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**Primary Care Mental Health Services in Finland, a hidden Lynchpin of
Psychiatric Re-hospitalisation**

Master's dissertation in Mental Health Policy and Services

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Abstracts

English Abstract

Psychiatric re-hospitalisation is multifaceted, determined by many factors, and often highlighted as a negative outcome. Investigating outpatient care including primary care can further insights of psychiatric re-hospitalisation.

The retrospective register based study included data from the HILMO Care Register for Health Care, and the AvoHILMO Register for Outpatient Visits in Primary Care encompassing two main objectives, investigating psychiatric re-hospitalisation in the Finnish context, and exploring the use of primary care by the study cohort. The study cohort (N= 16 814 adults) comprised of people with experience of psychiatric inpatient care in 2012. More diverse primary care services were expected to have protective impacts on psychiatric re-hospitalisation.

The average re-hospitalisation rate was 40%, varying between hospital districts with Kymenlaakso Hospital District at 28% and Länsi-Pohja Hospital District at 54%. Re-hospitalisation rate correlated with length of stay, share of study cohort in hospital district, and aspects of service type.

Primary care visits within a week following discharge were seen to correlate negatively with population density, areas with lower population density having a higher level of a primary care visit within a week. Mental health care visits were more likely to take place at the primary care centre, with other specialities having more home based care means of contact. There was a strong positive correlation between likelihood of being seen within a week within primary care, and amount of Mental Health Care Assistants included in the primary care workforce.

Differences in service use between the hospital districts was apparent, the current study illuminating how people with mental health disorders severe enough to require hospitalisation access outpatient care, particularly primary care. Further developing primary care by developing the diversity of the workforce and types of services available would be in line with current recommendations for more holistic or person centred mental health care.

Key words

Psychiatric re-hospitalisation, mental health care, primary care, health care system

Resumo

O reinternamento psiquiátrico é um fenómeno multifacetado, determinado por diversos fatores e frequentemente apontado como um resultado negativo. Investigar os cuidados de saúde ambulatoriais, incluindo os Cuidados de Saúde Primários, pode proporcionar mais informações sobre o reinternamento psiquiátrico.

O presente estudo retrospectivo incluiu dados do *HILMO* - Registo dos Cuidados Sociais e de Saúde, assim como do *AvoHILMO* - Registo dos Cuidados de Saúde Primários a Doentes Ambulatoriais. Os dois objetivos principais do estudo abrangeram a pesquisa sobre o reinternamento psiquiátrico no contexto finlandês e a análise do uso dos Cuidados de Saúde Primários utilizando um estudo de coorte. O estudo de coorte

(N=16.814 adultos) comprendeu pessoas com experiência em regime de internamento psiquiátrico no ano de 2012. Esperava-se que serviços de Cuidados de Saúde Primários mais variados pudessem ter um impacto mais protetor em casos de reinternamento psiquiátrico.

A taxa média de reinternamento foi de 40%, variando entre distritos hospitalares, desde 28% no hospital Kymenlaakso até 54% no hospital *Länsi-Pohja*. O índice de reinternamento hospitalar esteve correlacionado com o tempo de estadia, parte do estudo de coorte em distritos hospitalares e aspectos de tipo de serviço.

As consultas nos Cuidados de Saúde Primários uma semana depois da alta mostraram uma correlação negativa com a densidade populacional, com áreas de menor densidade populacional possuindo um maior nível de consultas nos cuidados primários durante essa semana. As consultas de saúde mental tiveram mais frequentemente lugar em centros de saúde primários, enquanto outras especialidades privilegiaram o cuidado domiciliário como meio de contato. Houve uma forte correlação positiva entre a probabilidade de atendimento em cuidados de saúde primários no prazo de uma semana depois da alta e o número de profissionais de saúde mental incluído na equipe de Cuidados de Saúde Primários.

Diferenças na utilização de serviços entre os vários distritos hospitalares foram evidentes. O presente estudo mostra como pessoas com perturbações mentais suficientemente graves para requerer hospitalização, acedem aos cuidados ambulatorios, particularmente aos Cuidados de Saúde Primários. O melhoramento dos Cuidados de Saúde Primários através do aumento da diversidade de profissionais e dos tipos de serviços disponíveis estaria em consonância com as recomendações atuais para cuidados de saúde mental mais holísticos ou centrados na pessoa.

Palavras-chave

Reinternamento psiquiátrico, cuidados de saúde mental, cuidados de saúde primários, sistema de cuidados em saúde

Spanish Resumen

La re-hospitalización psiquiátrica es multifacética, determinada por muchos factores, y a menudo resaltada como un resultado negativo. La investigación de la atención ambulatoria, incluyendo la atención primaria, puede proporcionar más entendimiento sobre la re hospitalización psiquiátrica.

El estudio retrospectivo está basado en los datos del Registro de Atención de Salud HILMO y el Registro de Visitas de Pacientes Externos en Atención Primaria AvoHILMO y abarca dos objetivos principales: Investigar la re- hospitalización psiquiátrica en el contexto finlandés y explorar el uso de la atención primaria por parte de la cohorte de estudio. La cohorte del estudio (N = 16 814 adultos) estaba compuesta por personas con experiencia en atención psiquiátrica de pacientes hospitalizados en el 2012. Se esperaba que los servicios de atención primaria más diversos tuvieran un impacto protector en la re-hospitalización psiquiátrica.

La tasa hospitalaria media fue del 40%, variando entre los distritos hospitalarios del Distrito Hospitalario de Kymenlaakso en el 28% y del Distrito Hospitalario de Länsi-Pohja en el 54%. La tasa de re-hospitalización se correlacionó con la duración de la estadia, la proporción de la cohorte de estudio en el distrito hospitalario y los aspectos del tipo de servicio.

Las visitas de atención primaria dentro de una semana se correlacionaron negativamente con la densidad de población, las zonas con menor densidad poblacional tienen un nivel más alto de visitas de atención primaria dentro de una semana. Las visitas de atención para salud mental tenían más probabilidades de llevarse a cabo en el centro de atención primaria, mientras que otras especialidades tenían más atención y contacto desde el hogar.

Hubo una fuerte correlación positiva entre la probabilidad de ser atendido dentro de una semana en atención primaria y la cantidad de asistentes de salud mental incluidos en la fuerza de trabajo de atención primaria.

Las diferencias en el uso de servicios entre los distritos hospitalarios fueron evidentes. El estudio está ilustrando cómo las personas con trastornos de salud mental lo suficientemente graves como para requerir hospitalización, tienen acceso a la atención ambulatoria, en particular la atención primaria.

Desarrollar la atención primaria mediante el desarrollo de la diversidad de la fuerza laboral y los tipos de servicios disponibles estaría en consonancia con las recomendaciones actuales para una atención de salud mental más holística o centrada en la persona.

Palabras clave:

Re-hospitalización psiquiátrica, Atención de salud mental, Atención primaria, Sistema de salud

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List of acronyms

HILMO	HILMO Care Register for Health Care
AvoHILMO	AvoHILMO Register for Outpatient Visits in Primary Care
SMC	Specialist Medical Care
KELA	Social Insurance Institution of Finland
HD	Hospital Districts
CX	CEPHOS-LINK
MC	Medical Care
HC	Health Care
MHI	Mental Health Index
AMS	All included Medical Specialties
MHS	Mental Health Speciality
ACT	Assertive Community Treatment
EIT	Early Intervention Teams
UN	United Nations
GP	General Practitioner

Literature Review

Background

The burden of mental health disorders is an area which is increasingly being recognised globally. In 2015 mental health was included in the United Nations (UN) Sustainable Development Goals (SDGs), with the UN not only acknowledging the significant burden it presents, but also defining mental health as a priority for global development for the next 15 years.¹

Twenty-seven percent of the European adult population is estimated as being (or having been) affected by at least one mental disorder in the past 12 months, many of whom do not receive the care or treatment they need.² This unmet need or *treatment gap* can be attributed to many factors such as lack of services, barriers or delayed access to care. The level of the gap has been seen to vary between countries, existing even in high-income countries with universal health care coverage and well-developed community care systems.³ Estimations of the treatment gap for a period for help-seeking over one year for major depression ranging from 36% in the Netherlands to 73% in Finland.⁴ This treatment gap culminates in personal, social and economic consequences⁵, and can contribute to increased healthcare expenditure.^{6,7} A thorough understanding of barriers to treatment is an important aspect of a country's health care planning and development processes, in terms of identifying vulnerable groups, allocating resources and setting priorities.

Barriers contributing to the treatment gap include both attitudinal barriers as well as structural barriers. Attitudinal barriers stem from factors such as the desire to look after one's own problems⁸, stigma and public attitudes towards mental illness⁹, or fear of being discriminated in the workplace¹⁰ which may lead to people actively not seeking help for their mental health difficulties, or contribute to dropping out from treatment.¹¹ Structural barriers such as lack of access to treatment due to geographical distance, barriers relating to cost of care or lack of health insurance coverage¹², as well as the quality and level of services amplify the treatment gap further.¹³

Healthcare governance is of key importance when it comes to accessible services. Policy makers including the World Health Organisation (WHO) believe in the value of robust Primary Health Care Services (PHCS) (also referred to here as primary care services), urging member states to integrate mental health into primary care services, improving accessibility, affordability and acceptability.^{14,13,15,16} This drive is echoed by the Balanced Care Model for mental health care, which emphasises the role of community based services with primary care services placed at the forefront of delivery but in collaboration with specialist and when needed, hospital based care.¹⁷ High income countries should be able to offer the most diverse and dynamic services with well-integrated and comprehensive primary care services, supported by specialist services. These may include, for example, Assertive Community Treatment (ACT) or Early Intervention Teams (EIT), and additional/alternative specialist acute in-patient care in the form of acute day hospitals, crisis houses or home treatment/crisis resolution teams.¹⁸ Although encompassing a strong emphasis on community based care, the balanced model for mental health care acknowledges the complex and lasting nature of certain mental disorders, and that psychiatric hospitalisation during acute phases may at times be required, even though it stipulates that a sole reliance on hospital based care is inadequate.¹⁷

A common occurrence associated with hospital based psychiatric care is what has been coined the 'revolving door' phenomenon. This phenomenon describes the occurrence of psychiatric inpatients repeatedly returning to hospital care relatively soon after discharge. Psychiatric re-hospitalisation has during recent decades, and in conjunction with the deinstitutionalization process, often been highlighted as a negative outcome in need of attention. The rate at which psychiatric patients are re-hospitalised has been used as a measure for potentially unfavourable service structures. The OECD for example, uses psychiatric re-hospitalisation rates as a quality indicator representing *"the lack of proper management of mental health conditions outside of hospital"*.¹⁹ While this may hold true in some instances, psychiatric re-hospitalisation is a multifaceted issue, a complex phenomenon determined by a whole host of factors.

Finland has a long tradition of using healthcare registers, producing an enormous amount of data in relation to a wide range of healthcare service use.²⁰ With the help of these registers, service use can be mapped out and summarise how, for example, services are accessed by particular patient groups. Understanding existing service use may illuminate any potential gaps in the system. The Comparative Effectiveness Research on Psychiatric Hospitalisation by Record Linkage of Large Administrative Data Sets (CEPHOS-LINK) project compared psychiatric re-hospitalisation rates in six European countries: Austria, Finland, Italy, Norway, Romania, Slovenia.²¹ Looking at psychiatric re-hospitalisation and service use in more detail at a country level may provide further insights and understanding of this complex phenomenon.

Methods

A literature review was conducted highlighting context and breadth of previous studies in relation to the core concepts of the study listed below. The literature review was not conducted in a systematic way, but intended to pull together the central components included in the current study.

The main databases and search engines used were MEDLINE, EBSCOhost, Cochrane Library and Google Scholar. Reviews found this way were also used for identifying further studies of relevance. Searches also included grey literature such as working papers, government documents, white papers and evaluations. Search terms were chosen in order to cover the different core contexts and included various combinations of the following terms and their synonyms: "psychiatric", "mental health", "mental health disorder", "mental illness", "re-hospitalisation", "readmission", "primary care services", "integrated", "mental health services", "specialised services", "secondary services" "access", "care", "Finnish mental health services", "Finnish health care registers", and "register based studies".

Only literature pertaining to the adult age group, over the age of 18, was included. No geographical area or date restrictions were used, although literature naturally based itself on countries with universal and integrated health services, spanning the era from the 1970's onwards. All of the reviewed studies were published in English or Finnish.

Results

Due to the breadth of the review, looking at psychiatric re-hospitalisation and mental health services in primary care, focus was predominantly placed on literature consisting of the following core concepts; psychiatric re-hospitalisation, primary care services, and/or healthcare registers in Finland.

Psychiatric re-hospitalisation

Psychiatric re-hospitalisation can be seen to be a multifaceted issue spanning many key areas. In order to allow for a more comprehensive and multilevel understanding of risk factors relating to psychiatric re-hospitalisation, the CEPHOS-LINK study published a series of systematic literature reviews in relation to determinants of psychiatric re-hospitalisation under four main headings. These headings allowed for different areas of psychiatric re-hospitalisation to be teased out, even though some overlap between the headings is inevitable. This overlap further highlights the need for close attention to detail when using psychiatric re-hospitalisation as a measure.

