, monitoring of vital parameters and home visits by nurses. The HaH intervention was supervised by a specialist unit at hospital. In two of the RCT:s patients had access to a respiratory nurse or hospital unit 24 hours a day, 7 days per week (Echevarria et al.2018, Ojoo et al. 2002), in two RCT:s patients were cared for by district nurses out of hours (Cotton et al.2000, Davies et al.2000) while this information was not specified in Nissen et al. 2007.

Three studies (Cotton et al. 2000, Davies et al.2000, and Echevarria et al.2018,) had some indirectness and some study limitations. The studies by Nissen et al. 2007 and Ojoo et al.2002, had major indirectness and major study limitations. See Appendix 5 for details on the assessment of directness and RoB.

Results per outcome for selected patients with COPD

Mortality (appendix 4.1)
Mortality was reported in all five included RCTs yet at different times of follow up. Figure 1 in Appendix 6 provides a forest plot of results in all included studies.

Meta-analyses for studies without major risk of bias (Cotton et al. 2000, Davies et al. 2000, and Echevarria et al. 2018) are provided in figure 1 and 2. With a follow-up up to 3 months, there was no significant difference in mortality between intervention and control group, yet the CI is wide.

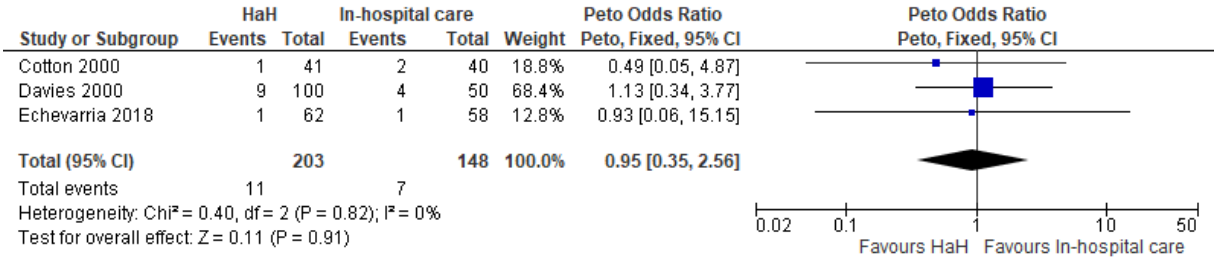

Figure 1. Peto Odds ratio of mortality in selected patients with COPD, meta-analysis of RCTs without major risk of bias

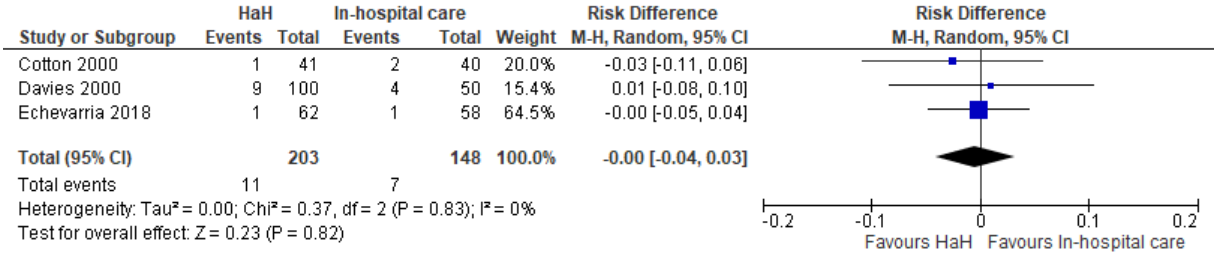

Figure 2. Risk difference in mortality in selected patients with COPD, meta-analysis of RCTs without major risk of bias

Conclusion: For selected patients with COPD usually hospitalised, there may be no difference in mortality (for 3 month follow up) between HaH compared with in-hospital care (GRADE: ⊕⊕OO).

Change in health status (appendix 4.2)
One study (Davies et al. 2000) reported no significant differences in health status (FEV^1 after bronchodilation) between the treatment groups at 2 weeks or at 3 months follow up.

Conclusion: For selected patients with COPD usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding health status changes during the hospital treatment (GRADE: ⊕OOO).

Complications (excluding mortality reported above) (appendix 4.4)
One small study (Nissen et al. 2007, including 44 patients with COPD) found no significant differences between the treatment groups after two months.

Conclusion: For selected patients with COPD usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding complications (GRADE: ⊕OOO).

Health related quality of life (appendix 4.5)
Davies et al., 2000 and Echevarria et al., 2018 present data on HrQoL and found no significant differences between groups.

In Davies et al., 2000 the St George's respiratory questionnaire (ranging from 0 to 100, higher scores indicating more limitations) was collected in 150 patients with COPD with

no significant between group difference in the mean change from baseline to 3 months follow up (HaH: -0.48 (SD 16.92) vs in-hospital care: -3.13 (SD 14.02).

Echevarria et al., 2018 including 120 patients, report no significant difference in EQ-5D-5L regarding mean unit change from baseline to 14 days follow up or the percentage of patients with minimally clinically important improvements at 90 days follow up (HaH: 44% vs in-hospital care: 41%).

Conclusion: In selected patients with COPD usually hospitalised, HaH may result in little or no difference in HrQoL compared to in-hospital care (GRADE: ⊕⊕OO).

Readmission after discharge (appendix 4.8)
Observations regarding readmission were reported for all five included studies, yet in different ways.

Two RCTs (Echevarria et al., 2018 and Nissen et al., 2007) explicitly separate readmission during the period of care with HaH and the period after discharge from HaH. A forest plot of results of all available data from the included studies is provided in Appendix 6 figure 2. Meta-analyses for studies without major risk of bias (Cotton et al. 2000, Davies et al., 2000, and Echevarria et al., 2018) are provided in figure 3 and 4.

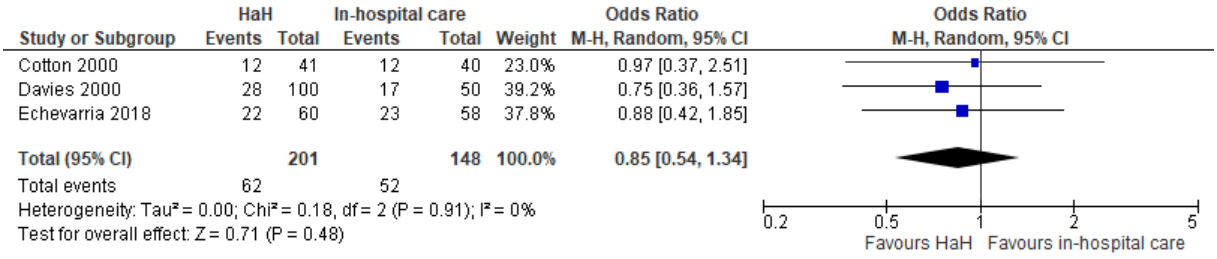

Figure 3. Odds ratio of readmission within two to three months after discharge in selected patients with COPD, meta-analysis of RCTs without major risk of bias

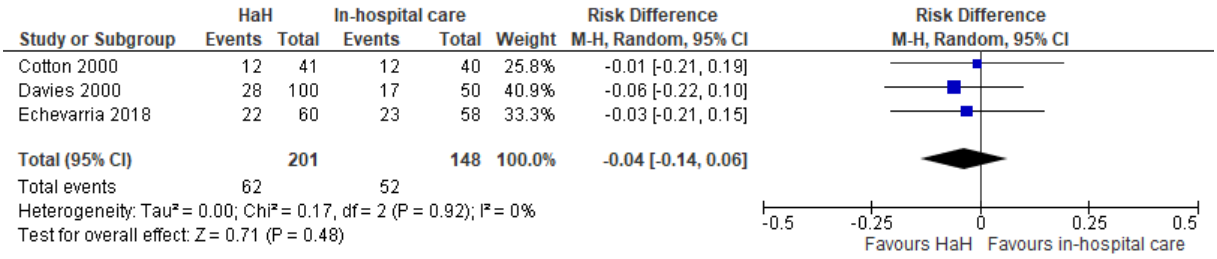

Figure 4. Risk difference of readmission within two to three months after discharge in selected patients with COPD, meta-analysis of RCTs without major risk of bias

Conclusion: In selected patients with COPD usually hospitalised, HaH may result in little or no difference in readmission after discharge compared to in-hospital care (GRADE: ⊕⊕OO).

Length of stay (appendix 4.9)
The only publication that reports data on length of stay according to our definition is a

small study by Nissen et al. 2007 with major concerns regarding both directness and study limitations.

Conclusion: In selected patients with COPD usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding length of stay (GRADE: ⊕OOO).

The outcomes emergency department visits, patients, staff or caregiver experience were not reported in a way that allowed for comparison of HaH and in-hospital care in any of the included studies in patients with COPD.

9.1.2. Patients with respiratory tract infections usually hospitalised

Background – patients with respiratory infections usually hospitalised
Community-acquired pneumonia (CAP) is an acute infection of the pulmonary parenchyma acquired outside of the hospital environment. (Svenska infektionsläkarföreningen, 2024). The incidence of hospitalisation in bacterial pneumonia in Sweden in 2023 was 351,2 per 100 000 (Socialstyrelsen, 2024b). The total number of admissions to hospital for patients with pneumonia in Sweden in 2023 was 401,8 per 100 000 inhabitants and the mean time of admission was 5,8 days (Socialstyrelsen, 2024c).

Respiratory failure due to respiratory infection is the most common cause of death in patients with neuromuscular disease such as muscular dystrophy (Calvert et al., 2006). A combination of non-invasive ventilation and cough assistance in neuromuscular disease have been reported to reduce hospitalisation and pulmonary morbidity (Simonds et al., 2006, Khan et al., 2023).

Included studies regarding selected patients with respiratory tract infections
Two RCTs, Collins et al., 2014 and Vianello et al., 2013, were included in this report. Collins et al., 2014 is a small feasibility study in patients with pneumonia and Vianello et al., 2013 included patients with neuromuscular disease and respiratory infections.

The HaH intervention in Collins et al., 2014 implied that a hospital respiratory physician and nurse team performed up to two daily visits for vital parameters, and if needed blood tests. Intravenous antibiotics, intravenous fluids, and oxygen therapy could be provided. Patients in the HaH group had access to a 24-hour emergency number. The HaH intervention in Vianello et al., 2013 implied that a hospital respiratory physician and nurse team came for once daily visits during the first three days and thereafter two daily visits by a district nurse and visits by respiratory physician at the discretion of the nurse or a general practitioner. Patients were equipped with non-invasive ventilation, cough machines, pulsoximeters and antibiotics. Patients had phone access to a pulmonologist (not stated if this was available 24-hours daily).

Both studies have some problems with directness. Vianello et al., 2013 has some and Collins et al., 2014 more serious study limitations. Both studies have major limitations in precision.

Results per outcome for selected patients with respiratory tract infections

Mortality (appendix 4.1)
There was no difference in mortality between the treatment groups in Collins et al. 2014 (time of follow up not stated) or in Vianello et al., 2013 (follow up at three months).

Change in health status (appendix 4.2)
This outcome was measured in Collins et al., 2014 reporting no differences between the treatment groups.

Complications (excluding mortality reported above) (appendix 4.4)
The included RCTs provide limited information regarding complications. Collins et al., 2014 mentions one hospital-acquired infection in the comparator group, none in the intervention group. Vianello et al., 2013 report no significant difference in the number of treatment failures between treatment groups.

Health related quality of life (appendix 4.5)
Collins et al.,2014 report no significant difference in HrQoL between the treatment groups.

Readmission after discharge (appendix 4.8)
Collins et al.,2014 report readmission to hospital after 30 days for none of the 8 patients in the HaH group and 2 of 6 patients in the control group.

Length of stay (appendix 4.9)
The two small RCTs provide very limited information regarding length of stay.

Conclusions: For selected patients with respiratory tract infection usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding mortality (during up to three months follow up), change in health status, complications, HrQoL, readmission after discharge, or length of stay (GRADE: ⊕OOO).

The outcomes emergency department visits, or experience by patient, staff or caregiver were not reported in any of the included studies in patients with respiratory tract infection.

9.1.3 Patients with heart failure usually hospitalised

Background – patients with heart failure usually hospitalised
In Sweden, heart failure is the most common cause for hospitalisation within the practice of internal medicine. A study by Boman et al., 2021 demonstrates that heart failure care is costly and represents 2-3% of the total Swedish health care expenses. Approximately 2% of the population have heart failure. For people over 80 years of age, the prevalence increases to 10%.

According to the Swedish National Board of Health and Welfare (Socialstyrelsen, 2024d) in 2022, approximately 22 000 patients were admitted to hospital due to heart failure. After being discharged, 5 600 individuals were readmitted within 30 days and another 3 900 died within the same time period.

In Region Västra Götaland (VGR), a department responsible for compilation of care statistics "regional vårdanalys" reports that approximately 8 000 patients with a heart failure diagnosis (ICD I50) are registered in specialised care. Of these about half are

annually hospitalised and 30% of those who are hospitalised die. The average length of stay in hospital for a patient with heart failure is 9 days (Socialstyrelsen, 2024e, Regional vårdanalys, VGR utdataenhet).

For patients with heart failure there are no defined criteria for hospital admission. Each case is clinically assessed by physicians who decide whether hospital care is necessary.

Included studies regarding selected patients with heart failure
Three RCT's regarding patients with heart failure were included (Mendoza et al., 2009, Patel et al., 2008, and Tibaldi et al., 2009).

In the study by Patel et al., 2008, patients allocated to HaH-care had daily visits for 5-7 days (if needed) by a specialist nurse who conducted a clinical examination, secured blood samples and could administer intravenous diuretics after contact with a cardiologist. Patients were discharged from HaH when clinically improved. Patients were able to contact a specialist nurse up to one month after discharge. Mendoza et al., 2009 provided a personalised schedule during patients' Emergency Department visits where (if needed) patients would get daily visits by an internal medicine specialist and nurse. If deemed necessary, ECGs and laboratory samples could be secured in the patient's home and x-rays and UCGs had the same availability as for patients with traditional hospital care. Patients were discharged with follow-up to primary care when clinically improved and if worsened or not responding to treatment, patients could be admitted for in-hospital care. Tibaldi et al.,2009 offered a geriatric home hospitalisation Service (GHHS), consisting of hospital level healthcare by physicians, nurses, physiotherapists, a social worker, and a counsellor. Patients allocated to this group received, daily visits of physician and nurse. Interventions available to these patients were equal to those available for patients receiving traditional in-hospital care including spirometry, UCG, ECG, blood tests, oral and intravenous medication, and oxygen therapy. For all RCTs patients could reach a nurse or physician at any time for urgent matters.

Regarding directness, the study by Patel et al., 2008 was considered to have no limitations whereas Tibaldi et al.,2009 and Mendoza et al., 2009 had some limitations. Tibaldi et al., 2009 and Patel et al., 2008 had some study limitations whereas Mendoza et al., 2009 had major study limitations. All studies had major limitations regarding precision.

Results per outcome for selected patients with heart failure

Mortality (appendix 4.1)
All studies reported mortality data and a forest plot of results in all studies is provided in Appendix 6, figure 3. Meta-analyses for studies without major risk of bias are provided in figure 5 and 6. Mendoza et al., 2009 and Patel et al., 2008 report data at 1 year follow up, and Tibaldi et al., 2009 at up to 6 months follow up. None of the studies reported a significant difference between the treatment groups.

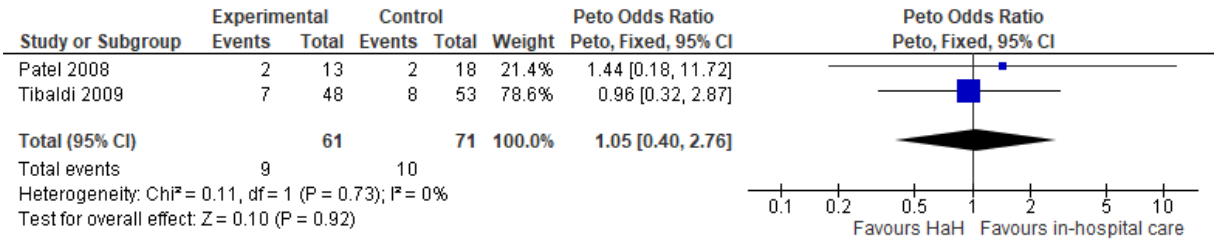

Figure 5. Peto odds ratio of mortality in selected patients with heart failure, meta-analysis of RCTs without major risk of bias

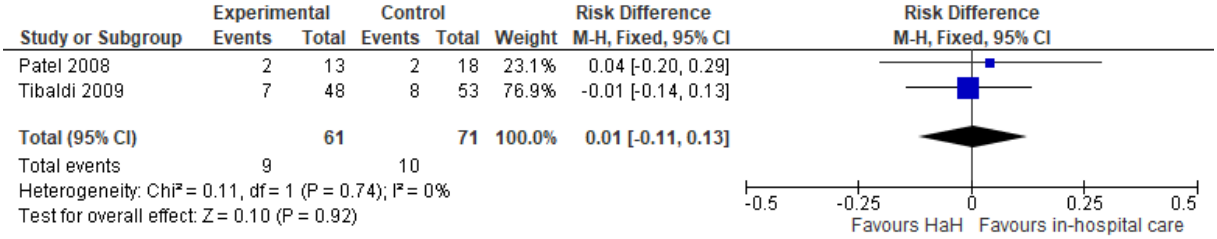

Figure 6. Risk difference in mortality in selected patients with heart failure, meta-analysis of RCTs without major risk of bias

Conclusion: For selected patients with heart failure usually hospitalised, it is uncertain whether HaH results in any difference regarding the risk of mortality (during up to 12 months follow up) compared to in-hospital care (GRADE: ⊕OOO).

Change in health status (appendix 4.2)
Patel et al., 2008 report no significant difference in NHYA-classification at 1, 4, 8 and 12 months follow up between the treatment groups.

Conclusion: For selected patients with heart failure usually hospitalised, it is uncertain whether there is a difference between HaH compared to traditional in-hospital care regarding changes in health status (GRADE: ⊕OOO).

Emergency department visits (appendix 4.3)
Patel et al., 2008 reported no significant difference in ED-visits for patients who received HaH care compared to in-hospital care.

Conclusion: For selected patients with heart failure usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding ED-visits after discharge (GRADE: ⊕OOO).

Complications (excluding mortality reported above) (appendix 4.4)
Only the study by Tibaldi et al., 2009 describes observations regarding complications – mentioning a numerically lower rate of selected medical complications (mainly infections and delirium) observed in the HaH group; however, the result was not statistically significant nor fully reported.

Conclusion: For selected patients with heart failure usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding complications (GRADE: ⊕OOO).

Health related quality of life (appendix 4.5)
All included RCTs collected HrQoL assessments with different questionnaires. Results were either not significant (Mendoza et al., 2009) or insufficiently described (Tibaldi et al., 2009 and Patel et al., 2008).

Conclusion: For selected patients with heart failure usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding HrQoL (GRADE: ⊕OOO).

Caregiver experience (appendix 4.7)
Tibaldi et al., 2009 reported caregiver experience, specifically on relative stress scale. On admission a significantly higher stress score was reported in the HaH compared to the in-hospital care group. The quantitative results are not sufficiently disclosed for a between-group comparison at discharge.

Conclusion: For selected patients with heart failure usually hospitalised, it is uncertain whether there is a difference between HaH compared to in-hospital care regarding caregiver experience (GRADE: ⊕OOO).

Readmissions after discharge (appendix 4.8)
Mendoza et al., 2009 and Tibaldi et al., 2009 reported readmission rates (a forest plot of the results in all studies is provided in figure 7).

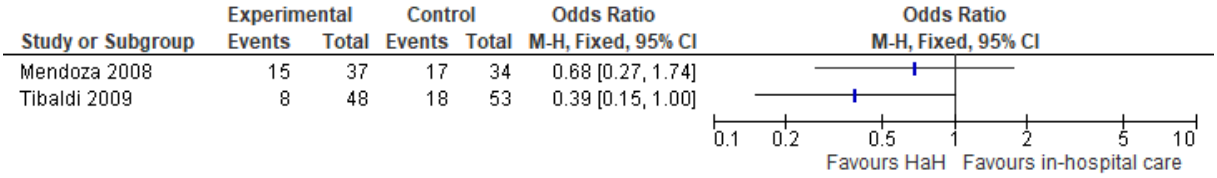

Figure 7. Odds ratio of readmission after discharge in selected patients with heart failure, forest-plot of all included RCTs

Tibaldi et al., 2009 reported readmissions during HaH, and separately subsequent readmissions to hospital at 6-month follow-up as well as the number of days between discharge and first hospital readmission. Of the patients readmitted within 6-months 76% were readmitted due to their heart failure. It was observed that the patient group receiving in-hospital care had a shorter time to first hospital readmission compared to the HaH group (p=0.02).

