

**The use of primary care services among senior citizens  
with somatic illnesses in rural areas of Norway.**

**One year follow up**

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## Abstract

**Background:** Few studies are published focusing on older people, their health, functioning and use of primary health services in different areas of Norway.

**Purpose:** To investigate use of primary health services in a rural area, explained by municipality belonging, adjusted for socio-demographic variables, degree of morbidity, level of functioning and mental health among somatic ill senior citizens.

**Material and methods:** In a cross sectional study 484 hospitalized patients ( $\geq 65$  year) were included, of whom 451 (226 women) participated in a year follow up, registering use of primary health care (the outcome). Estimated unit health services costs by SINTEF Health Research were used in the mean cost calculation. The risk of using more primary health care than the mean cost pr. patient (or not) compared to the reference municipality, was analyzed by logistic regression. The independent variables were assessed by Mini-Mental State Examination, Hospital Anxiety and Depression scale, Lawton and Brody's scales of self-maintaining and instrumental activities and Charlson Comorbidity Index.

**Results:** The risk of nursing home service use above mean cost pr. patient was significantly less for the participants in Rendalen (OR 0.23, 95% CI = 0.08-0.63), Folldal (OR 0.25, 95% CI 0.07-0.89) and Røros (OR 0.25, 95% CI = 0.10-0.60) compared to Tynset. No significant association in municipality belonging and in-home nursing or General Practitioner costs were found. Compared to Tynset, the odds for using more than mean total health costs was significantly reduced in Rendalen (OR 0.31, 95% CI 0.13-0.74), Folldal (OR 0.35, 95% CI 0.12- 1.00) and Tolga (OR 0.22, 95% CI 0.07- 0.68).

**Conclusion:** The cost of nursing home service and total health care service pr patient varied in the municipalities of residence among recently hospitalized senior citizens in a rural area. Even if it was adjusted for age, gender and health, functional and social variables, confounding factors may exist, making further research necessary.

## Relevance

The society is facing an aging population in need of customized and effective health services. Factors possibly associated with differences in use and provided health care as required among older people should be identified and studied.



## Table of contents

<b>Abstract .....</b>	<b>3</b>
<b>Relevance.....</b>	<b>3</b>
<b>1 Introduction .....</b>	<b>1</b>
1.1 The topic of the thesis.....	2
<b>2 Theoretical background.....</b>	<b>3</b>
2.1 Legal acts and guidelines regarding Norwegian public health care .....	3
2.1.1 The Act Relating to Patient's Rights .....	4
2.1.2 The Act Relating to the Municipal Health Services.....	4
2.1.3 The Act Relating to Specialist Health Care .....	4
2.2 The structure, administration and financing of.....	5
public health care in Norway .....	5
2.2.1 Specialized health care .....	5
2.2.2 Primary care in the municipalities.....	6
2.3 Calculation of health care consumption .....	7
2.4 Diseases and impaired functionality among senior citizens .....	8
2.4.1 Cognitive functionality level, dementia and mental disorders.....	8
2.4.2 Somatic diseases.....	10
2.4.3 Impaired functionality and assessment of physical functioning .....	12
2.4.4 Impaired physical and instrumental functioning.....	13
and assessment of functioning.....	13
2.5 Demographic aspects in the older population of rural municipalities Norway ....	14
2.5.1 Demographic aspects.....	14
2.5.2 The rural area and senior citizens.....	14
2.5.3 Primary health care in the area.....	15

2.5.4	Specialist health care services in the area .....	15
<b>3</b>	<b>Methods .....</b>	<b>17</b>
3.1	Research design and ethical approval.....	17
3.2	Participants .....	17
3.3	Measurements .....	19
3.4	Procedure .....	21
3.5	Data analysis.....	23
<b>4</b>	<b>Results.....</b>	<b>25</b>
4.1	Sample characteristics .....	25
4.2	The participants use of primary health services .....	26
	by the municipalities during follow-up .....	26
4.3	Mean cost pr. patient of the health services.....	27
	by the municipalities during follow up .....	27
4.4	Factors associated with health care services.....	27
	cost above mean pr. patient by the municipalities .....	27
	in the follow up .....	27
<b>5</b>	<b>Discussion .....</b>	<b>33</b>
5.1	The main results in comparison with previous research.....	33
5.1.1	Nursing home services cost.....	33
5.1.2	In home nursing and general practitioner service cost.....	34
5.1.3	Total health service costs .....	35
5.2	Limitations.....	36
<b>6</b>	<b>Conclusion .....</b>	<b>37</b>
	<b>References .....</b>	<b>38</b>

## **Tables**

- Table 1** Unit costs for health services provided by the municipalities
- Table 2** Characteristics of study sample at inclusion
- Table 3** Number (%) of patients in the sample sorted by the municipalities and their use (yes/no) of nursing home, in-home nursing, general practitioner consulting and physio-, occupational- and speech therapy during the 365 day of follow up.
- Table 4** Mean health services costs (in Euro) pr. patient, by municipality and in total for the 365 days of follow-up, N=451
- Table 5** Nursing home costs (above mean cost or not per patient) by municipality in three adjusted logistic regression models. Follow up period 365 days.
- Table 6** In-home nursing costs (above mean cost or not per patient) by municipality in three adjusted logistic regression models. Follow up period 365 days.
- Table 7** Total health service costs (above mean cost or not per patient) by municipality in three adjusted logistic regression models. Follow up period 365 days.

## **Figures**

**Fig. 1 Flytskjema: Number of hospitalized patients  $\geq 65$  years at Sykehuset Innlandet Division Tynset, included, excluded and at 1 year follow up**



## **Attatchments**

- 1) Informasjon**
- 2) Samtykkeskjema**
- 3-5) Hjelpark for registrering av informasjon (A: 1-3)**
- 6) B1: Kognitiv funksjon med MMSE**
- 7) B3: Spørsmål fra HUNT**
- 8) D1: Rankin**
- 9) D2: Lawton IADL**
- 10) D3: Lawton IADL**
- 11-12) F1: Hvordan føler du deg (HADS + 2 spm)**
- 13-16) Helseregistreringskort**
  
- 17) Regional Etisk Komite, REK Godkjenning**





# 1 Introduction

In recent decades, the public healthcare system in Norway has undergone both statutory and political changes; particularly important in this context has been the health care services for the population over 65 years (1-5).

Since 1988, the municipalities have been responsible for the structure, administration and provision of primary care for inhabitants (4, 6), including services such as general practitioner, nursing homes, in-home nursing, and physiotherapy occupational therapy and speech therapy service.

There is a higher incidence of illness and impairment among senior citizens, caused by morbidity, co-morbidity and ageing (7, 8). Disability and functional impairment also increases the risk of complications of diseases, associated with higher consumption of health and care services, as well as increased mortality (9, 10).

About 40% of acutely admitted patients in Norway are 75 years and older (11). These patients are often in need of compounding medical treatments and assistance from both the specialist health services (provided by the state) and the primary health service (provided by the municipalities) after discharge (5, 12). However, elderly people are not a homogeneous group. Their needs of health and care services vary considerably, depending on overall health and functioning (8). Studies have established differences in both the municipalities' priorities and ability to provide adapted services and the demand and use of the municipal health services by senior citizens (13, 14).

Statistically there is extensive documentation dealing with the use of public health services, reporting differences among regions in hospitalization rates, use of institutional care and a shift away from institutional care in favor of in-home nursing and facilitating living at home for seniors in need of help. (11-16). However, little has been published focusing on senior citizens' health, functioning and differences in use of primary health services (13, 14).

The Norwegian Public Health Act (5) requires the local government in the municipalities to provide customized and equal services for elderly people with illnesses in need of help. This legislation emphasizes the relevance to gather information and study factors associated with the consumption of public health care among senior citizens, and identify differences possibly explained by municipality of residence senior citizen.

SI Tynset is a general hospital, treating on average 1000 admissions in the medical ward a year of elderly patients ( $\geq 65$  years), where 95% of these are not elective admissions. The hospital recruits patients from nine surrounding municipalities, in a rural region where cooperation between the local public hospital and the primary care services are established and integrated. This context is well suited to study possible associations among elderly people in the regions in relation to use of primary health service, socio-demographic and health-related factors, morbidity level, physical and cognitive functioning and mental health.

## **1.1 The topic of the thesis**

The purpose of the study is to investigate: The use of primary services explained by municipality of residence, adjusted for socio-demographic variables, degree of morbidity, level of functioning and mental health among previously hospitalized senior citizens in medical ward in a rural area of Norway, one year of follow up.

## **2 Theoretical background**

### **2.1 Legal acts and guidelines regarding Norwegian public health care**

Norway has extensive legislation and guidelines for health care regulation, defining responsibilities and expected level of quality in the national public health services (17). The health care system is founded on the principles of equal access, availability and results in necessary medical care for the population, regardless of socioeconomic position and geographic residence (18).

A national strategy is set for quality improvement in all the health and social services, focusing on safety and efficiency, patient-centered care, care coordination, and continuity of care (18, 19).

A key point in the legislation states that all health care should be justifiable, at both individual and system levels. The services must be organized so that health staff can provide professional extensive and coordinated health care services to all patients, according to statutory obligations, and strive for quality and safety (20). Areas of care that include several organizational levels are regulated by separate acts, e.g. the Mental Care Act of 1999 (21), the Public Health Act of 2011 (21, 22) and the National Insurance Act of 1997 (23). The latter regulates financing and entitlement to certain non-medical benefits, including diseases, disability and rehabilitation.

The Patient's Rights Act (18, 19), the Act Relating to Municipal Health Services (24, 25) and the Specialist Health Care Act (26, 27). are particularly important for people in need of health care services at different structural levels .

### **2.1.1 The Act Relating to Patient's Rights**

The Act Relating to Patients' Rights ensures the individual's statutory rights, social security and respect for each patient's life, integrity and dignity (18, 19). Furthermore, the act regards the patient's rights to assessment and reassessment, the choice of general practitioner, hospitals and to individual plans if necessary (18, 28). The Patient Right's Act regulates the patient's right to participation and consent when given adequate information necessary for making decisions regarding their own health, what available health care implies and possible risks and side effects of health care (18, 19). Health legislation defines the statutory meaning of the patient, the patient's relatives, health care, health care services, health professionals and users (18, 19) The right to health care includes the patient's right to necessary medical care from both the municipality's health and care services and specialist health services (19, 29).

### **2.1.2 The Act Relating to the Municipal Health Services**

The Act Relating to the Municipal Health Services states the municipality's overall responsibility for providing health services necessary to meet the requirements of the law and regulations (24, 25). The objective is to prevent, treat and help people coping with illness, suffering and disabilities (24, 25), and also to promote social security, better living conditions for the disadvantaged, contribute to equality and prevent social issues (24).

### **2.1.3 The Act Relating to Specialist Health Care**

The Act Relating to Specialist Health Care ensures the required specialist care for people living or staying within the region, including assistance in case of accidents and other emergencies in the health region The regional health authorities should also facilitate collaboration within their own health service, other regional health authorities, counties, municipalities or other service providers (26, 27).