Pre-discharge factors: Predicting psychiatric re-hospitalisation in terms of factors relating to pre-discharge was discussed in a recent review by Donisi et al.²² Pre-discharge factors were defined on patient/individual level in relation to aspects preceding the hospital episode including aspects of the discharge phase itself such as discharge type, discharge planning, etc. Pre-discharge factors also included patients' demographic, social and economic characteristics; patients' clinical characteristics; patients' clinical history; patients' attitude and perception; environmental, social and hospital characteristics; and admission and discharge characteristics. The most consistently significant predictor of pre-discharge aspects of psychiatric re-hospitalisation was the existence of previous hospitalisations or outpatient contacts increasing the risk of psychiatric re-hospitalisation.²³ Similarly, longer duration of illness and lower general functioning (measured by GAF²⁴) were also associated with higher risk for re-hospitalisation. The psychiatric diagnosis turned out to be non-significant in many papers.^{25 26}

Socioeconomic aspects (age, gender, living circumstances, educational level) were generally found to influence re-hospitalisation, but the results were not always homogeneous and largely non-significant. Age and gender were a popular focus and were analysed in the majority of the papers included in the literature review, with most proving non-significant. However, older age was generally found to have a protective effect.²² Marital status/having a partner was often found to be a protective factor across the literature analysed, while unemployment remained a risk factor in bivariate analysis. Both living situation and educational level turned out as non-significant in the majority of the papers. Only one paper found a significant association in multivariate analysis indicating that more years of education was associated with a decrease in readmission risk.²⁷

Post-discharge factors: In a recent systematic review by Sfetcu et al. (2017)²⁸, post-discharge factors in the context of psychiatric re-hospitalisation were defined as factors relating to individual characteristics, aftercare factors, community care and service responsiveness, contextual factors and social support. Studies such as an earlier review by Durbin et al.²⁹ indicate a need for more detailed intervention studies relating to readmission such as discharge practices, and studies of the effect of community care. Although difficult to separate pre-discharge from post-discharge factors, individual factors, such as compliance to treatment (including compliance with follow-up appointments), were found to be significantly associated with re-hospitalisation, with less compliance relating to higher risk of re-hospitalisation.³⁰

Community care was defined as aftercare following a period of psychiatric hospitalisation, taking place in a variety of settings including community mental health centres, outpatient centres, primary health care centres, where patients can be supported by a range of health professionals such as General Practitioners (GP's), Psychiatrists, Nurses, Mental Health Professionals, either in person or via other means such as telephone. The review by Sfetcu et al.²⁸ included the variable 'contact with primary care', finding it to be effective at reducing re-hospitalisation.^{31 32} Contact with Psychiatric Nurses was also found to reduce re-hospitalisation in the context of home visits.^{33 34} However, it also indicated mixed results as more GP time was found to increase re-hospitalisation.³⁵ Additionally, service connectedness has been found to increase risk of re-hospitalisation.³⁶ This type of effect of outpatient contact correlating with increased inpatient service use has also been reflected in a recent Finnish study which found that a higher provision of mental health nurses at primary care level was associated with decreased use of specialised psychiatric outpatient visits, but also associated with increased use of inpatient care.³⁷

Environmental and Health System Characteristics: As opposed to looking at patient or individual level factors, studies looking specifically at health system level variables in relation to psychiatric readmission are scarce. Naturally, system variables are often intertwined with patient characteristics. In their recent review Kalseth et al.³⁸ explained this intertwined nature using the example of system level factors for psychiatric outpatient contacts. They postulated that following a period of psychiatric hospitalisation, outpatient follow-up visits may reflect both the clinical needs of the patient while simultaneously being a system characteristic. A follow-up appointment (or lack thereof) could reflect the clinical need for community based services following an inpatient stay, but could also relate to system level characteristics in terms of availability (or lack of availability) of outpatient care. Thus, the systematic review concluded that the risk of psychiatric readmission not only relates to patient characteristics but also to system and/or environmental factors. Additionally, these factors vary in between areas suggesting that the make-up of services plays a role, influenced by capacity, governance structures or treatment profiles and environmental characteristics.

The abovementioned review also found a positive relation between use of aftercare and re-hospitalisation, i.e. that the higher the share of patients receiving aftercare or community interventions, the lower the rehospitalisation rate.^{39 40} The review also discussed environmental factors including socioeconomic nature and urbanity. Although socioeconomic factors gave conflicting results, lower re-hospitalisation rates were found in urban areas, and also in areas with a higher population density.⁴¹

Length of Stay (LOS) is a frequent measure when it comes to psychiatric inpatient care, and can be seen to vary between counties.⁴² Length of stay can be an indicator of health needs of patient due to severity of illness, or reflect system level factors such as capacity, structure or treatment, and has been examined in many studies with inconsistent results. For example, Ono et al.⁴³ finding a longer length of stay to be a risk factor for *early* re-hospitalisation (within the first 3 months), but a protective factor towards *late* re-hospitalisation (within 4 -24 months). Kalseth et al.³⁸ found length of stay to be systematically associated with re-hospitalisation rate, potentially attributed to hospital practices such as premature discharge.⁴⁴ Shorter length of stay has also been associated with a higher patient turn over with indication suggesting that, in order to retain a high patient turnover, hospitals may have resorted to shorter length of stay.⁴⁵

Comorbidity: A recent literature review by Sprah et al.⁴⁶ reviewed the co-occurrence of mental and physical disorders in terms of re-hospitalisation. Although the main body of reviewed studies supported the

hypothesis that patients with mental disorders are at increased risk of re-hospitalisation if they had a co-occurring medical condition, the specific nature of the relationship is very complex and so far still not well understood. Epidemiological studies have investigated the complex and bidirectional nature of this comorbidity⁴⁷ indicating that physical conditions with a high symptom burden, such as migraine or back pain, might lead to depression⁴⁸ while major depression may be a risk factor for developing cardiovascular disease.⁴⁹ This comorbidity may have important consequences for healthcare planning, and hence an important addition to the study of psychiatric re-hospitalisation, especially when investigating integrated primary health care services. Studies show that physical complaints of people with mental health disorders are often overlooked by health professionals, likely a consequence of stigma and unequal access to equitable services for people with mental health disorders.⁵⁰

Usefulness of re-hospitalisation as an indicator: Results from the systematic reviews indicate with varying consistency differences attributable to health service characteristics, different clinical nature of study populations, admission and service policy and practices. Nevertheless, psychiatric re-hospitalisation rate has been used in different contexts such as a performance indicator for hospital comparisons, identification of risk groups, as well as for international comparisons.^{51 52} A review by Durbin et al.⁵³ indicate a need for more detailed intervention studies relating to re-hospitalisation such as discharge practices, and studies of the effect of community care. Similarly, Kansagara et al.⁵¹ called for further clarity on the subject of using re-hospitalisation as an indicator. They purported for example that it is likely that hospital and health system-level factors such as the timeliness of post-discharge, and aspects of follow-up including coordination of care with the primary care physician, has an effect.^{54 55 56} Focused efforts to reduce psychiatric re-hospitalisation in the 1990's included 'case management' models and enhanced primary care access, all with varying results.^{57 58} Shedding light on impacts of healthcare service structures and availability of services may allow for further insights on different ways of reducing unnecessary psychiatric re-hospitalisations and ensuring adequate community support.

Primary Care

The second core concept in the current review focuses on primary care and its relevance in the context of psychiatric re-hospitalisation. The WHO definition of primary care builds on the principles of equity, participation, intersectoral collaboration, appropriate technology and a central role played by concepts elaborated in the 1978 Declaration of Alma-Ata.⁵⁹ Primary care varies greatly from country to country even within Europe, and is essentially about providing universally accessible health care including mental health care, as close as possible to where people live and work, based on population needs.⁶⁰ Building adequate and well-functioning primary care services is heavily dependent on context including historical aspects, welfare systems, health burden, healthcare system as a whole, financing, as well as societal values and norms.^{61 62}

Kringos et al.⁶⁰ in a recent systematic review focused their attention on different crucial aspects of primary care consisting of dimensions related to *Structure*, comprising three dimensions: 1) governance; 2) economic conditions; 3) workforce development. *Process*, determined by four dimensions: 4) access; 5) continuity of care; 6) coordination of care; 7) comprehensiveness of care. *Outcome*, including three dimensions: 8) quality care; 9) efficiency of care; 10) equity in health. Furthermore, Kringos et al. have investigated the role of primary care on different aspects of healthcare such as reducing unnecessary hospitalisations in 27 European countries, including Finland.⁶³ Although their studies focused on somatic

diseases, they echoed previous studies suggesting that stronger primary care services led to a host of positive effects such as improving population health, reducing socioeconomic inequalities in health, and avoiding potentially unnecessary hospitalisations.

Attaining accessibility and quality of care is highly dependent on the availability, accessibility, acceptability and quality of the workforce within it.⁶⁴ The WHO Global strategy on human resources for health, Workforce 2030⁶⁵ brings up the need for making more effective use of health workers through increased team focus, and collaborative care within primary services. Integrated primary care requires enhanced skill sets, and potentially different (or additional) professionals constituting well networked multi-professional teams.⁶⁶ GPs are usually central to primary care, often holding a gatekeeping role. Although varying between countries, a trend towards a stronger role for health workers is emerging, with the primary care workforce expanding to include nurse practitioners, registered nurses and other health care professionals alongside the GP,⁶⁷ facilitating access, and optimising quality of care delivery.⁶⁸

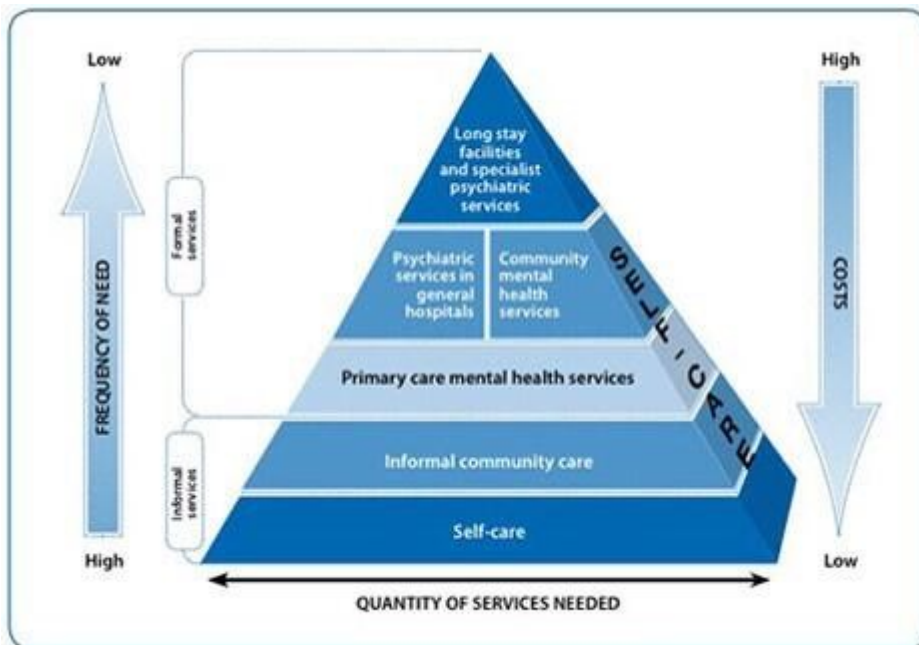


Figure 3. WHO service organization pyramid for an optimal mix of services for mental health⁶⁹

Models of collaborative care echo this need for multi-professional collaboration and lend itself well to mental health care within primary care. Collaborative Care has been described as “a team-based, multicomponent intervention to enact care delivery redesign by systematically improving coordination of patient care through organizational leadership support, evidence-based provider decision-making, and clinical information systems as well as engaging patients in their care through self-management support and linkages to community resources”.⁷⁰ Collaborative Care models have also been seen as especially well-placed for countries with extensive rural communities.⁷¹

Health Care Registers in Finland

Population statistics have been gathered in Finland since the 18th Century, with health survey information about the health and welfare of the Finnish population gathered for over 50 years, covering a wide range of data on both national and regional levels. Hence, availability of data is good and has been widely used in evaluating, for example, effects of national health policy targets. Legislative frameworks govern the use of healthcare registers both within health care services and research alike. In Finland, the majority of healthcare registers are by law⁷² under the authority of the National Institute for Health and Welfare which functions in accordance with the Statistics Act.⁷³

For research purposes, making use of existing data is ideal as both time and financial costs can be reduced significantly. One of the main prerequisites for relying on register based studies in research is good data quality. Validity is of utmost importance here, ensuring that the events included in the database are a valid representation of reality. Finnish administrative registers have been shown to have good validity both in terms of internal validity⁷⁴ and when cross-referenced with patient records or other primary sources.⁷⁵ Additionally, quality is ensured through collaboration between reporting institutions and the register controller, in the case of HILMO Care Register for Health Care (HILMO) and AvoHILMO Register for Outpatient Visits in Primary Care (AvoHILMO), the register controller is the National Institute for Health and Welfare.^{76 77} Unique personal identification numbers allow for record linkage across different registers allowing for comprehensive datasets by population subgroups, socioeconomic status, and geographical area.

Finnish legislation on data protection allows for the use of administrative data for scientific, historical and statistical research purposes. The legislation enforces authorities to ensure that individual rights are not violated, or exploited.⁷⁸ Subject to ethical scrutiny, researchers must apply for permission to use data for specific clearly defined studies although no informed consent is required. Defining research questions in register based studies is usually more of a fluid process as the content of the registers is set, research questions have to be formulated taking into account what material is available for study. Although register based studies are of genuine benefit for research, some limitations are important to bear in mind as summarised in a recent review by Thygesen and Ersbøll⁷⁹. As previously mentioned, one frequently cited limitation of register based studies is that researchers are dependent on what data the registry holds, as data collection is not performed by the researchers themselves and some necessary information may be unavailable. Additionally, information on confounding variables may not be available. Missing data is also an issue which often leads to difficulties, reasons as to why the data is missing from the registry often unavailable. The large array of available data may lead to data dredging and misleading post hoc analysis not ideal in the strictest of research terms, but potentially useful for exploration. Additionally the large number of participants in a patient level register based study can lead to misleading significance levels which is important to bear in mind. Notwithstanding the limitations, register based studies are an important part of epidemiological,⁷⁹⁵ health services,⁸⁰ and public health research⁸¹.