Mendoza et al. (2009) reported readmission at 1 year follow-up and did not find a significant difference between treatment groups.

Conclusion: For selected patients with heart failure usually hospitalised, it is uncertain whether HaH results in any difference regarding readmission after discharge compared to in-hospital care (GRADE: ⊕OOO).

Length of stay (appendix 4.9)
Mendoza et al., 2009 and Tibaldi et al., 2009 reported length of stay and a forest plot of the results is provided in figure 8.

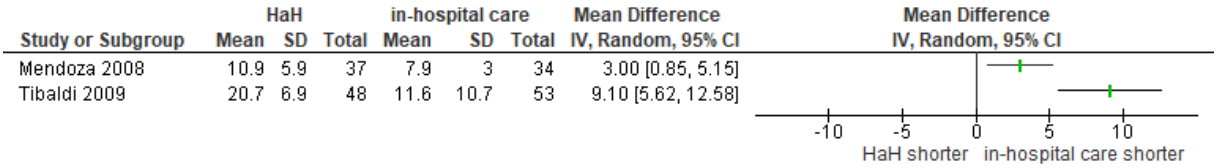

Figure 8. Mean difference of length of stay in selected patients with heart failure, forest-plot of all studies

Both studies report that patients receiving in-hospital care had significantly shorter length of stay. Tibaldi et al., 2009 report that the mean length of stay in the in-hospital care group is 9 days shorter than for the HaH group. However, the authors note that no patient in the HaH group was institutionalised compared to 16% in the in-hospital group. They consider that transfer to long-term facilities after discharge may allow for earlier discharge (thus shorter length of stay) compared to discharge home.

Conclusion: For selected patients with heart failure usually hospitalised, length of stay may be longer in HaH compared to in-hospital care (GRADE: ⊕⊕OO).

The outcomes patient or staff experience were not reported in any of the included studies in patients with heart failure usually hospitalised.

9.1.4 Patients with neutropenia usually hospitalised

Background - patients with neutropenia usually hospitalised
Febrile neutropenia requiring hospitalisation is a serious complication that primarily affects cancer patients undergoing chemotherapy. This condition is characterised by an abnormally low concentration of neutrophils, a type of white blood cell crucial for fighting bacterial and fungal infections. Neutrophils are the primary defence against infections, and their deficiency makes individuals more susceptible to bacterial infections, which can become life-threatening if not promptly treated.

Neutropenia affects approximately 17% of patients receiving chemotherapy, with over half of initial hospitalisations occurring during the first two treatment cycles (Boccia et al., 2022). Risk factors for hospitalisation due to febrile neutropenia include age 65 years or older, certain cancer types (e.g., lung cancer), advanced disease stage, and impaired Eastern Cooperative Oncology Group (ECOG) performance status (Bachlitzanaki et al., 2023).

The clinical presentation of neutropenia often includes fever, along with an absolute neutrophil count <0.5 × 10^9/L (Hey, 2018). However, it is important to note that elderly patients or those on steroids may not develop fever despite having neutropenic sepsis.

Management of febrile neutropenia requires prompt hospitalisation, as it is considered an oncologic emergency. Key aspects of treatment include rapid initiation of broad-spectrum antibiotics, comprehensive evaluation including blood cultures and chest X-rays, admission to a single room with neutropenic precautions, and continuous monitoring of vital signs and neutrophil count (HEY, 2018).

The median duration of hospitalisation for neutropenia is 9 days, ranging from 3 to 43 days (Bachlitzanaki, 2023). While most patients (91.5%) show improvement or cure of infection, neutropenia can lead to increased mortality risk, delays in cancer treatment potentially affecting overall survival, and reduced quality of life (Bachlitzanaki, 2023).

Included studies regarding selected patients with neutropenia usually hospitalised
One study including 117 patients in this patient population was included. The RCT by Talcott et al. (2011) compares the safety of early supported discharge for carefully selected low-risk patients with febrile neutropenia to standard in-hospital care.

The study was considered to have some limitations regarding directness, and major study limitations.

Results per outcome for selected patients with neutropenia usually hospitalised

Mortality (appendix 4.1)
Talcott et al., 2011 report no deaths in either the HaH or the in-hospital care arm of the trial.

Complications (excluding mortality reported above) (appendix 4.4)
Talcott et al. (2011) reported major medical complications in 9% of HaH treatment episodes and 8% of in-hospital care treatment episodes, with no statistically significant difference between the two groups.

Quality of life (appendix 4.5)
According to the study by Talcott et al. (2011), there was no significant between-group difference in patient-reported quality of life assessed by the global health status scale of the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire C30 (EORCT QLQ C-30).

Length of stay (appendix 4.9)
Talcott et al., 2011 report a median duration of the febrile neutropenia episode of four days in both groups. No information on the length of treatment until discharge from HaH is provided.

Conclusions: For selected patients with neutropenia usually hospitalised, it is uncertain whether HaH results in any difference regarding mortality, complications, HrQoL, or length of stay compared to in-hospital care (GRADE: ⊕OOO).

The outcomes change in health status, emergency department visits, readmission after discharge, or experience by patient, staff or caregiver were not reported in the included study regarding patients with neutropenia usually hospitalised.

9.2 Elderly patients usually hospitalised due to acute deterioration (P2)

Background – Elderly patients usually hospitalised due to acute deterioration
In 2023, persons aged 65 and over made over 75 000 visits to Emergency departments in VGR (Socialstyrelsen, 2024a), and the risk of being admitted to in-hospital care increases with age (Socialstyrelsen, 2024b). At Sahlgrenska University Hospital, patients aged 70-79 were the age-group with the largest number of in-hospital episodes in 2024. Common reasons for persons aged 70 and over to be admitted to in-hospital care at Sahlgrenska University Hospital were stroke, hip-fractures, heart-insufficiency, COPD, pneumonia and urinary diseases (Sahlgrenska University Hospital, Slutenvårdsdashboard, 2024).

Frailty is a central concept in the care of older adults with multimorbidity (Ekdahl et al., 2020). It refers to increased vulnerability due to cumulative physiological decline, resulting in reduced strength, slower mobility, and diminished resilience, which increases the risk of falls, disability, and health deterioration (Clegg et al., 2013).

Certain routines apply for patients with frailty within Sahlgrenska University Hospital. Risk assessment of falls, malnutrition, pressure sores and confusion should be made and a plan to handle these risks should be established. The care should be given with a person-centred approach and actions such as early mobilisation, medication reconciliation and early planning of the discharge process should be applied with the aim to maintain and strengthen the individual resources of patients with frailty (Sahlgrenska, 2024).

Included studies regarding selected mixed elderly patient population usually hospitalised

Five publications regarding four RCTs were included (Harris et al., 2005; Levine et al., 2018; Levine et al., 2020; Moss et al., 2024; Shepperd et al., 2021), with two publications (Moss et al., 2024; and Levine et al., 2020) reporting data from the same trial. Three studies addressed admission avoidance (Levine et al., 2018; Levine et al., 2020; Moss et al., 2024; Shepperd et al., 2021), while one included both early supported discharge and admission avoidance (Harris et al., 2005). Two studies were led by geriatricians (Harris et al., 2005; Shepperd et al., 2021) and three by general internists (Levine et al., 2018; Levine et al., 2020; Moss et al., 2024). In all studies HaH implied daily home visits by physicians and nurses, alongside support from multidisciplinary teams including physiotherapists, occupational therapists, and social workers.

The mean and median ages in all studies were over 70 years, except in a small pilot study by Levine et al. (2018), where the mean age was over 60 years. Common diagnoses in the studies were COPD, chronic heart failure, and infections.

In two of the included studies (Levine et al., 2018; Levine et al., 2020), frailty was assessed using the PRISMA scale with mean score of frailty of 3 or over (where scores $\geqslant$ 3 indicate frailty). Shepperd et al. (2021) describe the study-intervention, Comprehensive geriatric assessment Hospital at home (CGA-HAH) as an alternative to hospital care for frail elderly patients. Harris et al., (2005) did not screen for frailty.

The studies by Shepperd et al., 2021 and Levine et al., 2020 were considered to have some indirectness and risk of bias. All other studies were assessed to have major limitations in both directness and risk of bias.

Results per outcome for selected mixed elderly patient population usually hospitalised

Mortality (appendix 4.1)

Four studies reported mortality data with follow up periods of 30 days (Levine et al (2018 and 2020), 90 days (Harris et al, 2005) and 1, 6, and 12 months (Shepperd et al 2021). A forest plot of the results in all studies is provided in Appendix 6 figure 4. Figures 9 and 10 below provide meta-analyses for studies with no major risk of bias.

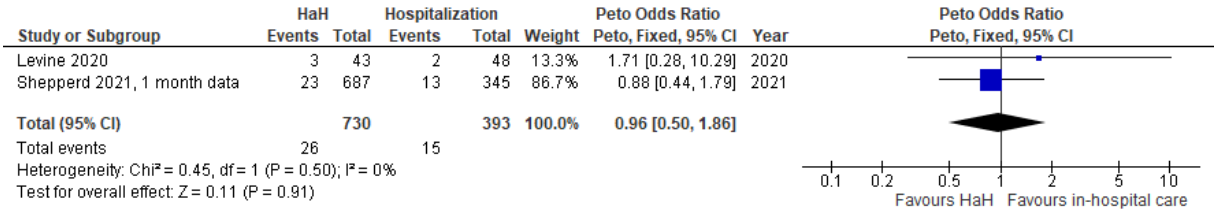

Figure 9. Peto odds ratio in mortality in selected mixed elderly patient population, meta-analysis of RCTs without major risk of bias

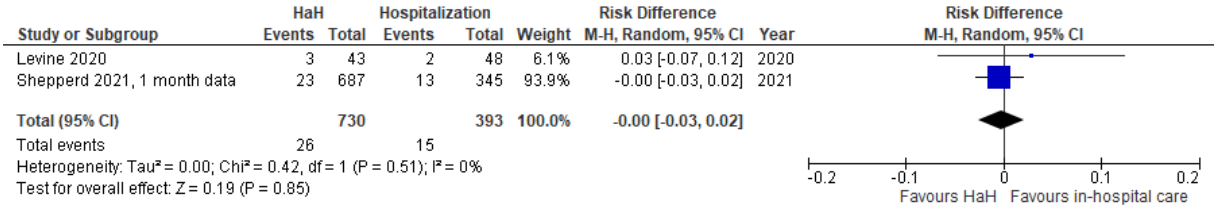

Figure 10. Risk difference in mortality in selected mixed elderly patient population, meta-analysis of RCTs without major risk of bias

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, there may be no difference in mortality (for 1 month follow up) between HaH compared with in-hospital care (GRADE: ⊕⊕OO).

Change in health status (appendix 4.2)
The study by Harris et al., 2005 reported data on self-reported complete recovery at 10, 30 and 90 days after admission with no significant differences between the treatment groups.

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, it is uncertain whether there is a difference in change in health status between HaH compared with in-hospital care (GRADE: ⊕OOO).

Emergency department visits (appendix 4.3)
Levine et al. (2018 and 2020) reported data on ED-visits post-discharge for patients receiving HaH care compared to in-hospital care. A forest plot of results in all studies is provided in figure 11.

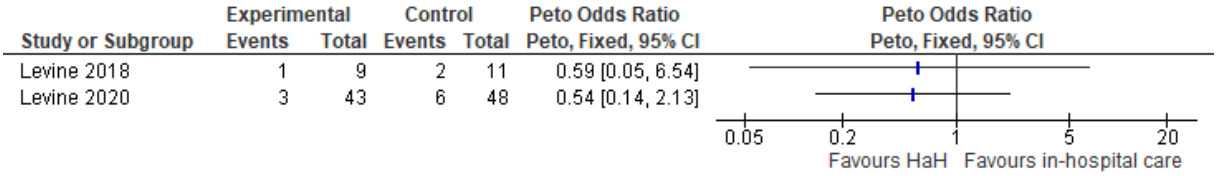

Figure 11. Peto Odds ratio of ED-visits post discharge in a selected mixed elderly patient population, forest-plot of all included RCTs

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, it is uncertain whether HaH care leads to differences in the need for ED-visits after discharge compared with in-hospital care (GRADE: ⊕OOO).

Complications (excluding mortality reported above) (appendix 4.4)
Harris et al., (2005), Levine et al., (2018 and 2020) and Shepperd et al., (2021) provide data regarding complications. None of the studies reported significant differences in unexpected medical injuries or adverse events between the HaH and in-hospital care groups. However, reporting was limited to serious and unexpected events. Common complications typical in the population studied, such as falls, infections or pressure sores, were either not systematically recorded or were underreported.

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, it is uncertain whether HaH care leads to differences in the complications compared with in-hospital care (GRADE: ⊕OOO).

Health-related quality of life (appendix 4.5)
Harris et al., (2005) used the SF-36 to assess health status at 90 days and Shepperd et

al., (2021) assessed quality of life using the EQ-5D-5L at six months. Both studies report no significant differences in HrQoL between the treatment groups.

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, it is uncertain whether HaH care has an impact on quality of life compared to traditional hospitalisation (GRADE: ⊕OOO).

Patient experience (appendix 4.6)
Levine et al., (2018 and 2020) reported no significant differences between the treatment groups regarding patient satisfaction.

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, it is uncertain whether HaH care affects patient experience compared to in-hospital care (GRADE: ⊕OOO).

Caregiver experience (appendix 4.7)
In the study by Harris et al., (2005) caregivers of HaH patients reported significantly lower levels of strain (measured by the Carer Strain Index) compared to caregivers to in-hospital patients. Moss et al., (2024), using the Zarit Burden Interview, found no significant differences in caregiver burden between the treatment groups at admission or discharge. Reporting in the studies was limited in scope, focusing primarily on distress or burden without capturing broader aspects of the caregiver experience, such as emotional or logistical challenges.

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, it is uncertain whether there is a difference in caregiver experience between HaH compared with in-hospital care (GRADE: ⊕OOO).

Readmission after discharge (appendix 4.8)

Three publications included data for post-discharge readmission (Harris et al., 2005., Levine et al., 2018., and Levine et al., 2020). A forest-plot of results in all studies is provided in figure 12.

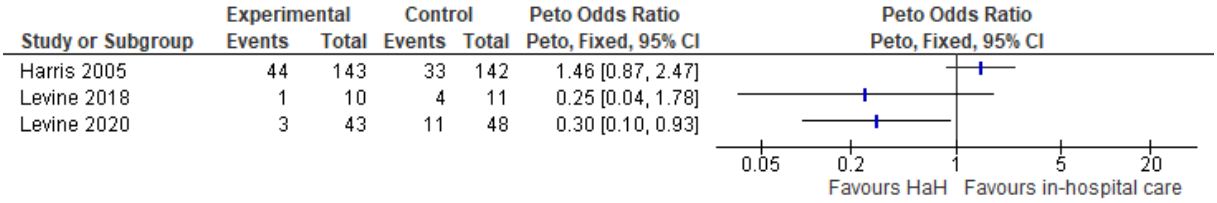

Figure 12. Peto odds ratio of readmission post discharge in a selected mixed elderly patient population, forest plot of all included RCTs

Shepperd et al., 2021 also provided data on readmission from randomisation until 1, and 6 months yet without differentiation whether readmission was prior to or after discharge in the HaH group.

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, it is uncertain whether there is a difference regarding post-discharge readmission between HaH compared with in-hospital care (GRADE: ⊕OOO).

Length of stay (appendix 4.9)
Harris et al., (2005), Levine et al., (2018 and 2020) and Shepperd et al., (2021) reported data regarding the length of stay and a forest plot including all studies where adequate data are available is provided in Appendix 6 figure 5. Harris et al., (2005) reported that patients in the HaH group had longer duration of care due to the gradual transition and extended home support. Levine et al., (2020) similarly found a trend towards longer length of stay in the HaH group, likely due to the individualised pace of recovery and tailored home care interventions. Shepperd et al., (2021) observed a

significantly longer length of stay for HaH care compared to in-hospital care, emphasising that the additional time allowed for comprehensive multidisciplinary care and follow-up in the home environment. Meta-analysis for studies without major risk of bias is provided in figure 13

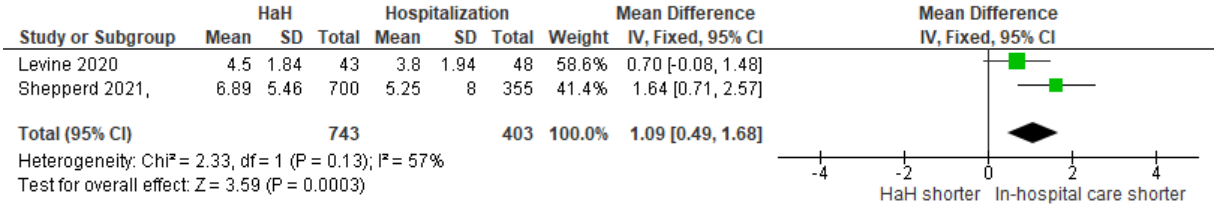

Figure 13. Mean difference in length of stay for a selected mixed elderly population, forest-plot and meta-analysis of RCTs without major risk of bias

Conclusion: For selected elderly patients usually hospitalised due to an acute deterioration, HaH care may result in longer length of stay compared to in-hospital care (GRADE: ⊕⊕OO).

The outcome staff experience was not reported in any of the included studies in elderly patients with acute deterioration requiring hospitalisation.

10 Ethical aspects

For most outcomes in this report, including mortality and complications, we found no differences between HaH and hospital care but the certainty of evidence for these conclusions was low to very low. The patient's view is poorly studied Likewise, there is a lack of data regarding the perspective of family members for whom daily life may be affected considerably by the choice of care model (e.g. as HaH may imply frequent healthcare visits and provision of technical equipment in the patient's home). Compared to in-hospital care, HaH might increase responsibilities for patients' families and relatives, who already have other sociopsychological or economic obligations.

Access to HaH services may vary depending on factors as: geographical distance to the hospital; preconditions in the patient's home, digital exclusion in case of impaired ability to manoeuvre technical monitoring; or patients with diseases not yet considered for HaH. These aspects of HaH may impede the right to equal access to care as well as challenge the principles of human dignity.

Identifying patients who are sufficiently stable to be cared for at home can facilitate the realisation of the principle of solidarity by freeing up hospital beds for patients in greater need of in-hospital care. However, given the transboundary nature of certain care activities, successful implementation of HaH requires establishment of close collaboration between hospital and primary care.

There is also an uncertainty regarding cost implications of HaH which limits the assessment of the cost-effectiveness of HaH.

Some studies report patients having a strong preference for HaH whilst others describe significant exclusion of patients not comfortable with the possibility of being randomised to HaH or conventional care. If HaH models eventually prove more cost-efficient, patients may be expected to be treated according to this model. Also, the probability that HaH may require a high level of patient engagement and support from familiy members is an

important aspect, particularly in economic calculations. Costs related to care by family members are seldom included in cost analyses.

11 Organisational aspects

Time frame for the putative introduction of the new health technology

Care according to a HaH model is to some extent already being provided in VGR e.g. by the mobile teams described in chapter 5. In 2023, Sahlgrenska University Hospital (SU) launched a strategy and project called "*SU at Home*" ("Sahlgrenska Hemma"). 21 existing initiatives in a variety of clinical fields (for an overview see Appendix 7) are subsumed in *SU at Home*. Some of these initiatives align with the PICO of this HTA report. (*SU at Home* project manager P. Almgren, personal communication, November 26, 2024 and January, 2025).

Consequences of the new health technology for personnel

Research has shown that staff who have not worked with HaH before often demonstrate positive attitudes towards it and are willing to participate in HaH, e.g. through rotations. This could be one way to train HaH professionals (Choe et al., 2024).

An interview study by Teske et al. (2024) with doctors and nurses working in mobile teams at four Swedish hospitals found that they felt proud of the impact they made on patients' lives, that their profession was meaningful, and that their work environment was healthy. They emphasised the importance of good collaboration within the healthcare organisation for ensuring high-quality care. They identified difficulties achieving around-the-clock staffing, as well as logistical challenges regarding the scheduling and preparation for home visits, including finding solutions for choice and transport of necessary equipment. Maintaining cleanliness during treatment (e.g. wound dressings) in patients' homes was also perceived as a recurring problem.