## **2.2 The structure, administration and financing of public health care in Norway**

The Ministry of Health and Care Services of the Norwegian government is legally responsible for Norway's healthcare organization and structure, and can change, modify and repeal existing legislation, as well as set fiscal policy which influences the delivery of healthcare services (30, 31)

The health care system is semi-decentralized, as reflected in the legislation. The central government is responsible for the specialist care, administered by four Regional Health Authorities, RHAs. The local government (the municipalities) is essentially responsible for primary care (4, 31).

Citizens of Norway have access to public health care through a National Insurance Scheme (NIS), managed by the Norwegian Health Economics Administration (HELFO), funded from taxation on income, supported by state grants, municipal taxes and some user-charging. Patients pay specified user charges in relation to the services of general practitioners and medical specialists, and there are also charges for prescription medication, laboratory and radiology tests (max. NOK 2,040 a year). However, certain groups, such as people suffering from chronic illnesses, are exempted from any healthcare costs (23, 31).

### **2.2.1 Specialized health care**

Specialist care is financed through block grants (60%), and activity-based financing from the central government to the RHAs (40%) (31).

There are four RHAs in Norway: Northern Norway RHA, Central Norway RHA, Western Norway RHA and South-Eastern Norway RHA, which are responsible for the provision of specialized care, including somatic and mental health institutions and associate responsibilities (emergency telephone, ambulance service, laboratories and pharmacies) and services allocated to, but provided by private actors (27, 31).

The regional health authorities perform their statutory duties through subsidiary health trusts (HF). The health trusts are expected to provide services in accordance with the requirements of the legislation and the regional health authorities (26, 32).



The hospitals in the health trusts are divided into three levels.

Local hospitals should be able to take care of the most common diseases and injuries or stabilize patients before transferring them to a region- or university hospital (33). The local hospital and the standards of their services to the inhabitants of an area are defined by the regional health care trust, and they handle 60-75% of all patients in Norwegian hospitals (31).

Regional hospitals provide specialized treatment for groups of patients (such as, gastro- or heart diseases) in a larger area, in addition to serving as a local hospital for the population in a defined area (30).

Each RHA has a university hospital with allocated resources and duties related to the education of medical personnel, research and national or multiregional features for patients needing highly specialized treatment. However, university hospitals can also function as local hospitals for parts of the population and as regional hospitals for residents in a region (27, 34).

### **2.2.2 Primary care in the municipalities**

The responsibility for the provision and funding of primary health care is devolved to 428 municipalities, including services such as nursing homes, home-based care and services, safety alarms, General Practitioner, physical- and occupational therapists, rehabilitation, and after-hours emergency services (4).

The local governments have a great deal of freedom in organizing primary care services. However, the funding of general practitioners is determined by the central government, mainly to maintain equal public access to this service (35).

There has been a shift from institutional care in favor of in-home nursing for the physically and/or cognitively impaired elderly people. Several Norwegian and European studies report that most seniors want to live at home as long as possible, in spite of illness, disabilities or impairment which makes them dependent of help and care (36). The cost of in-home nursing is also less than the cost of nursing home care (8, 37).

During the period 2008-2013, the nursing homes accommodations has been stable at approximately 41,000 (38). The quantity of people aged 67 years and older, receiving in-home nursing had increased from 32,700 to 39,100 during the same period (38).

Only 30 % among recipients of health care over 80 years live in nursing homes, while 10 % live in sheltered accommodation with day time assistance and care. The majority, 60 %, are living at home (39).

Regular General Practitioner Scheme was introduced in 2001, in order to increase commitment, continuity and better accessibility in the service (40). Most of these FTEs (82 percent, about 3700 doctors) are employed at medical practice in the municipalities (41).

The municipalities are responsible for providing a GP scheme to their inhabitants. The GPs are self-employed on contract (74 %), employed by the municipality (14 %) or temporary employees as interns (9 %) (41).

The municipals are also obliged to provide physiotherapy, occupational- and speech therapy services (4, 18).

### **2.3 Calculation of health care consumption**

There is no standardized formula or way of calculating health care consumption in the primary health care services.

The calculation cost in this thesis is estimated unit costs for the various health services, based on national calculations from SINTEF Health Research, developed and used in the trial described in “Early supported discharge for stroke patients improves clinical outcome. Does it also reduce use of health services and costs? One-year follow-up of a randomized controlled trial” (42). The costs are measured as service-costs, a combination of tariffs and calculated average costs (42). This was the most accurate measurement in order to calculate use of primary health services as the mean cost of each unit per participant within the municipal of residence.

## **2.4 Diseases and impaired functionality among senior citizens**

Incidence of illnesses and injury increases with age (43-45), though the proportion of seniors requiring assistance decreased slightly or remained stable over the last 20 - 30 years (46, 47). Results from studies in Sweden, England, USA and Norway may indicate that seniors are healthier, more functional and have better memory capacity than earlier (47-50). Significant factors for the risk and increasing prevalence of diseases and disabilities are age and co-morbidities. Mental, cognitive and somatic disorders such as depression, anxiety and dementia, and somatic illnesses such as cardiovascular disease, COPD, diabetes, cancer and musculoskeletal diseases are more common in older age and entail varying degrees of impairment or disability (47-50).

### **2.4.1 Cognitive functionality level, dementia and mental disorders**

**Cognitive functionality** among people 65 years and older has been gradually improved, especially in the last 20 years among the youngest in the age group (65-79), explained by development of society, better living conditions in their childhood, and the increased welfare they achieve later in life, prevention measures, improvements in the curative health services, rehabilitation and assistance (51).

Though the brain retains accumulated knowledge and expertise in older age, there are large individual differences. Normal age-related changes in brain function causes reduced speed of information processing and impairments in attention tasks that require dividing or switching of attention among multiple inputs. Impaired cognitive function does not automatically result in disability to cope in daily life activities (51, 52).

**Dementia** is a general term for progressive brain diseases usually occurring in old age, causing permanent impairment of brain functions such as memory, judgment, planning, problem solving and concentration levels and leads to impaired cognitive function and mental, functional and behavioral symptoms (53). The ability to perform activities associated with daily life is impaired (53, 54). There is no known specific single cause of dementia, but it is believed to be an interaction between genetic-, environmental factors and aging (27, 28). The proportion of people suffering from dementia increases with age.

There are currently about 70,000 people suffering from dementia in Norway. The disease is affecting about 250,000 people, when including the patients and their families (55). The large number of people affected by dementia diseases means that the public administration, health professionals and service providers face major challenges, with regard to planning and facilitating professionally and individually adapted services (55, 56).

**Depression and anxiety** are common disorders among elderly people, specially related to physical and cognitive health impairment and psychosocial factors such as loss of function, loss of people close, loss of position and a diminishing social network (57-59).

Depression disorders can cause sadness, loss of enjoyment of life, sleeping problems, loss of appetite and at its most severe, suicidal thoughts (57, 58, 60). Anxiety disorders cause feelings of fear, worry and apprehension, excessive or disproportional to the problems or situations that are feared. The feeling becomes overwhelming and affects daily tasks, social life, and relationships (61, 62).

Both the incidence and prevalence of depression and anxiety seems to increase with age. International studies have shown that depression is common among the older population, but reported rates vary from 8-15% in the elderly living at home, 11-62% among nursing home residents and 6-73% in studies among elderly with somatic health problems (63-66). Prevalence estimates for severe anxiety disorders and symptoms of anxiety appear to be as varied as for depression, reported in the range of 1-15% in the general population sample and 1-31% for seniors 65 years and older in various clinical settings (62, 66).

Depressive and anxiety disorders and symptoms among elderly people are often not discovered, but confused with the aging process or somatic diseases, and can worsen the outcome of many medical conditions and cause disability. The disorders can also be part of the somatic disease or a response to the disease, often seen with diagnoses such as cancer, COPD, heart diseases and along with dementia and stroke ((60, 67, 68)). Untreated depression and anxiety symptoms and disorders can lead to cognitive impairment, disability, poor physical health, and a poor quality of life and represent a significant burden for the individual, family and support system (57, 63). Some studies have reported an increase in mortality among elderly people with depression (60, 69)

Increased depressive symptoms among the older population in rural versus urban areas is also indicated (70, 71). However, the first follow up study among medical inpatients in a rural area of Norway showed a low prevalence of clinical depression in the selection (65).

## 2.4.2 Somatic diseases

**Cardiovascular diseases** are a group of disorders of the heart and blood vessels, including coronary, cerebrovascular and peripheral arterials, causing diagnosis such as heart failure, stroke, deep vein thrombosis and pulmonary embolism disease (72, 73).

The age-specific mortality of the disease is significantly reduced over the last 30 years (29 (74), leading to higher prevalence of the disease and impairments caused by the disease.

Chronic heart failure is the main diagnosis (55, 000 patients) of hospitalization for patients over 65 years in Norway, and can lead to impairment and need of daily care assistance (75).

Stroke causes loss of brain function due to a disturbance in the blood supply caused by either ischemia (lack of blood flow) or hemorrhage often causing paralysis, speech disorders, mental defects and major disability (76, 77). Risk factors for stroke include high blood pressure, previous stroke or transient ischemic attack (TIA), and diabetes (76). Age is also risk factor; overall, two thirds of strokes occur in those over 65 years (74), and the number of cases has increased in recent years (73, 77). Around 15,000 people are affected by stroke each year in Norway, of which about 5000 die. Between 60,000 and 70,000 people live with disabling after-effects at various levels (73).

**Chronic obstructive pulmonary disease (COPD)** is a collective term for diseases of the lungs and bronchi, causing restricted air flow rate when breathing, especially when exhaling (78). COPD are endemic diseases, affecting 329 million (5%) people worldwide (79), resulting in the deaths of over 3 million people in 2012 (80). The number of deaths is projected to increase due to higher smoking rates and an aging population in many countries (81), and the incidence is increasing both in Norway and in the rest of world . There is considerable variation in the reported prevalence of COPD. The overall prevalence in adults appears to be between 4% and 10% (81) . Probably 250,000 - 300,000 people in Norway suffer from COPD, but less than half know they have the disease, although many experience undiagnosed symptoms, distress and reduced quality of life (79, 82) .

COPD is a chronic progressive disease, permanently reducing lung function, causing disability in physical functioning, increased risk of other illnesses and depression and anxiety (78, 79).

**Diabetes mellitus** is a chronic disease characterized by persistently elevated blood glucose and disturbances of body metabolism, due to impaired function of the hormone insulin. The disease occurs in two types; Diabetes type 1, insulin dependent diabetes mellitus, caused by lack of insulin production in the pancreas, most often debuting in younger people (83, 84)

Diabetes type 2, also called adult-onset diabetes, caused by insufficient insulin production or inability to utilize the hormone (insulin resistance) (83, 84).

Diabetes is increasing globally, driven both by population growth and ageing, causing long-term complications and disabilities.

In Norway, between 100,000 and 130,000 individuals suffer from type 2 diabetes (85-87).

The disease is increasing especially among men and elderly people (88-90).

The main risk factors for developing diabetes are heredity, obesity and physical inactivity (91). Patients with diabetes have an increased incidence of atherosclerotic cardiovascular, peripheral arterial, and cerebrovascular disease, including heart disease, stroke, kidney failure, hypertension and loss of vision (91) .