Discussion

Studying psychiatric re-hospitalisation in relation to outpatient care, in particular primary care has a good grounding in terms of previous literature. The literature review underlined the complex nature of psychiatric re-hospitalisation and the necessity of its further study. Psychiatric re-admissions are costly, creating significant disruptions to individuals and families alike.^{82 83 84} On an individual level, severity and type of psychiatric disorder as well as a history of previous psychiatric hospitalisations have been associated with a higher risk of psychiatric re-hospitalisation.⁸⁵ These patient-level factors are invariably important when making individual care plans or planning health services ensuring that people with a higher risk of re-hospitalisation have their needs met effectively. Including the risk of psychiatric re-hospitalisation in care planning, follow-up and within outpatient services could be a central component in an individual care plan.⁸⁶

As well as patient level factors, psychiatric re-hospitalisation can also be affected by health system determinants. Differences in how healthcare systems are built may impact levels of psychiatric re-hospitalisation, both in terms of what services are available and in relation to practices including administrative and discharge policies.⁸⁷ Healthcare systems differ greatly across countries including the way in which health care is regulated, financed, governed, organised and delivered by different financial, organisational and institutional mental health care models.^{88 89}

Integrated and well-functioning primary care provides an ideal base for all healthcare needs, including mental health care. This is especially pertinent considering the sizeable burden of mental health disorders. Primary care services can provide care for mild, moderate and even severe mental health disorders, including a wide range of tasks such as diagnosis and treatment elaborating strategies for the prevention of mental disorders as well as co-ordinating care overall.

Although not intended to resolve all aspects of mental health disorders, well-integrated primary mental health services should operate in close liaison with both secondary and tertiary services creating an optimal mix of services. Although care may occur within primary care services, supervision and consultation with specialist services is an important part of this mix, especially for people with severe mental health disorders who may require inpatient care from time to time.⁹⁰

Traditionally, health systems remain built around acute, episodic models of care, which may not always fit the needs of more multidimensional or chronic health problems.⁹¹ This begs the question of how psychiatric re-hospitalisation should be scrutinized considering the long term nature of some mental health disorders associated with it. It is clear that there is agreement that inpatient services should be available, and perhaps even some level of re-hospitalisation could be expected in relation to long term difficulties. However, debates on whether the deinstitutionalisation movement has gone too far argue that this process overlooks the need for inpatient services. Arguments assert that this reduction increases risks such as suicide, and has contributed to inpatient care losing its therapeutic potential.⁹² On the other hand, opponents to this side of the debate acknowledge the need for more comprehensive services, but call for resources to be used for the development of more patient centred approaches such as joint crises plans⁹³ and residential alternatives⁹⁴ to hospital care.⁹⁵

Conclusion

Further study combining all core concept areas included in the current literature review appears to be relevant. A need for investigating the effect of outpatient care on psychiatric re-hospitalisation rate is important in order to delineate the use of this as an indicator, investigate regional differences, and also explore the collaborative nature of primary care and specialised outpatient services. Looking at outpatient care in terms of risk of psychiatric re-hospitalisation is an important step in developing more person centred community based services.

Primary care services have been included in previous studies on psychiatric re-hospitalisation. Well-integrated primary care services could potentially improve mental health services and contribute towards less hospital based services. Using the framework developed by Kringos et al.⁶³ could potentially frame an exploration of different areas of primary mental health care.

Not only does Finland have a well-developed and integrated primary care system, but its healthcare system is currently highly decentralised, with municipalities retaining autonomy in terms of how services are built. This decentralised system allows for area differences to be investigated, both in terms of the breadth of services, but also in term of psychiatric re-hospitalisation levels.

Finnish Health Care Registers can be considered to be of good quality and comprehensive enough for research purposes, making them an ideal base for health care service study.

Main study:

Primary Care Mental Health Services in Finland, a hidden Lynchpin of Psychiatric Readmission

Introduction

As in many other European countries, mental health services in Finland are under continuous development. Finland embarked on a process of deinstitutionalization slightly later than its northern European neighbours with a large scale reform only gaining momentum in the 1980's. Since then, mental health services have been reformed from predominantly consisting of inpatient care located in separate psychiatric hospitals, to integrated community services with less emphasis on hospital based care.

In 1980, Finland had a total of 20 000 psychiatric beds located in 100 psychiatric hospitals catering for its relatively small population of 4 771 292 people.⁹⁶ These hospitals typically had both long and short term wards, providing all aspects of care for mild to severe mental health disorders, geriatric disorders, and learning disabilities. The subsequent reform of mental health services was embedded in a prolific healthcare reform which included decentralising the health care system, granting autonomy to the municipalities, integrating mental health services with general health, establishing new legislation in the form of the Mental Health Act⁹⁷, and radically decreasing the focus on inpatient treatment in psychiatry. Throughout the reform psychiatric beds were steadily reduced from 6531 in 1995, 4897 in 2005, down to 4036 in 2010, and again reduced to 3408 in 2015.⁹⁸ Today, the majority of these beds are located in general hospitals with only two psychiatric hospitals remaining both assigned to forensic patients or otherwise more challenging circumstances.

In addition to scaling down inpatient services, the period of deinstitutionalisation was paralleled by the development of outpatient and community services as well as integrating mental health services with both social and primary care services.⁹⁹ This process made a good start in the 1980's when the reduction of inpatient care was considered to be adequately compensated for by the newly available outpatient services.¹⁰⁰ Unfortunately, progress was hampered by a hard recession which hit Finland in the 1990's leading to cutbacks and erroneous resource allocation. Savings from the reduction in inpatient services were not always injected into outpatient services meaning that development of outpatient services did not develop at the same rate as hospital beds were reduced.¹⁰¹ Critically, this meant that Finnish outpatient services did not continue with its more impressive start, finding themselves in a crisis situation where psychiatric inpatient services and outpatient services were simultaneously being reduced, leading to a considerable treatment gap.¹⁰²

Today, Finland can be seen to have promising infrastructure for well-developed mental health services with a highly specialized health care workforce.^{103 104} Throughout the ongoing deinstitutionalisation process, outpatient services continue to grow, figures indicating a 24% increase in outpatient care since 2006.^{101 105} Outpatient care consists of services from both primary and specialist contexts. Specialist Medical Care (SMC) services (also referred to as specialised care from here on), is usually accessed through referral from

Primary Health Care (PHC) services (also referred throughout at primary care), performing a gate keeping role acting as the entry point for all health concerns, including mental health care. According to the most recent report on Psychiatric Specialised Health Care published by the National Institute for Health and Welfare, the total number of outpatient visits in the mental health services during 2014 was 2.6 million visits, nearly a third of which (31%) were primary care visits, the rest were within specialised care.¹⁰⁵ There were 601 232 mental health visits made within primary care in 2012, the majority (91 %) of these visits to 'other' practitioners employed at the primary health care centres, the remainder being made to physicians.

Psychotherapy is publically available in Finland, but rarely found within public health systems. Psychotherapy is mainly accessed through the Social Insurance Institution of Finland (KELA) rehabilitative services, which reimburse part of psychotherapy costs although restrictions and limits apply. Often these restrictions have to do with a greater demand than supply, psychotherapy generally being more available in urban areas compared rural ones, a common challenge considering Finland's broad geographical composition.¹⁰⁶

There is a continued need for the development of outpatient services in Finland today including increased focus on preventative and promotional aspects of mental health, collaboration between services and sectors, all areas of action promised in the current Governmental plan.¹⁰⁷

The Administrative context of Healthcare in Finland

The state of a country's health services is invariably tied to context and infrastructure. Finland is located in Northern Europe, with a small population of 5 426 674 in 2012¹⁰⁸ spread over a large, predominantly rural area, totalling 338 424 km². It is a parliamentary republic with a central government based in the capital of Helsinki. The Finnish public administration system consists of three levels: state, province and municipality. Municipalities have a high level of autonomy, are able to levy taxes and are by law¹⁰⁹, responsible for the provision of basic public services to their residents including primary care and social care. Although healthcare is mainly financed by taxes collected by the state (State Income Tax) and municipalities (Municipal Tax),¹¹⁰ the Social Insurance Institute for Finland (KELA) covers some family benefits, National Health Insurance, rehabilitation, basic unemployment security, housing benefits, financial aid for students, state-guaranteed pensions as well as partially reimbursing mandatory occupational healthcare costs.¹¹¹

Hence, although Finland is predominantly counted as having a tax based healthcare system, in practice it has three different healthcare systems receiving public funding to different degrees, municipal healthcare, private healthcare and occupational healthcare, all with differing financing mechanisms. Although built upon a long-standing welfare state philosophy committed to equitable and highly available services, the current system does suffer from unequal availability and distribution of health services.^{112 113}

Municipal health services are provided via primary care, a requirement set out by the Primary Care Act.¹⁰⁹ These public health services include health promotion, and any related provision of health counselling, health checks, oral healthcare, medical rehabilitation, occupational healthcare, environmental healthcare, emergency medical care, outpatient care, home nursing, at-home hospital care and inpatient care, mental health services, and substance abuse services where these are not covered by social services or specialist care services. There are currently a total of 150 primary care centres throughout Finland.¹¹⁴

While municipalities are responsible for providing its residence adequate primary and social care, specialist services are provided by hospital districts. Finland is divided into 21 hospital districts each varying in size

with large differences in population density ranging from 1.4 people per km² in Lappi Hospital District, to 178.6 people per km² in the Uusimaa Hospital District.¹¹⁵ In accordance with the Act on Specialised Medical Care¹¹⁶, all municipalities must belong to a hospital district.

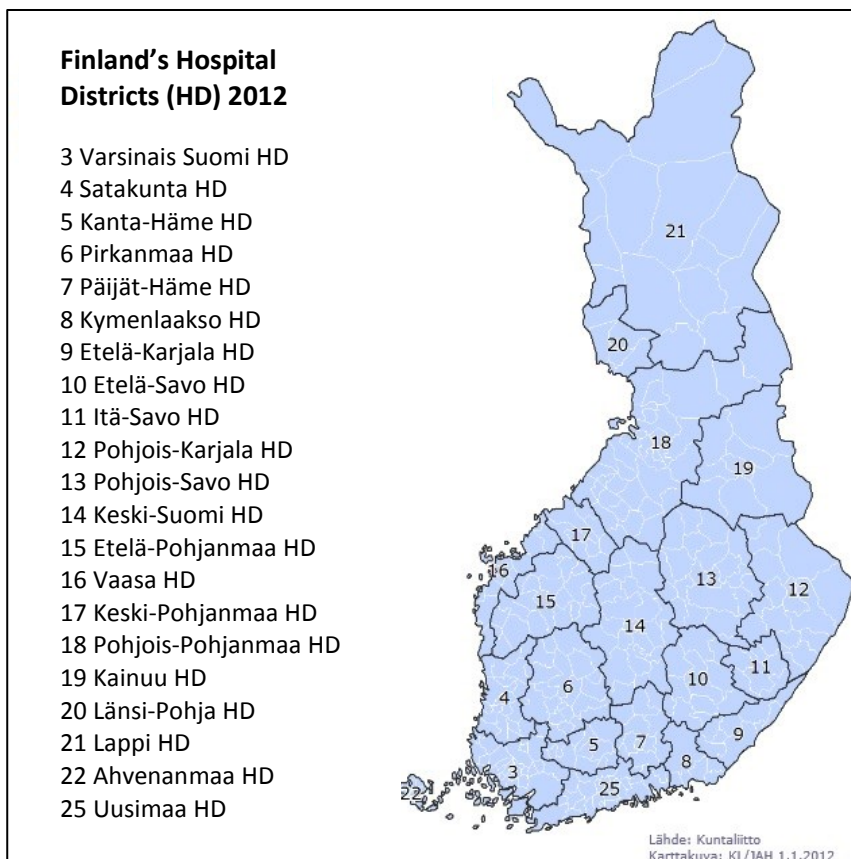


Figure 4. Map of hospital districts in Finland 2012

In many respects Finland is an ideal country to study aspects of primary care services as they are currently highly decentralised and diverse, this diversity is also reflected in service use. For example, in 2012, the Lappi Hospital District had the highest level of primary care clients, represented as a percentage of the region's population (73.8 %) in comparison to Ahvenanmaa Hospital District which had the lowest (53.7 %) level of primary care clients. These differences can potentially be attributed to the availability and structure of their health systems. Lappi Hospital District is the least populated hospital district in Finland and may have more limited access to specialised services, therefore more highly developed primary care services. Ahvenanmaa Hospital District on the other hand, is the smallest hospital district in Finland and has a unique politically autonomous status, allowing it to govern services in a different model in comparison to the rest of Finland. In the Ahvenanmaa Hospital District, both primary and specialist services are administered by one unit, which could result in higher records of specialist healthcare use. These health service and demographic factors will no doubt influence how healthcare services are accessed, delivered and how healthcare data is generated.