More studies are needed regarding both the workload of health professionals in HaH and how to measure that workload (Cordero-Guevara et al., 2022; Flo et al., 2019), as well as regarding how to best educate and train HaH professionals (Leff et al., 2022).

12 Economic aspects

Regarding economic aspects the intention was to describe costs of HaH compared to in-hospital care a) based on available information for VGR, and b) based on included RCTs presenting costs.

a) Information for VGR

As described above, mobile speciality units (NSVT) have been initiated in VGR and have started to provide care that in some instances aligns with the question at issue in this HTA. Efforts have been made to compare costs for HaH and in-hospital care in VGR. However, it has not been possible to identify costs for comparable patient groups (for more details see Appendix 8).

b) Information based on included RCTs

For seven of the included 15 RCTs, information on costs was available (one RCT in patients with COPD, two RCTs in patients with heart failure and four RCTs in the mixed population of elderly with acute deterioration).

Three of these seven RCTs were assessed to provide adequate quality of cost estimation and were considered to have no major risk of bias. Table 1 presents the results of these three RCTs. Note, that the studies consider different perspectives of analysis, namely health care, health and social care, and societal perspective. All three RCTs report a reduction in average cost estimates with HaH ranging from 10% to 25%. (Note, that the reported confidence intervals are wide, stretching from relevant cost reduction to some cost increases).

Table 1. Costs of 'hospital and home (HaH)' and 'in-hospital care' and assessment of the quality of cost estimation

Disease area	Reference	Costing perspective	Unit of reported costs	Cost of treatment				Quality of cost estimation	Assessment of directness (D) and RoB[#]
				HaH (Mean, SD)	Hospital (Mean, SD)	Absolute Difference (95% CI)	Absolutedifference expressed as % based on in-hospital cost		
COPD	Echevarria et al., 2018	Health and social care perspective	Health and formal social care average costs at 90 days	£ 3 857.8 SD: £3 199.6)	£ 4 873.5, SD: £ 5631.1	- £ 1 015.7 (−2735.5 to 644.8)	20.8% lower	High	D: ? /+ RoB: ?
Acute care for elderly patient	Levine et al., 2020	Healthcare perspective	Acute care episode (mean cost)				19% lower		
			Acute care episode and 30 days after acute care episode (mean cost)				25% lower	Medium	D: ? RoB: ?
	Singh et al., 2022	Health care, Health & social care and societal perspective	Health care costs	£ 7,060 SD: £12,78	£ 7,864 £SD:13,486	- £ 805 (−2,687 to 1,078)	10.2% lower	Medium	D: ? RoB: ?
			Health and social care costs	£ 13,975 SD: £ 17,248	£ 16,521 SD: £ 17,639	- £ 2,547 (−5,059 to −34)	15.4% lower		
			Societal costs	£ 18,437 SD: £ 19,057	£21,453 SD: £ 18,902)	- £ 3 017 (−5,765 to −269)	14.1% lower		

[#] plus = no/minor concerns, ? = some concerns, minus = major concerns

Information regarding cost estimations in all seven identified RCTs irrespective of the adequacy of the cost estimation and risk of bias, are provided in Appendix 8. Six of seven RCTs report lower costs for HaH as compared to in-hospital care ranging from an average of a 13% to 67% reduction in costs. One RCT reports an increase of average costs by 85% for HaH compared to in-hospital care, mainly explained by longer length of stay, and the HaH approach being new and not yet working at full capacity during this RCT.

13. Discussion

Summary of main results

This report examines the benefits and risks of HaH compared to in-hospital care and included 15 RCTs covering four diagnosis groups and a mixed elderly population.

For mortality and complications, we found no differences between HaH and in-hospital care, but the certainty of evidence was low for two, and very low for all other conclusions.

Also, it was concluded with low certainty of evidence that there may be no difference in HrQoL and rate of post-discharge readmission with HaH and in-hospital care for selected patients with COPD exacerbation.

For the following differences the certainty of evidence was low: For selected patients with heart failure as well as for selected elderly patients with an acute deterioration the length of stay may be longer for HaH compared to in-hospital care.

For all other comparisons the certainty of evidence was very low, or no data were available. The patients' and families' perspective are poorly studied.

Economic consequences of HaH for healthcare in VGR were not possible to estimate.

Hospital at home intervention versus standard hospital care

There is no universally accepted definition of HaH. The definition used in this report was provided by the project nominators and differs from some other contexts where HaH is referenced. The generalisability of the identified material to the current VGR context was limited. The HaH-intervention differed between the included studies (e.g. different frequency of visits, different inclusion criteria, different duration of HaH). Some studies required that participants had a caregiver at home. In several studies it was possible for the participants to receive social care at home as part of the intervention. At Sahlgrenska, this would not be provided by the hospital but by the municipality, which requires a well organised health care cooperation with other providers/ administrations. This collaboration is crucial for delivering person-centred care that respects and responds to individual patient preferences, needs and values.

In most studies only a limited proportion of patients was eligible for HaH (ranging from 11% to 70%). Careful selection of patients to be offered HaH is crucial to ensure patients' safety and to be viable from an organisational and economic perspective. In several studies, patient recruitment was slow and posed a challenge for study conduct which to some extent may be related to inclusion criteria, but also to patients' attitude to HaH and participation in a RCT. Echevarria et al. (2018) found that a clear majority in both groups (90% in the HaH group and 89% in the control group) said they would have preferred HaH care to in-hospital care. However, these data are not comparable, as the preference is based on actual experience of HaH in the intervention group, whilst it is only based on information about HaH in the control group. Still, the observation underscores the importance of investigating the patients' perspectives.

Findings suggest that for patients to be cared for at home regardless of diagnosis, certain criteria must be met; a close proximity to the hospital, sufficient stability of the condition

to stay at home, and ability to contact the HaH team in case of deteriorated health. Ensuring patient safety and person-centred care is essential in HaH, requiring tailored care plans that respect patients' preferences, needs and values.

Strengths and limitations of this HTA

A strength of the present HTA is the selection process to only include studies containing HaH models and populations relevant for Swedish hospital care today and to exclude studies where the in-hospital care does not correspond to current routine. Another strength is that the analysis was restricted to RCTs to limit the risk of confounding factors. However, only few recent RCTs were identified. By limiting the inclusion criteria to RCTs, potentially important well-designed non-RCTs may have been disregarded. A reason for the lack of recent RCTs may be that HaH already has been implemented gradually and afterwards followed up in non-RCTs. The limitation to RCTs might especially also have hindered finding more recent studies and data on staff, patient, and caregiver experiences, which are often explored in other study designs.

Economic aspects

The analyses in this HTA reveal considerable uncertainty regarding cost implications of HaH. In Sweden, substantial cost reductions by HaH have been reported in the region of Skåne (Skånes universitetssjukvård, 2023), yet relevant information (e.g. regarding the patient population and the conditions treated) has not been revealed in that description.

An important question related to both economic and organisational aspects is to which extent HaH increases the need for clinical staff compared to in-hospital care, if e.g. physicians and nurses must spend time moving between patients' homes. Given an aging population the availability of clinical staff in relation to the number of patients in need of speciality care is expected to decrease. Optimal use of the limited resource of clinical personnel as physicians and nurses may thus become even more crucial in future.

The uncertainty of resource implications (both monetary and staff) emphasises the need for close follow up of these aspects to ensure that intended effects are fulfilled and displacement effects avoided.

Agreements and disagreements with other studies and reviews

The literature search identified 17 systematic reviews (SR), five of which were relevant for the question at issue in the present HTA. An overview of all five relevant SRs is provided in Appendix 9 and the two SRs (Edgar et al., 2024 and Patel et al., 2024) considered to be of high quality are presented below.

Edgar et al., 2024 investigates the effectiveness and cost of admission avoidance in an elderly population with different diagnoses. Only two outcomes correspond to those in our HTA (mortality, and patient satisfaction). Regarding mortality, Edgar et al., 2024 reported a RR of 0.88 (0.68 to 1.13) based on 5 studies with a total of 1502 patients. They conclude that there is moderate certainty of evidence that HaH compared to in-hospital care, for a selected group of patients probably make little or no difference for the risk of death. In the present HTA we arrive at a Peto OR of 0.96 (0.50 to 1.86) based on 2 studies without major risk of bias including 1123 patients and the certainty of evidence regarding this comparison was considered low. This difference in assessment may be due to several factors: Compared to the present HTA, Edgar et al., 2024 included several studies excluded from the present HTA as the setting did not correspond to current care in Sweden or due to wrong intervention (the hospital was not responsible for the HaH intervention). Further Edgar et al., 2024 had a less sceptical risk of bias assessment for

the studies also assessed in the present HTA. Regarding costs, Edgar 2024 summarise that HaH probably reduces costs to the health service with a range of different amounts given different methods and resource use.

The other SR considered to be of high quality, Patel et al., 2024, investigates HaH with focus on the use of remote monitoring. Findings in this SR are limited due to a substantial lack of information regarding technology and HaH applied in the studies. Costs of care, specifically the difference between automated and manual monitoring, are discussed in the SR however given the heterogeneity of studies and the lack of information no conclusion was reached.

Table 2: Other relevant published systematic reviews in the field with high quality (QUICKSTAR level >=5) (for a complete table see Appendix 9)

Systematic review	**Research question**	**Included studies** (N, study design), overlap with present HTA	**Conclusion**	**QUICKSTAR* level (rational)**	**Comment**
Edgar 2024	"To determine the effectiveness and cost of managing patients with admission avoidance hospital at home compared with inpatient hospital care".	20 RCTs 16 of these also identified in the present HTA, 8 of these included in present HTA)	"Admission avoidance hospital at home, with the option of transfer to hospital, may provide an effective alternative to inpatient care for selected patients who require hospital admission. The 20 trials included in this review were conducted in several different countries. Although the health systems in these countries vary with respect to the way healthcare financing is structured, the policy objectives are the same, with admission avoidance hospital at home being provided to control costs and reduce demand for inpatient hospital beds"	6 (?) (yet, optimistic risk of bias assessment, use of fixed effects analysis across studies in different patient populations)	Different definition of HaH compared to the present HTA as it does not require that the hospital has main responsibility. Conclusions overall given a higher certainty of evidence than in the present HTA - partly given a less problematic view on RoB of included studies.
Patel, 2024	"To examine randomised controlled trials (RCTs) of "hospital at home" (HAH) for admission avoidance in adults presenting with acute physical illness to identify the use of vital sign monitoring approaches and	21 RCTs (16 studies also identified in the present HTA, of these 7 included in the present HTA)	"This review highlights gaps in the reporting and evidence base informing remote vital sign monitoring in alternatives to admission for acute illness, despite expanding implementation in clinical practice. Although continuous vital sign monitoring using wearable devices may offer added benefit, its use in existing RCTs is limited. Recommendations for the implementation and evaluation of remote monitoring in future clinical trials are proposed"	6	Note: main focus on remote vital sign monitoring.

	evidence for their effectiveness”				

* Quickstar -a stepwise tool developed by The Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU) for assessment of risk of bias/systematic errors in SRs. The steps are: 1. Definition of PICO and literature search; 2. Inclusion/exclusion according to PICO, listing of included studies; 3. Risk of bias assessments; 4. Evidence synthesis/meta-analyses; 5. Certainty of evidence consideration; 6. Documentation of excluded studies, conflicts of interest, and an a priori published SR protocol.

14 Future perspectives

Scientific knowledge gaps
The certainty of evidence regarding benefits and risks of HaH compared to in-hospital care is low or very low for the comparisons considered important in this analysis.

HaH research has been conducted since at least the millennium. However, due to advances in technology and medicine, and corresponding changes in healthcare routine, also HaH models are subject to change and especially studies of HaH as an alternative to current in-hospital care are needed. Additionally, there is significant variation between patient groups, as well as hospital organisations worldwide which limit generalisability of findings. Further, a lack of consistency in the measurement of outcomes was noted. To enhance the certainty of evidence, further high-quality studies are needed. A systematic review of non-RCTs for a more precisely defined research question may be considered.

Ongoing research
In the search of the clinical trials registry (https://clinicaltrials.gov), 233 trials were identified, of which nine studies were considered relevant for this report and are presented in Appendix 10.

An emerging trend in ongoing studies is the intensified collaboration between different healthcare services, e.g. in an ongoing study in Denmark involving over 800 acutely ill elderly patients (NCT05360914). This study compares traditional hospital care with a HaH model that includes a new care pathway involving acute teams in the municipalities who initiate the treatment of the patient. In this study, the treatment course is discussed with the emergency department specialist, who can determine if e.g. a check-up in the emergency department, for example with an X-ray, is required.

Another development is that innovation in medicine and technology may enable treatment in a HaH setting. For instance, one ongoing study (NCT05419115) investigates a new formulation of a pH-neutral furosemide administered subcutaneously via a small patch pump to support early discharge of patients suffering from heart failure.

Further identified ongoing studies are likely to contribute to knowledge regarding HaH models in health conditions not investigated in the studies included in this HTA, such as mild acute pancreatitis, cirrhosis with ascites, and patients who have undergone bariatric sleeve gastrectomy.

This report concerns HaH models that include physical home visits of the healthcare staff. The search of the clinical trials registry also identified ongoing studies with the objective to investigate whether telemedicine/telemonitoring can improve the scalability and efficiency of HaH models and reduce the need for physical attendance, especially of physicians.

15 Participants in the project

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Karolina Larsson, MD, PhD, Region Västra Götaland, Department of Research, Development, Education and Innovation, Sahlgrenska University Hospital, contributed to the definition of the research question at issue and the initial discussion regarding relevance of studies with focus on the relevance of the comparator group in relation to current clinical practice in Sweden.

Declaration of interests

The participants in the project declare no conflict of interest.

Project time

The HTA was accomplished during the period of 2024-04-10 to 2025-05-28.

Literature searches were conducted 2024-05-14, with an update 2024-06-28.

Components of this Health Technology Assessment

- ✓ Description of methods
- ✓ PICO
- ✓ Full literature search
- ✓ Flowchart
- ✓ Selection based on relevance
- ✓ Quality assessment
- ✓ Data tabulation
- ✓ Evidence synthesis
- ✓ Meta-analysis
- ✓ Certainty of evidence by GRADE
- ✓ Summary
- ✓ Economical aspects
- ✓ Organisational aspects
- ✓ Ethical aspects
- ✓ Ongoing studies
- ✓ Excluded articles
- ✓ Participation of experts
- ✓ External review
- ✓ Knowledge gaps identified
- ✓ Conflict of interest reported

Appendix 1: PICO, study selection, search strategies, and references

Question(s) at issue:

For adult patients with conditions usually hospitalised (according to current standard of treatment in Sweden) - are there clinical benefits and what are the risks when receiving hospital care at home - compared to in-hospital care?

PICO	
P	Adult[1] patients with conditions[2] usually hospitalised according to current healthcare routine in Sweden. P1: Studies with population of patients with specific conditions (eg. heart failure, COPD, neurological disease, infection). P2: Studies including patients with differing specified conditions
I	Hospital at home[3] - a care model providing healthcare with visits in the patient's home for patients who otherwise would need hospitalisation.
C	In-hospital care (without study-specific set up)
O	Mortality (primary outcome) Change in health status (according to validated scale) Emergency department visits Complications (excluding mortality) (including infections) Health related quality of life (based on validated scales) Patient experience/satisfaction (including sense of security) (based on validated scales) Staff experience (based on validated scales) Experience of close relatives (based on validated scales) Readmission (after discharge from hospital at home or in hospital care) Length of stay (of hospital at home or in hospital care)

1 During the in- exclusion process, the focused question was limited to an adult population after registration of the first protocol in Prospero, but prior to quality assessment of studies and data extraction.

2 Studies regarding the following populations will be excluded:

Studies with broad patient populations without condition-specific inclusion criteria, studies regarding patients with psychiatric diseases requiring hospitalisation, and studies with patients living in residential care.

3 The hospital is in charge, i.e. studies where the general practitioner (GP) is in charge for the care at home will be excluded.

Eligibility criteria

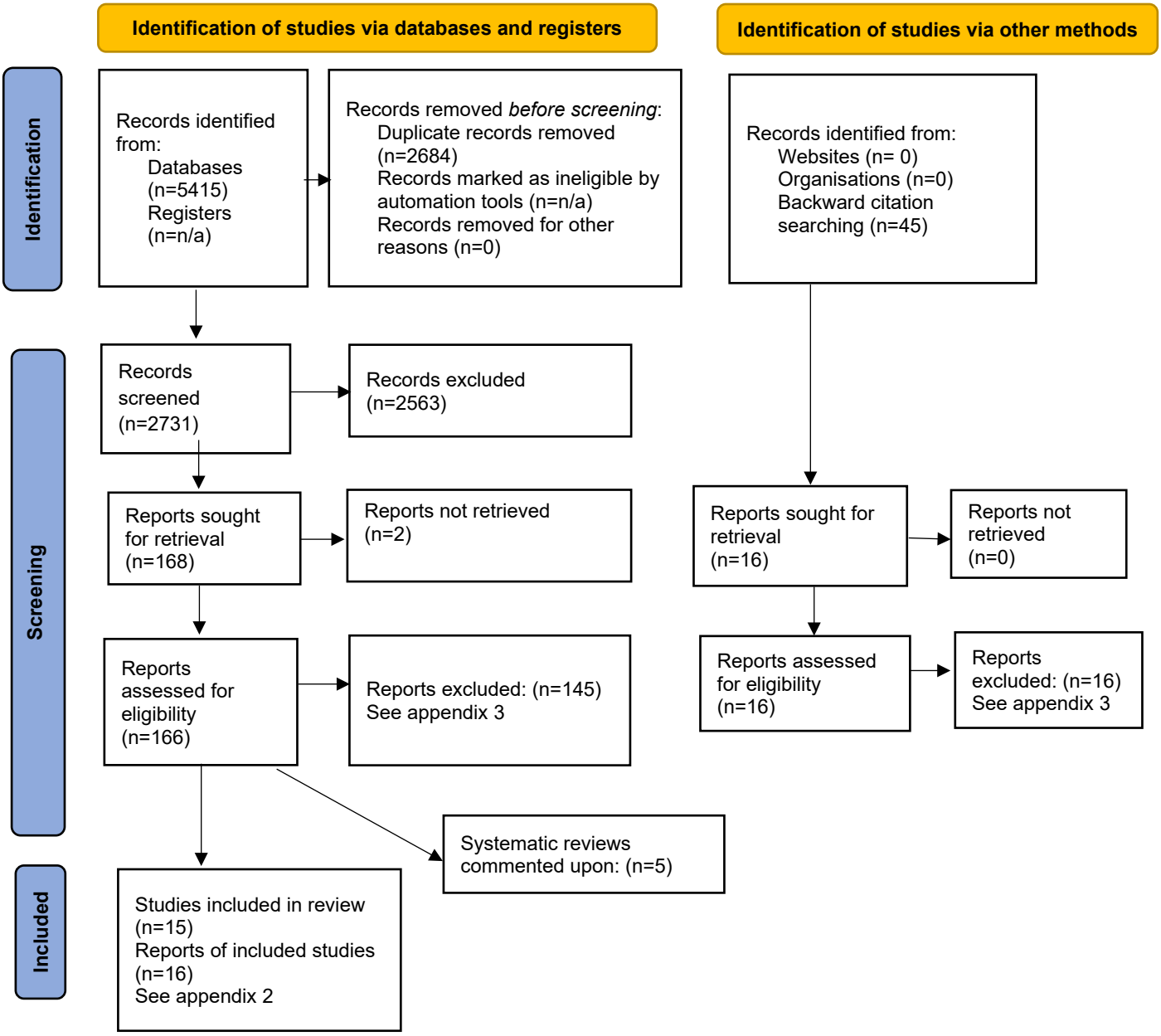
Study design:
Randomised controlled trials
Systematic reviews, only to be commented upon

Language:
English, Swedish, Norwegian, Danish

Publication date:
No limit for randomised controlled trials, systematic reviews published from 2019-

Selection process – flow diagram

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources



From: Page et al., 2021

Search strategies

Searches were originally performed in May 2024. After going through the search results, additional search terms were identified and searches were updated in June 2024, and it is the updated search strategies that are listed below.