**Cancer** is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body (89, 92). About 14.1 million new cases of cancer occur globally, causing approximately 8.2 million (14.6%) deaths per year (66). The most common malignancies for males are lung-, prostate-, colorectal- and stomach cancer.

Among females are breast-, colorectal-, lung- and cervical cancer most prevalent (89, 92).

The cancer risk increases significantly with age (93, 94). Most cancers in Norway are diagnosed in persons 50 years and older. Colorectal-, prostate- and lung cancers have the highest incidence rates in the oldest age groups, 75-85 years (94).

Increase in life expectancy has led to an increase in the number of cancer cases. Far more people survive cancer today than 50 years ago. With a higher average age of the population, persons who may have disabling conditions related to current or previous cancer diagnoses are expected to increase in the next decades (94, 95).

**Musculoskeletal diseases and injuries** are a frequent cause of health impairment and functional impairment among elderly people and involves degenerative changes in joints and spine and osteoporosis that can increase fracture risk, cause pain and reduced mobility (96). Overall, musculoskeletal diseases are more common among women than men. About 70 % of the annual 9,000 hip fractures occur among women, and are most common and increasing in patients 75 years and older (97).

### **2.4.3 Impaired functionality and assessment of physical functioning**

Physical function is defined as the capacity to perform physical daily activities without assistance and undue fatigue, with the capacity to participate in leisure activities and to meet unforeseen emergencies (32, 98). Impairment is defined as a disability compared to a person's previous level of function, and may be due to illness or general age deterioration (99), explained as an irreversible biological process prior to death, involving physical, psychological, social and existential consequences (99).

The level of physical function serves as an indicator of current health status, not specific to a particular disease or condition. Physical function is predictive of health- and social-care use, including nursing home admission (100, 101) and hospitalization (102, 103), and is also an important factor in research for comparing, associations and prediction of risks and mortality (100). Studies tend to suggest that disability in the elderly is reducing among seniors younger than 85 years, despite an increase in chronic diseases and conditions (104-107). Although women live longer than men, they have a higher degree of functional impairment than men towards the end of their lives (106). For people aged 85 years and older, the tendency regarding disability is less clear (104, 105), where 30% of the individuals are not in substantial need of primary care, though more than 50 % have extensive needs for assistance, i.e. are completely dependent on other people's help and care around the clock (106).

The need of assistance depends on the ability in basic self-care tasks, Activities of Daily Living, ADLs and includes activities as dressing, eating, functional mobility, personal and toilet hygiene. Instrumental Activities of Daily Living (IADLs) are used to assess independent living skills more complex than the basic ADLs, such as using the telephone, shopping, food preparation, housekeeping, laundry, mode of transportation, responsibility for own medications, and ability to handle finances (108).

#### **2.4.4 Impaired physical and instrumental functioning**

##### **and assessment of functioning**

Physical function is defined as the capacity to perform physical daily activities without assistance and undue fatigue, with the capacity to participate in leisure activities and to meet unforeseen emergencies (32, 98). Impairment is defined as a disability compared to a person's previously level of function, and may be due to illness or general age deterioration (99), explained as an irreversible biological process prior to death, involving physical, psychological, social and existential consequences (99).

Level of physical function serves as indicator of current health status, not specific to a particular disease or condition. Physical function is predictive of health- and social-care use, including nursing home admission (100, 101) and hospitalization (102, 103), and is also an important factor in research for comparing, associations and prediction of risks and mortality (100).

Studies tend to suggest that the prevalence of physical impaired function in the elderly is reduced among seniors less than 85 years, despite an increase in chronic diseases and conditions (104-107). Although women live longer than men, they have higher degree of physical function impairment than men towards the end of (106).

For people aged 85 years or more, the tendency regarding development of impaired physical functioning is less clear (104, 105), where 30% of the individuals are not in substantial need of primary care, though more than 50 % have extensive needs for assistance, i.e. are completely dependent on other people's help and care around the clock (106).

Level of functioning are often assessed in ability to manage basic self-care tasks as dressing, eating, functional mobility, personal and toilet hygiene. Instrumental Activities of Daily Living (IADLs) are used to assess independent living skills more complex than the basic ADLs, such as using the telephone, shopping, food preparation, housekeeping, laundry, mode of transportation, responsibility for own medications, and ability to handle finances (109).



## 2.5 Demographic aspects in the older population of rural municipalities Norway

Worldwide we are facing a global demographic challenge regarding the increase of the aging population, having profound implications of an economic, social, political and cultural development (110).

### 2.5.1 Demographic aspects

The population of Norway is also growing older, and represents a challenge for the public welfare system, networks and caregivers (111). Despite this, Norway will probably experience the least dramatic changes in Europe, due to the age structure of the population and higher birth rates. During the period 2020-2035, the population aged over 80 years will probably increase from 220,000 (4.5 %) in 2011 to about 350,000 (5.8 %) in 2030 and expand to over 550,000 (8.3 %) in 2050 (112).

However, there are differences between the urban and rural areas. The municipalities with high population density generally have a lower increase in the proportion of elderly people, because of migration, high birth rate and immigration. The municipalities with fewer than 3000 inhabitants will, relatively speaking, experience the greatest increase in the proportion of elderly people (113)



### 2.5.2 The rural area and senior citizens

Statistics Norway (SSB) ranges municipalities as small when serving 5,000 inhabitants and large when serving 20000 inhabitants or more. The small municipalities are often divided into two subgroups: less than 2,000 inhabitants, and municipalities serving between 2,000 and 5000 inhabitants (114).

The district region in the middle-east of Norway, located 340 km north of Oslo and 170 km south of Trondheim includes nine municipalities; Stor Elvdal,

Rendalen, Alvdal, Folldal, Tynset, Tolga, Os, Røros and Holtålen.

Tynset and Røros are the regional centers of the municipalities which are located in two counties, Hedmark and Sør Trøndelag.

Population in the region has been stable, counting 25,629 inhabitants in 2008 and 25,559 in 2013 (107).

Following statistics from the year 2008 (the year first year of follow up), the inhabitants are distributed in the municipalities as follows: Røros 5,580; Tynset 5,570; Rendalen, Tolga and Folldal under 2000 inhabitants (1650-1900); Stor Elvdal, Alvdal, Os and Holtålen over 2000 (2030-2600)(115). The population in the area has a greater proportion (11.74 %) than the national average (8.7 %) aged 67 years and older. The population composition has only had minor alterations in the last decade (115).

### **2.5.3 Primary health care in the area**

Nursing home accommodation in the municipalities count between 28-39, except from Røros (78), Tynset (54) and Folldal (19) (116). Percentage of residents in nursing homes aged 80 year and older, is reported as Tynset

11.1 % and Røros 18.2% (116).

Recipients of comprehensive (including nursing care) in home care services, aged 67 years or more was in Tynset 15.1 % and Røros 13.6% (117).

There is even distribution of total in home service in the area, but the statistics reported are not dividing in home nursing and assistance in the home, making further description of the services comparable with the services studied in the selection impossible (118).

Each municipality had 1-3 positions in the Regular General Practitioner Scheme, except Røros and Tynset, reporting respectively 4.6 and Tynset 5.9. A temporarily intern were employed in all municipalities, except Folldal and Tolga (119).

### **2.5.4 Specialist health care services in the area**

Innlandet Hospital Trust has six somatic hospitals (located in Hamar, Elverum, Gjøvik, Lillehammer, Kongsvinger and Tynset). Tynset Hospital is serving as local hospital for the municipalities in the study. . The hospital has an admission area of 15,000 km<sup>2</sup>, serving 25,000 people. 4600 residents in the region are in the age group of potential study population (65). Leakage to other local hospitals may exist due to geographical conditions.



## **3 Methods**

### **3.1 Research design and ethical approval**

A cross sectional study was conducted at a public hospital including older patients ( $\geq 65$  year), over a period of two years (1.9.2006 – 31.8.2008) from a rural area of Norway. The first year after inclusion, follow-up data was collected.

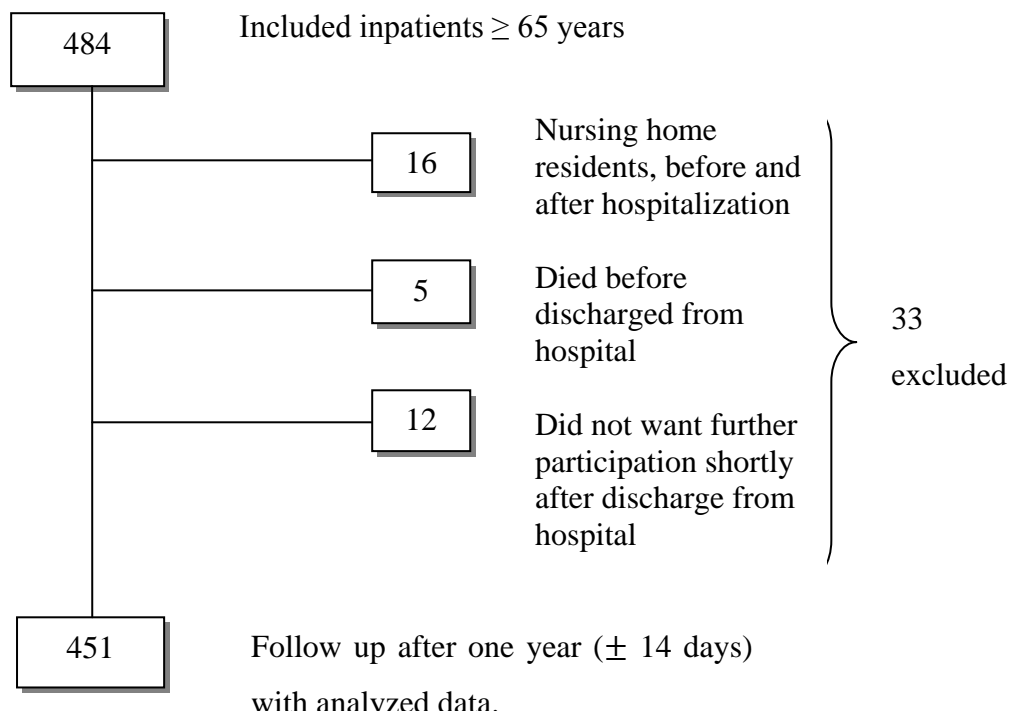
### **3.2 Participants**

All patients aged 65 years and older, acutely admitted to the internal medical inpatient service of Innlandet Hospital trust, Tynset division, residing in the area and being hospitalized for 48 hours or more were assessed for inclusion (65).

Of all 802 patients who were considered potential study participants, 318 (40%) were excluded, 116 patients due to severe cognitive impairment (scoring three on the Clinical Dementia Rating Scale, CDR) (120, 121), 25 had severe communication difficulties (aphasia, dysphasia or severe hearing impairment), 47 were in terminal state or died before inclusion, 106 suffered from severe physical impact (mainly caused by cardiovascular, pulmonary or cancer diagnosis) that made completion of the protocol impossible and 24 patients did not want to participate (65, 122).

In total, 484 patients were included in the main study. However, in the present sub-study we excluded: 16 patients who were nursing home residents before inclusion, 5 patients who died before being discharged from hospital and 12 patients who withdraw their consent to participate in the study shortly after hospital discharge.