Psychiatric re-hospitalisation

Psychiatric re-hospitalisation, also known as the ‘revolving door’ phenomenon has been highlighted as a negative outcome in need of attention by organisations such as the OECD.¹¹⁷ While it may be attributable as a negative outcome, it is in fact a multifaceted issue, determined by a whole host of factors. Studies indicate psychiatric re-hospitalisation to be attributable to health service characteristics, different clinical nature of study populations, admission and service policy and practices. A review by Durbin et al.¹¹⁸ question aspects of discharge practices, and the effect of community care on psychiatric re-hospitalisation while Kansagara et al.⁵¹ called for further clarity on how hospital and health system-level factors such as the timeliness of post-discharge follow-up including coordination of care with the primary care physician correlates with psychiatric re-hospitalisation.^{119 120 121} Focused efforts to reduce psychiatric re-hospitalisation in the 1990’s include ‘case management’ models and enhanced primary care access, all with varying results.^{122 123} Shedding light on impacts of healthcare service structures and availability of services may allow for further insights on different ways of reducing unnecessary psychiatric re-hospitalisations and ensuring adequate community support.

Objectives and purpose of the study

The current study is an extension of the Comparative Effectiveness Research on Psychiatric Hospitalisation by Record Linkage of Large Administrative Data Sets (CEPHOS-LINK) study.ⁱ The CEPHOS-LINK project¹²⁴ carried out comparisons of psychiatric re-hospitalisation rates, identifying their predictors in unselected patient populations from six European countries all with very different health care systems (Austria, Finland, Italy, Norway, Romania, Slovenia) resulting in a total patient population of 225 600.

The current study focuses solely on Finnish data stemming from the CEPHOS-LINK project and has two main objectives;

1. to investigate the concept of psychiatric re-hospitalisation as a potential measure in the Finnish context throughout its 21 Hospital Districts and its demographic determinants, and
2. to explore the use of both primary care and specialised outpatient services by the study cohort during the year of 2012.

Hence, the primary objective will be to decipher regional variation in, as well as investigate usability of, psychiatric readmission rates in Finland. Potential regional differences in how many of the people included in the study (N=16 814), returned to psychiatric inpatient care within a year. A special focus was placed on outpatient services, in particular primary care services in relation to different demographic measures including psychiatric re-hospitalisation rate.

The expected outcome is that more diverse and well developed outpatient and primary care services will have protective impact on psychiatric re-hospitalisation rates.

ⁱ The CEPHOS-LINK project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement no 603264

Methodology

Data

Collection

The study utilised data from the CEPHOS-LINK project, adhering to directives and ethical permission requirements granted by the Ethical Committee at the Institute for Health and Welfare (THL). Data was extracted from two national healthcare registers covering both primary care, using the Register for outpatient visits in Primary Care (AvoHILMO)ⁱⁱ and specialised care using the Care Register for Health Care (HILMO)ⁱⁱⁱ. The study used clear inclusion and exclusion criteria detailed below.

The Finnish CEPHOS-LINK study cohort was defined using the HILMO registry and consisted of adult patients, who had been discharged from hospital with a primary psychiatric diagnosis including schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders, mood disorders, anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders, behavioural syndromes associated with physiological disturbances and physical factors and disorders of adult personality and behaviour, according to diagnostic codes F2-6 in the ICD10 classification system during the year 2012. The hospital episode had to have taken place over minimum one night in within a psychiatric speciality to be considered as a psychiatric inpatient stay. Forensic psychiatry was excluded as well as data from forensic hospitals. Discharges (transfers) to other institutions were also excluded, as were cases where patients had died. The final cohort consisted of data from 16 814 patients, identifiable via an anonymized research number.

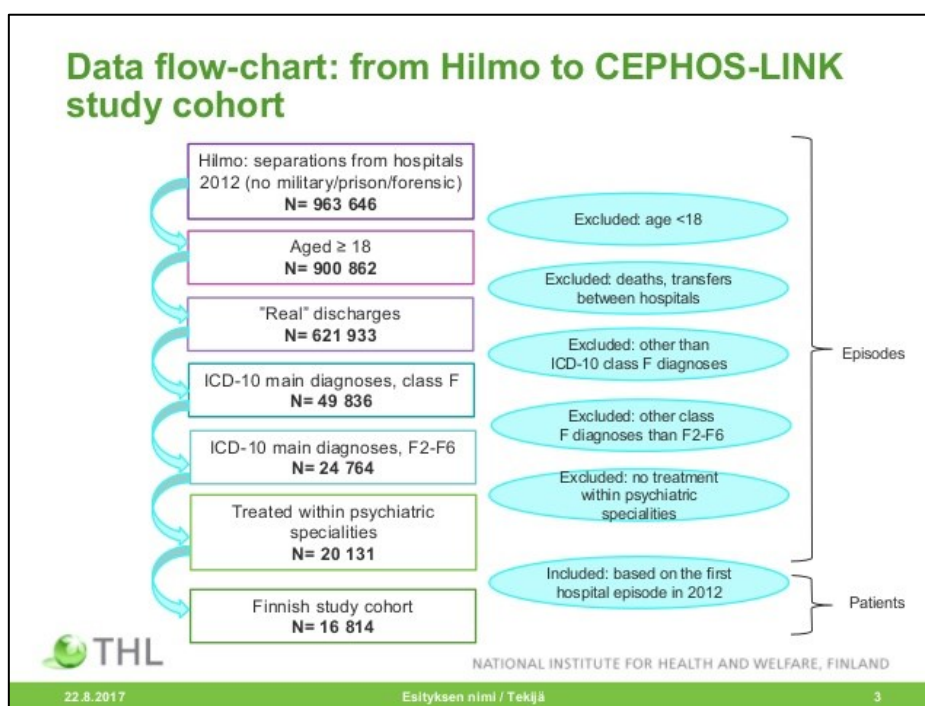


Figure 5: Data flow chart defining CEPHOS-LINK study cohort

ⁱⁱ The AvoHILMO Register for outpatient visits in Primary Care, also managed by THL provides data for all patient encounters within the publicly provided primary care (primary health care centers) in Finland since 2011

ⁱⁱⁱ HILMO Care Register for Health Care is managed by THL and is one of the oldest individual level, whole country, hospital discharge registers in the world. The HILMO registry contains nationwide linkable data on all inpatient hospital discharges including personal identification codes since 1969 as well as information on specialized outpatient visits.

Additionally, data relating to outpatient visits were extracted from the HILMO registry including all psychiatric specialties, as well as data from general medicine and occupational health specialties was extracted. Planned appointments as well as emergency and consultation visits were included as well as psychiatric day hospital visits.

Data from the primary care AvoHILMO register for this same cohort was then identified via the anonymised research number and linked with the data derived from the HILMO registry. Not all medical specialities from primary care services was included, with specialities such as dentistry and antenatal care being omitted. Medical specialties from the AvoHILMO registry included in the data mental health work, substance abuse, general outpatient care, occupational health and home hospital care, home help, occupational therapy, social work within healthcare, rehabilitation and specialised therapy and day activities.

Demographic information for the year 2012 from all 21 hospital districts such as population (18-97 years)¹²⁵, population density¹¹⁵, and Mental Health Index (MHI)¹²⁶ was obtained from Statistics Finland.

Data Use

Table 1 – Cohort and Health care Service Data

Descriptive	Number in cohort
N	16 814
Male	7 502
Female	9 312
F20 Schizophrenia	7 363
F30-F31 Bipolar Disorder	2 122
F32-F39 Depression	4 909
F40-F48 Anxiety Disorders	1 642
F50-59 Psychosomatic Disorders	256
F6 Personality Disorders	522
Total Avohilmo visits 2012	93 4781
Mean AvoHILMO visits per person	320
Median AvoHILMO visits per person	130
Maximum AvoHILMO visits per person	3178
Minimum AvoHILMO visit per person	1

Table 1: Descriptive data from the study cohort

Measures

All data was aggregated into the 21 hospital districts and the following variables compiled for analysis. Further information on how specific measures were compiled can be found in Annex 1.

Re-hospitalisation rate; was calculated as a percentage of patients returning to psychiatric hospital care following discharge using data from the HILMO registry. Re-hospitalisation rate was calculated within 356 days. Analyses were done on hospital district level, comprising of 21 hospital districts throughout Finland.

Length of stay; was calculated using dates from the HILMO registry as the complete uninterrupted length of the index stay in any type of inpatient care.

Analysis of Primary Care visits; percentages were calculated in relation to recorded visits. In this study, figures using data from the AvoHILMO register included two different constellations of primary care specialties 1) using a broad definition including visits in relation to All included Medical Specialties (AMS) mentioned above, excluding the mental health speciality and 2) using a restricted definition including only visits to primary care using a Mental Health Speciality (MHS) code. More details of codes and included specialities in Annex 1.

Primary vs Specialist outpatient services; were investigated using information from both HILMO and AvoHILMO registers, and calculated by counting the percentage of outpatient contacts occurring within a week after hospital discharge, in line with Finnish Current Care Guidelines^{iv}.

Primary Care Service Type; was defined as Medical Care (MC) or Health Care (HC) in relation to any primary care visit. Primary care visits coded as MC relating to matters considered a medical concern such as medical examinations, measures, treatment and rehabilitation in relation to symptoms, illness, injury or disability. Visits relating to HC on the other hand are more preventative in nature including health promotion and public health initiatives.

Primary Care Means of contact; means of contact was recorded as one of the ten following options; taking place at the primary care centre, as a home visit, as a visit at work, as a hospital visit, by way of telephone contact, electronic contact, by letter, recorded as a (professional) consultation visit or documentation without patient no contact, and finally other contact.

Visits to different professionals; AvoHILMO records to what type of professional visits are made to. Visits to a total of 121 different professionals were coded in the study cohort. For the purpose of this study, these professionals were grouped into seven groups to according to healthcare roles defined by Statistics Finland.^v More details of codes and grouping in Annex 1.

Demographic indicators; Hospital district population, hospital district population density, share of the CEPHOS-LINK study cohort in terms of hospital district population is included in order to give a contextual picture of the hospital district in question. Non-age standardised Mental Health Index is used as a crude indicator of psychiatric morbidity per hospital district. The Mental Health Index is based on three

^{iv} Independent, evidence-based clinical practice guidelines covering important issues related to Finnish health, medical treatment as well as prevention of diseases.

^v Statistics Finland provides codes for all healthcare professionals http://www.stat.fi/meta/luokitukset/ammatti/001-2010/luokitusavain_2.html

components i.e. number of suicides or suicide attempts leading to hospitalisation, number of special refunds for medicines prescribed for the treatment of psychosis, and level of disability pensions due to mental health issues. The Mental Health Index is centred around a baseline of 100, with areas with higher Mental Health Index denoting higher mental health burden.

Data analysis

For the current study, patient level data from the Finnish component of the CEPHOS-LINK study was processed and databases restructured in order to allow for aggregated analyses on hospital district level. Although originating from a large cohort of 16 814 patients, results were aggregated to 21 hospital districts meaning it did not fulfil statistical assumptions relating to normal distributions and had to be analysed using non-parametric statistical methods.

Aggregated data was analysed using Spearman's rank correlation coefficients in order to investigate the association between different aspects of health care service structures. Scatterplots were used to illustrate correlations between key indicators.

Descriptive statistics were used to chart differences between hospital districts.

Statistical software IBM SPSS version 24 was used for statistical analyses.

Results

Hospital District demographics

The following demographic data was included and comparisons made by hospital districts. Demographic data was based on both CEPHOS-LINK data, but also on data from Statistics Finland. The order of the hospital districts in the resulting graphs are based re-hospitalisation rate (lowest to highest), and not for example ordered alphabetically or by hospital district code.

Table 2 Cohort, Demographics and Re-hospitalisation

Hospital District Code	Hospital District	Population	Population Density (km ²)	CX cohort (N)	Percentage of CX (N) by HD population (%)	Length of Stay (LOS)	Mental Health Index	CX Re-hospitalisation rate - 356 days (%)
3	Varsinais-Suomi	382 404	43	1 365	0.36	24	111	35.9
4	Satakunta	182 847	29	710	0.39	26	81	40.3
5	Kanta-Häme	140 194	34	535	0.38	16	96	40.4
6	Pirkanmaa	416 456	36	1 492	0.36	29	106	41.4
7	Päijät-Häme	173 467	35	646	0.37	17	118	35.5
8	Kymenlaakso	143 068	38	487	0.34	21	110	28.4
9	Etelä-Karjala	109 256	25	416	0.38	15	101	39.7
10	Etelä-Savo	86 738	11	294	0.34	20	113	35.1
11	Itä-Savo	37 536	12	129	0.34	19	110	34.1
12	Pohjois-Karjala	138 577	9	487	0.35	24	124	34.3
13	Pohjois-Savo	201 454	15	1 005	0.50	21	149	41.9
14	Keski-Suomi	199 767	17	654	0.33	26	122	33.0
15	Etelä-Pohjanmaa	157 304	14	642	0.41	25	107	45.5
16	Vaasa	132 968	25	435	0.33	17	81	43.7
17	Keski-Pohjanmaa	60 467	13	233	0.39	20	116	39.1
18	Pohjois-Pohjanmaa	30 3047	11	1 435	0.47	16	131	44.1

19	Kainuu	63 378	4	252	0.40	11	124	44.4
20	Länsi-Pohja	51 782	9	179	0.35	21	131	53.6
21	Lappi	96 493	1	344	0.36	15	110	36.6
22	Ahvenanmaa	22 804	18	92	0.40	9	45	44.6
25	HUS (Uusimaa)	124 6438	179	4 857	0.39	15	78	41.5

Table 2: Re-hospitalisation rate and demographic information per hospital district in 2012