Database: Ovid MEDLINE(R) ALL (OvidSP)
Date: 28 June 2024
No. of results: 1,385

#	Searches	Results
1	Home Care Services, Hospital-Based/	1992
2	(hospital at home or hospital in the home or in-home hospital or home hospital or home based hospital or hospital care at home or hospital care in the home or advanced care at home or advanced care in the home or home hospitali#ation or hospital level care at home or hospital level care in patient* or virtual ward*).ab,ti,kf.	1664
3	(early discharge or early supported discharge).ab,ti,kf.	3768
4	1 or 2 or 3	6981
5	(Randomized Controlled Trial or Controlled Clinical Trial or Pragmatic Clinical Trial or Equivalence Trial or Clinical Trial, Phase III).pt.	711785
6	exp Randomized Controlled Trial/ or exp Randomized Controlled Trials as Topic/ or Controlled Clinical Trial/ or exp Controlled Clinical Trials as Topic/ or Random Allocation/ or Double-Blind Method/ or Single-Blind Method/ or Placebos/ or Control Groups/	999188
7	(random* or sham or placebo*).ti,ab,hw,kf.	1920377
8	((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf.	276655
9	((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf.	1858
10	(control* adj3 (study or studies or trial* or group*)).ti,ab,kf.	1307557
11	(Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw,kf.	58383
12	allocated.ti,ab,hw.	89768
13	((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw,kf.	48266
14	((equivalence or superiority or non-inferiority or noninferiority) adj3 (study or studies or trial*)).ti,ab,hw,kf.	13561
15	(pragmatic study or pragmatic studies).ti,ab,hw,kf.	660
16	((pragmatic or practical) adj3 trial*).ti,ab,hw,kf.	8544
17	((quasiexperimental or quasi-experimental) adj3 (study or studies or trial*)).ti,ab,hw,kf.	13946
18	(phase adj3 (III or "3") adj3 (study or studies or trial*)).ti,hw,kf.	37132
19	or/5-18	2749990
20	Meta-Analysis.pt.	203162
21	Meta-analysis/ or Systematic review/ or exp Meta-analysis as topic/ or Systematic Reviews as Topic/ or exp Technology assessment, biomedical/	394017
22	((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ab,kf,ti.	368602
23	((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ab,kf,ti.	17642
24	((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ab,kf,ti.	42902
25	(data synthes* or data extraction* or data abstraction*).ab,kf,ti.	45710
26	(handsearch* or hand search*).ab,kf,ti.	11639
27	(mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ab,kf,ti.	38736
28	(met analy* or metanaly* or technology assessment* or HTA or HTAs or technology overview* or technology appraisal*).ab,kf,ti.	13155

29	(meta regression* or metaregression*).ab,kf,ti.	16554
30	(meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw.	524501
31	(medline or cochrane or pubmed or medlars or embase or cinahl).ab,hw,ti.	385955
32	(cochrane or (health adj2 technology assessment) or evidence report).jw.	21942
33	(comparative adj3 (efficacy or effectiveness)).ab,kf,ti.	19202
34	(outcomes research or relative effectiveness).ab,kf,ti.	11802
35	((indirect or indirect treatment or mixed-treatment) adj comparison*).ab,kf,ti.	3122
36	or/20-35	759621
37	19 or 36	3234370
38	4 and 37	1443
39	**limit 38 to (danish or english or norwegian or swedish)**	**1385**

Database: Embase 1974 to 2024 June 26 (OvidSP)
Date: 28 June 2024
No. of results: 1,261

#	Searches	Results
1	(hospital at home or hospital in the home or in-home hospital or home hospital or home based hospital or hospital care at home or hospital care in the home or advanced care at home or advanced care in the home or home hospitali#ation or hospital level care at home or hospital level care in patient* or virtual ward*).ab,ti,kf.	2637
2	(early discharge or early supported discharge).ab,ti,kf.	6353
3	1 or 2	8838
4	exp randomized controlled trial/ or "randomized controlled trial (topic)"/ or controlled clinical trial/ or "controlled clinical trial (topic)"/ or exp randomization/ or double blind procedure/ or single blind procedure/ or placebo/ or control group/	1727056
5	(random* or sham or placebo*).ti,ab,hw,kf.	2691329
6	((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf.	377628
7	((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf.	2409
8	(control* adj3 (study or studies or trial* or group*)).ti,ab,kf.	1820961
9	(Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw,kf.	74379
10	allocated.ti,ab,hw.	115800
11	((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw,kf.	92847
12	((equivalence or superiority or non-inferiority or noninferiority) adj3 (study or studies or trial*)).ti,ab,hw,kf.	20158
13	(pragmatic study or pragmatic studies).ti,ab,hw,kf.	1026
14	((pragmatic or practical) adj3 trial*).ti,ab,hw,kf.	9649
15	((quasiexperimental or quasi-experimental) adj3 (study or studies or trial*)).ti,ab,hw,kf.	21741
16	(phase adj3 (III or "3") adj3 (study or studies or trial*)).ti,hw,kf.	137659
17	or/4-16	3969819
18	exp meta analysis/ or "systematic review"/ or "meta analysis (topic)"/ or "systematic review (topic)"/ or biomedical technology assessment/	688219
19	((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ab,kf,ti.	445533

20	((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ab,kf,ti.	20330
21	((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ab,kf,ti.	60163
22	(data synthes* or data extraction* or data abstraction*).ab,kf,ti.	55374
23	(handsearch* or hand search*).ab,kf,ti.	14183
24	(mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ab,kf,ti.	51128
25	(met analy* or metanaly* or technology assessment* or HTA or HTAs or technology overview* or technology appraisal*).ab,kf,ti.	22357
26	(meta regression* or metaregression*).ab,kf,ti.	20213
27	(meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw.	814911
28	(medline or cochrane or pubmed or medlars or embase or cinahl).ab,hw,ti.	500049
29	(cochrane or (health adj2 technology assessment) or evidence report).jx.	32020
30	(comparative adj3 (efficacy or effectiveness)).ab,kf,ti.	28094
31	(outcomes research or relative effectiveness).ab,kf,ti.	16996
32	((indirect or indirect treatment or mixed-treatment) adj comparison*).ab,kf,ti.	5912
33	or/18-32	1087390
34	17 or 33	4638710
35	3 and 34	1782
36	limit 35 to (embase or medline)	1303
37	**limit 36 to (danish or english or norwegian or swedish)**	**1261**

Database: Web of Science Core Collection *(Entitlements: - WOS.SCI: 1970 to 2024; - WOS.AHCI: 1975 to 2024; - WOS.BHCI: 2005 to 2024; - WOS.BSCI: 2005 to 2024; - WOS.ESCI: 2019 to 2024; - WOS.ISTP: 1990 to 2024; - WOS.SSCI: 1970 to 2024; - WOS.ISSHP: 1990 to 2024)*
Date: 28 June 2024
No. of results: 939

#	Search Query	Results
1	”hospital at home” or ”hospital in the home” or ”in-home hospital” or ”home hospital” or ”home based hospital” or ”hospital care at home” or ”hospital care in the home” or ”advanced care at home” or ”advanced care in the home” or ”home hospitalisation” or ”home hospitalization” or ”hospital level care at home” or ”hospital level care in patient*” or ”virtual ward*” or ”early discharge” or ”early supported discharge” (Topic)	5834
2	(randomised OR randomized OR randomisation OR randomization OR placebo* OR (random* AND (allocat* OR assign*)) OR (blind* AND (single OR double OR treble OR triple))) (Topic)	1575467
3	#2 AND #1	973
4	**#2 AND #1 and English (Languages)**	**939**

Database: The Cochrane Library
Date: 28 June 2024
No of results: 1,047 ref
Cochrane reviews: 24
Trials: 1,023

ID	Search	Hits

#1	("hospital at home" or "hospital in the home" or "in-home hospital" or "home hospital" or "home based hospital" or "hospital care at home" or "hospital care in the home" or "advanced care at home" or "advanced care in the home" or "home hospitalisation" or "home hospitalization" or "hospital level care at home" or "hospital level care in patient" or "hospital level care in patients" or "virtual ward" or "virtual wards" or "early discharge" or "early supported discharge"):ti,ab,kw (Word variations have been searched)	1416
#2	MeSH descriptor: [Home Care Services, Hospital-Based] explode all trees	285
#3	#1 OR #2	1641
#4	(clinicaltrials OR trialsearch):so	506744
#5	(conference proceeding):pt	244130
#6	#4 OR #5	750874
#7	**#3 NOT #6, in Trials and Cochrane reviews**	**1047**

Database: CINAHL via EBSCOhost Research Databases
Date: 28 June 2024
No. of results: 783

#	Query	Limiters/Expanders	Results
S41	**S1 AND S39**	**Expanders - Apply related words; Apply equivalent subjects Narrow by Language: - english Search modes - Find all my search terms**	**783**
S40	S1 AND S39	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	794
S39	S21 OR S38	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	1,043,902
S38	S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	346,295
S37	TI (((indirect or "indirect treatment" or mixed-treatment) N0 comparison*)) OR AB (((indirect or "indirect treatment" or mixed-treatment) N0 comparison*)) OR KW (((indirect or "indirect treatment" or mixed-treatment) N0 comparison*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	1,311
S36	TI ("outcomes research" or "relative effectiveness") OR AB ("outcomes research" or "relative effectiveness") OR KW ("outcomes research" or "relative effectiveness")	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	4,021
S35	TI (comparative N3 (efficacy or effectiveness)) OR AB (comparative N3 (efficacy or effectiveness)) OR KW (comparative N3 (efficacy or effectiveness))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	7,355
S34	SO (cochrane OR (health N2 "technology assessment") OR "evidence report")	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	10,045
S33	AB (medline OR cochrane OR pubmed OR medlars OR embase OR cinahl) OR DE (medline OR cochrane OR pubmed OR medlars OR	Expanders - Apply related words; Apply equivalent	185,527

	embase OR cinahl) OR MJ (medline OR cochrane OR pubmed OR medlars OR embase OR cinahl) OR MW (medline OR cochrane OR pubmed OR medlars OR embase OR cinahl) OR SU (medline OR cochrane OR pubmed OR medlars OR embase OR cinahl) OR TI (medline OR cochrane OR pubmed OR medlars OR embase OR cinahl)	subjects Search modes - Find all my search terms	
S32	TX (meta-analy* OR metaanaly* OR "systematic review*" OR "biomedical technology assessment*" OR "bio-medical technology assessment*")	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	275,032
S31	TI ("meta regression*" OR metaregression*) OR AB ("meta regression*" OR metaregression*)	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	5,405
S30	TI ("met analy*" OR "metanaly*" OR "technology assessment*" OR HTA OR HTAs OR "technology overview*" OR "technology appraisal*") OR AB ("met analy*" OR "metanaly*" OR "technology assessment*" OR HTA OR HTAs OR "technology overview*" OR "technology appraisal*")	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	4,986
S29	TI (("mantel haenszel" OR peto OR "der simonian" OR dersimonian OR "fixed effect*" OR "latin square*")) OR AB (("mantel haenszel" OR peto OR "der simonian" OR dersimonian OR "fixed effect*" OR "latin square*"))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	10,487
S28	TI (handsearch* OR "hand search*") OR AB (handsearch* OR "hand search*")	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	5,139
S27	TI ("data synthes*" OR "data extraction*" OR "data abstraction*") OR AB (("data synthes*" OR "data extraction*" OR "data abstraction*"))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	16,120
S26	TI (((integrative N3 (review* OR overview*)) OR (collaborative N3 (review* OR overview*)) OR (pool* N3 analy*))) OR AB (((integrative N3 (review* OR overview*)) OR (collaborative N3 (review* OR overview*)) OR (pool* N3 analy*)))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	21,303
S25	TI (((quantitative N3 (review* OR overview* OR synthes*)) OR (research N3 (integrati* OR overview*)))) OR AB (((quantitative N3 (review* OR overview* OR synthes*)) OR (research N3 (integrati* OR overview*))))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	8,609
S24	TI (((systematic* N3 (review* OR overview*)) OR (methodologic* N3 (review* OR overview*)))) OR AB (((systematic* N3 (review* OR overview*)) OR (methodologic* N3 (review* OR overview*))))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	168,957
S23	MH ("meta analysis" OR "systematic review")	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	166,254
S22	PT "meta analysis"	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	58,534
S21	S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	799,216
S20	TI (phase N3 (III or 3) N3 (study or studies or trial*)) OR SU (phase N3 (III or 3) N3 (study or studies or trial*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	7,313

S19	TI ((quasiexperimental or quasi-experimental) N3 (study or studies or trial*)) OR AB ((quasiexperimental or quasi-experimental) N3 (study or studies or trial*)) OR SU ((quasiexperimental or quasi-experimental) N3 (study or studies or trial*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	21,811
S18	TI ((pragmatic or practical) N3 trial*) OR AB ((pragmatic or practical) N3 trial*) OR SU ((pragmatic or practical) N3 trial*)	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	3,992
S17	TI (pragmatic study or pragmatic studies) OR AB (pragmatic study or pragmatic studies) OR SU (pragmatic study or pragmatic studies)	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	6,595
S16	TI ((equivalence or superiority or non-inferiority or noninferiority) N3 (study or studies or trial*)) OR AB ((equivalence or superiority or non-inferiority or noninferiority) N3 (study or studies or trial*)) OR SU ((equivalence or superiority or non-inferiority or noninferiority) N3 (study or studies or trial*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	5,774
S15	TI ((open label or open-label) N5 (study or studies or trial*)) OR AB ((open label or open-label) N5 (study or studies or trial*)) OR SU ((open label or open-label) N5 (study or studies or trial*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	16,661
S14	TI allocated OR AB allocated OR SU allocated	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	25,463
S13	TI (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*) OR AB (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*) OR SU (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*)	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	65,589
S12	TI (control* N3 (study or studies or trial* or group*)) OR AB (control* N3 (study or studies or trial* or group*)) OR SU (control* N3 (study or studies or trial* or group*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	501,419
S11	TI ((singl* or doubl* or tripl* or trebl*) N0 (blind* or dumm* or mask*)) OR AB ((singl* or doubl* or tripl* or trebl*) N0 (blind* or dumm* or mask*)) OR SU ((singl* or doubl* or tripl* or trebl*) N0 (blind* or dumm* or mask*))	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	89,023
S10	TI (random* or sham or placebo*) OR AB (random* or sham or placebo*) OR SU (random* or sham or placebo*)	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	555,051
S9	MH Control Group	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	14,979
S8	MH Placebos	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	14,112
S7	MH Triple-Blind Studies	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	305
S6	MH Single-Blind Studies	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	16,088

S5	MH Double-Blind Studies	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	54,083
S4	MH Random Assignment	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	85,646
S3	MH Randomized Controlled Trials+	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	144,323
S2	PT Randomized Controlled Trial	Expanders - Apply related words; Apply equivalent subjects Search modes - Find all my search terms	156,726
S1	TI ("hospital at home" or "hospital in the home" or "in-home hospital" or "home hospital" or "home based hospital" or "hospital care at home" or "hospital care in the home" or "advanced care at home" or "advanced care in the home" or "home hospitalisation" or "home hospitalization" or "hospital level care at home" or "hospital level care in patient" or "hospital level care in patients" or "virtual ward" or "virtual wards" or "early discharge" or "early supported discharge") OR AB ("hospital at home" or "hospital in the home" or "in-home hospital" or "home hospital" or "home based hospital" or "hospital care at home" or "hospital care in the home" or "advanced care at home" or "advanced care in the home" or "home hospitalisation" or "home hospitalization" or "hospital level care at home" or "hospital level care in patient" or "hospital level care in patients" or "virtual ward" or "virtual wards") OR SU ("hospital at home" or "hospital in the home" or "in-home hospital" or "home hospital" or "home based hospital" or "hospital care at home" or "hospital care in the home" or "advanced care at home" or "advanced care in the home" or "home hospitalisation" or "home hospitalization" or "hospital level care at home" or "hospital level care in patient" or "hospital level care in patients" or "virtual ward" or "virtual wards" or "early discharge" or "early supported discharge")	Search modes - Find all my search terms	3,555

Source	Search terms / Browsing	No. of results	No. of relevant results
SBU www.sbu.se ”Visa även träffar äldre än 5 år”	Browsat Rapporter		0
Folkehelseinstituttet (Norge) https://www.fhi.no/publ/	Browsat kategori Metodevurdering		0
Behandlingsrådet (Danmark) https://behandlingsraadet.dk/	Browsat		0
Nationale Kliniske Anbefalinger og Retningslinjer (Danmark) https://www.sst.dk/da/Fagperson/Retningslinjer-og-procedurer/NKA-og-NKR/NKR-og-NKA-efter-omraade	Browsat		0
CAMTÖ https://www.regionorebrolan.se/sv/forskning/kontakt-och-organisation/hta-enheten-camto/	Browsat		0
HTA Region Stockholm https://www.chis.regionstockholm.se/hta/rapporter/	Browsat		0

Regional samverkansgrupp HTA (tidigare Metodrådet) i Sydöstra sjukvårdsregionen https://sydostrasjukvardsregionen.se/samverkansgrupper/hta/genomforda-bedomningar/	Browsat		0
HTA Syd https://vardgivare.skane.se/kompetens-utveckling/sakkunniggrupper/hta-skane/#110365	Browsat		0
Medicinska rådet, Region Dalarna https://www.regiondalarna.se/plus/vard/utveckling-och-utbildning/kunskapsstyrning/vetenskapliga-radet/#:~:text=Vetenskapliga%20r%C3%A5det%20inr%C3%A4ttades%202024.,beslut%20i%20%C3%B6vergripande%20medicinska%20fr%C3%A5gor.	Browsat		0

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A comprehensive review of reference lists brought 45 new records.

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Project: Hospital at home

Appendix 2 – Characteristics of included studies

Author Year Country	Length of Follow-Up for data collection	Study Groups; Intervention vs control	Patients (n)	Proportion meeting eligibility criteria Site of recruitment	Mean Age (years)	Male (%)	Support at home	Eligibility criteria regarding geographic distance	Outcome variables
Collins et al., 2014 United Kingdom	6 months	I: Early supported discharge with specialist respiratory care at home C: Acute hospital care	Respiratory infection I: 8 C: 6	21% (42 / 200) of screened patients Patients admitted to hospital from ED or via acute medical admissions unit and GP with pneumonia or lower respiratory tract infection	65 I: 61 C: 70	I: 63% C: 33%	Inclusion criteria: Can manage activities of daily living with current support Exclusion criteria: Unable to manage at home with maximal support	Not reported	Mortality, Change in health status, Complications, HrQoL, Readmission, Length of stay
Cotton et al., 2000 United Kingdom	60 days	I: Early discharge with home treatment supported by respiratory nurses C: Conventional hospital management	COPD I: 41 C: 40	37% (151 / 412) of COPD admissions Respiratory nurse visiting medical ward to identify patients	I: 66 C: 68	I: 46% C: 40%	I: Assessed by a respiratory nurse first day of discharge Nurse supported early discharge	Population in east Glascow (Royal Glascow Infirmary University Hospital)	Mortality, Readmission
Davies et al., 2000 United Kingdom	3 months	I: Nurse administered homecare C: Inpatient care	COPD I: 100 C: 50	33% (192 / 583) of screened patients Patients assessed for eligibility at an ED	I: 70 C: 70	I: 45% C: 60 %	"social support was immediately available if required"	Not reported	Mortality, Change in health status, HrQoL, Readmission
Echevarria et al., 2018 United Kingdom	90 days	I: Hospital at home (1-2 visits a day by nurse) C: Usual care in hospital	COPD I: 62 C: 58	58% (120 / 207) of screened patients Patients with COPD admitted to hospital after contact with ED	I: 71 C: 69	I: 47% C: 48%	Prior social care I: 5% C: 1,7%	Not reported	Mortality, HrQoL, Patient experience, Readmission, Length of stay
Harris et al., 2005	90 days	I: Hospital at home-care: Admission avoidance	Mixed group	34 % (285 /851) of patients referred either from ED or as early discharge	80	Not mentioned	Inclusion criteria that patients had suitable living arrangements	Not reported	Mortality, Change in health status, Complications

Appendix 2 – Characteristics of included studies

Author Year Country	Length of Follow-Up for data collection	Study Groups; Intervention vs control	Patients (n)	Proportion meeting eligibility criteria Site of recruitment	Mean Age (years)	Male (%)	Support at home	Eligibility criteria regarding geographic distance	Outcome variables
New Zealand		and Early supported discharge C: Hospital care	I: 143 C: 142 Subgroups Early discharge I: 104 C: 105 Admission prevention I: 39 C: 37				The service included intensive home support I: nurse available 7 days a week, 10 h per day. Multidisiplinary team		HrQoL, Caregiver experience, Readmission
Levine et al., 2018 USA	30 days	I: Home hospital care C: Hospital care	Mixed group I: 10 C:11	37 % (21/57) of patients assessed for eligibility Patients assessed for eligibility at an ED	I: 65 C: 60	I: 78% C: 27%	Social support was not an inclusion criterion but all participants reported excellent social support Twice daily nurse visit, once daily physician visit, in- home diagnostics, continuous monitoring, intravenous medication, physician available 24/7.	Lived within catchment area	Mortality, ED-visits, Complications, Patient experience, Readmission, Length of stay
Levine et al., 2020 USA	30 days After discharge	I; Home hospital care C; Hospital care	Mixed group I: 43 C: 48	37% (91/248) of patients assessed for eligibility	I: 80 C:72	I: 65% C: 62%	Not excluded if living alone Twice daily nurse visit, once daily	5-mile catchment area	Mortality, ED-visits, Complications, Patient