**Fig. 1 Number of hospitalized patients  $\geq 65$  years at Sykehuset Innlandet Division Tynset, included, excluded and at 1 year follow up:**



### 3.3 Measurements

**Actually level and use of primary health care (i.e. outcome)** after discharge were registered systematically and prospectively by using registration cards developed at St-Olav hospital (123) (see attachment 1). All included patients were asked to document use of primary health care by these cards. If registration cards were not completed or a lack of information was suspected, data were collected by information from the patient and/or consent to gather missing documentation.

In addition, the place of residence (municipality) during the year of follow-up was controlled in the hospital administrative system by obtaining the residential address from the national register. The length of hospitalization in days was documented by the hospital's administrative systems.

#### **Morbidity**

The degree of registered morbidity was classified using Charlson Comorbidity Index and Schneeweiss weighting (124-126). Charlson Comorbidity Index is a well validated utility where 22 clinical conditions are given a score depending on the risk of dying associated with each one. Scores are summed to provide a total score to predict mortality (124, 127).

**Level of physical and instrumental functioning** was assessed by using Lawton and Brody's Physical Self-Maintenance Scale (PSMS), and Lawton Instrumental Activity of Daily Living, I-ADL. Higher scores indicate a lower level of functioning (PSMS score range 6–30, I-ADL score range 0–30). A PSMS score of 6 and an I-ADL score of 8 indicate a normal level of functioning (108). The assessment tools are recommended for use in Norwegian health care (109, 128, 129) and studies among older adults with or without co-morbidities (130-132).

The fall tendency and vision/hearing functions were self-reported by single items from the population-based Health Study of Nord-Trøndelag (133) and Resident Assessment Instrument (RAI-AC) (134).

**Cognitive function** was assessed by means of the Mini-Mental State Examination, MMSE (135) and Clinical Dementia Rating Scale (CDR) (120).

MMSE is a 30-point interviewer-administered measure, testing arithmetic, memory and orientation abilities (135). MMSE scores under 25 can indicate cognitive impairment (135); CDR contains six categories (memory, orientation, judgment and problem solving, community affairs, home and hobbies and personal care) and classifies the severity of dementia from 0 (no dementia) to 3 (severe dementia)(121), calculated by means of an algorithm prioritizing the category of memory (120, 121).

Both measures are translated, adapted and validated for Norwegian conditions (121, 135).

**Mental health** was rated by the Hospital Anxiety and Depression Scale, HADS, developed to identify depression and anxiety in somatic hospital inpatient services (136)

Depressive (HADS-D) and anxiety symptoms (HADS-A) were assessed separately, using the self-report inventory consisting of seven items (range 0–21). Higher scores indicate more severe symptoms(136).

The cut-off point for having clinically significant depression or anxiety was set to  $\geq 8$  in each scale (137).

HADS has been validated in Norway and used in several studies (138-140), also among elderly people (65, 141) and is available in a Norwegian edition (142).

**Socio-demographic background** (age, gender, living alone or not) was documented for all the participants, assessed by self-report items used in the health studies of HUNT (143, 144)

**Time of death** was collected from the hospital administrative system within the year of follow-up.

The Cause of Death Registry in Norway records time of death for all residents. The data is digitally transmitted to the hospital administrative system based on the 11 digits national identity number linked to each person.

### **3.4 Procedure**

Patients were assessed for the study and invited to participate when medically stabilized. The MMSE was administered by the trained research assistants. When the MMSE score was 18 or lower, the CDR was performed. If the CDR score was  $>2$ , severe cognitive impairment is indicated and the patients were excluded from further participation in the study. Gender, age and cause for exclusion were documented for all excluded

Written and oral information was given by two trained research assistants (registered nurses), who were responsible for further information, obtaining consent and performing data collection through structured interviews including the assessment scales described and further procedure. Prior to the start of the study, the assistants completed a 2-day course on how to conduct the interview followed of training on a variety of healthy objects (145).

Date of inclusion was documented when informed consent was obtained from the patient. In cases of concerning a lack of ability to consent, the patients' next of kin was informed and was given the opportunity to consent or refuse participation on behalf of the patient. Assistance to read and/or check the self-report inventories was provided to patients in need of help to do this.

At discharge the registration cards for primary health services were distributed for the first six months. Further information and registration cards for the last 6 months were sent to the participants by mail, followed by a phone call to remind the participants to return completed cards and keep up further registration. The participants were contacted by phone a year ( $\pm 14$  days) after the date of inclusion and a follow-up interview was agreed and conducted where chosen by the participant.

The study was approved by the Regional Committee for Medical Research Ethics in South-Eastern Norway and the Norwegian Social Science Data Service (see attachment 2).



**Table 2 Unit costs for health services provided by the municipalities**

Primary health care	Unit costs			
Per 24-hours	2015		2012	
<b>Nursing home</b>	115,00 €	= 943,00 kr	1076,54 kr	= 142,23 €
<b>In-home nursing</b>	30,50 €	= 250,10 kr	285,52 kr	= 37,72 €
Per visit				
<b>General practitioner</b>	22,10 €	= 181,22 kr	206,88 kr	= 27,33 €
<b>Physiotherapy</b>	38,50 €	= 315,70 kr	360,41kr	= 47,62 €
<b>Psychiatric nurse</b>	30,50 €	= 250,10 kr	285,52 kr	= 37,72 €
<b>Speech therapy</b>	73,20 €	= 600,24 kr	685,24 kr	= 90,54 €
<b>Occupational therapy</b>	120,10 €	= 984,82 kr	1124,29 kr	= 152,25 €
<b>Safety alarm per year</b>	365,90 €	= 3000,38 kr	3425,28 kr	= 452,55 €

### 3.5 Data analysis

Data were scanned and manually checked, then analyzed, using the Statistical Package of Social Science (SPSS) version 19.0 (IBM, Chicago, IL, USA). The description of data characteristics are reported as mean and standard deviation for continuous data.

In order to analyze use of primary health services in the study population, the mean cost of each unit of care was calculated per participant. Estimated unit costs for primary health services were based on national calculations from SINTEF Health Research (123), adjusted for inflation (14.2 %, for the years 2005 - 2012 ) (146). The mean value of the Euro through 2012 was NOK 7.50 (147). The cost is presented for the services nursing home and in-home nursing (pr 24 hours), general practitioner, physiotherapy, occupational- and speech therapy (per visit) and safety alarm (per year). (Table 1)

The primary outcome (over or below mean unit cost in primary care per patient) was studied by logistic regression.

The municipality being the geographical center of the region (Tynset) hosted the hospital, had the highest proportion of participants and was set as reference level for the municipalities in both crude and adjusted logistic regression analysis.

Continuous variables not linearly associated with the outcome were dichotomized (i.e. MMSE, HADS, P-ADL, I-ADL). Theoretically and clinically accepted cut-off levels for the current variables were used (108, 109, 121, 127, 135, 137, 139, 142).

Initially the variables municipality, death within the year of follow-up age, gender, living alone, elevated co-morbidity, cognitive, physical and instrumental functioning (P-ADL, I-ADL) and symptoms of depression and anxiety (HADS) were studied.

The variables with a potential effect ( $p < 0.2$ ) on the primary outcome are presented.

Logistic regression analyses using the procedure as described above were performed for each level of primary care. Probability values below 0.05 were considered statistically significant.



## 4 Results

### 4.1 Sample characteristics

The study sample consisted of 451 persons (226 -50.1 % women) with a mean age of 80.6 (SD 7.5) years, the range 65 – 101 years (see table 2). Before the actual hospital admission 151 (33.5%) of the patients were in need of in home nursing. At inclusion, 307 (68.1%) patients had impaired physical functioning (PSMS > 6), 229 (50.8%) patients had instrumental functioning impairment (I-ADL), and 245 (54.3%) had some cognitive impairment (MMSE<25).

**Table 2** Characteristics of study sample at inclusion

	Number (% of all)	451	(100)
<b>Sosio-demographic</b>			
Men	N (%)	225	(49.9)
Women	N (%)	226	(50.1)
Age	Mean (SD)	80.6	(7.5)
Living alone	N (%)	233	(51.7)
Smoking	N (%)	56	(12.4)
<b>Medical information</b>			
In home nursing	N (%)	151	(33.5)
Charlson Index	Mean (SD)	2.1	(2.0)
Duration in days of actual hospitalization	Mean (SD)	5.5	(5.3)
Time before inclusion	Mean (SD)	4.35	(3.6)
<b>Physical impairment</b>			
PSMS > 6	N (%)	307	(68.1)
IADL > 8	N (%)	229	(50.8)
Fallen the past year	N (%)	125	(27.7)
Reading vision	N (%)	96	(21.3)
Hearing loss	N (%)	174	(38.6)
<b>Cognitive and emotional situation</b>			
Cognitive impairment (MMSE <25)	N (%)	245	(54.3)
Prevalence of depressive symptoms (HAD-D ≥ 8)	N (%)	43	(9.5)
Prevalence of anxiety symptoms (HAD-A ≥ 8)	N (%)	41	(9.1)

## 4.2 The participants use of primary health services

### by the municipalities during follow-up

The use of registered primary health services in the follow-up year were reported and categorized as 1) receiving nursing home care around the clock, 2) in home nursing with adapted care and 3) outpatients visits by general practitioner or 4) use of physiotherapist, occupational therapy or speech therapy. In all, a total of 110 (24.4%) participants in this study were nursing home residents for all or a period of the year of follow up, of whom 38 (36.5%) had Tynset as municipalities of residence. For further description see table 3.

**Table 3 Number (%) of patients in the sample sorted by the municipalities and their use (yes/no) of nursing home, in-home nursing, general practitioner consulting and physio-, occupational- and speech therapy during the 365 day of follow up.**

Municipalities of residence	Nursing home		In-home nursing		General Practitioner		Physio- occ.-and speech therapy			
	n	(%)	n	(%)	n	(%)	n	(%)		
<b>Tynset</b>	104	(23.1)	38	(36.5)	35	(33.7)	68	(65.4)	4	(3.8)
<b>Stor Elvdal</b>	27	(6.0)	8	(29.6)	12	(44.4)	19	(70.4)	3	(11.1)
<b>Alvdal</b>	40	(8.9)	9	(22.5)	15	(37.5)	23	(57.5)	1	(2.5)
<b>Rendalen</b>	57	(12.6)	13	(22.8)	31	(54.4)	38	(66.7)	0	-
<b>Folldal</b>	39	(8.6)	7	(17.9)	16	(41.0)	26	(66.7)	3	(7.7)
<b>Holtålen</b>	23	(5.1)	6	(26.1)	12	(52.2)	11	(47.8)	2	(8.7)
<b>Tolga</b>	33	(7.3)	5	(15.2)	19	(57.6)	22	(66.7)	1	(3.0)
<b>Os</b>	29	(6.4)	5	(17.2)	11	(37.9)	21	(72.4)	2	(6.9)
<b>Rørros</b>	99	(21.9)	19	(19.2)	43	(43.4)	68	(68.7)	4	(4.0)
<b>N (%)</b>	451	(100)	110	(24.4)	194	(43.0)	296	(65.8)	20	(4.4)

### **4.3 Mean cost pr. patient of the health services by the municipalities during follow up**

Using the estimated unit costs for primary health services from SINTEF Health Research (123), the calculated mean costs pr. patient of the health service provided by the municipalities were 7881.98 (SD 1403.85) Euro. For further details of mean costs pr. patients, health services and municipalities, see table 4.