Map of Psychiatric Re-hospitalisation rates in Finland

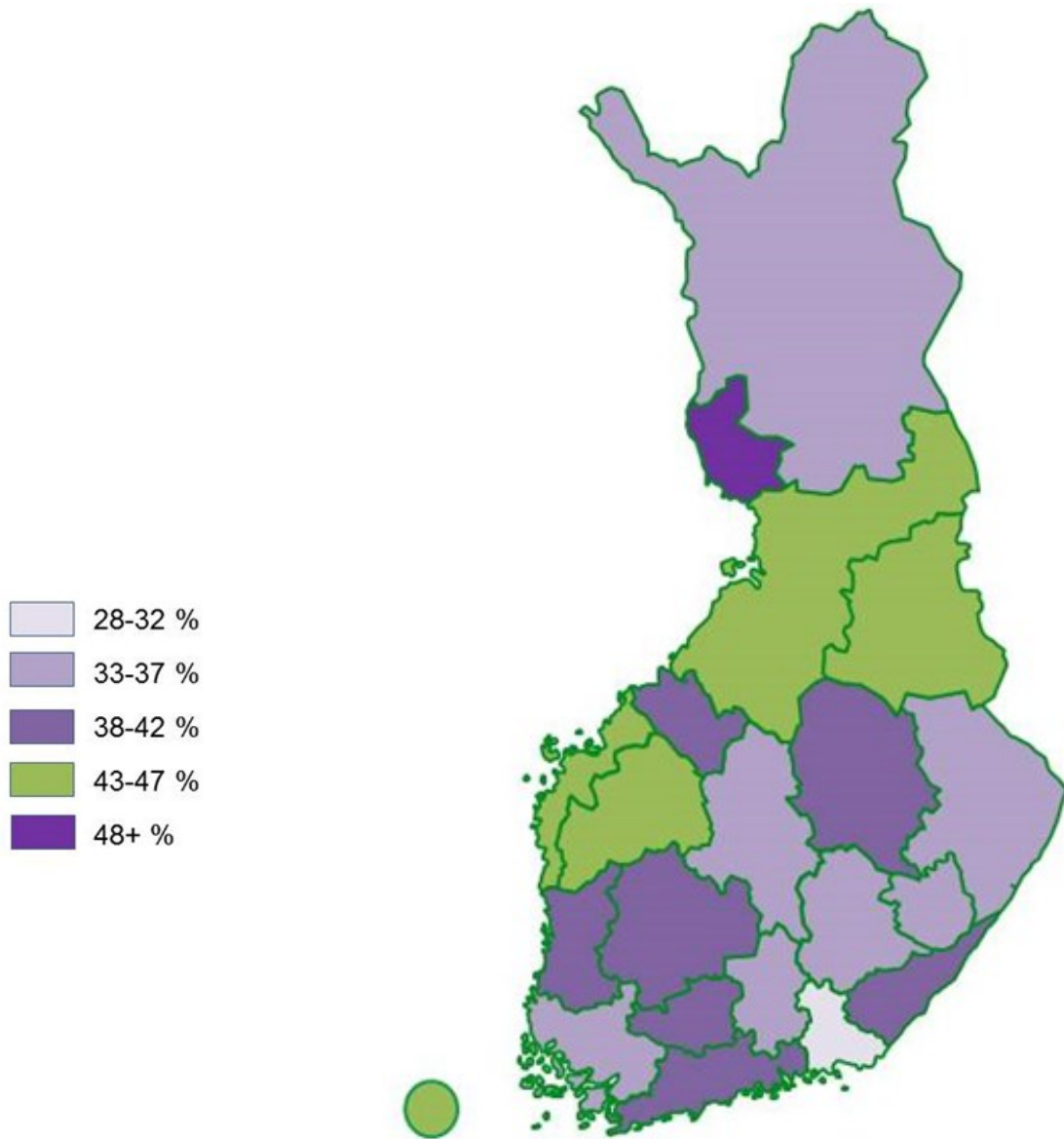


Figure 6. Psychiatric re-hospitalisation within 356 days, by hospital district in 2012

Using re-hospitalisation rate as an indicator

The main CEPHOS-LINK study provided the current study with re-hospitalisation rates for all 21 hospital districts in Finland. The average re-hospital rate calculated at 356 days for the whole of Finland is 39%. The re-hospitalisation rate varied between hospital district, the lowest re-hospitalisation rate being Etelä Karjala Hospital District at 26% and the highest being in Länsi-Pohja Hospital District at 53% (Table 2)

Correlations between re-hospitalisation rates in hospital districts and other variables were calculated. Re-hospitalisation rate was found to correlate only with the following variables; Length of Stay (Fig.5), Percentage of the CEPHOS-LINK cohort by HD (Fig.6) and some aspects of Service Type (Fig.12 and Fig.13).

Length of Stay: A moderate negative correlation was found between re-hospitalisation rate measured at 356 days, and length of stay according to hospital district, $r = 0.476$, $n = 21$, $p = 0.029$. A scatterplot summarises the result (Fig.5), hospital districts with higher length of stay having lower re-hospitalisation rates.

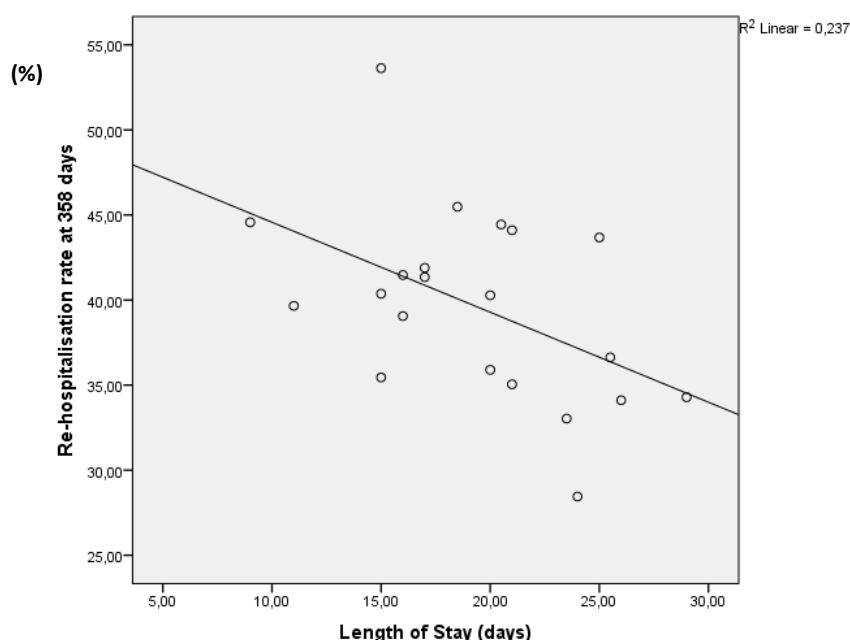


Figure 7. Correlation between re-hospitalisation and length of stay

Percentage of the CEPHOS-LINK cohort by HD: A fairly strong positive correlation $r = 0.612$, $n = 21$, $p = 0.003$ was found between re-hospitalisation rate and percentage of the CEPHOS-LINK cohort by hospital district. A scatterplot summarises the result (Fig.6), indicating that hospital district's with a higher percentage of CEPHOS-LINK cohort having higher re-hospitalisation rates. This suggests that areas with a higher tendency towards psychiatric inpatient service use, also have a higher rate psychiatric re-hospitalisation.

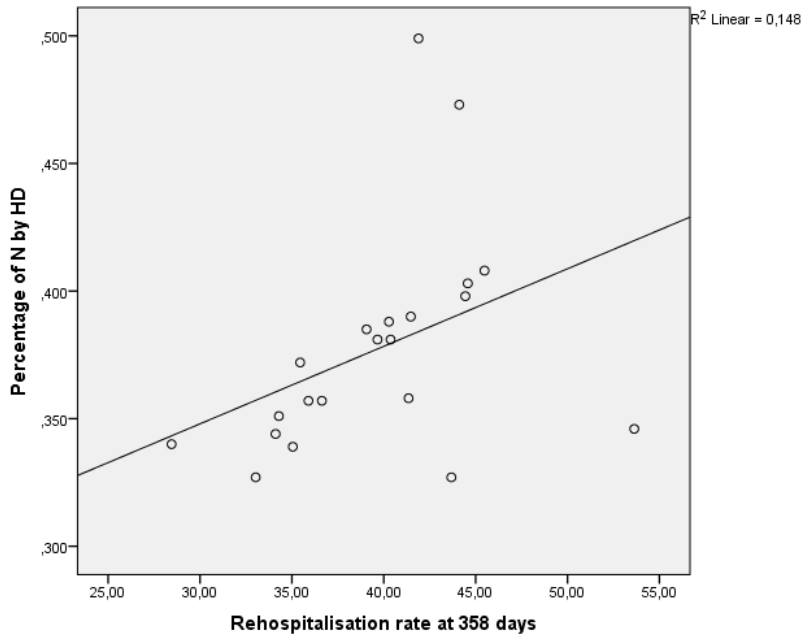


Figure 8. Correlation re-hospitalisation and percentage of N by HD

Furthermore, a negative correlation $r = -0.494$, $n = 21$, $p = 0.023$ was found between length of stay and percentage of the CEPHOS-LINK cohort by hospital district. A scatterplot summarises the result (Fig.7) with hospital districts with a higher percentage of CEPHOS-LINK cohort showing a lower length of stay, suggesting the higher use of psychiatric inpatient services, the shorter the length of stay.

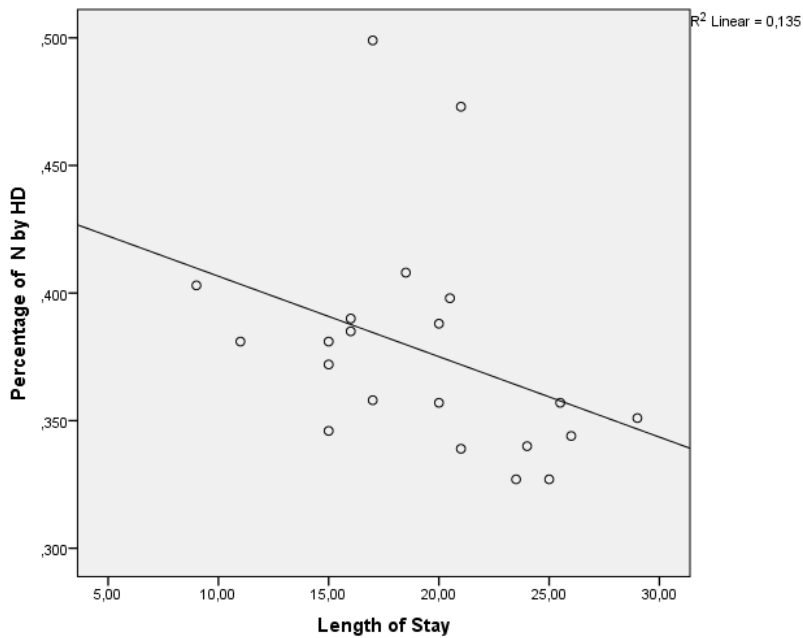


Figure 9. Correlation length of stay and percentage of N by HD

Mental Health Index was not found to correlate with re-hospitalisation rate, although a negative correlation between population density and Mental health index, $r = -0.610$, $n = 21$, $p = 0.003$ was found.

Mental Health Index was higher in areas with lower population density (Fig.8), suggesting that areas with a lower population had a higher mental health burden.

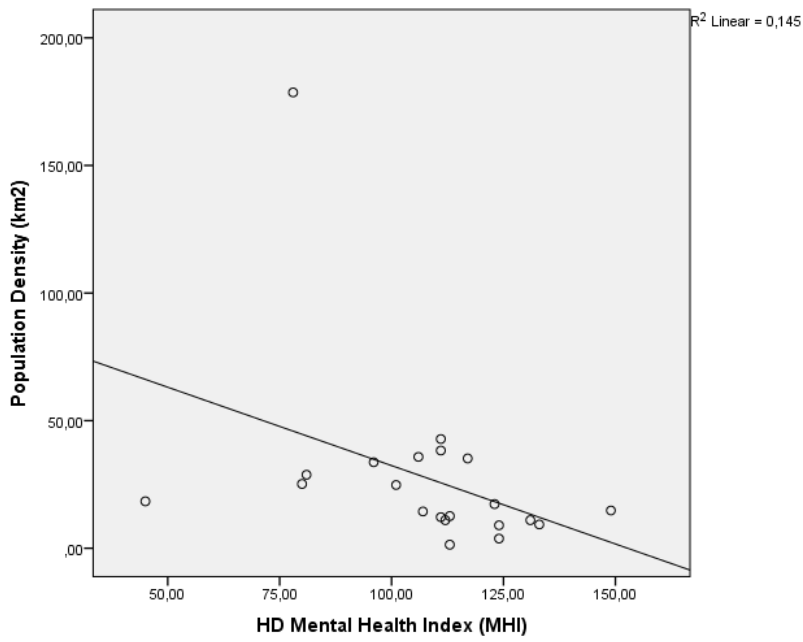


Figure 10. Correlation population density (km2) and hospital district and Mental Health Index

Primary health care vs specialist medical services per hospital district

Outpatient visits, specifically coded as mental health visits taking place within a week of discharge were calculated using data from the HILMO register for specialist visits, as well as primary care visits from the AvoHILMO register. There were considerable differences in how hospital districts divided outpatient visits between primary and specialised serviced. Ahvenanmaa Hospital District showed very few mental health visits in primary care at 9 %, with 91% of visits occurring in specialist care. This, in contrast to Kymenlaakso Hospital District which had the highest level of mental health visits occurring within a week of discharge in primary care, 86 % with the remaining 14 % occurring in specialised care. On average, 51 % of the first combined specialist and primary care outpatient visits took place within a week, ranging from 34 % in Vaasa to 69 % in Ahvenanmaa (Fig.9).