Appendix 2 – Characteristics of included studies

Author Year Country	Length of Follow-Up for data collection	Study Groups; Intervention vs control	Patients (n)	Proportion meeting eligibility criteria Site of recruitment	Mean Age (years)	Male (%)	Support at home	Eligibility criteria regarding geographic distance	Outcome variables
				Patients assessed for eligibility at an ED			physician visit, in-home diagnostics, continuous monitoring, intravenous medication, physician available 24/7.		experience, Readmission, Length of stay
Mendoza et al., 2009 Spain	12 months	I: Hospital care at home C: Hospital care	HF I: 37 C: 34	Not reported Patients recruited at ED	I: 78 C: 80	I: 81% C: 90%	Excluded if not guaranteed all day supervision	Within 10 km from hospital	Mortality, HrQoL, Readmission, Length of stay
Moss et al., 2024 USA	30 days after discharge	I: Home hospital vs C: Hospital	Mixed diagnos I: 43 C: 48 Caregivers I: 22 C: 11	Not applicable – study in caregiver to patients Patients recruited at ED	Patients: I: 85 C: 82	Patients: I: 23% C: 18% (Patients with carers)	Twice daily nurse visit, once daily physician visit, in-home diagnostics, continuous monitoring, intravenous medication,	Not reported	Caregiver experience
Nissen et al., 2007 Danmark	2 months	I: Nurse assisted home care C: Hospital treatment	COPD I: 22 C: 22	11% (44/ 390) of patients admitted due to exacerbation of COPD Patients recruited from medical ward	I: 69 C: 69	I: 55% C: 60%	Not reported	Exclusion criteria: Not living in the catchment area	Mortality, Complications, Readmission, Length of stay
Ojoo et al., 2002 United Kingdom	2 weeks after discharge	I: Hospital at home. Daily monitoring by Respiratory outreach nurses	COPD I: 30 C: 30	36% (117 / 328) of patients admitted to the medical chest unit	I: 70 C: 70	I: 53% C: 50%	I: 4 of 30 received home help/district nurse	Exclusion if residence over 15 miles from hospital	Mortality

Appendix 2 – Characteristics of included studies

Author Year Country	Length of Follow-Up for data collection	Study Groups; Intervention vs control	Patients (n)	Proportion meeting eligibility criteria Site of recruitment	Mean Age (years)	Male (%)	Support at home	Eligibility criteria regarding geographic distance	Outcome variables
		C: Inpatient care		Patients recruited from medical chest unit			C: 4 of 30 received home help/district nurse		
Patel et al., 2008 Sweden	12 months	I: Hospital care at home C: hospital care	HF I:13 C:18	3% (31/1127) of screened patients with CHF Patients recruited from an ED, a heart failure outpatient clinic or a medical ward.	I:77 C:78	I:46% C:83%	Not required	Not reported	Mortality, Changes in health status, ED-visits, HrQoL
Shepperd et al., 2021a United Kingdom	12 months	I: CGAHAH (Comprehensive geriatric assessment hospital at home) C: Hospital care	1055 I: 700 C: 355	55% (2636/4805) potentially eligible, 22% (1055/4805) recruited Patients considered for unplanned hospital admission from acute medical care or home	I: 83 C: 83	I: 39% C: 40%	Caregiver not required Intervention: CGA Multi-disciplinary team	Exclusion criteria was “lived outside the CGA HAH-area"	Mortality, Complications, HrQoL, Lenght of stay
Talcott et al., 2011 USA	2 to 4 days after discharge	I: Hospital-at-home (early discharge) vs C: Hospital Care	121 I: 50 C: 71 (patient episodes)	Not reported, yet difficulties with enrolement reported Patients with post chemotherapy neutropenia at inpatient observation unit	I: 47 C: 66	I: 40% C: 50%	Caregiver not required Intervention: Daily visit from nurse, Home visit by physician 2 to 4 days after discharge	2 hours distance to the hospital	Mortality, Complications, HrQoL

Appendix 2 – Characteristics of included studies

Author Year Country	Length of Follow-Up for data collection	Study Groups; Intervention vs control	Patients (n)	Proportion meeting eligibility criteria Site of recruitment	Mean Age (years)	Male (%)	Support at home	Eligibility criteria regarding geographic distance	Outcome variables
							Self monitoring at home.		
Tibaldi et al., 2009 Italy	6 months	I: Geriatric Home Hospitalization Service vs C: general medical ward	101 I: 48 C: 53	35% (186/528) of patients assessed refusal to participate reduced proportion to 19% (101/528) Patients presenting at ED with acute decompensation of CHF	I: 82 C: 80	I: 46% C: 57%	Inclusion: Appropriate care supervision at home	Hospital catchment area	Mortality, HrQoL, Readmission, Length of stay
Vianello et al., 2013 Italy	3 months	I: Hospital-at-home vs C: Hospitalized group	Neuro-muscular disease with respiratory infection 53 I:26 C:27	53 patients with neuromuscular disease and respiratory infection Patients referred to ED or out-patient clinic	I: 45 C: 47	I: 65% (17 of 26) C: 89% (24 of 27)	Exclusion criteria: No non-professional caregiver or caregiver networks at home	Exclusion criteria: Living outside geographic area covered	Mortality, Complications,

C: Comparator, CHF: Chronic Heart Failure, COPD: Chronic Obstructive Pulmonary Disease, ED: Emergency Departmeng, GP: General Practicioner, HrQoL: Health related quality of life, I: Intervention

Project: Hospital at home
Appendix 3
Excluded articles

Author, year	Reason for exclusion
Aimonino et al., 2008	Wrong population (lack of information on COPD diagnosis and the severity of disease e.g. regarding lung function)
Aimonino et al., 2007	Wrong population (lack of information on COPD diagnosis and the severity of disease e.g. regarding lung function)
Aimonino et al., 2000	Wrong publication type (conference abstract)
Arsenault-Lapierre et al., 2021	Wrong publication type (systematic review) wrong population
Askim et al., 2010	Wrong population (treatment not in line with current healthcare routine in Sweden), wrong comparison
Askim et al., 2006	Wrong population (treatment not in line with current healthcare routine in Sweden), wrong comparison
Askim et al., 2004	Wrong population (treatment not in line with current healthcare routine in Sweden), wrong comparison
Bagust et al., 2002	Wrong population
Bajaj et al., 2006	Wrong intervention (parental care)
Bajwah et al., 2020	Wrong publication type (systematic review)
Bautz-Holter et al., 2002	Wrong intervention (rehabilitation provided by community service)
Björkdahl et al., 2023	Wrong C (not current Swedish standard care)
Blomkvist et al., 2019	Wrong publication type (systematic review)
Board et al., 2000	Wrong P (lack of information on diagnosis) wrong I (unclear regarding hospital responsibility)
Booth et al., 2004	Wrong population and intervention (treatment not in line with current healthcare routine in Sweden)
Boulvain et al., 2004	Wrong population, wrong intervention postnatal care
Bowrey et al., 2015	Wrong comparison (self-care)
Bransgrove et al., 2024	Wrong focus, mapping of Australian research
Brooten et al., 1986	Wrong population (not adult patients)
Brännström et al., 2014	Wrong comparison (care provided mainly by GP, patients not in hospital)
Caplan et al., 1999	Wrong intervention (hospital not in charge of the care at home)
Caplan et al., 2004	Wrong comparison (discharged to home without a discharge plan)
Caplan et al., 2005	Wrong intervention (GP-led)
Caplan et al., 2006	Wrong population (broad patient population without clear differentiation of specified conditions living in residential care)
Casteli et al., 2020	Wrong publication type (review of reviews)
Chua et al., 2022	Wrong publication type (qualitative review)
Clapin et al., 2017	Wrong population (not adult patients)
Coast et al., 1998	Wrong outcome (cost only) based on Richards et al., 1998 which is excluded due to wrong intervention
Coffey et al., 2019	Wrong publication type (narrative review)
Cole et al., 2024	Wrong study design (retrospective randomisation of data)
Connor et al., 2023	Wrong focus, qualitative review mapping research themes
Corcoran et al., 2024	Wrong intervention (telemedicine)
Cordero-Guevara et al., 2022	Wrong publication type (systematic review)
Corwin et al., 2005	Wrong intervention (community care team)

Project: Hospital at home
Appendix 3
Excluded articles

Author, year	Reason for exclusion
Crotty et al., 2002	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Crotty et al., 2003	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Cruz et al., 1997	Wrong population (not adult patients). Wrong intervention, social workers visits
Cunliffe et al., 2004	Wrong intervention (discharge team support)
Dawes et al., 2007	Wrong intervention (early discharge in consultation with specialist nurse)
de Sousa Vale et al., 2020	Wrong study design (systematic review not based on randomized controlled trials, narrative analysis)
Demetriou et al., 2023	Wrong population (children). Wrong focus (burden of hospitalisation in general)
Detollenaere et al., 2023	Wrong publication type (systematic review)
Dhalla et al., 2014	Wrong comparison (care by providers other than the hospital)
Díaz et al., 2005	Wrong language (Spanish)
Donald et al., 1995	Wrong I (rehab team at home)
Donnolley et al., 2004	Wrong intervention (community-based rehabilitation)
Dougherty et al., 1998	Wrong population (not adult patients)
Dougherty et al., 1999	Wrong population (not adult patients)
Elliott et al., 2020	Wrong publication type (scoping review)
Esmond et al., 2006	Wrong study design (non-randomised)
Fabris et al., 2004	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Fjaertoft et al., 2003	Wrong intervention (hospital not in charge of the care at home; primary care managed most of the care, the mobile team mainly had a coordinating and planning role)
Fjaertoft et al., 2004	Wrong comparison
Fjaertoft et al., 2005	Wrong comparison
Fjaertoft et al., 2011	Wrong comparison
Flierman et al., 2023	Wrong publication type (systematic review), wrong comparator
Forsander et al., 1995	Wrong intervention (training apartment)
Gámez-López et al., 2012	Wrong language (Spanish)
Gardner et al., 2019	Wrong publication type (systematic review) wrong focus (risk assessment)
Gjelsvik et al., 2014	Wrong intervention (rehabilitation at home not provided by the hospital)
Goossens et al., 2013	Wrong intervention (visits by community nurse)
Goossens et al., 2020	Wrong publication type (systematic review)
Grande et al., 1999	Wrong P I and C (patients with different diagnoses requiring long term palliative care) receiving complex care not in line with current healthcare routine in Sweden
Grande et al., 2000	Wrong P I and C (patients with different diagnoses requiring long term palliative care) receiving complex care not in line with current healthcare routine in Sweden
Gregory et al., 2019	Wrong population (not adult patients)
Gunnell et al., 2000	Wrong population (broad patient population without clear differentiation of specified conditions)

Project: Hospital at home
Appendix 3
Excluded articles

Author, year	Reason for exclusion
Hansson et al., 2013	Wrong study design (case study)
Hendricks et al., 2011	Wrong O (focus costs)
Hernandez et al., 2003	Wrong population (all included patients did not require hospitalization)
Hill et al., 2000	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Hobohm et al., 2020	Wrong publication type (conference abstract)
Hofstad et al., 2014	Wrong intervention (rehabilitation at home not provided by the hospital)
Holmqvist et al., 1998	Wrong comparison (comparison not in alignment with current healthcare routine in Sweden)
Hughes et al., 1990	Wrong population (patients included because of their status as "severely disabled veterans" and not because of specified conditions). Wrong intervention (patients require long term care, not hospitalization)
Hwang et al., 2009	Wrong language (Korean)
Ibrahim et al., 2019a	Wrong population (not adult patients)
Ibrahim et al., 2019b	Wrong population (not adult patients)
Indredavik et al., 2000	Wrong comparison
Indredavik et al., 2008	Wrong comparison
Jee et al., 2022	Systematic review not looking at hospital at home
Jones et al., 1999	Wrong outcome (cost only), based on Wilson et al., 1999 which is excluded due to wrong intervention
Kalra et al., 2000	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Karlsson et al., 2016	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Karlsson et al., 2020	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Kessler et al., 2018	Wrong intervention (self-care, home monitoring)
King et al., 2000	Wrong intervention and comparison (outpatient chemotherapy vs domiciliary chemotherapy)
Kirkland et al., 2020	Wrong publication type (scoping review)
Knight et al., 2023	Systematic review studying taxonomy of care models
Kotronias et al., 2018	Wrong intervention (early discharge with no hospital at home)
Lawrence et al., 2022	Wrong publication type (systematic review), wrong population (pediatric)
Lee et al., 2022	Wrong intervention (medical day care)
Lee et al., 2023	Wrong publication type (systematic review)
Leff et al., 2005	Wrong study design (nonrandomised). Wrong comparison (outpatient rehabilitation)
Leong et al., 2021	Wrong publication type (review of reviews)
Levine et al., 2021	Wrong study design (qualitative)
Mahomed et al., 2008	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Mayo et al., 2008	Wrong comparison (outpatient appointments)
McNamee et al., 1998	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Mentz et al., 2018	Wrong publication type (research letter, no results, describes a palliative care intervention)

Project: Hospital at home
Appendix 3
Excluded articles

Author, year	Reason for exclusion
Mittaine-Marzac et al., 2021	Wrong publication type (systematic review with several different comparisons, Hospital at Home not in focus)
Mokhachane et al., 2006	Wrong population, very low birth-weight children. Wrong intervention, no Hospital at Home.
Mäkela et al., 2020	Wrong study design (qualitative)
Namnabati et al., 2019	Wrong population (children with neonatal jaundice), wrong intervention (parental care)
Nicholson et al., 2001	Wrong outcome (cost only)
Nordin et al., 2015	Wrong study design (qualitative)
Norman et al., 2023	Wrong publication type (systematic review)
O'Cathain et al., 1994	Wrong study design (non-randomised)
Oluyase et al., 2021	Systematic review looking at several interventions
Ortenstrand et al., 1999	Wrong population (not adult patients)
Ortenstrand et al., 2001	Wrong population (not adult patients)
Osborne et al., 2019	Wrong study design, qualitative review
Parsons et al., 2020	Wrong intervention (supported discharge planning)
Parsons et al., 2018	Wrong intervention (supported discharge planning)
Patel et al., 2004	Wrong outcome (cost only), based on a study by Kalra et al., 2000 which is excluded due to wrong population
Petrou et al., 2004	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Pettersson et al., 2021	Wrong population (children, jaundice)
Pontin et al., 2003	Wrong publication type (commentary)
Pozzilli et al., 2002	Wrong comparison (ambulatory care)
Puig-Junoy et al., 2007	Wrong outcome (costs only) based on a study by Hernandez et al., 2003 which is excluded due to wrong populaiton
Rafsten et al., 2023	All patients spent longer time in hospital than in present treatment
Rafsten et al., 2020	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Rafsten et al., 2019	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Rasmussen et al., 2016	Wrong intervention (rehabilitation at home not supported by hospital)
Rea et al., 2004	Wrong intervention (admission avoidance, primary care programme)
Ricauda et al., 1998	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Ricauda et al., 2004	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Richards et al., 1998	Wrong population (treatment not in alignment with current healthcare routine in Sweden) Wrong intervention (hospital not in charge of the care at home)
Richards et al., 2005	Wrong intervention (care provided by Primary Health Care)
Rodgers et al., 1997	Wrong intervention (hospital not in charge of the care at home; community-based team provided an in reach service to hospitals
Sartain et al., 2001	Wrong study design (qualitative)
Sartain et al., 2002	Wrong population (not adult patients)
Schapira et al., 2022	Wrong intervention (transitional care)

Project: Hospital at home
Appendix 3
Excluded articles

Author, year	Reason for exclusion
Scott et al., 2021	Wrong publication type: systematic review focusing on physical activity levels, aiming to include all study designs.
Shepperd et al., 1998a	Wrong intervention (hospital not in charge of the care at home)
Shepperd et al., 1998b	Wrong outcome (cost only)
Shepperd et al., 2021b	Wrong publication type: systematic review focusing end- of- life care
Shepperd et al., 2022	Publication of the same study as described in the included study Shepperd et al., 2021a
Singh et al., 2022	Overlapping with Shepperd et al. (2021a) yet used for cost information
Skwarska et al., 2000	Wrong intervention (hospital not in charge of the care at home)
Suwanwela et al., 2002	Wrong intervention, home care provided by a Red Cross volunteer group in cooperation with relatives
Teng et al., 2003	Wrong comparison, discharged patients
Thorsén et al., 2005	Wrong comparison, home rehabilitation vs outpatient rehabilitation
Tibaldi et al., 2004	Insufficient information on outcomes
Tibaldi et al., 2013	Wrong language (Italian)
Tiberg et al., 2012a	Wrong P: children, wrong I (family house at hospital area, ie not patient's home)
Tiberg et al., 2012b	Wrong P: children, wrong I (family house at hospital area, ie not patient's home)
Tiberg et al., 2014	Wrong P: children, wrong I (family house at hospital area, ie not patient's home)
Tiberg et al., 2016	Wrong P: children, wrong I: at hospital site, ie not patient's home. Wrong outcome: cost only.
Tiberg et al., 2019	Wrong P: children, wrong study design: no comparator.
Tie et al., 2009	Wrong population (not adult patients)
Utens et al., 2010	Wrong publication type (study protocol)
Utens et al., 2012	Wrong intervention (hospital not in charge of the care at home; community-based nursing care at home)
Utens et al., 2013	Wrong intervention (hospital not in charge of the care at home; community-based nursing care at home)
Wells et al., 2004	Wrong population (treatment not in alignment with current healthcare routine in Sweden)
Williams et al., 2022	Wrong publication type (systematic review)
Williams et al., 2023	Wrong publication type (conference abstract)
Williams et al., 2024	Wrong publication type (systematic review)
Wilson et al., 1999	Wrong intervention (hospital not in charge of the care at home)
Wilson et al., 2002	Wrong intervention (hospital not in charge of the care at home)
Wong et al., 2016	Wrong comparison (discharged patients supported via phone calls)
Ytterberg et al., 2010	Wrong comparison (home rehabilitation vs outpatient rehabilitation)

C: Comparator, COPD: Chronic Obstructive Pulmonary Disease, GP: General Practicioner, I: Intervention, P: Population

Project: Hospital at home

*	+	No or minor problems
	?	Some problems
	-	Major problems

Appendix 4.1
Outcome variable: Mortality

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
COPD								
Cotton et al. 2000 UK	81 I: 41 C: 40	Total 6 / 81 I: 5 / 41 C: 1 / 40	After 60 days: 1/41 (2 %) Between group difference n. sign	After 60 days: 2/40 (5%)		?	?	-
Davies et al. 2000 UK	150 I: 100 C: 50	Total 25 / 150 Dropouts regarding mortality Total 12 / 150 I: 7 / 100 C: 5 / 50	At 14 days 2 (2%) At 3 months 9 (9%) Between group difference n. sign	At 14 days 0 (0%) At 3 months 4 (8%)		?	+/?	?
Echevarria et al. 2018 UK	120 I: 62 C: 58	I: 2 C: 0	After 14 days: 0 (0%) After 90 days: 1 (2 %) Between group difference n. sign	After 14 days: 0 (0%) After 90 days: 1 (2 %)		+	?	?
Nissen et al. 2007 Denmark	44 I: 22 C: 22	I: 0 C: 0	After 2 months: 1/22 (5%) Between group difference n. sign.	After 2 months: 0/22 (0%)		-	-	-
Ojoo et al. 2002 UK	60 I: 30 C: 30	Total 6 of 60 I: 3 of 30 C: 3 of 30	After 3 months: 1/27 (4%) Between group difference n. sign	After 3 months: 3/27 (11%)		-	-	-
Respiratory infections								
Collins et al. 2014 UK	14 I: 8 C: 6	0	1/8 (13%)	1/6 (17%)	Small feasibility study, not designed to compare clinical outcome data. Follow up for up to 6 months	?	?/-	-
Vianello et al. 2013 Italy	53 I: 26 C: 27	0	After 3 months: 3/26 (12%) Between group comparison: p= 0.42	After 3 months: 4/27 (15%)	Neuromuscular disease patients with respiratory infection	+/?	?	-