### **4.4 Factors associated with health care services cost above mean pr. patient by the municipalities in the follow up**

The association between above the mean cost pr. nursing home patient during the follow-up year (versus: not above the mean cost) and the municipality of residence are presented in three adjusted logistic regression models in table 5.

In the logistic regression model adjusting for all available socio-demographic and health variables of potential importance, the odds for nursing home service cost above mean pr. patient was significantly decreased for the participants in Rendalen (OR 0.23, 95% CI = 0.08-0.63), Folldal (OR 0.25, 95% CI 0.07-0.89) and Røros (OR 0.25, 95% CI = 0.10-0.60) compared to Tynset.

The use of higher than mean in- home nursing cost pr. patient (versus not) by the municipality are reported in three adjusted logistic regression models in table 6. In the logistic regression model adjusting for all available socio-demographic and health variables of potential importance there is no significant association between the municipality of residence and in home nursing costs.

No significant association between higher costs than the mean pr. patient for general practitioner services during the follow-up year (versus not above the mean) and the municipality of residence of the patients is found.

Lastly, there is an association between an above the mean total health service cost pr. patient during the follow-up year (versus not above the mean) and the municipality of residence when adjusting for socio-demographic and health differences in the study sample (see table 7). In all, there was a reduced risk of more than mean health services costs pr. patient in three municipalities compared to Tynset, i.e. had Rendalen (OR 0.31, 95% CI 0.13-0.74), Folldal OR 0.35, 95% CI 0.12- 1.00) and Tolga (OR 0.22, 95%CI 0.07- 0.68).

**Table 4****Mean health services costs (in Euro) pr. patient, for each municipality and in total for the 365 days of follow-up, N=451**

<b>Municipalities</b>	<b>Nursing home</b>		<b>In home nursing</b>		<b>General Practitioner</b>		<b>Physiotherapy, occupational and speech therapy</b>		<b>Total</b>		
	Mean (SD)		Mean (SD)		Mean (SD)		Mean (SD)		Mean (SD)		
<b>Stor-Elvdal</b>	4398.59	(10965.69)	2002.05	(3974.67)	53.65	(80.75)	142.86	(558.94)	6597.16	(12007.69)	
<b>Alvdal</b>	5895.43	(4399.77)	2126.38	(4237.33)	38.26	(45.40)	7.61	(48.15)	8067.69	(14617.36)	
<b>Rendalen</b>	4241.95	(12616.22)	3085.79	(4691.63)	64.73	(97.95)	0		7392.46	(12859.85)	
<b>Folldal</b>	2396.03	(8271.16)	2293.09	(4521.43)	107.22	(135.70)	57.39	(242.86)	4853.73	(9382.88)	
<b>Tynset</b>	8639.10	(16616.61)	1662.50	(3550.30)	73.32	(107.33)	64.65	(448.65)	10439.58	(16537.05)	
<b>Tolga</b>	2305.85	(8541.78)	2431.17	(4194.57)	93.58	(119.92)	17.32	(99.47)	4847.92	(9033.06)	
<b>Os</b>	6444.49	(15776.23)	2084.99	(4442.70)	88.59	(110.69)	24.47	(115.58)	8642.53	(15540.91)	
<b>Røros</b>	4098.81	(12440.28)	2922.68	(5199.68)	67.63	(80.52)	31.56	(210.20)	7120.68	(12777.70)	
<b>Holtålen</b>	5404.74	(14335.50)	4900.36	(6320.14)	81.99	(178.65)	134.55	(470.62)	10521.64	(14038.85)	
<b>Total</b>	<b>N=451</b>	5280.17	(13511.73)	2483.54	(4552.04)	72.54	(104.86)	45.73	(304.76)	7881.98	(13679.01)



**Table 5** Nursing home costs (above mean cost or not per patient) by municipality in three adjusted logistic regression models<sup>1</sup>.  
Follow up period 365 days.

N = 451	OR <sub>1</sub>	(95% CI)	OR <sub>2</sub>	(95% CI)	OR <sub>3</sub>	(95% CI)
<b>Municipals of Residence,</b>						
Tynset	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
Stor Elvdal	0.70	(0.24 - 2.05)	0.66	(0.22 - 2.02)	0.58	(0.18 - 1.89)
Alvdal	0.74	(0.30 - 1.81)	0.80	(0.31 - 2.05)	0.75	(0.27 - 2.09)
Rendalen	<b>0.37</b>	<b>(0.14 - 0.97)</b>	<b>0.31</b>	<b>(0.11 - 0.84)</b>	<b>0.23</b>	<b>(0.08 - 0.63)</b>
Folldal	0.37	(0.12 - 1.16)	<b>0.26</b>	<b>(0.08 - 0.87)</b>	<b>0.25</b>	<b>(0.07 - 0.89)</b>
Holtålen	0.48	(0.13 - 1.76)	0.43	(0.11 - 1.67)	0.31	(0.08 - 1.26)
Tolga	0.32	(0.09 - 1.15)	0.29	(0.08 - 1.06)	<b>0.24</b>	<b>(0.06 - 0.92)</b>
Os	0.70	(0.24 - 2.05)	0.80	(0.26 - 2.56)	0.91	(0.27 - 3.10)
Røros	<b>0.39</b>	<b>(0.18 - 0.84)</b>	<b>0.32</b>	<b>(0.14 - 0.73)</b>	<b>0.25</b>	<b>(0.10 - 0.60)</b>

OR : Odds ratio CI: Confidence interval Significant associations: **Bold text\*** =  $p \leq 0.05$

<sup>1</sup>**OR<sub>1</sub>**: Analyses are adjusted for each other and death within the year of follow-up.

**OR<sub>2</sub>**: Analyses are adjusted for each other and death within the year of follow-up, the variables in the model above, socio demographic variables (age, gender, living alone) and somatic health indicators (Charlson Co-morbidity Index and length of hospital admission).

**OR<sub>3</sub>**: Analyses are adjusted for each other and death within the year of follow-up, the variables in the model above, socio demographic variables (age, gender, living alone), somatic health indicators (Charlson Co-morbidity Index and length of hospital admission) and degree of function (PSMS/ I-ADL, MMSE) and emotional health (HAD-A and HAD-D).

**Table 6 In-home nursing costs (above mean cost or not per patient) by municipality in three adjusted logistic regression models<sup>2</sup>. Follow up period 365 days.**

	<b>OR<sub>1</sub></b>	<b>(95% CI)</b>	<b>OR<sub>2</sub></b>	<b>(95% CI)</b>	<b>OR<sub>3</sub></b>	<b>(95% CI)</b>
<b>Municipals of Residence,</b>						
<b>Tynset</b>	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
<b>Stor Elvdal</b>	1.17	(0.39 - 3.51)	1.13	(0.37 - 3.49)	1.09	(0.33 - 3.61)
<b>Alvdal</b>	1.28	(0.50 - 3.25)	1.30	(0.50 - 3.40)	1.16	(0.42 - 3.24)
<b>Rendalen</b>	1.84	(0.84 - 4.05)	1.83	(0.80 - 4.15)	1.44	(0.61 - 3.45)
<b>Folldal</b>	1.13	(0.43 - 3.00)	0.99	(0.36 - 2.69)	1.10	(0.38 - 3.17)
<b>Holtålen</b>	<b>3.32</b>	<b>(1.24 - 8.91)</b>	<b>2.83</b>	<b>(1.02 - 7.92)</b>	2.76	(0.93 - 8.18)
<b>Tolga</b>	1.15	(0.41 - 3.21)	0.93	(0.32 - 2.68)	0.82	(0.27 - 2.51)
<b>Os</b>	0.83	(0.26 - 2.70)	0.74	(0.22 - 2.48)	0.79	(0.22 - 2.86)
<b>Røros</b>	1.39	(0.68 - 2.82)	1.15	(0.55 - 2.40)	1.17	(0.54 - 2.53)

OR: Odds ratio CI: Confidence interval Significant associations: **Bold text =  $p \leq 0.05$**

<sup>2</sup> **OR<sub>1</sub>**: Analyses are adjusted for each other and death within the year of follow-up.

**OR<sub>2</sub>**: Analyses are adjusted for each other and death within the year of follow-up, the variables in the model above, socio demographic variables (age, gender, living alone) and somatic health indicators (Charlson Co-morbidity Index and length of hospital admission).

**OR<sub>3</sub>**: Analyses are adjusted for each other and death within the year of follow-up, the variables in the model above, socio demographic variables (age, gender, living alone), somatic health indicators (Charlson Co-morbidity Index and length of hospital admission) and degree of functioning (PSMS/ I-ADL, MMSE) and emotional health (HAD-A and HAD-D).

**Table 7 Total health service costs (above mean cost or not per patient) by municipality in three adjusted logistic regression models<sup>3</sup>. Follow up period 365 days.**

	OR <sub>1</sub>	(95% CI)	OR <sub>2</sub>	(95% CI)	OR <sub>3</sub>	(95% CI)
<b>Municipals of residence:</b>						
Tynset	1.00	(Reference)	1.00	(Reference)	1.00	(Reference)
Stor Elvdal	0.69	(0.26 - 1.78)	0.61	(0.22 - 1.68)	0.48	(0.16 - 1.46)
Alvdal	0.85	(0.39 - 1.87)	0.89	(0.39 - 2.06)	0.83	(0.32 - 2.20)
Rendalen	0.69	(0.39 - 1.42)	0.56	(0.26 - 1.23)	<b>0.31</b>	<b>(0.13 - 0.74)</b>
Folldal	0.58	(0.25 - 1.36)	0.42	(0.17 - 1.04)	<b>0.35</b>	<b>(0.12 - 1.00)</b>
Holtålen	1.78	(0.71 - 4.45)	1.59	(0.59 - 4.30)	1.33	(0.43 - 4.12)
Tolga	0.43	(0.16 - 1.14)	0.34	(0.12 - 0.94)	<b>0.22</b>	<b>(0.07 - 0.68)</b>
Os	0.87	(0.36 - 2.11)	0.89	(0.34 - 2.36)	1.18	(0.38 - 3.66)
Røros	0.85	(0.47 - 1.53)	0.67	(0.35 - 1.25)	0.53	(0.25 - 1.10)

OR : Odds ratio CI: Confidence interval Significant associations: **Bold text =  $p \leq 0.05$**

<sup>3</sup> **OR<sub>1</sub>**: Analyses are adjusted for each other and death within the year of follow-up.

**OR<sub>2</sub>**: Analyses are adjusted for each other and death within the year of follow-up, the variables in the model above, socio demographic variables (age, gender, living alone) and somatic health indicators (Charlson Co-morbidity Index and length of hospital admission).

**OR<sub>3</sub>**: Analyses are adjusted for each other and death within the year of follow-up, the variables in the model above, socio demographic variables (age, gender, living alone), somatic health indicators (Charlson Co-morbidity Index and length of hospital admission) and degree of functioning (PSMS/ I-ADL, MMSE) and emotional health (HAD-A and HAD-D).