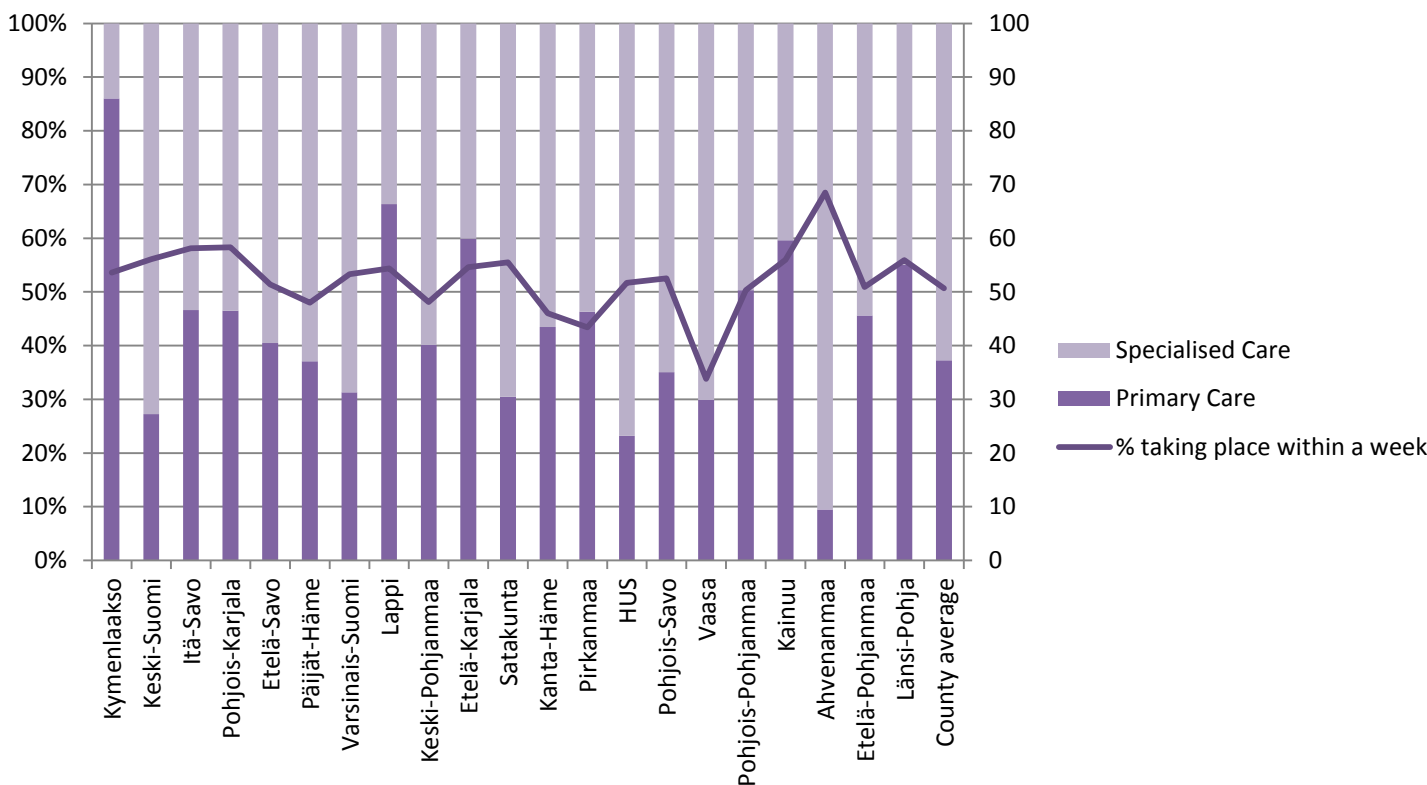


Figure 11. Mental health outpatient visits within a week following discharge; percentage of outpatient visits in primary care vs specialist care within a week of discharge.

There was a strong negative correlation between percentage of visits in primary care within a week and percentage of visits to specialised outpatient care within a week by Hospital District, $r= 0.729$, $n= 21$, $p=0.000$, indicating no overlap between the two (data not shown).

Additionally, primary care visits within a week was seen correlate negatively with population density, the lower the population density the higher the likelihood of a primary care visit within a week , $r= -0.521$, $n= 21$, $p=0.015$ (data not shown).

Primary care service use; type of service

Type of primary care visit is coded either as Medical Care (MC) or Health Care (HC) in the AvoHILMO register. Using the broad definition AMS (ie excluding mental health speciality), the country average for MC was 68% with the remaining 32% recorded as HC, ranging from 99 % in the Länsi Pohja Hospital District, to 42 % in the Itä Savo Hospital District (Fig.10).

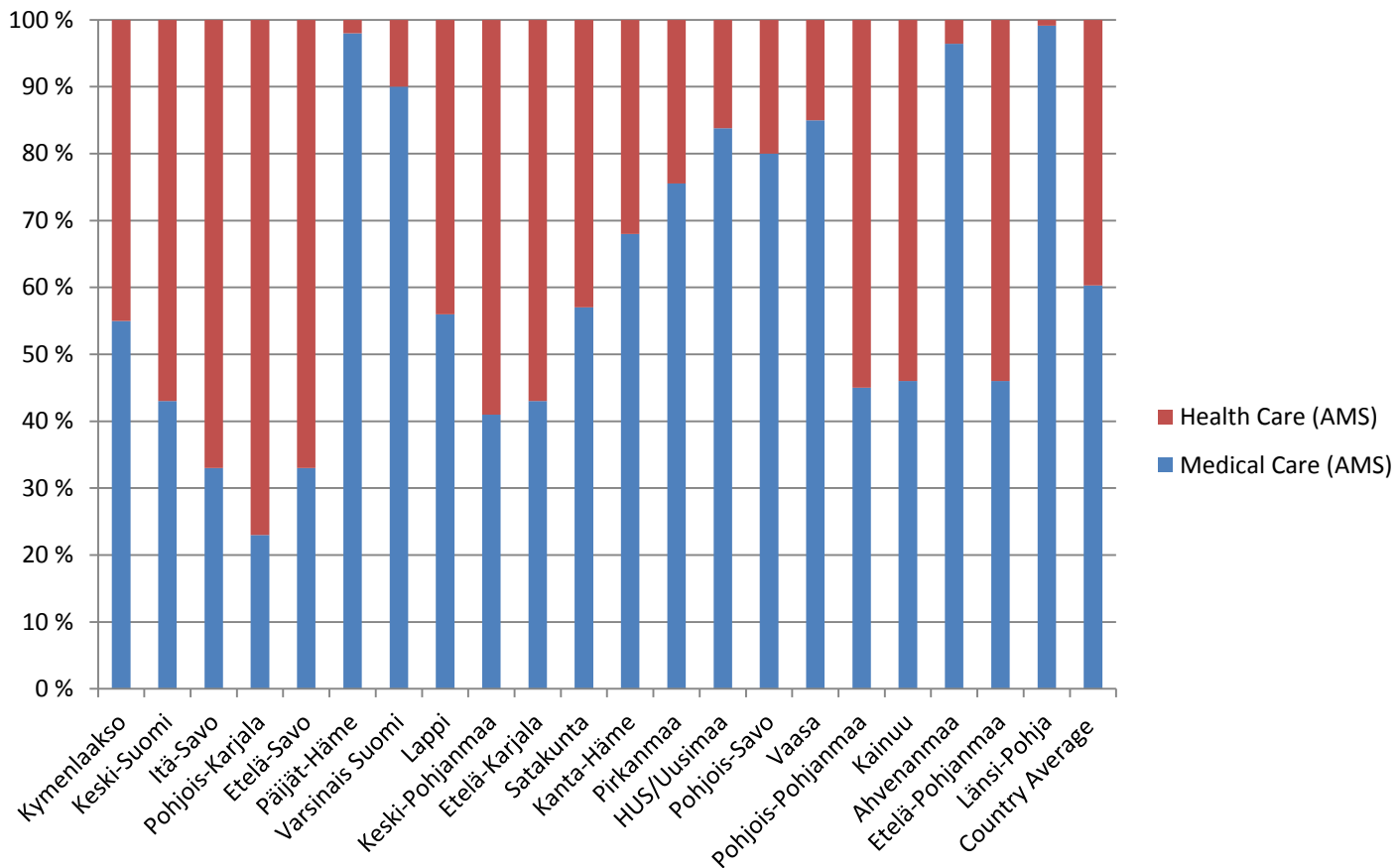


Figure 12. Service type for broader All Medical Specialities (AMS), primary care visits by hospital district.

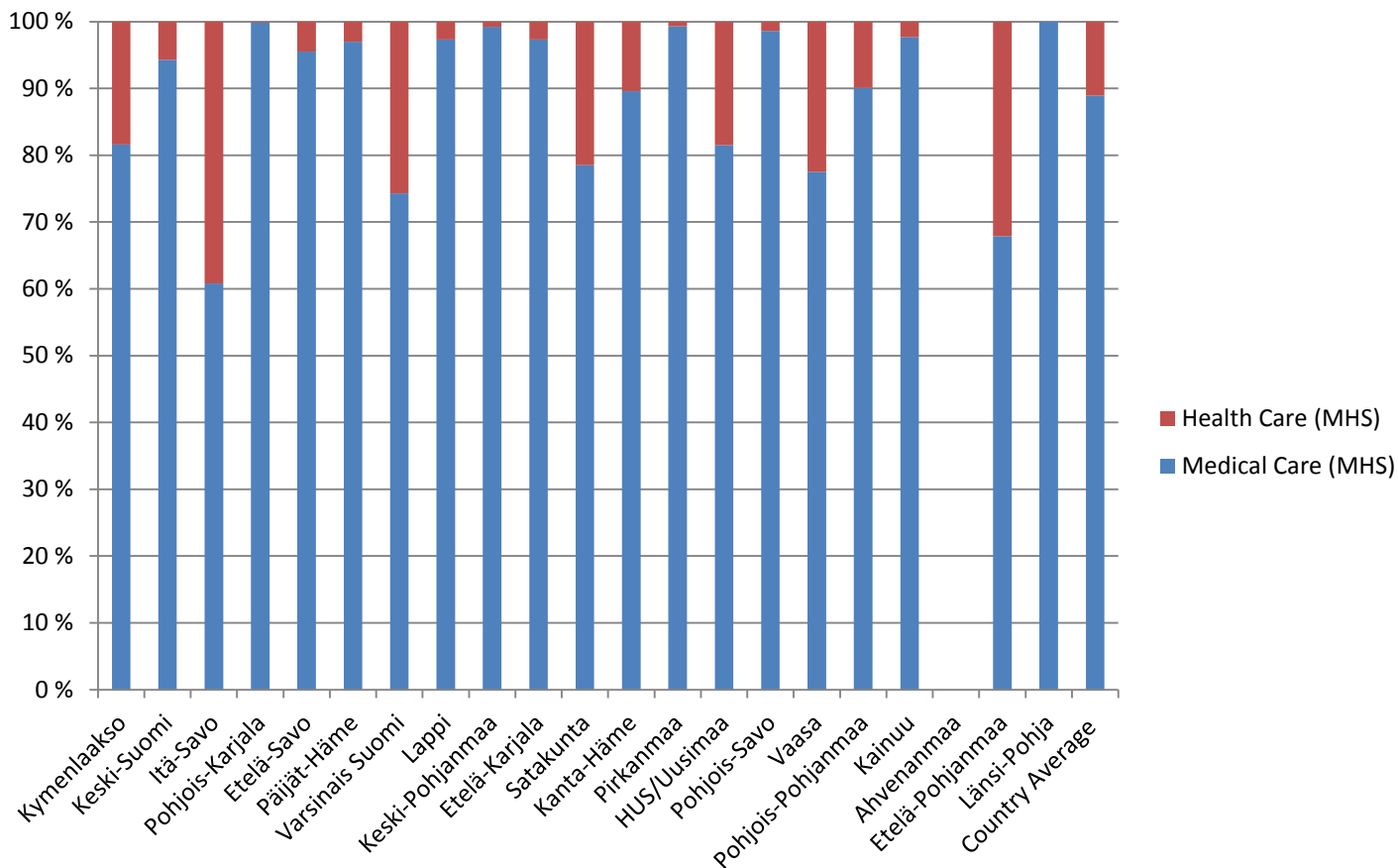


Figure 13. Service type for restricted Mental Health Speciality (MHS), primary care visits by hospital district.

Using the restricted definition including only MHS, the country average for Service Type MC was 89 % with the remaining 11 % recorded as HC, ranging from 100 % MC coding in Länsi Pohja Hospital District to 61 % in Itä Savo Hospital District (Fig.11). Although the restricted definition was not found to correlate to re-hospitalisation rate, the increased emphasis on MC within mental health visits is clear.

Using the restricted definition MHS, Service type MC was positively correlated with hospital district Mental Health Index $r= 0.585$, $n= 21$, $p=0.007$ (Fig.12) indicating that hospital districts with higher Mental Health Index (indicating higher mental health burden) had a stronger focus on MC within primary mental health care.