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.1
Outcome variable: Mortality

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Heart failure								
Mendoza et al. 2009 Spain	80 I :39 C: 41	Total 9 of 80 I: 2 of 39 C: 7 of 41	After 365 days: 2 /37 (5%) Between group difference: p= 0.67	After 365 days: 3/34 (9%)		?	-	-
Patel et al. 2008 Sweden	31 I: 13 C: 18		2/13	2/18	Follow-up up to 12 months after inclusion in the study	?(+)	?	-
Tibaldi et al. 2009 Italy	101 I: 48 C: 53	0	at 6 months follow-up 7/48 (15 %) Between group difference: n. sign	at 6 months follow-up 8/53 (15.0%)	Deaths at 6 months follow-up includes the deaths at discharge	?	+	-
Neutropenia								
Talcott et al. 2011 USA	Patient episodes 121 I: 50 C: 71	I: 3 C: 5	0 deaths	0 deaths		?	-	-
Mixed elderly patient population								
Harris et al. 2005 New Zealand	285 I: 143 C: 142	Withdrawals I: 4 C: 10	90 days after randomization 10 (7 %)	90 days after randomization 8 (6 %)	The study includes Subgroup with early discharge: I: 104, C: 105 Subgroup admission prevention: I: 39, C: 37	-	-	?
Levine et al. 2018 USA	21 I: 10 C: 11	1 I: 1 C: 0	Mortality at 30 days post-discharge: 0	Mortality at 30 days post-discharge: 0		-	-	-

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.1
Outcome variable: Mortality

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Levine et al. 2020 USA	91 I: 43 C: 48	0	All-cause mortality ≤30 days after discharge: 3 (7%)	All-cause mortality ≤30 days after discharge: 2 (4%)		?	?	-
Shepperd et al. 2021a UK	1055 I: 700 C: 355	I: 13 C: 10	Total number of deaths At 3-day follow-up: 3 At 5-day follow-up: 3 At 1 month follow-up: 23 At 6 months follow-up: 114 (17 %) At 12 months follow-up: 188 (28 %)	Total number of deaths At 3-day follow-up: 0 At 5-day follow-up: 2 At 1 month follow-up: 13 At 6 months follow-up: 58 (18 %) At 12 months follow-up: 82 (25 %)	Between group comparisons at 6 months: p= 0.94 at 12 months: p= 0.47	?	?	+

C: Comparator, COPD: Chronic Obstructive Pulmonary Disease, I: Intervention

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.2
Outcome variable: Change in health status

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
COPD								
Davies et al. 2000 United Kingdom	150 I:100 C: 50	At 2 weeks Total 2 / 150 I: 2 / 100 (2%) C: 0 / 50 (0%) At 3 months Total 25 / 150 (17%) I: 16 / 100 (16%) C: 9 / 50 (18%)	FEV_1 after bronchodilation at 2 weeks, mean (95% CI) 42.6% (13.4%-81.8 %) FEV_1 after bronchodilation at 3 months 41.5% (8.2%-74.8 %) At 3 months Mean change (SD) FEV_1 litres 0.11 (0.34)	FEV_1 after bronchodilation at 2 weeks, mean (95% CI) 42.1% (5.1%-79.1 %) FEV_1 after bronchodilation at 3 months 41.9% (6.2%-77.6 %) At 3 months Mean change (SD) FEV_1 litres 0.14 (0.32)		?	+/?	?
Respiratory infections								
Collins et al. 2014 United Kingdom	14 I: 8 C: 6	0 of 14 (0%) Regarding CAP-SYM Total 5 / 14 (35.7%) I: 2 / 8 C: 3 / 6	CAP-SYM at day 28 (n:6) 90% recovery Between group difference n. sign.	CAP-SYM at day 28 (n: 3) 88% recovery	Small feasibility study not designed to compare outcome data	?	?/-	-
Heart failure								
Patel et al. 2008 Sweden	31 I: 13 C: 18	3 withdrew consent (Control group) 4 died (2 in each group)	NYHA (I-IV) median (IQR) Initial: 3 (3-3) After 1 month: 2.5 (2-3) After 4 months: 2(2-3) After 8 months: 2 (2-3) After 12 months: 2.5 (2-3)	NYHA (I-IV) median (IQR) Initial: 3 (3-3) After 1 month: 3 (2-3) After 4 months: 3 (2-3) After 8 months: 3 (2-3) After 12 months: 3 (2-3)	NYHA I-IV higher class indicates more severe symptoms of HF. At 8 months follow up there were only 11 patients in HC (initial 13) and 13 patients in CC (initial 18)	?	?	-
Mixed elderly patient population								

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.2
Outcome variable: Change in health status

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Harris et al. 2005 New Zealand	285 I: 143 C: 142	Withdrawals 10 days I: 15 /143 C: 13 /142 30 days I: 22 /143 C: 28 /142 90 days I: 31 /143 C: 26 /142	Proportion of self-reported complete recovery 10 days: 25/128 (19.5 %), 30 days: 39/121 (32.2 %), 90 days: 63/112 (56.3%) Between group comparisons: n. sign.	Proportion of Self-reported complete recovery 10 days: 27/129 (20.9 %) 30 days: 30/124 (24.2 %), 90 days: 53/116 (45.7 %)	The study includes Subgroup with early discharge: I: 104, C: 105 Subgroup admission prevention: I: 39, C: 37	-	-	?

C: Comparator, CAP-Sym: Community-Acquired Pneumonia Symptom Questionnaire, CI: Confidence Interval, COPD: Chronic Obstructive Pulmonary Disease, HF: Heart Failure, I: Intervention, IQR: Interquartile Range, FEV_1: forced expiratory volume in one second, NYHA: New York Heart Association

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* + No or minor problems
? Some problems
- Major problems

Appendix 4.3
Outcome variable: Emergency department visit

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Heart failure								
Patel et al. 2008 Sweden	31 I: 13 C: 18	3 withdrew consent (Control group) 4 died (2 in each group)	HF-related ED visits (n (IQR)) 0.3 (0.6) Between group comparison: n. sign.	HF-related ED visits (n (IQR)) 0.3 (0.5)	The statistical measures provided in the article are unclear	?	?	-
Mixed elderly patient population								
Levine et al. 2018 USA	21 I: 10 C: 11	1 I: 1 C: 0	At 30 days post-discharge 1 / 9 (11%) Between group comparison: n. sign.	At 30 days post-discharge 2 / 11 (18%)		-	-	-
Levine et al. 2020 USA	91 I: 43 C: 48	0	Patients with ED-presentation within 30 days after acute care episode: 3/43 (7%) Between group comparison: n. sign.	Patients with ED-presentation within 30 days after acute care episode: 6/48 (13%)		?	?	-

C: Comparator, COPD: Chronic Obstructive Pulmonary Disease, ED: Emergency department, HF: heart failure, I: Intervention, IQR: Interquartile Range

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.4
Outcome variable: Complications

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
COPD								
Nissen et al. 2007 Denmark	44 I: 22 C: 22	I: 0 C: 0	After 2 months: 6/22 patients (1 pneumonia, 2 cardiovascular instabilities, 3 other)	After 2 months: 6/22 patients (3 pneumonia, 2 heart failure, 1 cardiovascular instability)		-	-	-
Respiratory infection								
Collins et al. 2014 UK	14 I: 8 C: 6	0%	Hospital acquired infection 0	Hospital acquired infection 1	Small feasibility study not designed to compare outcome	?	?	-
Vianello et al. 2013 Italy	53 I: 26 C: 27	0	Treatment failure 8/26 (31%) Between group comparison: p= 0.19	Treatment failure 13/27 (48%)	Neuromuscular disease patients with respiratory infection	+/?	?	-
Heart failure								
Tibaldi et al. 2009 Italy	101 I: 48 C: 53	I: 9 (2 Lost to follow-up 7 Died) C: 10 (2 Lost to follow-up 8 Died)	Not reported	Not reported	The publication mentions a marginally, not statistically significant, lower rate of selected medical complications observed in the home-treated group (mainly delirium and infections). The result is not fully reported	?	+	-
Neutropenia								
Talcott et al. 2011 USA	121 episodes I: 50 episodes	I: 3 C: 5	Major medical complication, n (%) episodes 4 (9%) episodes	Major medical complication, n (%) 5 (8%) episodes	Major medical complications defined “any medical event requiring urgent diagnostic or therapeutic intervention”	?	-	-

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.4
Outcome variable: Complications

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
	C: 71 episodes		Between group comparison: p:0.56 Hypotension: 3 (6%) episodes Other (Anal pain): 1 (2 %) episode	Hypotension: 5 (8 %) episodes Other (Anal pain): 1 (1 %) episode				
Mixed elderly patient population								
Harris et al. 2005 New Zealand	285 I: 143 C: 142	Withdrawals 10 days I: 7 of 143 C: 0 of 142 30 days I: 14 of 143 C: 17 of 142 90 days I: 15 of 143 C: 17 of 142	Falls Day 0-10: 11/136 (8 %) Day 11-30: 8 /129 (6 %) Day 31-90: 14/128 (11 %) Between groups differences: n. sign.	Falls Day 0-10: 8/142(6 %) Day 11-30: 6 /125(5 %) Day 31-90: 18 /125 (14 %)	The study includes Subgroup with early discharge: I: 104, C: 105 Subgroup admission prevention: I: 39, C: 37	-	-	?
Levine et al. 2018 USA	21 I: 10 C: 11	1 I: 1 C: 0	Adverse events: 0/ 10	Adverse events: 1 /11 (9 %) Nosocomial acute kidney injury	Adverse events to be recorded included falls, standard hospital-acquired conditions, mortality during admission and for HaH-patients also “unexpected return to hospital rate”.	-	-	-
Levine et al. 2020 USA	91 I: 43 C: 48	0	Any safety event: 4 (9%) Inappropriate medication use: 0 (0%)	Any safety event: 7 (15%) Inappropriate medication use: 5 (10%)		?	?	-
Shepperd et al. 2021a United Kingdom	1055 I: 700 C: 355		Research related serious adverse events:	Research related serious adverse events: 0	Note – only unexpected AEs reported. “Expected adverse events for this population included falls,	?	?	?

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.4
Outcome variable: Complications

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
			1 metabolic acidosis caused by alcohol excess and poor diabetic control		pressure sores, hospital or community-acquired infection, transfer to hospital and death"			

AE: Adverse Event, C: Comparator, COPD: Chronic Obstructive Pulmonary Disease, I: Intervention,

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.5
Outcome variable: Quality of life

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
COPD								
Davies et al. 2000 United Kingdom	150 I: 100 C: 50		St George's respiratory questionnaire N: 34 Baseline mean: 71.5 (43.4 to 99.6) Mean change at 3 months: - 0.48 (SD 16.92) Between group comparison n. sign.	St George's respiratory questionnaire N:16 Baseline mean: 71.0 (43.4 to 98.6) Mean change at 3 months: - 3.13 (SD 14.02)	St George's respiratory questionnaire Ranges from 0 to 100 with higher scores indicating more limitations	?	-	?
Echevarria et al. 2018 United Kingdom	120 I: 62 C: 58	I: 2 C: 0	EQ-5D-5L Mean (SD) unit change at 14 days: (N:62) 0.091 (0.249) Percentage with MCID improvement: 57% Between group comparison n. sign. Mean (SD) unit change at 90 days: (N: 59), 0.003 (0.287) Percentage with MCID improvement: 44% Between group comparison n. sign.	EQ-5D-5L Mean (SD) Unit change at 14 days: (N:57) 0.055 (0.316) Percentage with MCID improvement: 49% Mean (SD) unit change at 90 days: (N:56) 0.007 (0.338) Percentage with MCID improvement: 41%		+	?	?

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.5
Outcome variable: Quality of life

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Respiratory infection								
Collins et al. 2014 United Kingdom	14 I: 8 C: 6	2 of 14 (14.3%)	SF-12 Change from day 0 to 28, mean:1 point	SF-12 Change from day 0 to 28, mean: 0.4 points	Using SF-12 a change of at least 6-point is deemed necessary for clinical significance Small feasibility study not designed to compare data	?	?	-
Heart failure								
Patel et al. 2008 Sweden	31 I: 13 C: 18	3 withdrew consent (Control group) 4 died (2 in each group)	Not reported	Not reported	"No meaningful differences in HRQL could be identified". HrQoL assessed using EuroQol five-dimension questionnaire (EQ-5D)	?	?	-
Mendoza et al. 2009 Spain	80 I:39 C:41	Total 9 of 80 I: 2 of 39 C: 7 of 41	Change from to 12 months* SF-36 physical component 3.6 (-0.5: to7.7) Between group comparison: p= 0.47 SF-36 mental component: 4.0 (-0.9 to 8.9) Between group comparison: p= 0.38	Change from to 12 months* SF-36 physical component: 2.2 (-1.9 to 6.4) SF-36 mental component: 2.8 (-2.4 to 8.0)	*Analysis of covariance, adjusted to base levels. Lack of clarity on provided statistics	?	-	-
Tibaldi et al. 2009 Italy	101 I: 48 C:53	I: 9 (2 lost to follow up, 7 deaths) C: 10 (2 lost to follow up, 8 deaths)	Nottingham Health Profile score, mean, (SD) Baseline: 18.9 (9) Change from baseline to 6 months: +1.09 (2.57) Between group difference: p: 0.046	Nottingham Health Profile score, mean, (SD) Baseline: 16.5 (9) Change from baseline to 6 months: +0.18 (1.94)	Nottingham Health Profile ranges from 0 to 38. (the lower the score, the better the quality of life)	?	-	-

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.5
Outcome variable: Quality of life

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Neutropenia								
Talcott et al. 2011 USA	Patient episodes 121 I: 50 C:71	I: 3 C: 5	EORCT QLQ C-30 Change from admission to discharge Role Function subscale Mean change: 0.58 Between group difference: p:0.05 Emotional Function subscale Mean change: 3,27 Between group difference: p:0.04 All other subscales, including global health status scale Between group difference: n. sign.	EORCT QLQ C-30 Change from admission to discharge Role Function subscale Mean change: 0.78 Emotional Function subscale Mean change: -6.94	EORCT QLQ C-30: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire C30. The instrument includes five functional scales (physical, role, cognitive, emotional, and social), where higher scores indicate better function, three symptom scales, a global health status scale, and several single items assessing additional symptoms commonly reported by cancer patients	?	-	-
Mixed elderly patient population								
Harris et al. 2005 New Zealand	285 I: 143 C: 142	Withdrawals I: 22 C:22	SF-36 at 90 days Mean (SD) PCS: 34.8 (10.7) MCS: 53.4 (10.5) Between group comparison n. sign.	SF-36 at 90 days Mean (SD) PCS: 34.4 (9.9) MCS: 52.1 (12.0)		-	-	?

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.5
Outcome variable: Quality of life

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Shepperd et al. 2021a United Kingdom	1055 I: 700 C: 355	I :204 C: 106 (Missing or unclear score)	Health status – EQ-5D index score Mean (SD) Baseline: 0.53 (0.275) at 6 months: 0.53 (0.282) adjusted mean difference (95% CI): 0.00 (-0.04 to 0.04), p= 0.923 Health status – EQ-5D VAS Mean (SD) Baseline: 56.8 (21.35) at 6 months: 62.4 (22.81) adjusted mean difference (95% CI): 0.32 (-3.08 to 3.73), p= 0.852	Health status – EQ-5D index score Mean (SD) Baseline: 0.53 (0.301) at 6 months: 0.54 (0.304) Health status – EQ-5D VAS Mean (SD) Baseline: 55.6 (21.35) at 6 months: 62.2 (22.81)	EQ-5D-5L is divided into 2 parts where the first measures quality of life in 5 dimensions. In the second part EQ-5D VAS the respondent's self-rate their health from 0 to 100	?	-	+

C: Comparator, COPD: Chronic Obstructive Pulmonary Disease, HrQoL: Health related Quality of Life, I: Intervention, MCID: minimally clinically important difference, MCS: mental component summary, PCS: physical component summary, SD: Standard Deviation

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.6
Outcome variable: Patient experience

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
COPD								
Echevarria et al. 2018 United Kingdom	120 I: 62 C: 58	I: 2 C: 0	Would prefer HAH treatment during future exacerbations of similar severity 54/60 (90%)	Would prefer HAH treatment during future exacerbations of similar severity 51/57 (88%)	Note, these data are no direct comparison as the patients' response is based on actual experience of HaH in the Intervention group, but merely on the information provided about HaH in the Control group	+	?	?
Mixed elderly patient population								
Levine et al. 2018 USA	21 I: 10 C: 11	1 I: 1 C: 0	Picker questionnaire (0–15), median (IQR): 15 (4) Between group comparison: p= 0.18	Picker questionnaire (0–15), median (IQR): 13 (4)	Patient experience measured at 30 days post discharge. Picker questionnaire score ranging from 0-15 with higher numbers indicating better outcome IQR: interquartile range	-	-	-
Levine et al. 2020 USA	91 I: 43 C: 48	0	Picker patient experience questionnaire score, median (IQR): 14 (2)	Picker patient experience questionnaire score, median (IQR): 14 (3)	Picker questionnaire score ranging from 0-15 with higher numbers indicating better outcome IQR: interquartile range	?	?	+

C: Comparator, COPD: Chronic Obstructive Pulmonary Disease, HaH: Hospital at Home, I: Intervention, IQR: Interquartile Range

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.7
Outcome variable: Caregiver experience (Närståendevårdare)

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Heart Failure								
Tibaldi et al. 2009 Italy	101 I: 48 C: 53	I: 9 C: 1	Relative Stress Scale, mean (SD) On admission 25.4 (16.6) Between group comparison: p= 0.003 At discharge 22.4 (15.8) Within group change: p= 0.37	Relative Stress Scale, mean (SD) On admission 17.1 (10,.8) At discharge: Not reported	Relative Stress Scale higher levels indicating more stress. No complete results for the control group	?	+	-
Mixed elderly patient population								
Harris et al. 2005 New Zealand	285 I: 143 C: 142	Withdrawals Not stated for carer strain index in article	At 90 days Carer strain Index, mean (SD): 4.6 (3.6) Between group comparison: p= 0.02	At 90 days Carer strain Index, mean (SD): 6.2 (3.7)	Carer strain is a validated index ranging from 0-13, a higher score indicates a higher level of stress. The study includes a subgroup with early discharge: I: 104, C: 105 Subgroup admission prevention: I: 39, C: 37	-	-	?
Moss et al. 2023 USA	Caregivers I: 22 C:11	0	Zarit Burden Interview (ZBI)-12, Median (IQR) On admission: 9.5 (4.8) Within 30 from discharge: 9.5 (10.8) Between group difference On admission: p:0,30, change from admission: p= 0.33	ZBI-12 Median (IQR) On admission: 15.0 (11.5) Within 30 from discharge: 8.0 (10.5)	ZBI-12 scores range from 0 to 48 with suggested scoring: ≤10, no-to-mild burden: 11–20, mild–moderate burden: >20, high burden. Sub-study of Levine et al., 2020 in n: 90 patients (42 with caregivers and 48 without). Of 42 with caregiver, 33 provided complete ZBI-12 data (I: 22, C: 11)	-	-	-

C: Comparator, COPD: Chronic Obstructive Pulmonary Disease, I: Intervention, IQR: Interquartile Range, SD: Standard deviation

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.8
Outcome variable: Readmission

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
COPD								
Cotton et al. 2000 United Kingdom	81 I: 41 C: 40		After 60 days: 12/41 (29%) Between group difference (95% CI); 0,7% (-19,2 to 20.6) n. sign.	After 60 days: 12/40 (30%)		?	?	-
Davies et al. 2000 United Kingdom	150 I: 100 C: 50	Total: 25 of 150 (16.7%) I: 16 of 100 (16%) C: 9 of 50 (18%)	During first 2 weeks: 9 patients (9%) After 3 months 37/100 (37%) of these presumably 28 after discharge from HaH Between group difference n. sign.	After 3 months 17/50 (34%)		?	+/?	?
Echevarria et al. 2018 United Kingdom	120 I: 62 C: 58	I: 2 C: 0	After 90 days: 22/62 (37%)	After 90 days: 23/58 (40%)	Patients with one or more hospital readmissions (return to hospital during HAH was not considered a readmission, but rather an increase in level of care.)	+	?	?
Nissen et al. 2007 Danmark	44 I: 22 C: 22	I: 0 C: 0	After 2 months: 4/22 patients 7 times (32%)	After 2 months: 8/22 patients 9 times (41%)		-	-	-
Ojoo et al. 2002 United Kingdom	60 I: 30 C: 30	0	After 3 months: 33.3%	After 3 months: 44.4%	Unclear whether readmissions include readmissions during HaH or after discharge from HaH only	-	-	-
Respiratory tract infection								