## **5 Discussion**

To the best of my knowledge, this is the first follow-up study in Norway of rural senior citizens with regard of the municipalities' use of primary services after hospitalization in a medical ward.

The main results present differences among the municipalities. Rendalen, Folldal and Røros are less likely to use more than mean nursing home service cost in the period compared to Tynset. There is no significant association in municipality belonging and in-home nursing or General Practitioner costs. Compared to Tynset, there is a reduced risk of using more than mean total health costs in Rendalen, Folldal and Tolga.

### **5.1 The main results in comparison with previous research**

#### **5.1.1 Nursing home services cost**

In the analysis adjusted for age, gender, impaired physical, mental functioning and co-morbidity or death within a year, we found that in three municipalities, Rendalen, Folldal and Røros, the patients were less likely to have received as much nursing home care in the follow-up period as the reference municipality Tynset. In line with our results regarding the use of nursing home services, others have found major variations among the municipalities in the use of both institutional- and in-home nursing (8, 148-152).

In disagreement with the this result, studies have reported that small municipalities, which are typical for rural districts, have a higher institutional consumption, and have also explained differences between urban and rural areas, where rural areas have institutional recourses for 18-19 % of the population aged 80 years and older, compared to 13-15 % in urban areas (153).

However it is a key challenge in the organization of primary care services to create a balance between the home- and institutional based care (3, 154, 155), relative to the proportion of elderly people in each municipality at the time, their functionality and their needs (153).

Rendalen and Folldalen have less than 2000 inhabitants and are considered very small municipalities (156). Røros is also considered a small municipality in the region and in Norway, serving about 5500 inhabitants. The municipality is comparable to Tynset, yet we found that Røros was less likely to use more than the mean nursing home service cost in the

period compared to Tynset. This result can possibly be explained by inequalities in consumption and/or availability in nursing home services or confounding, i.e factors not identified as significant and adjusted for in this study.

The municipalities are free to structure and administrate the primary health care service within the requirements of acts and legalizations. Different structure and priorities may exist in the municipalities. Some may give in-home nursing priority rather than nursing home care institutions, and thus, the patients may stay longer at home with assistance and care than in other municipalities, but this we cannot tell. This study has only investigated a selection of hospitalized seniors citizens, where no associations in cost differences in home nursing service were found among the municipalities, though significant variations in the cost of primary health care, also for institutions, has been reported elsewhere (157). Differences in expenditure in institutional care can allow a municipality to operate a higher amount of accommodation than another municipality at the same cost. This can be explained by different ways of budgeting or calculating the cost, quality differences in the service, local conditions such as expensive housing, heating, cost of labor in the service etc (157). The structure of public health care in Røros can be organized differently, since they provide about 25 more institution beds(38) compared to the same sized municipality Tynset, though the risk of using higher than mean nursing home- costs was reduced in Røros. Even so, as previously commented, we have only studied older, previous in patients during one year.

### **5.1.2 In home nursing and general practitioner service cost**

No significant association is found in the municipality of residence and in-home nursing or general practitioner costs, adjusted for the variables explained.

Assuming equal health services among the municipalities and adjusted for all significant variables, we could have expected a higher consumption of in-home nursing among the municipalities that had lower than mean nursing home use.

According to Statistics Norway there are currently about 11,000 (8 %) seniors who are not receiving help, despite the fact that they have great difficulty in performing the necessary tasks of daily life. The reason for this gap in demand and providing is not yet sufficiently accounted for. A possibly major factor is that most live in households with other people (157).

No significant association is found by municipality and General Practitioner cost adjusted for the demographic and health variables included. Thus, after controlling for personal differences in the participants none of the municipalities had significant risk of higher mean general practitioner costs. The lack of differences may be due to general government funding and demands to ensure equality in the services independent of community belonging (35, 158)

### **5.1.3 Total health service costs**

Compared to Tynset, there is a reduced risk of using more than mean total health costs in Rendalen, Folldal and Tolga. The result for Rendalen og Folldal can be explain by less use of nursing home accommodation, which constitutes a major part of the expenditure in primary health care. These three municipals are all serving less than 2000 inhabitants. Tolga is also the smallest in acreage, most of the inhabitants live nearby the municipal center, reducing cost of transportation and making provision of in home nursing less time consuming. There is no firm explanation for why the municipals Rendalen, Folldal og Tolga were less likely to use more than mean total primary health service costs, but all these municipalities have less than 2000 inhabitants and are in the county of Hedmark. The proportion of senior citizens is evenly distributed in the involved municipalities, and is less likely have major impact of the results.

## 5.2 Limitations

This thesis is limited by the selection of patients studied; somatic ill old senior citizens in need of hospitalization, regarding the inclusion criteria. A different result is plausible for another selection.

The data was gathered in the years before the Coordination Reform, which introduced an economic incentive for municipalities to work toward fewer patient hospitalizations by meeting the patients` needs in the primary health care. The organization of the primary health care in the municipalities may thus have been changed. Furthermore, even if the best efforts to adjust for confounding factors such as age, gender and health, functional and social variables were included, all relevant factors may not have been considered.

The results in this study cannot be generalized for municipalities or regions, nor can causal associations for in patients in general be drawn from the analyses due to the study design and selection. Furthermore, there is a lack of complete information regarding use of all levels of special health care services (i.e outpatients, services allocated by private actors) for the follow-up period. The Regional Committee for Medical Research Ethics in South-Eastern Norway (REK) approval of this study did not include medical or hospitalization data from specialized health care other than Innlandet Hospital Trust (see attachment 2). Also, due to the geographically position, leakage to other local hospitals may exist.

The thesis does not regard the aspect of quality of life, satisfaction within the health services provided or economic evaluation on any level.

Studies have reported that 90% of care dependent seniors want to stay at home as long as possible (81). In small municipalities suffering of limited resources, health care expertise and institutional places, it can be cost effective providing more in-home nursing and less institutional accommodation (17). On the other hand it will also contribute to increased satisfaction and dignity in elderly care, by providing the service in their own home. These aspects may therefore affect health care service provision, cost and satisfaction among the receivers, though it is not in the scope of this study. Further investigation and research is necessary.

## **6 Conclusion**

The cost of nursing home service and total health care service per patient varied some among the municipalities among recently hospitalized senior citizens in a rural area. Even if it was adjusted for age, gender and health, functional and social variables, confounding factors may exist, making further research necessary.



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# REGIONAL KOMITE FOR MEDISINSK FORSKNINGSETIKK

## Øst-Norge (REK I)

Førsteamanuensis Anne Helvik  
Medisinsk teknisk forskningssenter  
NTNU  
7489 Trondheim

Deres ref.:

Vår ref.: 402-06164 1.2006.2106

Dato: 26. juni 2006

### **Den eldre pasient - forekomst av depressive symptom under og etter innleggelsen på medisinsk avdeling SI Tynset**

Regional komité for medisinsk forskningsetikk, Øst-Norge, vurderte prosjektet på sitt møte 20.06.06.

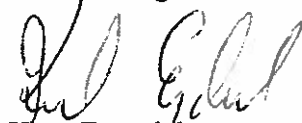
Komiteen mener at dette er et vel forberedt og nyttig prosjekt, og har ingen innvendinger mot at det blir gjennomført.

Det bes opplyst i informasjonsskrivet at samtalene tas opp på bånd, og når båndene vil bli slettet.

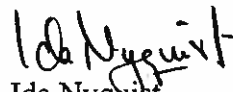
Dersom denne komiteen ønskes nevnt i informasjonsskrivet, kan det stå at komiteen har vurdert prosjektet, og ikke har innvendinger mot at det blir gjennomført.

Pårørende kan ikke samtykke i deltakelse på vegne av pasienter som ikke selv kan samtykke. Pårørende kan imidlertid skrive under på at de ikke har innvendinger mot at pasienten blir inkludert. Setningen "(...) og råder til at pasienten kan delta" bes således endret til "og har ingen innvendinger mot at pasienten blir inkludert" i følgende samtykkeformulering for pårørende: "Ovennevnte pasient har en slik medisinsk tilstand at samtykke etter min vurdering ikke kan innhentes. Jeg har mottatt informasjon og råder til at pasienten kan delta i studien. Pasienten vil senere bli forespurt om videre deltakelse".

Med yennlig hilsen



Knut Engedal  
professor dr.med.  
leder



Ida Nyquist  
sekretær

Innleggesdato **DJ.DJ.** | | | | | | |

Navn: \_\_\_\_\_

Inklusjonsdato **DJ.DJ.** | | | | | | |

Medisinsk ferdigbehandlet, dato

Utskrivningsdato **DJ.DJ.** | | | | | | |**DJ.DJ.** | | | | | | |Sosial status  Gift/samboer  Enke/enkemann  Ugift  Kjønn  Kvinne  MannFødselsdato **DJ.DJ.** | | | | | | |Etnisk herkomst  Norsk  Flyktning  InnvandrerInnskrevet fra  Hjemmet  Rehabilitering  Sykehjem  Annen avd.  AnnetUtskrevet til  Hjemmet  Rehabilitering  Sykehjem  Annen avd.  Annet  DødKommunal tilhørighet  Storelvdal  Alvdal  Rendalen  Folldal  Tynset  Tolga  
 Os  Røros  Holtalen  Annet

## Hjelpetiltak ved inntekt

- Hjemmehjelp  
 Hjemmesykepleie  
 Dagtilbud  
 Fysioterapi  
 Ergoterapi  
 Hjelpemidler  
 Rehabilitering i institusjon  
 Sykehjem  
 Annet  
 Ombygging av bolig

## Hjelpetiltak ved utskriving

- Hjemmehjelp  
 Hjemmesykepleie  
 Dagtilbud  
 Fysioterapi  
 Ergoterapi  
 Hjelpemidler  
 Rehabilitering i institusjon  
 Sykehjem  
 Annet  
 Ombygging av bolig

ProsjektIDpenr: | | | | |

Medisinsk informasjon H0yde (cm) j | | |

Vekt (kg) | | | |

BT systolisk ved inklusjon | | |

BT diastolisk ved inklusjon | | |

Diagnose ved innleggelsen, Hoveddiagnose / | | | / .D

Bidiagnoser | | | | / .D | | | | / .D | | | | / .D | | | | / .D

Antall bidiagnoser [ | ]

Diagnose ved utskrivning, Hoveddiagnose | | | | .D

Bidiagnoser | | | | / .D | | | | / .D | | | | / .D | | | | / .D

Antall bidiagnoser [ | ]

Antall innleggelser siste 5 ar: [ | ]

Diagnoser ved tidligere innleggelser: (siste 5 ar) | | | | / .D | | | | / .D | | | | / .D  
| | | | / .D | | | | / .D  

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| | | | / .D | | | | / .D

Depresjonsdiagnose kjent ved inklusjon? DJa ONei

Ved inklusjon MMSE: [ | ]

MADRS: [ | ]

## Helse og dagligliv

ProsjektID: \_\_\_\_\_

6. I hvilken grad har din fysiske helse eller følelsesmessige problemer begrenset deg i din vanlige sosiale omgang med familie eller venner i løpet av de siste 4 uker?