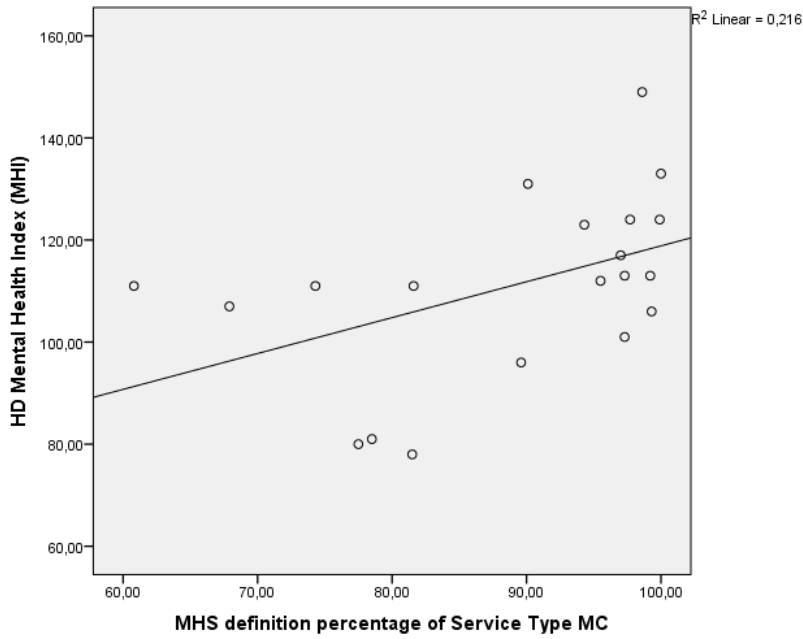


Figure 14. Correlation between hospital district Mental Health Index and Service Type MC using the restricted Mental Health (MHS) definition.

A moderate positive correlation was found between Service Type when using the broader definition AMS and re-hospitalisation rate, $r = 0.658$, $n = 21$, $p = 0.034$ indicating higher focus on MC in hospital district's with higher re-hospitalisation rate (Fig.13).

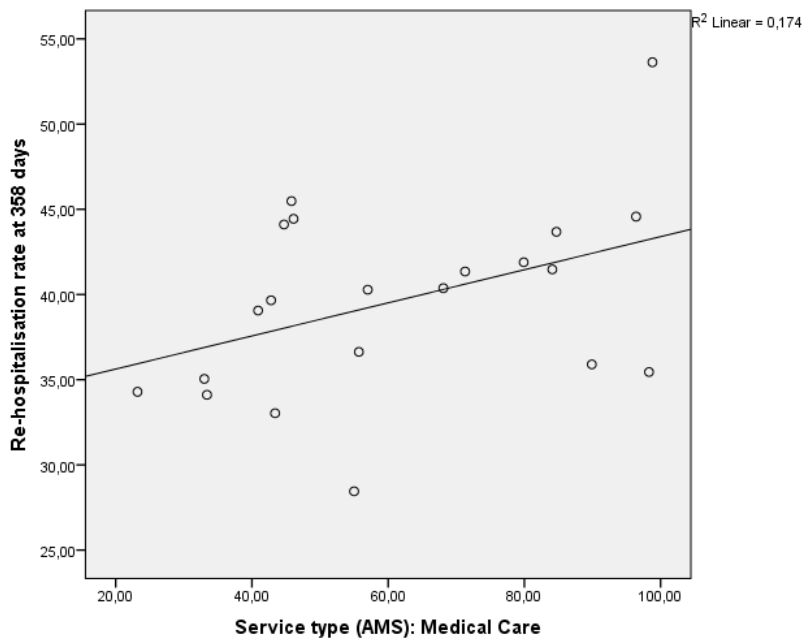


Figure 15. Correlation between Re-hospitalisation rate and Service Type using the broad All Medical Specialities (AMS), definition

Means of Contact is recorded as one of ten options, listed in Fig.14 below. Means of contact varied between hospital district and by medical speciality. When using the broad definition AMS, visits taking place at the primary care centre constituted on average 20 % of all visits, with home visits constituting 63 % of all visits. Telephone contact constituted on average 9 % of all visits.

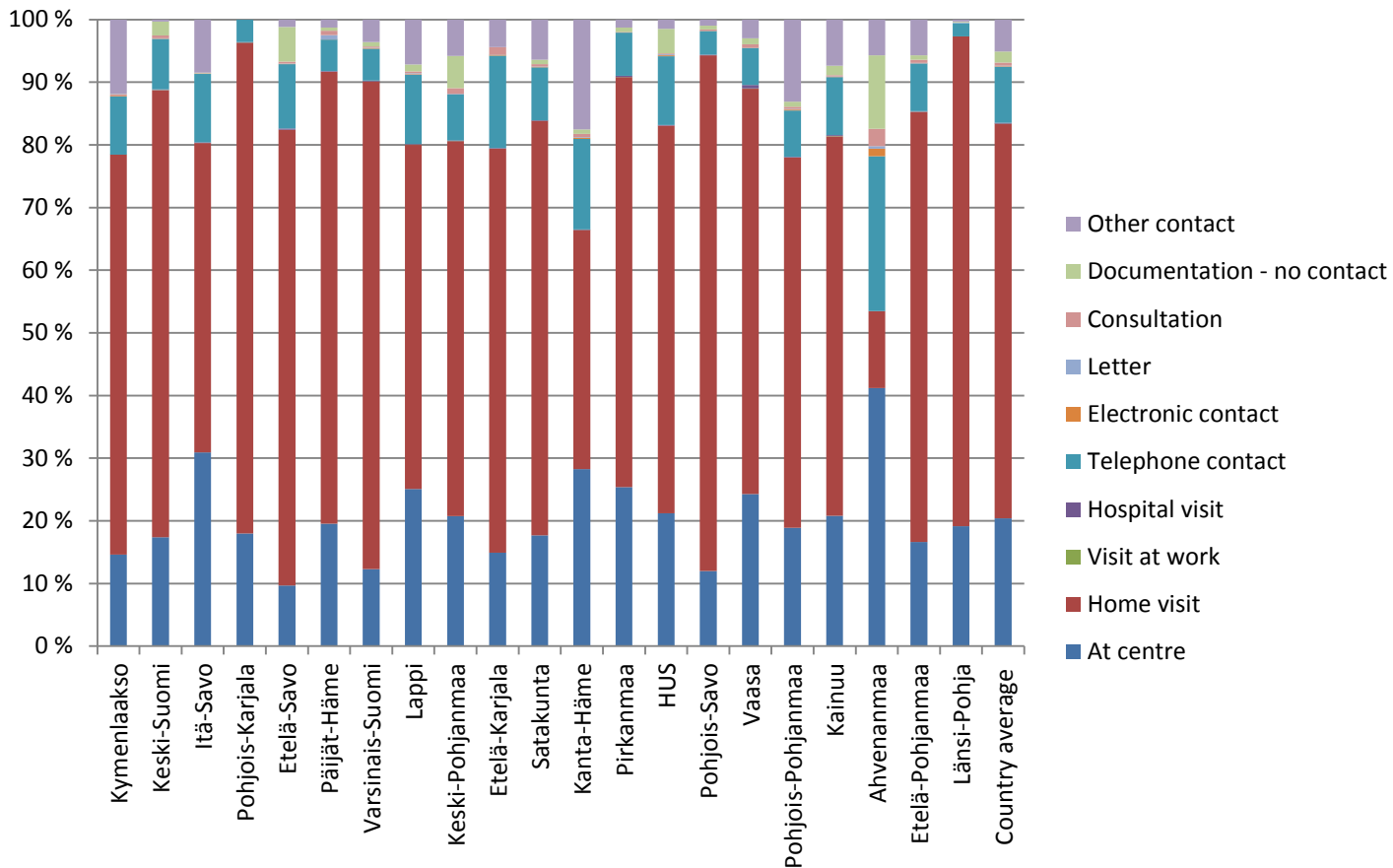


Figure 16. Means of contact using the broad all medical Specialities (AMS), definition

Means of Contact looked a little different when using the restricted definition MHS, where visits taking place at the primary care centre constituted on average 56 % of all visits, with home visits constituting on average 15 % of all visits. Telephone contact constituted on average 12 % of all visits (Fig. 15).

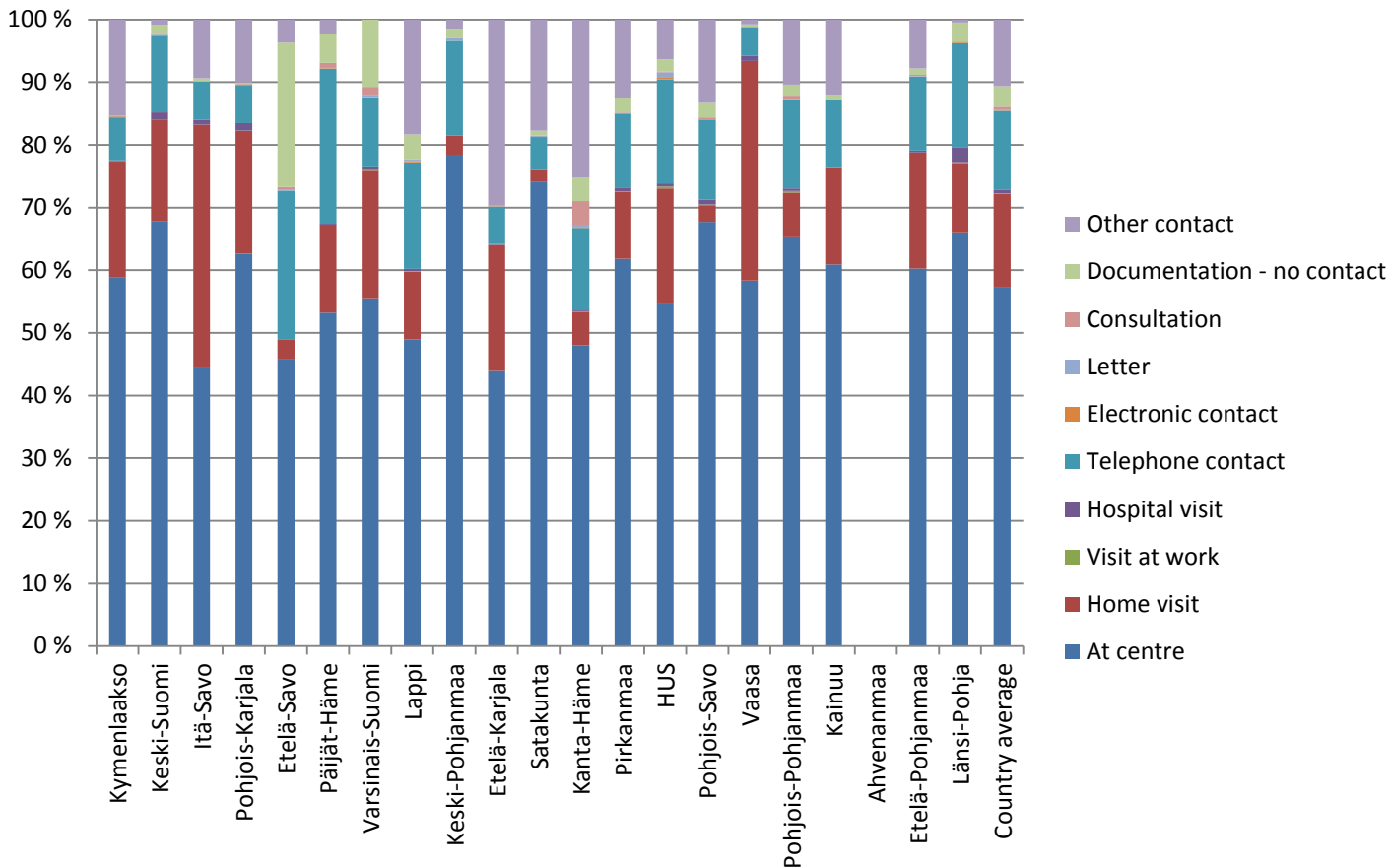


Figure 17. Type of Contact by hospital district using the restricted Mental Health (MHS) definition.

Visits to different professionals

Diversity of visits to different professionals using the broad definition AMS (Fig.16), and diversity visits to professionals using the restricted definition MHS (Fig.17) was examined. Variation in the diversity of professionals between hospital district's and also between the broad (AMS) and restricted definitions (MHS) was found. When using the broad definition, AMS, there was more emphasis on visits to General Health Care Assistants with the country average being 59 %. When using the restricted definition MHS, there was understandably higher use of Mental Health Care Assistants (10 %) and Psychologists and Psychotherapists (5 %), but less emphasis on General Health Care Assistants (10 %). Number of visits to General Practitioners was also higher for the broad definition AMS (9 %) in comparison to the restricted definition MHS (2 %), which could be related to coding practices. Visits to Nurses (64 %) was higher in the restricted definition MHS, compared to the broad definition AMS (30%).