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.8
Outcome variable: Readmission

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Collins et al. 2014 United Kingdom	14 I: 8 C: 6	0	After 30 days: 0/8 (0%)	After 30 days: 2/6 (33%)	Note: Small infeasibility study not designed to compare outcome	?	? /-	-
Vianello et al. 2013 Italy	53 I: 26 C: 27	0	8/26 required hospitalisation during the Intervention period	No comparative data				
Heart failure								
Mendoza et al. 2009 Spain	80 I: 39 C: 41	Total 9 of 80 I: 2 of 39 C: 7 of 41	Readmission for heart failure at 1 year follow-up, n (%):15 (41) Between group comparison: p= 0.42	Readmission for heart failure at 1 year follow-up, n (%): 17 (50)		?	-	-
Tibaldi et al. 2009 Italy	101 I: 48 C: 53	I: 9 of 48 C: 10 of 53	Readmission during intervention, n (%) 4 (8%) Subsequent admission to hospital, n (%) At 6-month follow-up 8/48 (17%) Between group comparison for subsequent admission: p: 0.19 Mean (SD) number of days between discharge and first additional hospital admission 84.3 (22.2) Between group comparison for number of days until	Readmission during hospitalisation: not applicable Subsequent admission to hospital, n (%) At 6-month follow-up 18/53 (34%) Mean (SD) number of days between discharge and first additional hospital admission 69.8 (36.2)	Four patients were readmitted to hospital during the intervention, one for a fall, one for intestinal bleeding, one for a stroke and one for health problem of the caregiver 76% of patients that were readmitted within 6 months were readmitted for their CHF, no significant difference between groups	?	+	-

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.8
Outcome variable: Readmission

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
			first additional hospital admission: p= 0.02					
Neutropenia								
Talcott et al. 2011 USA	Patients: 113 I: 47 C: 66 Episodes of neutropenia 121 121 I: 50 C: 71	8 episodes	Hospital readmission during intervention 4 (9%)	Hospital readmission during intervention Not applicable	I: Early discharge. C: Hospital care Four patients in Early Discharge group were readmitted to hospital during intervention			
Mixed elderly patient population								
Harris et al. 2005 New Zealand	285 I: 143 C: 142 Subgroup Early discharge I: 104 C: 105 Admission prevention	Withdrawals I: 0 C: 0	Not readmitted N: 99/143 (69.2%) First readmitted days 1-10 N: 18/143 (12.6%) First readmitted days 11-30 N: 12/ 143 (8.4%) First readmitted days 31-90 N: 14/143 (9.8%) Between-group comparison: n. sign.	Not readmitted N: 109/142 (76.8%) First readmitted days 1-10 N: 9/142 (6.3%) First readmitted days 11-30 N: 9/142 (6.3%) First readmitted days 31-90 N: 15/142 (10.6%)	The study includes Subgroup with early discharge: I: 104, C: 105 Subgroup admission prevention: I: 39, C: 37	-	-	?

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.8
Outcome variable: Readmission

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
	I: 39 C: 37							
Levine et al. 2018 USA	21 I: 10 C: 11	1 I: 1 C: 0	30-day readmission N: 1 (11%) Between-group comparison: p= 0.32	30-day readmission N: 4 (36%)		-	-	-
Levine et al. 2020 USA	91 I: 43 C: 48	0	Readmitted within 30 days after discharge: 3 (7%) Of these three, one was readmitted for the same condition as originally hospitalized for	Readmitted within 30 days after discharge: 11 (23%) Of these 11.six were readmitted for the same condition as originally hospitalized for		?	?	-
Shepperd et al. 2021 United Kingdom	1055 I: 700 C: 355	I:13 C: 10	Readmission or transfer to hospital at 1 month: 173 (25.7 %) Between group comparison: p:0.012 Readmission or transfer to hospital at 6 months: 343 (54.4 %) Between group comparison: p= 0.40	Readmission or transfer to hospital at 1 month: 64 (19.4%) Readmission or transfer to hospital at 6 months: 171 (56.5 %)	Numbers include the period where patients in the control group are in hospital /not at risk for readmission	?	?	+

C: Comparator, CHF: Chronic Heart Failure, CI: Confidence Interval, COPD: Chronic Obstructive Pulmonary Disease, HaH: Hospital at Home, I: Intervention, IQR: Interquartile Range, SD: Standard deviation,

Project: Hospital at home

* + No or minor problems ? Some problems - Major problems

Appendix 4.9
Outcome variable: Length of stay

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
COPD								
Cotton et al. 2000 United Kingdom	81 I: 41 C: 40	Total 6 of 81 (7.4%) C: 5 of 41 (12.2%) C: 1 of 40 (2.5%)	Length of initial stay at hospital facility: Mean 3.2 days (1–16) days Length of care with Hospital at home: median 24 days Additional days in hospital after readmission: 8.75 days Between group difference (95% CI): 0.92 (-6.5 to 8.3)	Length of initial stay at hospital facility Mean 6.1 days (range 1–13) Additional days in hospital after readmission: 7.83	In the HaH group "The median duration of nurse follow up was 24 days and the median number of nurse visits was 11"	?	?	-
Davies et al. 2000 United Kingdom	150 I: 100 C: 50	Total: 25 of 150 (16.7%) I: 16 of 100 (16%) C: 9 of 50 (18%)	Not reported	Initial length of stay in hospital Mean 5 days (interquartile range 4-7)		?	+/?	?
Nissen et al. 2007 Denmark	44 I: 22 C: 22	I: 2? C: 0?	Length of initial stay at hospital facility, mean (SD): 1.3 days (0.5) Length of care with Hospital at home mean (range): 5.1 (2 to 13) Length of stay: 6.4 days	Length of initial stay at hospital facility, mean (SD): 3.7 days (2.8)	Difference length of initial stay at hospital facility p= 0.002	-	-	-

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.9
Outcome variable: Length of stay

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Echevarria et al. 2018 United Kingdom	120 I: 62 C: 58	I: 2 C: 0	Length of hospital stay (index admission), mean (SD) days: 1.2 (2.1) Length of stay within HaH, median (IQR) days: 4 (2-5) Length of stay at 90 days, mean (SD) days: 6.1 (9.7)	length of hospital stay (index admission), Mean (SD) days: 4.1 (4.6) NA Length of stay at 90 days, mean (SD) days: 10.3 (15.8)	Length of stay not reported in a format fitting our outcome definition	+	?	?
Ojoo et al. 2002 United Kingdom	60 I: 30 C: 30	0	Mean number of days in care: 7.4 days Between group difference: p= 0.14	Mean number of days in care: 5.9 days	No standard deviations provided	-	-	-
Respiratory infections								
Collins et al. 2014 United Kingdom	14 I: 8 C: 6	0 of 14 (0%)	Length of hospital stay Mean 3.4 days (1 to 7) Total length of care in home 2 to 6 days	Length of hospital days Mean 8,33 days (1 to 31)	Feasibility study not designed to compare outcome	?	?	-
Vianello et al. 2013 Italy	53 I: 26 C: 27	0	Time to recovery, mean (SD): 8.9 (4.6) days Between group comparison: p= 0.21	Time to recovery (defined as length of stay at hospital), mean (SD): 9.0 (8.9) days	In the HaH arm, district nurses visited all patients mornings and afternoons until recovery from exacerbation	+/?	?	-
Heart failure								

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.9
Outcome variable: Length of stay

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
Mendoza et al. 2009 Spain	80 I: 39 C: 41	Total 9 of 80 I: 2 of 39 C: 7 of 41	Mean (SD) length of hospital care, days: 10.9 (5.9) Between group comparison: p= 0.01	Mean (SD) length of hospital care, days: 7.9 (3.0)	Note: Not days in hospital, but total hospital care	?	-	-
Patel et al. 2008 Sweden	31 I: 13 C: 18	3 withdrew consent (Control group) 4 died (2 in each group)	Time consumed (h) 12 (7-34)	Time consumed (h) 120 (90-192)	Time consumed for intervention or initial hospitalisation	?	?	-
Tibaldi et al. 2009 Italy	101 I: 48 C: 53	0	Mean (SD) length of hospital care, days: 20.7 (6.9) Between group comparison: p= 0.001	Mean (SD) length of hospital care, days: 11.6 (10.7)	Period of treatment refers to number of days a patient received hospital care (at home or in hospital) before discharge	?	+	-
Neutropenia								
Talcott et al. 2011 USA	Patient episodes 121 I: 50 C: 71	I: 3 C: 5	Length of febrile Neutropenia (days, mean): 4.5 (Range 1-15)	Length of febrile Neutropenia (days, mean): 4.6 (Range 2-13)	Differences between the groups were also analysed separately based on fever and neutropenia, but no significant difference was found in either case	?	-	-
Mixed elderly patient population								
Harris et al. 2005 New Zealand	285 I: 143 C: 142	Withdrawals I: 2 C: 3	Mean (SD) length of stay 8.8 days (4.3)	Mean (SD) length of stay: 5.7 days (6.6)	Time from randomization to first discharge from HaH or in-hospital care	-	-	?

Project: Hospital at home

* + No or minor problems
? Some problems
- Major problems

Appendix 4.9
Outcome variable: Length of stay

Author year country	Number of patients n:	Withdrawals - dropouts	Results		Comments	Directness *	Study limitations *	Precision *
			Intervention	Control				
			Between group comparison: p<0.0001					
Levine et al. 2018 USA	21 I: 10 C: 11	1 I: 1 C: 0	Length of stay in HaH, median days (IQR): 3 (1) Between group comparison: p= 0.79	Length of stay in hospital, median days (IQR): 3 (3)		-	-	-
Levine et al. 2020 USA	91 I: 43 C: 48	0	Length of stay in HaH, mean (SD) days: 4.5 (1.84) Between-group difference: n. sign.	Length of stay, mean (SD)days: 3.8 (1.94)		?	?	+
Shepperd et al. 2021a United Kingdom	1055 I: 700 C: 355		Mean (SD) length of stay, days (in HaH): 6.89 (5.46)	Mean /SD) length of stay, days, (in hospital): 5.25 (8.00)	Including data of patients who switched groups after randomisation (37/700 treated in-hospital instead of HaH, and 76/345 treated in HaH instead of in-hospital)	?	?	+

C: Comparator, CI: Confidence Interval, COPD: Chronic Obstructive Pulmonary Disease, HaH: Hospital at Home, I: Intervention, IQR: Interquartile Range, SD: Standard deviation

Projekt: Hospital at home

Appendix 5 Assessment of directness and study limitations (plus = no/minor concerns ? = some concerns, minus = major concerns), and aspects considered relevant for assessment in consensus discussion. Assessments primarily regard the studies' primary outcome.

Study	Assessment			
	Directness		Study limitations	
COPD				
Cotton et al. 2000	?	Old study, many patients fail eligibility criteria, one nurse only, lack of information on the severity of COPD some may be treated in an outpatient setting today	?	No blinding, some drop out after randomisation, some imbalance in baseline regarding oxygen treatment, no CoI statement
Davies et al. 2000	?	High proportion of screen failures, many examinations prior to inclusion which may not be viable in clinical practice, lack of information on the severity of COPD some may be treated in an outpatient setting today	+/?	No blinding
Ecchevaria et al. 2018	+	Lack of information on the severity of COPD, some may be treated in an outpatient setting today	?	Imbalance in drop out, some imbalance in baseline characteristics, lack of information on blinding
Nissen et al. 2007	-	Unclear inclusion criteria and many screen failures	-	Very limited information on study conduct, no CoI statement, imbalance in steroid use, no information on blinding
Ojoo et al. 2002	-	Considerable proportion of screen failures, unclear disease severity, more attention than usual noted in the usual care arm	-	Lack of information on e.g. blinding, statistical analysis, and randomisation
Respiratory tract infection				
Collins et al. 2014	?	Many screen failures, more attention given to patients than in routine care	? / -	Imbalance in baseline characteristics (age), different impact of extra attention given to the patients in the treatment groups, lack of information about randomisation which seems to have failed
Vianello et al. 2013	+/?	Specific sub-group of patients, limited information on recruitment, substantial reliance of non-professional home care assistance	?	Imbalance in proportion with pneumonia
Heart failure				
Mendoza et al. 2009	?	No information on screening	-	Unbalanced drop-out, no protocol, unclear reporting bias
Patel et al. 2008	? /+	Difficult to understand how severe CHF patients had- for example assessment of oedema indicates that the population had less severe condition compared to today	?	Group not balanced (e.g. sex), recruitment stopped prior to sample size filled
Tibaldi et al. 2009	?	Long treatment times both in the HaH group (21 days) and in the in-hospital care group (12 days), old study.	+	No CoI statement
Neutropenia				

Projekt: Hospital at home

Appendix 5 Assessment of directness and study limitations (plus = no/minor concerns ? = some concerns, minus = major concerns), and aspects considered relevant for assessment in consensus discussion. Assessments primarily regard the studies' primary outcome.

Study	Assessment			
	Directness		Study limitations	
Talcott et al. 2011	-	Unclear how many patients were screen failures but a high proportion as recruitment was slow, and study paused for some time. Old data (25 years)	-	Unclear analysis in terms of episodes rather than patients, lack of information on episode duration, unbalanced numbers after randomisation, (less problematic for HrQoL)
Mixed elderly patient population				
Harris et al. 2005	-	Limited information on the patient population	-	Lack of information on baseline data, imbalance in withdrawal
Levine et al. 2018	-	Limited information on the patient population	-	Lack of information on baseline data, imbalanced groups
Levine et al. 2020	?	Screening unclear, adequacy of recruitment process discussed by the authors and problematic from VGR perspective	?	Early stop of study (protocol violation)
Moss et al. 2024	-	Unclear selection process	-	Unbalanced groups
Shepperd et al. 2021	?	Many ineligible (e.g. due to unwillingness to participate), limited information on diagnoses	?	Ca 20% received other treatment than randomised

CoI statement: Conflict of interest statement, COPD: Chronic obstructive pulmonary disease, HrQoL: Health-related quality of life

Project: Hospital at home

Appendix 6
Forest plots for the different patient populations – based on all included studies

COPD – forest plots based on all included studies

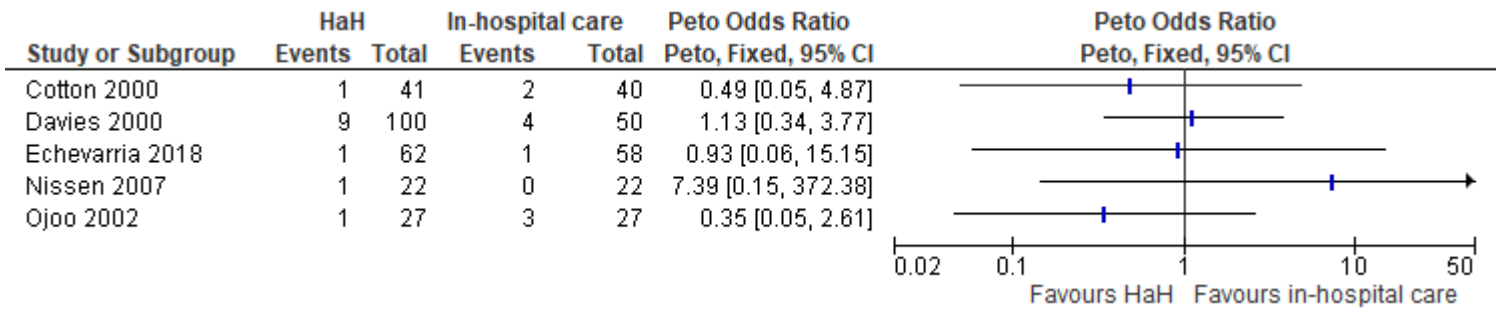


Figure 1. Peto Odds ratio of mortality in selected patients with COPD, forest-plot of all included RCTs

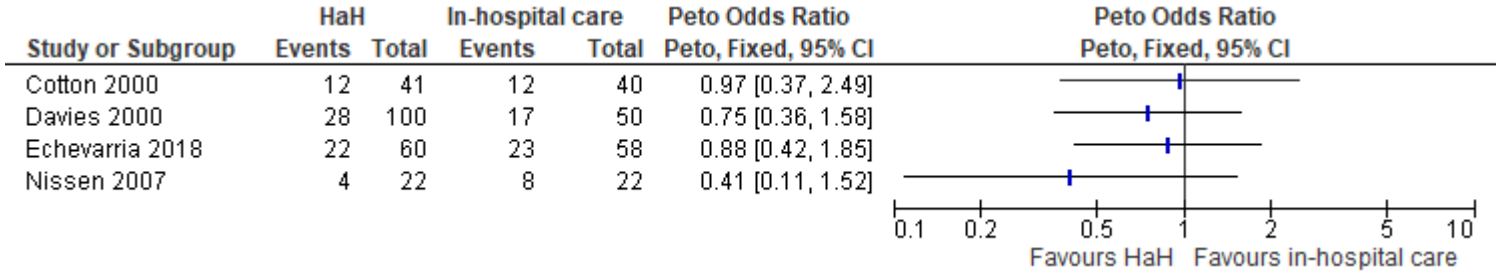


Figure 2. Peto Odds ratio of readmission within two to three months in selected patients with COPD, forest-plot of all included RCTs

Project: Hospital at home

Appendix 6
Forest plots for the different patient populations – based on all included studies

Heart failure – forest plots based on all included studies

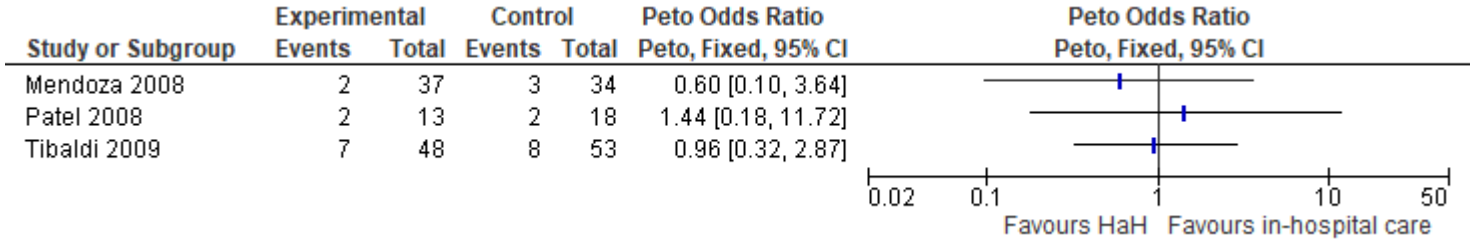
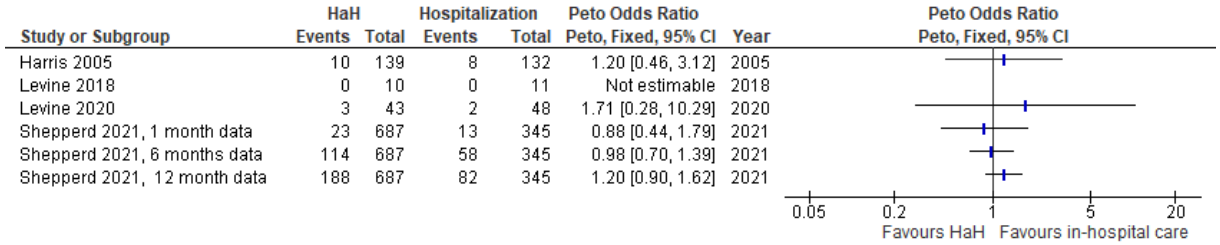


Figure 3. Peto Odds ratio of mortality in selected patients with heart failure, forest-plot of all included RCTs

Mixed elderly population – forest plots based on all included studies



Note, for the study by Shepperd 2021 overlapping results of follow up after 1 month, 6 months and 12 months are included in the plot

Figure 4. Peto Odds ratio of mortality in a selected mixed elderly population, forest-plot of all included RCTs

Project: Hospital at home

Appendix 6
Forest plots for the different patient populations – based on all included studies

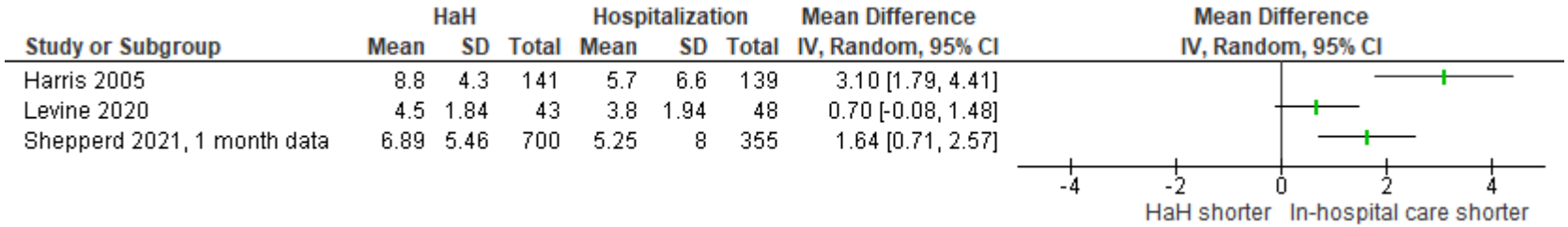


Figure 5. Mean difference in length of stay for a selected mixed elderly patient population, forest-plot of all included RCTs

Project: Hospital at home

Appendix 7 Initiatives related to Sahlgrenska hemma

In 2023, Sahlgrenska University Hospital (SU) launched a strategy and project called "*SU at Home*" ("Sahlgrenska Hemma"). Since there are different definitions of HaH, the strategy was deliberately not named "HaH at Sahlgrenska" to avoid preconceived ideas about the hospital's approach.