Ikke i det hele tatt     En del     Dutt     Mye     Kunne ikke ha sosial omgang

7. Hvordan er helsa di nå?

Darlig     Ikke helt god     God     Svært god

8. Har du tidligere konsultert lege eller fått medikamenter for følelsesmessige problem?

Nei     Ja

## Syn

9. Hvordan er evnen til å se i adekvat lys med briller hvis det brukes (ett svar)

Har adekvat syn - ser små detaljer, inkludert vanlig skrift i aviser/bøker

Lett nedsatt syn - leser store bokstaver, men ikke vanlig skrift i aviser og bøker

Moderat nedsatt syn - begrenset syn. Kan ikke lese avisoverskrifter, gjenkjenner objekter

Svært nedsatt syn - kan ikke gjenkjenne objekter men øynene følger når noe beveger seg

Alvorlig nedsatt syn - ingen syn eller ser bare farger eller konturer. Øynene klarer ikke å følge objekter

## Hørsel

10. Hvordan er hørselen (med høreapparat om det brukes) (ett svar)

Har adekvat hørsel, hører normal tale, TV, telefon

Lette vanskeligheter når flere snakker sammen

Hører kun i spesielle situasjoner, når det blir snakket høyt, klart og tydelig

Svært nedsatt hørsel - ingen brukbar hørsel

## Fall

11. Har du falt og slått deg siste året?  Nei     Ja

Hvis ja:

12. Hvor skjedde det?  Innen 0rs     Utendørs

13. Har du ufrivillig fallramlet i løpet av de siste tre måneder?  Nei     Ja

## Tobakk

14. Røyker du eller har du rnykt for?  Aldri     Sluttet     Røyker

Etter: Quan et al (2005) Med care 43( 11):130-1139  
(Quan har brukt opprinnelige Charlson Index)

Vektingen er fra: Schneeweis et al (2003) Health Services Research 38 (4): 1103-1120  
(Schneeweis har brukt Romano's Adaption av Charlson Index)

Forekommer som ICD- 10 diagnose de siste 5 ar inkludert denne innleggelsen

Besvarelse ved : **D** Inklusjon **D** 12 mnd etter ink!

Testdato:   | | | | Sign. tester: \_\_\_\_\_

N0	Conditions	Weight	Registrert
1	AIDS/HIV.....	4	<b>D</b>
2	Cerebrovascular disease.....		<b>D</b>
3	Chronic pulmonary disease.....	2	<b>D</b>
4	Congestive heart failure.....	2	<b>D</b>
5	Dementia.....	3	<b>D</b>
6	Diabetes with chronic complication.....	2	<b>D</b>
7	Diabetes without chronic complication.....	1	<b>D</b>
8	Hemiplegia or paraplegia.....	1	<b>D</b>
9	Malignancies including lymphoma and leukemia except malignant neoplasm of skin.....	2	<b>D</b>
10	Metastatic solid tumor.....	6	<b>D</b>
11	Mild liver disease..	2	<b>D</b>
12	Moderate or severe liver disease..	4	<b>D</b>
13	Myocardial infarction.....	1	<b>D</b>
14	Peptic ulcer disease..	0	<b>D</b>
15	Peripheral vascular disease.....	1	<b>D</b>
16	Renal disease (moderate and severe).....	3	<b>D</b>
17	Rheumatic disease/ Connective tissue disease.....	0	<b>D</b>



Pasientnavn: \_\_\_\_\_

ProsjektIDpenr: / / / / / / / / / /

Testdato: [ ] . [ ] . [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Besvarelse ved:

D Inklus-on

D 12 mnd etter inkl Sign tester- \_\_\_\_\_

1. ORIENTERING	Skar	Maksimal skar
Hvilken dato er <let i <lag?	D	1
Hvilken ukedag er <let idag?	D	1
Hvilken måned er <let?	D	1
Hvilken årstid er det?	D	1
Hvilket år er det?	D	1
Hvilken adresse har du? (Hvilken institusjon er du na?)	D	1
Hva er postnummeret? (Hvilken avdeling er dette?)	D	1
I hvilken by/kommune er vi na?	D	1
I hvilket fylke/landsdel er vi na?	D	1
I hvilket land er vi na?	D	1
<b>2. LA.:RING</b> Si 3 ord. Bruk 1 sekund til å uttale hvert ord. OST - SYKKEL - BOK. Be pasienten gjenta alle 3 ordene. Gjenta ordene, inntil pasienten har lært dem, og kan huske dem. Noter antall forsøk D	D	3
<b>3. ABSTRAKT TENKNING</b> Stav ordet SVERD baklengs.  Ett poeng for hver riktig bokstav sagt i den rette rekkefølge. Alternativt: Start med tallet 100. Trekk fra 7, rekk fra 7 igjen, og fortsett subtraksjonen i alt 5 ganger.	D	5
<b>4. KORTTIDHUKOMMELSE</b> Kan du si meg de ordene du skulle huske for litt siden? ( OST - SYKKEL - BOK )	D	3
<b>5. HØYERE KORTIKALE FUNKSJONER</b>  Vis fram en blyant. Hva er dette?  Vis fram en klokke. Hva er dette?  Gjenta følgende setning: "Aldri annet enn om og men." Ta et stykke papir med din høyre hand. Brett <let over på midten og legg <let på gulvet.  Les og utfør: "Lukk Øynene dine."  Skriv en setning.  Kopier denne tegningen.	D D D B D D D B	1 1 1 3 1 1 1
<b>TOTAL SKAR</b>	[D	30 60682





# Funksjonsniva Rankin + 1 spm (01)

ProsjektID: 

--	--	--	--	--	--

Pasientnavn: \_\_\_\_\_

Testdato: **DD**.**DD**.**DD**

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Besvarelse ved:

D Inklusjon

D 12 mnd etter inkl Sign. tester: \_\_\_\_\_

**1. Har du noen langvarig (minst 1 ar) sykdom, skade eller lidelse av fysisk eller psykisk art som nedsetter dine funksjoner i ditt daglige liv?**

Ja     Nei

## 2. RANKIN

**Hvordan er ditt funksjonsniva og din evne til å utføre vanlige daglige gjøremal i dag?**

Med vanlige daglige gjøremal menes f. eks. spising, pakledning, toalettbesøk. (sett et kryss ved det funksjonsniva som passer best)

**D Ingen symptomer og ingen funksjonssvikt.**

**D Ingen nevneverdig funksjonssvikt.** Har noen symptomer, men klarer å utføre alle oppgaver og aktiviteter som før.

**D Lett funksjonssvikt.** Klarer ikke å utføre alle aktiviteter som før, men klarer de vanlige daglige gjøremal uten hjelp.

**D Moderat funksjonssvikt.** Trenger litt hjelp i daglige gjøremal, men klarer å gå uten hjelp av en annen person.

**0 Alvorlig funksjonssvikt.** Klarer ikke å gå uten hjelp av en annen person. Klarer ikke vanlige daglige gjøremal uten hjelp fra andre.

**D Svært alvorlig funksjonssvikt.**  
Trenger konstant tilsyn og hjelp fra andre

**D**





**Lawton AOL (02)**  
**Fysisk selv-oppretholdelses skala**

ProsjektIDpenr: 

--	--	--	--	--	--	--	--	--	--

Pasientnavn: \_\_\_\_\_

Testdato: **DJ-DJ**

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Besvarelse ved:

nInklusjon

0 12 mnd etter inkl

Sign. tester: \_\_\_\_\_

<p><b>1. Toalett</b></p> <p><b>0</b> 1 = Klarer seg selv på toalettet</p> <p><b>0</b> 2 = Trenger å bli påminnet, eller hjelp til å vaske seg, har sjeldent uhell (høyst en gang i uken)</p> <p><b>D</b> 3 = Urinerer og gjør på seg i søvne mer enn en gang i uken.</p> <p><b>D</b> 4 = Urinerer og gjør på seg i vaken tilstand mer enn en gang i uken</p> <p><b>D</b> 5 = Ingen kontroll over avføring eller blære</p>	<p><b>2. Spising</b></p> <p><b>0</b> 1 = Spiser uten hjelp</p> <p><b>0</b> 2 = Spiser med noe hjelp ved måltider, og/eller spesialtilberedte måltider, eller trenger hjelp til vask etter måltider</p> <p><b>0</b> 3 = Spiser med moderat hjelp og er uryddig</p> <p><b>0</b> 4 = Trenger mye hjelp ved alle måltider</p> <p><b>D</b> 5 = Spiser ikke selv i det hele tatt, og motsetter seg forsøk på å bli matet av andre</p>
<p><b>3. Pakledning</b></p> <p><b>0</b> 1 = Kler av og på seg selv, og velger ut klær fra egen garderobe</p> <p><b>0</b> 2 = Kler av og på seg selv, med noe hjelp</p> <p><b>0</b> 3 = Trenger moderat hjelp ved pakledning eller utvalgelse av klær.</p> <p><b>0</b> 4 = Trenger mye hjelp ved pakledning, men samarbeider med den som hjelper</p> <p><b>0</b> 5 = Fullstendig ute av stand til å kle seg selv, og setter seg til motverge ved hjelp fra andre.</p>	<p><b>4. Personlig stell</b> (har, negler, hender, ansikt, klær)</p> <p><b>0</b> 1 = Alltid pent kledd, velstelt, uten hjelp.</p> <p><b>0</b> 2 = Steller seg selv tilstrekkelig, med hjelp av og til. F. eks. barbering</p> <p><b>D</b> 3 = Trenger moderat og regelmessig hjelp eller veiledning til personlig stell.</p> <p><b>0</b> 4 = Trenger hjelp til alt personlig stell, men holder seg ren og velstelt ved hjelp fra andre.</p> <p><b>D</b> 5 = Motsetter seg aktivt andres hjelp til personlig stell.</p>
<p><b>5. Fysisk bevegelse</b></p> <p><b>0</b> 1 = Gar ute i naturen eller i byen</p> <p><b>0</b> 2 = Beveger seg rundt hjemmet eller rundt kvartalet</p> <p><b>0</b> 3 = Beveger seg ved hjelp av (kryss av en)</p> <p><b>n</b>a. annen person      <b>n</b>b. rekkverk</p> <p><b>n</b>c. spaserstokk      <b>n</b>d. gastol</p> <p><b>O</b>e1. Rullestol, kommer i og ut på egen hånd</p> <p><b>O</b>e2. Rullestol, trenger hjelp til å komme i og ut.</p> <p><b>0</b> 4 = Sitter oppreist uten støtte i stol eller rullestol, men kan ikke bevege seg uten hjelp.</p> <p><b>0</b> 5 = Sengeliggende mer enn halvparten av tiden</p>	<p><b>6. Bading</b></p> <p><b>0</b> 1 = Bader selv uten hjelp (badekar, dusj, vask med svamp)</p> <p><b>0</b> 2 = Bader seg selv med hjelp i og ut av badekar</p> <p><b>0</b> 3 = Vasker kun ansikt og hender, men kan ikke bade resten av kroppen</p> <p><b>n</b> 4 = Vasker ikke seg selv, men er samarbeidsvillig med de som bader ham/henne</p> <p><b>0</b> 5 = Vasker ikke seg selv og gjør motstand på forsøk å holde ham/henne ren.</p>



Pasientnavn: \_\_\_\_\_

Besvarelse ved:

DInklusjon

D12 mnd etter inkl Sign. tester: \_\_\_\_\_

**1. Dyktighet ved bruk av telefonen**

- D 0 = Ikke aktuelt
- D 1 = Benytter telefonen på eget initiativ, slå opp nummeret og ringer etc.
- D 2 = Ringer noen få velkjente telefonnummer
- D 3 = Svarer telefonen selv, men ringer ikke selv.
- D 4 = Bruker ikke telefon

**3. Matlaging**

- D 0 = Ikke aktuelt
- D 1 = Planlegger, forbereder og serverer fullgode måltider selvstendig.
- D 2 = Lager tilstrekkelig med måltider dersom ingrediensene er tilstede
- D 3 = Varmer opp og serverer ferdiglagde måltider, men opprettholder ikke fullgod diett.
- D 4 = Må ha måltidene ferdiglaget og servert

**5. Vasking av klær**

- D 0 = Ikke aktuelt
- D 1 = Vasker alle klærne selv
- D 2 = Vasker smating, skyller strømper etc.
- D 3 = All vasking av klær må gjøres av andre

**7. Ansvarlig for egne medisiner**

- D 0 = Ikke aktuelt
- D 1 = Har ansvar for å ta medisiner i korrekte doser til riktig tid
- D 2 = Ansvar for å ta medisiner dersom de på forhånd er klargjort i korrekte doser.
- D 3 = Klarer ikke å ta hånd om egne medisiner

**2. Handling i butikker**

- O = Ikke aktuell
- 1 = Tar hånd om all handling alene
- 2 = Handler mindre innkjøp på egen hånd.
- 3 = Trenger hjelp til hver handling
- 4 = Er ikke i stand til å handle

**4. Hushold**

- D 0 = Ikke aktuelt
- D 1 = Vedlikeholder huset alene eller har hjelp til dette innimellom (for eksempel hjemmehjelp)
- D 2 = Gjører lettere oppgaver som oppvask og rer opp sengen
- D 3 = Gjører lettere oppgaver, men klarer ikke å holde et akseptabelt nivå av renslighet.
- D 4 = Trenger hjelp til alle husholdningsoppgaver
- D 5 = Deltar ikke i noen husholdningsoppgaver

**6. Transport**

- D 0 = Ikke aktuelt
- D 1 = Reiser selvstendig med offentlig transport eller kjører egen bil
- D 2 = Reiser på egenhånd med drosje, men bruker ikke annen offentlig transport.
- D 3 = Reiser med offentlig transport med hjelp eller sammen med andre.
- D 4 = Begrensede reiser med drosje eller i bil med hjelp fra andre.
- D 5 = Reiser ikke i det hele tatt

**8. Evne til å håndtere egen økonomi**

- D 0 = Ikke aktuelt
- D 1 = Bestyrer økonomien selvstendig (budsjetterer, betaler regninger og renter, går i banken og holder orden på egen inntekt)
- D 2 = Bestyrer dag til dag oppgaver, men trenger hjelp med bankoppgaver, store kjøp osv.
- D 3 = Kan ikke håndtere penger



## Hvordan f0ler du deg (F1)

ProsjektI0penr

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Pasientnavn: \_\_\_\_\_

Testdato:

[		]	[		]	,					
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Besvarelse ved:

Inklusjsm

Sign. tester: \_\_\_\_\_

12mnd etter inkl

Her kommer noen sp0rsmal om hvordan du f0fer deg. For hverI sp0rsmal/ setter du kryss for ett av de fire svarene som best beskriver dine f0/elser den siste uken. Ikke tenk for lenge pa svaret - de spontane svarene er best.

- Jeg f0ler meg nerv0s og urolig
  - Nei
  - Litt
  - En god del
  - Svrert mye
- Jeg gleder meg fortsatt over ting slik jeg pleide f0r
  - Avgjort like mye
  - Ikke fullt sa mye
  - Bare lite grann
  - Ikke i det hele tatt
- Jeg har en urof0else som om noe forferdelig vii skje
  - Ja, og noe svrert ille
  - Ja, ikke sa veldig ille
  - Litt, bekymrer meg lite
  - Ikke i det hele tatt
- Jeg kan le og se det morsomme i situasjoner
  - Like mye na som f0r
  - Ikke like mye na som f0r
  - Avgjort ikke na som f0r
  - Ikke i det hele tatt
- Jeg har hodet fullt av bekymringer
  - Veldig ofte
  - Ganske ofte
  - Avogtil
  - En gang i blant
- Jeg er i godt hum0r
  - Aldri
  - Noen ganger
  - Ganske ofte
  - For det meste
- Jeg kan sitte i fred og ro og kjenne meg avslappet
  - Ja, helt klart
  - Vanligvis
  - Ikke Sa ofte
  - Ikke i det hele tatt
- Jeg f0ler meg som om alt gar langsommere
  - Nesten hele tiden
  - Svrert ofte
  - Fra tid til annen
  - Ikke i det hele tatt
- Jeg f0ler meg urolig som om jeg har sommerfugler i magen
  - Ikke i det hele tatt
  - Fra tid til annen
  - Ganske ofte
  - Svrertoft
- Jeg bryr meg ikke lenger om hvordan jeg ser ut
  - Ja, har sluttet a bry meg
  - Ikke som jeg burde
  - Kan hende ikke nok
  - Bryr meg som f0r



11. Jeg er rastløs som om jeg stadig må være aktiv
- Uten tvil svært mye
  - Ganske mye
  - Ikke så veldig mye
  - Ikke i det hele tatt

13. Jeg kan plutselig få en følelse av panikk
- Uten tvil svært ofte
  - Ganske ofte
  - Ikke så veldig ofte
  - Ikke i det hele tatt

12. Jeg ser med glede fram til hendelser og ting:
- Like mye som før
  - Heller mindre enn før
  - Avgjort mindre enn før
  - Nesten ikke i det hele tatt

14. Jeg kan glede meg over gode bøker, radio/TV
- Ofte
  - Ikke så ofte
  - Fra tid til annen
  - Svært sjelden

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### Alt i alt

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#### 15. Føler du deg stort sett sterk og opplagt, eller trøtt og sliten?

- Meget sterk og opplagt
- Sterk og opplagt
- Ganske sterk og opplagt
- Både - og
- Ganske trøtt og sliten
- Trøtt og sliten
- Svært trøtt og sliten

#### 16. Når du tenker på hvordan du har det for tiden, er du stort sett fornøyd med tilværelsen eller er du stort sett misfornøyd

- Svært fornøyd
- Meget fornøyd
- Ganske fornøyd
- Både - og
- Noksa misfornøyd
- Meget misfornøyd
- Svært misfornøyd

Navn: \_\_\_\_\_

ProsjektIDopenr: | | | | |

F0dse to: \_\_\_\_\_

Utskrivningsdato: [ ] . [ ] . 1 | | | |

Utskrevet til:  Hjemmet  Rehabilitering  Sykehjem  Annen avd.  Annet  D0d

Dersom "Annet", spesifiser: \_\_\_\_\_ Dager i Med avd [ ]

	1.mnd etter utskrivning	2 mnd etter utskrivning	3 mnd etter utskrivning	4 mnd etter utskrivning
Hjemmesykepleie	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]
Sykehjemsopphold	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]
Trygghetsalarm	Antall [ ] Dager [ ]	Antall [ ] Dager [ ]	Antall [ ] Dager [ ]	Antall [ ] Dager [ ]
Dag tilbud	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]
Opphold i dag beh	Antall [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall [ ] Dager [ ]	Antall! [ ] Dager [ ]
Fysioterapi	Antall! [ ]	Antall [ ]	Antall! [ ]	Antall! [ ]
Ergoterapi	Antall! [ ]	Antall [ ]	Antall! [ ]	Antall! [ ]
Logoped	Antall! j   j	Antall j / j	Antall! /   j	Antall! [ ]
Legebes0k	Antall! [ ]	Antall! [ ]	Antall! [ ]	Antall! [ ]
Poliklinikk (lege)	Antall! [ ]	Antall [ ]	Antall! [ ]	Antall! [ ]
Psykiatrisk sykepleie	Antall [ ] Dager [ ]	Antall [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]
Annet :	Antall! [ ] Dager [ ]	Antall [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]
Nye sykehusopphold	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall! [ ] Dager [ ]	Antall [ ] Dager [ ]
Oppholdsted	D	D	D	D

D0dstidspunkt [ ]

[ ] Dato og sign.



	5 mnd etter utskrivning	6 mnd etter utskrivning	7 mnd etter utskrivning	8 mnd etter utskrivning
Hjerrimesykepleie	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ D Dager [ ] ]
Sykehjemsopphold	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ ] ] Dager [ ] ]
Trygghetsalarm	Antall [ D Dager [ D	Antall [ ] ] Dager [ ] ]	Antall [ ] ] Dager [ ] ]	Antall [ ] ] Dager [ ] ]
Dag tilbud	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ ] ] Dager [ D	Antall [ ] ] Dager [ ] ]
Opphold i dag beh	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ ] ] Dager [ ] ]
Fysioterapi	Antall [ D	Antall [ D	Antall [ D	Antall [ ] ]
Ergoterapi	Antall [ D	Antall [ D	Antall [ D	Antall [ ] ]
Logoped	Antall , j	Antall , , ,	Antall , ,	Antall
Legebesøk	Antall	Antall	Antall	Antall
Poliklinikk (lege)	Antall [ D	Antall [ D	Antall [ D	Antall [ ] ]
Psykiatrisk sykepleie	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ ] ] Dager [ ] ]
Annet :	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ ] ] Dager [ ] ]
Nye sykehus- opphold	Antall [ D Dager [ D	Antall [ D Dager [ D	Antall [ ] ] Dager [ D	Antall [ ] ] Dager [ ] ]
Oppholdsted	D	D	D	D

D0dstidspunkt [ ] [ D . \_\_\_\_\_

Dato og sign. \_\_\_\_\_

	9 mnd etter utskrivning	10 mnd etter utskrivning	11 mnd etter utskrivning	12 mnd etter utskrivning
Hjen:imesykepleie	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]
Sykehjemsopphold	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]
Trygghetsalarm	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]
Dag tilbud	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]
Opphold i dag beh	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]
Fysioterapi	Antall [ ][ ]	Antall [ ][ ]	Antall [ ][ ]	Antall [ ][ ]
Ergoterapi	Antall [ ][ ]	Antall [ ][ ]	Antall [ ][ ]	Antall [ ][ ]
Logoped	Antall [ ][ ]	Antall! [ ][ ]	Antall [ ][ ]	Antall [ ][ ]
Legebesøk	Antall	Antall	Antall	Antall
Poliklinikk (lege)	Antall [ ][ ]	Antall [ ][ ]	Antall [ ][ ]	Antall [ ][ ]
Psykiatrisk sykepleie	Antall [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]
Annet :	Antall [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]
Nye sykehus- opphold	Antall [ ][ ] Dager [ ][ ]	Antall! [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]	Antall [ ][ ] Dager [ ][ ]
Oppholdsted	D	D	D	D

D0dstidspunkt [ ][ ][ ][ ] / / ;

Dato og sign. \_\_\_\_\_