Before the start of *SU at Home*, related initiatives had been driven by doctors, nurses and supportive staff without cross-departmental coordination. As of January 2025, there were 21 such initiatives in a variety of clinical fields which now are in the process of being subsumed in *SU at Home* (an overview is provided in the table below). Some setups focused on early supported discharge, others on admission avoidance, or on a combination of both. Note that these teams did not necessarily identify with the term "HaH", nor did all of them align with the PICO defined in this HTA report. (*SU at Home* project manager P. Almgren, personal communication, November 26, 2024 and January, 2025).

Two *SU at Home* setups align with the PICO of this HTA report: Safe going home – for primigravidae (Swedish: "Trygg hemgång"), and – to some extent - Mobile speciality units ("Närsjukvårdsteamen" (NSVT, teams that have been used as a link between primary and specialised care).

Other initiatives within *SU at Home* do not fit the PICO of this report (e.g. as they concern a different population, as home visits are performed by external staff outside the hospital organisation, or as they provide long-term rather than acute hospital care).

Until now, some departments had their own teams and cars while others pooled cars with other units, mainly with the mobile specialty units (*NSVT)*. A formalised and broad introduction of "*SU at Home*" with home visits is planned for the upcoming years. It requires establishing structures for collaboration and knowledge sharing. Such structures are currently in their infancy and potential synergies are only starting to be identified. Additionally, developing and implementing training and routines to decrease dependence on individual staff, both for driving change and for carrying out new types of tasks, will be necessary for long-term success. The "*SU at Home*" project works with these and other aspects to support the introduction and align it with the hospital's strategic goals. The purpose of the project is to develop new care models within the "*SU at Home*" and scale up suitable models, as well as strengthen and implement existing and desirable care models.

Project: Hospital at home

Appendix 7 Initiatives related to Sahlgrenska hemma

Department / project	In line with PICO of this report	Entry points	Hours	Number of Cars	Home Visits	Estimated capacity	Status (as of Q1-2025)
Established teams corresponding to PICO							
Obstetrics Birthing centre at home ("BB hemma")	Yes	ESD	Weekdays 9-16 (extension discussed)	1	Yes	13% of births. Goal: 20%	Team doubled in 2024. Vision: cover all healthy primigravidae
Mobile speciality units ("Närsjukvårdsteamen" (NSVT)	Yes (some overlap with Primary care)	AA or ESD	Weekdays 8-17 (extension discussed)	12	Yes	8 500 home visits/year (in 2024)	Established since 2017
Pilot projects – planned and ongoing							
Obstetrics Pregnant patients with preterm prelabour rupture of membranes	No	ESD (ED, obst. ward, out-patient care)	Weekdays 8-17	1	No	TBD	1 patient piloted
Närsjukvårdsteam Östra (NSVT Ö) Acutely ill, inter-medicinal patients. (Pilot by one NSVT team to replace short inpatient stays)	Yes	AA or ESD (Emergency Medical Dispatch Center, ED, primary care, hospital wards)	Weekdays 8-17 (piloting evenings and weekends)	NSVT	Yes	Replace short inpatient stays avg. 5 days	50+ patients piloted
Orthopaedics Patients with some types of prothesis infections.	Possibly	ESD	24/7	NSVT	TBD	TBD	10-20 patients 2025
Neurology Patients with Transient ischemic attack	Possibly	ESD	TBD	TBD	TBD	1-3 hospital beds/day	Risk analysis ongoing
Rheumatology Patients requiring quick investigation of suspected debuting systemic vasculitis	Possibly	ESD	24/7	TBD	TBD	2 hospital beds/day	Pilot stopped during planning – looking for other options
Medical Intensive Care Unit (MICU) with **NSVT SU** Not decided, possibly geriatrics patients with infections and/or need for supplemental oxygen	Yes	AA or ESD (ED, MICU, geriatric ward)	TBD	NSVT	Yes	TBD	Investigating possibilities for pilot study

Project: Hospital at home

Appendix 7 Initiatives related to Sahlgrenska hemma

Established teams not corresponding to PICO							
Thorax Patients with surgical wound infections	To some extent	ESD	Weekdays 8-17 (extension discussed)	NSVT	No	1 hospital beds/day	Established 2024
Mobile team geriatric psychiatry	No (different population)	AA or ESD	Weekdays 8-16	2	Yes	1620 visits/year	Established before 2017
Neonatal care at home ("Neonatal sjukvård i hemmet")	No (different population)	ESD	Weekdays 8-16	1	Yes	1272 visits/year (2023)	Long established
Advanced paediatric care at home psychiatry ("Avancerad barnsjukvård i hemmet psykiatri")	No (different population)	ESD (more similar to outpatient clinical visits, e.g. follow-ups)	Weekdays 8-17	1	Yes	3 visits/day	Established 2024
Advanced paediatric care at home ("Avancerad barnsjukvård i hemmet")	No (different population)	ESD	Weekdays 8-17	2	Yes	1560 visits/year	Established 2021
Cystic fibrosis clinic ("Cystisk fibrosmottagning")	No (SU responsible, but different healthcare provider)	ESD	24/7	0	Yes	1500 inpatient days/year	Unclear date
Pulmonary clinic ("Lungmottagning PCD")	No (SU responsible, but different healthcare provider)	ESD	24/7	0	Yes	Handful patients per week	Unclear date
Haematology antibiotics at home ("Hematologen antibiotika hemma")	No (SU responsible, but different healthcare provider)	ESD	Weekdays 8-17	NSVT	Yes	45 patients since Dec-23 (as of Sep-24)	Established 2023
Mobile X-ray, ("Mobil röntgen")	No (replacing lengthy ED visit, not hospitalisation)	AA	Weekdays 8-17	1	Yes	70% negative X-rays avoid admission	Established 2020, re-established 2023

Project: Hospital at home

Appendix 7 Initiatives related to Sahlgrenska hemma

Advanced healthcare at home – palliative care (“Avancerad sjukhusvård I hemmet”)	Long-term treatment at home	ESD/AA	24/7	8	Yes	5337 visits/year	Established 2011, re-established 2023
Advanced psychiatry at home (“Avancerad psykiatri i hemmet”	Long-term treatment at home	ESD	Weekdays 8-16	3	Yes	1200 visits/year	Established 1998
Palliative resource team (”Palliativt resursteam”)	Long-term treatment at home	ESD/AA	Weekdays 8-16	12	Yes	3076 visits/year	Established 2022
Assisted Discharge Stroke (“Understödd hemgång stroke”)	Long-term treatment at home	ESD	Weekdays 8-17	0	Yes	647 visits/year	Unclear date

ED: Emergency department, NSVT: Närsjukvårdsteam, TBD: to be decided

Project: Hospital at home

Appendix 8: Economic aspects

a) Attempt to compare costs for HaH and in-hospital care in VGR

- Efforts have been made to assess the costs of Hospital at Home (HaH) compared to in-hospital care in Region Västra Götaland (VGR).
    - The scenario considered most likely to allow for a comparison was the närsjukvårdsteam (NSVT, a mobile speciality unit) with the following focus of data analysis for 2024:
        - Patients contacting the ED and at that visit recorded with the main diagnosis of heart failure, and with a visit by NSVT within 48 hours after the ED visit
        - For these patients, the number of subsequent NSVT visits and their timing were collected.
        - Costs per NSVT visit were calculated by dividing the yearly cost for the NSVT by the total number of visits performed by the team (irrespective diagnosis)
    - For comparison, standard costs for in-hospital care for patients with heart failure (uncomplicated cases) were identified. We extracted data for the diagnosis-related groups (DRGs) and cost per patient in VGR.

- The data received based on this approach do - according to our view - not allow for a comparison of costs as the extent of care provided by NSVT indicates that so far, the patient population and their need for care differs substantially from patients with in-hospital care. The question at issue in this HTA project is whether HaH could be offered **instead of** in-hospital care to patients with different conditions usually hospitalised. So far, the appreciated care provided by NSVT focused on patients with a different care level and comparison of costs for these patients with costs for in-hospital care would be inadequate as described below:
        - NSVT: Given 48 h window after an ED visit for heart failure diagnosis: 43 patients were identified. Of these,
            - 18 patients had just one subsequent NSVT visit (10 of whom had no visit of a physician at home),
            - 10 patients had two visits
            - 6 patients had three visits
            - 5 patients with four visits
            - 3 patients with five visits
        - In-hospital care: The standard cost /care episode for in-patient care for patients with heart failure (uncomplicated cases) is based on a patient population with a mean 7 days stay in hospital.
        - It is considered highly unlikely that the patient population managed with 1-5 NSVT home visits is comparable to the population currently treated on average 7 days in hospital.

Project: Hospital at home

Appendix 8: Economic aspects

b) Cost estimates in included RCTs

Costs of 'hospital and home (HaH)' and 'in-hospital care' and assessment of the quality of cost estimation

Disease area	Reference	Costing perspective	Unit of reported costs	Cost of treatment				Quality of cost estimation	Assessment of directness (D) and RoB**
				HaH (mean/median, disperson*)	Hospital (mean/median, disperson*)	Absolute Difference (95% CI)	. Difference Expressed as % related to mean cost of in-hospital care		
COPD	Echevarria et al., 2018	Health and social care perspective	Health and formal social care average costs at 90 days	£ 3 857.8 SD: £3 199.6	£ 4 873.5 SD: £ 5631.1	- £ 1 015.7 (−2735.5 to 644.8)	20.8% lower	High	D: + ; RoB: ?
Heart failure	Mendoza et al., 2009	Healthcare perspective	Mean cost	€ 2541 SD: € 1334	€4502 SD: € 2153		44% lower		D:? RoB: -
	Patel et al., 2008	Healthcare perspective	Median cost at 12 months including HF clinic	€ 2680	€ 5750		53% lower		D: ?/+ RoB: ?
Acute care for elderly patient	Harris et al., 2005	Healthcare perspective	The average total cost per patient	NZ$ 6 524	NZ$ 3 525	+ NZ$ 2 999	85.1% higher		D:: - RoB:-
	Levine et al., 2018	Healthcare perspective	Median direct cost per episode				52% lower		D: - RoB: -
			Median direct cost for the acute care plus 30-day post-discharge period for home patients				67% lower		
	Levine et al., 2020	Healthcare perspective	Acute care episode (mean cost)				19% lower	Medium	D: ? RoB: ?
			Acute care episode and 30 d after acute care episode (mean cost)				25% lower		
	Singh et al., 2022 (cost estimates related to Shepperd et al., 2021a)	Health and social care perspective and societal perspective	Health care costs	£ 7,060 SD: £12,78	£ 7,864 SD: £13,486	- £ 805 (−2,687 to 1,078)	10.2% lower	Medium	D: ? RoB: ?
			Health and social care costs	£ 13,975 SD: £ 17,248	£ 16,521 SD: £ 17,639	- £ 2,547 (−5,059 to −34)	15.4% lower		
			Societal costs	£ 18,437 SD: £ 19,057	£21,453 SD: £ 18,902)	- £ 3 017 (−5,765 to −269)	14.1% lower		

[#] plus = no/minor concerns, ? = some concerns, minus = major concerns

CI: Confidence Interval, HaH: Hospital at Home, HF: heart failure, RoB: Risk of bias, SD: standard deviation

*Dispersion: Whenever data available

** Confidence intervals estimated with simulations

Project: Hospital at home

Appendix 9: Other relevant published systematic reviews

Table 2: Other relevant published systematic reviews in the field

Systematic review	Research question	Number of included studies, overlap with present HTA	Conclusion	QUICKSTAR* level (rational)	Comment
Edgar et al., 2024	"To determine the effectiveness and cost of managing patients with admission avoidance hospital at home compared with inpatient hospital care"	20 studies 16 of these also identified in the present HTA, 8 of these included in present HTA)	"Admission avoidance hospital at home, with the option of transfer to hospital, may provide an effective alternative to inpatient care for selected patients who require hospital admission. The 20 trials included in this review were conducted in several different countries. Although the health systems in these countries vary with respect to the way healthcare financing is structured, the policy objectives are the same, with admission avoidance hospital at home being provided to control costs and reduce demand for inpatient hospital beds"	6 (?) (yet, optimistic risk of bias assessment, use of fixed effects analysis across studies in different patient populations)	Different definition of HaH compared to the present HTA as it does not require that the hospital to have main responsibility. Conclusions overall given a higher certainty of evidence than in the present HTA - partly given a less problematic view on RoB of included studies
Patel, et al., 2024	"To examine randomised controlled trials (RCTs) of "hospital at home" (HAH) for admission avoidance in adults presenting with acute physical illness to identify the use of vital	21 studies (16 studies also identified in the present HTA, of these 7	"This review highlights gaps in the reporting and evidence base informing remote vital sign monitoring in alternatives to admission for acute illness, despite expanding implementation in clinical practice. Although continuous vital sign monitoring using wearable devices may	6	Note: main focus on remote vital sign monitoring

Appendix 9: Other relevant published systematic reviews

	sign monitoring approaches and evidence for their effectiveness"	included in the present HTA)	offer added benefit, its use in existing RCTs is limited. Recommendations for the implementation and evaluation of remote monitoring in future clinical trials are proposed"		
Lin et al., 2024	"While Hospital-at-Home (HaH) programs have emerged as a promising alternative to traditional routine hospital care, showing initial benefits in metrics such as lower mortality rates, reduced readmission rates, shorter treatment durations, and improved mental and functional status among older individuals, the robustness and magnitude of these effects relative to conventional hospital settings call for further validation through a comprehensive meta-analysis."	15 studies (7 RCTs, 8 non-RCTs). 6 RCTs also identified in the present HTA, however all were excluded)	"Results suggest that early discharge HaH is linked to decreased mortality, albeit supported by low-certainty evidence across 13 studies. It also shortens the length of treatment, corroborated by seven trials. However, its impact on readmission rates and mental status remains inconclusive, supported by nine and two trials respectively. Functional status, gauged by the Barthel index, indicated potential decline with early discharge HaH, according to four trials. Subgroup analyses reveal similar trends."	3 (?) (some lack of clarity of research question, optimistic risk of bias assessment, metanalyses across RCTs and non-RCTs	Note: All included RCTs in this SR were excluded in the present HTA
Shi et al., 2024	"Technology-enabled inpatient-level care at home services, such as virtual wards and hospital at home, are being rapidly implemented. This is the first systematic review to	69 studies (38 RCTs, 31 non-RCTs) - 33 of the RCTs also identified in	"We found that a range of technology-enabled inpatient-level care at home models may result in similar or reduced readmission risk compared with hospital-based inpatient care. Impacts on mortality are more uncertain, except for two models showing no increased risk compared with	1 (unclear research question without information regarding	Note: Lacks a clear research question and does not describe the patient population considered

Appendix 9: Other relevant published systematic reviews

	link the components of these service delivery innovations to evidence of effectiveness to explore implications for practice and research"	the present HTA, however only 6 of these included in present HTA)	hospital-based inpatient care. The certainty of current evidence means further research could change findings. Further implementation of inpatient-level care at home models should be alongside evaluation to explore the potential benefits of using specific technologies particularly to gain further insights into clinical and cost-effectiveness particularly in high-priority population"	patient population.	
Wang et al., 2024	"This scoping review aims to provide an overview of patients and caregivers perceptions of hospital-at-home (HaH) services."	24 studies (2 of these also identified in the present HTA, however both were excluded)	"This scoping review integrated available evidence on assessing HaH services quality from the perspectives of patients and caregivers and provided insights for future research and clinical improvement. The findings can inform the development of HaH service interventions in areas such as patient and caregiver training, service content, care pathway, communication, coordination with care teams and the use of technologies and financial resources in real-world practice."	3 (no risk of bias assessment)	Note: Scoping review

* Quickstar -a stepwise tool developed by The Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU) for assessment of risk of bias/systematic errors in SRs. The steps are: 1. Definition of PICO and literature search; 2. Inclusion/exclusion according to PICO, listing of included studies; 3. Risk of bias assessments; 4. Evidence synthesis/meta-analyses; 5. Certainty of evidence consideration; 6. Documentation of excluded studies, conflicts of interest, and an a priori published SR protocol.

HaH: Hospital at Home, HTA: Health Technology Assessment, RoB: Risk of bias, RCT: Randomised Controlled Trial

Project: Hospital at home

Appendix 10
Ongoing studies

Other studies in the field

Patient population	NTC code/ Country	Estimated completion date	Study design	Study groups	Estimated number of patients	Outcomes (*primary)
Elderly with acute illness (e.g. cystitis, erysipelas, or pneumonia)	NCT05360914 Denmark	20270801	RCT	Home hospital care vs Traditional hospital care	849	Readmission*HrQoL* Mobility, mortality, and number of contacts with primary and secondary health care system
Heart failure	NCT05419115 United Kingdom	20240830 (not registered as completed or published)	RCT	Early supported discharge vs Traditional hospital care	550	Days alive out of hospital* Length of stay, change in quality of life, heart failure hospitalisations, mortality, safety, and device failures.
Acute illness	NCT05766956 United States	20241230 (not registered as completed or published)	RCT	Home hospital care vs Traditional hospital care	360	Mortality* Readmission Secondary outcomes are not provided
Mild acute pancreatitis	NCT05473260 Spain	20250716	RCT	Home hospital care vs Traditional hospital care	308	Treatment failure* Complications, readmissions, mortality, costs, QoL
Acute illness (heart failure, COPD, asthma, infections etc)	NCT05256303 United States and Canada	20240117 (not registered as completed or published)	RCT	Home hospital care vs Traditional hospital care	160	Mortality, Readmission complications, length of stay, HrQoL patient experience / satisfaction, caregiver experience/ satisfaction Costs *
Bariatric sleeve gastrectomy	NCT05259111 United States	20230323 (not registered as completed or published)	RCT	Early supported discharge vs Traditional hospital care	100	Length of stay* Motion, cost, opioid use, ED visits, readmissions, complications, Patient satisfaction and experience
Patients with cirrhosis presenting with ascites	NCT05205954	20251230	RCT	Home hospital care vs Traditional hospital care	40	Enrolment rate*, Retention rate*

Appendix 10
Ongoing studies

Patient population	NTC code/ Country	Estimated completion date	Study design	Study groups	Estimated number of patients	Outcomes (*primary)
	United States					Acceptability of the intervention, change in symptom burden, HrQoL, self-efficacy, illness understanding, mood, care giver burden, Care giver self-efficacy, readmissions, ED-visits, transfers back to hospital, and time to first outpatient GI/hepatology appointment
Studies completed more than 5 years ago, yet no corresponding publications identified						
Lower respiratory tract infections	NCT02454114 United Kingdom	Completed 20150101	RCT	Early supported discharge vs Traditional hospital care	26	Time to recovery* Mortality, readmission, patient and carer satisfaction, recovery, length of stay, and functional status, health economic
Elderly with acute exacerbation of COPD	NCT00369083 Italy	Completed 20051001	RCT	Early supported discharge vs Traditional hospital care	100	Mortality*, Readmission*, Length of stay, caregiver stress, costs, HrQoL

*Primary endpoint
COPD: Chronic Obstructive Pulmonary Disease, ED: Emergency Department, HrQoL: Health related Quality of Life, RCT: Randomised Controlled Trial,