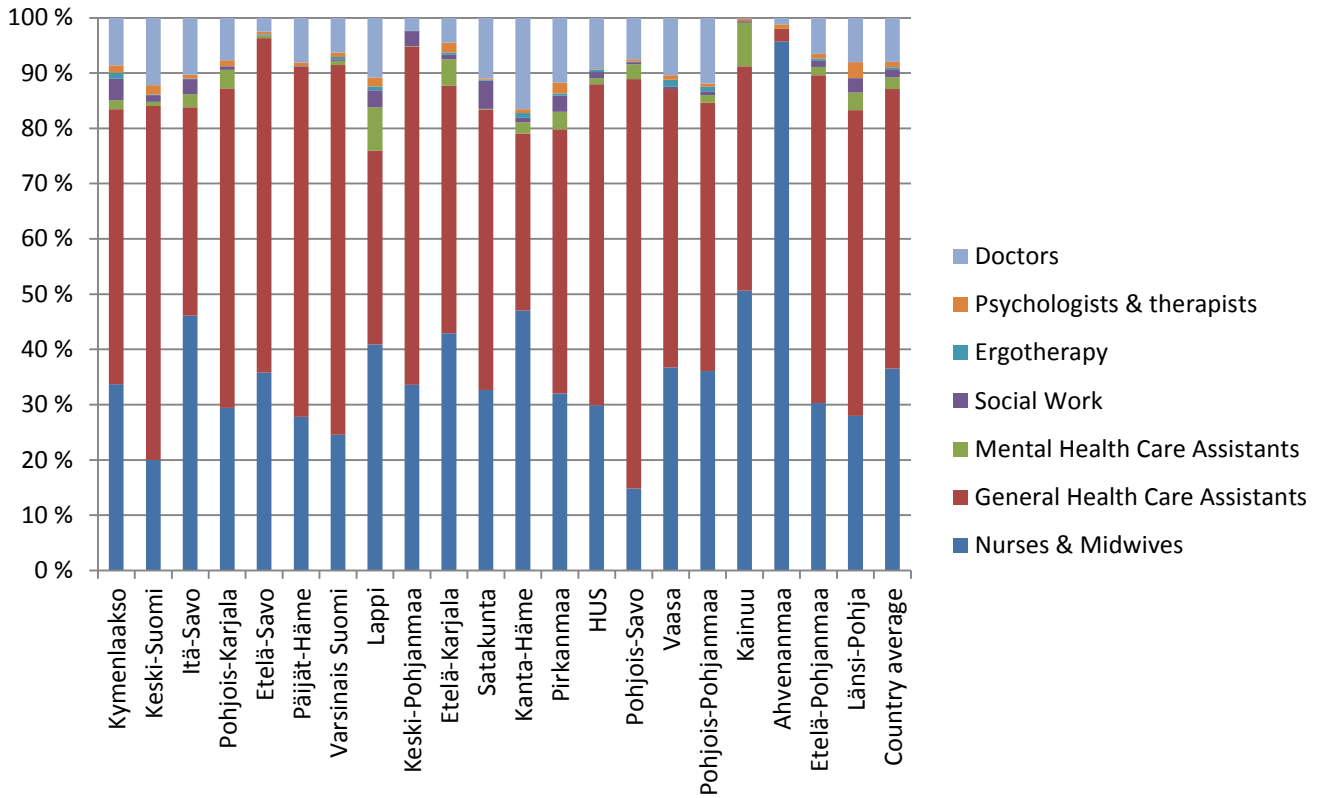


Figure 18. Diversity visits to professionals, using the broad All Medical Specialities (AMS), definition by HD

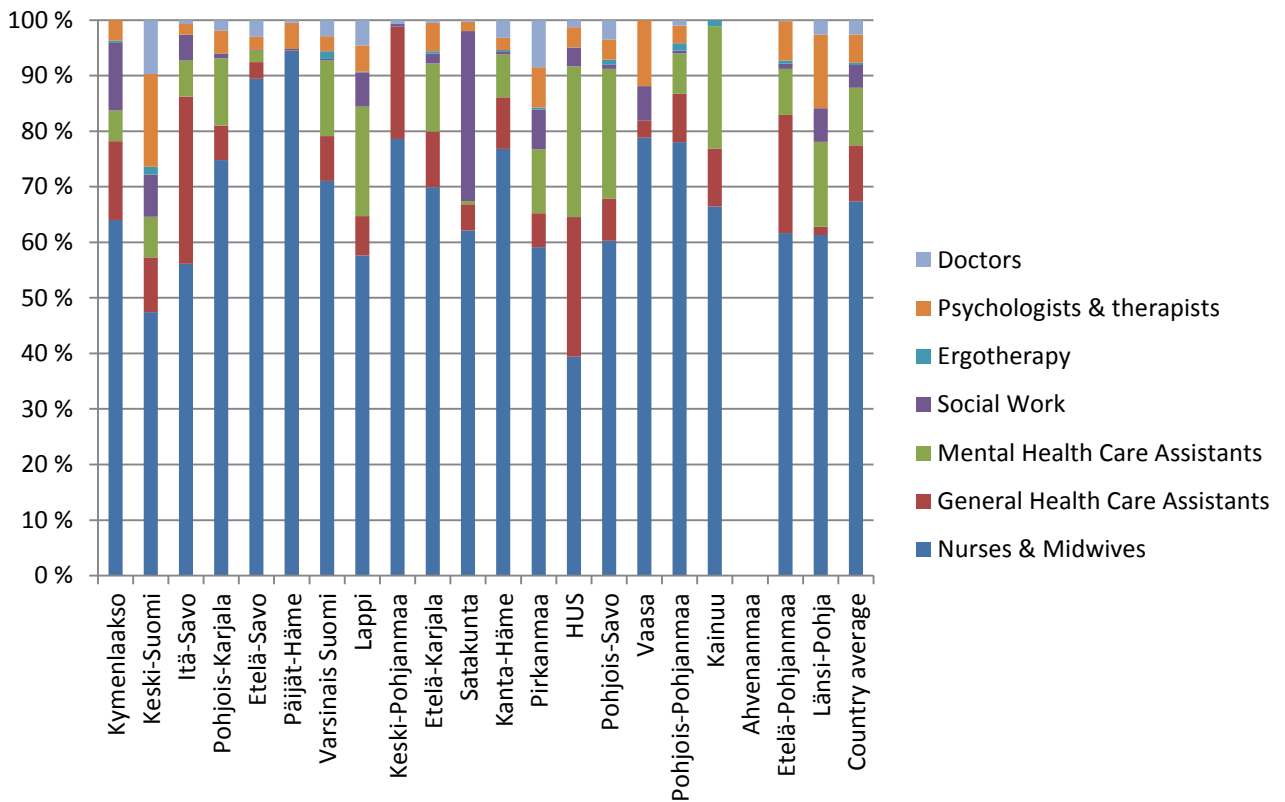


Figure 19. Diversity visits to professionals by hospital district, using the restricted Mental Health (MHS) definition.

There was a strong positive correlation between percentage of visits in primary care within a week and percentage of Mental Health Care Assistants by hospital district, $r = 0.777$, $n = 21$, $p = 0.000$. A scatterplot summarises (Fig.18) illustrating areas with higher likelihood of patients receiving a primary care visit within a week also had a higher percentage of visits to Mental Health Care Assistants.

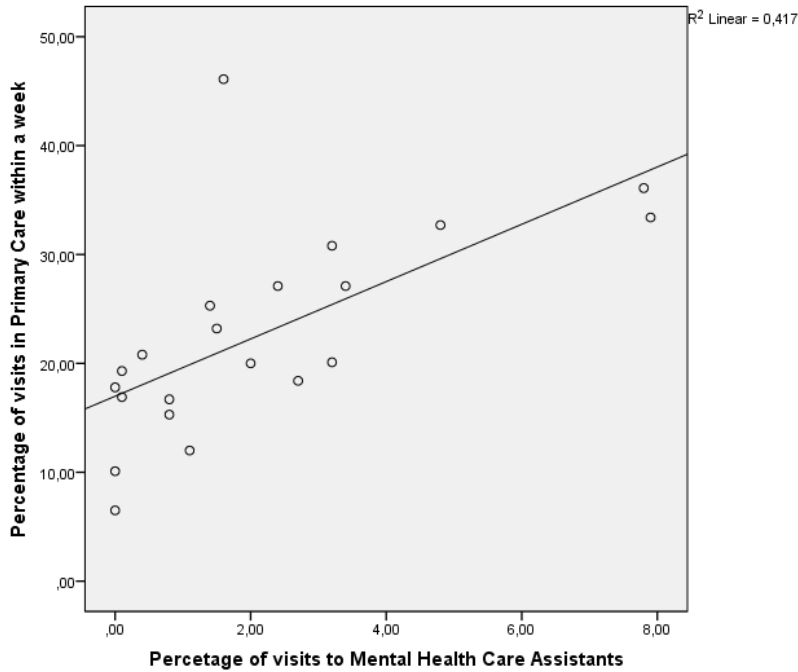


Figure 20. Correlation between percentage of visits in primary care within a week and Mental Health Care Assistants.

Discussion

Many studies including the main CEPHOS-LINK study¹²⁴, seek further clarification of the reliability and usability of re-hospitalisation rate as a measure in different contexts. The current study investigated psychiatric re-hospitalisation in relation to outpatient care, particularly by looking at differences in the make-up of primary care services using two large Finnish Health Care Registers, as well as exploring it in terms of demographic data. Not only was psychiatric re-hospitalisation rate investigated as an indicator, the nature of primary care service use for the study cohort consisting people with mental health difficulties severe enough to undergo at least one period of psychiatric hospitalisation was explored in detail. Comparisons were made between hospital districts, taking into consideration demographics and health care service structure.

Re-hospitalisation rate was seen to vary between hospital districts and correlated with length of stay and with a higher percentage of the population having received inpatient psychiatric care. Mental Health Index was found to vary between hospital districts and found to correlate with population density with areas with lower population density exhibiting a higher mental health burden.

As far as the data from the registers would allow, areas of interest in terms of primary care service use was loosely based on aspects of primary healthcare services as postulated by Kringos et al. attempting to isolate data relating to; *structure*, comprising of three dimensions: 1) governance; 2) economic conditions; 3) workforce development. *Process*, determined by four dimensions: 4) access; 5) continuity of care; 6) coordination of care; 7) comprehensiveness of care. *Outcome*, including three dimensions; 8) quality care; 9) efficiency of care; 10) equity in health.¹²⁷ Of course many of these remain outside of the scope of the present study but nevertheless provide an interesting framework for consideration.

Hospital districts were seen to prioritise either primary or specialised services in terms of psychiatric outpatient care, this could be attributed to structural aspects in relation to the dimensions mentioned above. Also in relation to structure, and potentially also relating to process, use of primary care services by the cohort in question was seen to vary between hospital districts. Differences in aspects of primary care use such whether the Service Type was predominantly medical or health care orientated, means of contact and variation in primary care workforce can also be related the dimensions mentioned above.

Psychiatric re-hospitalisation rate and Mental Health Index

Re-hospitalisation rates have been seen to be affected by many factors, on both patient and healthcare system level. The current study had the benefit of studying a cohort consisting of patients with psychiatric diagnoses. Undoubtedly this cohort is still a very heterogenic patient group, whose mental health needs will vary considerably. Although psychiatric morbidity and other patient level factors may well effect chances of being re-hospitalised, the current study had a stronger focus on health system factors and unravelling how these may also affect the re-hospitalisation rate of this particular cohort.

Psychiatric re-hospitalisation rate was explored both in terms of differences between hospital districts and also in relation to various demographic indicators. The average re-hospitalisation rate (measured at 356 days) for the whole country in the year 2012 was 39%, meaning that of the 16 814 people who have been hospitalised for over one night due to a psychiatric diagnosis in the year 2012, 39 % of them returned to hospital care within a year. Psychiatric re-hospitalisation varied between hospital districts with the highest

level of psychiatric re-hospitalisation taking place in Länsi Pohja Hospital District at 54%, to Kymenlaakso Hospital District, with only 28% returning for psychiatric inpatient care within a year.

The Mental Health Index without age-standardisation was used as a crude indicator of the burden of severe mental health difficulty in the hospital districts, in order to establish whether mental health needs on a general level differed between the hospital districts. Hospital district's with higher Mental Health Index ratings denoted higher levels of suicides and suicide attempts leading to hospitalisation, larger number of special refunds for medicines prescribed for the treatment of psychosis, and a higher level of disability pensions due to mental health issues for the adult population.

The Mental Health Index was found to vary between hospital districts ranging from 45 in Ahvenanmaa Hospital District to 149 in Pohjois Savo Hospital District. Mental Health Index was also found to correlate with population density with areas with lower population density exhibiting a higher Mental Health Index (Fig.8). Reasons behind this phenomenon remains unclear and defined causality is beyond the scope of this study. On the one hand this variance could potentially be attributable to patient factors, with some hospital districts perhaps suffering from a higher burden of mental health disorders. Alternatively, it could also reflect access to timely mental health support, areas with higher population density perhaps managing a narrower treatment gap resulting in a lower burden of mental health disorders. Even though re-hospitalisation rate was not found to correlate with Mental Health Index it could be reasonable to assume health system factors play a considerable role in terms of the variety in both measures.

Percentage of Cohort by Population of Hospital District

The share of the study cohort was investigated in relation to the size of the hospital district population in order to establish whether the re-hospitalisation rate was at all related to the number of patients in the cohort. For example, did a higher re-hospitalisation rate relate to a small number of frequently re-hospitalised patients, or was it due to a more pervasive focus on frequent hospital care, or some other system related variable. These system variables may reflect a stronger focus on hospital-centred practices for mental health, or alternatively it may reflect low threshold practices where patients have for example 24-hour access to care if they should feel the need for it.

The percentage of the CEPHOS-LINK cohort in relation to the hospital district population varied from 0.33 % in Keski Suomi Hospital District and Vaasa Hospital District to 0.50 % in Pohjois Savo Hospital District. Re-hospitalisation rate was found to positively correlate with the percentage of CEPHOS-LINK cohort by HD population (Fig.6), indicating that the higher the share of people in the hospital district population having had (at least) one psychiatric hospitalisation, the higher the chance of subsequent re-hospitalisation is. Definite causality again difficult to establish, however it could be assumed that it has to do with a system level factors for example more pervasive use of hospital care, rather than being due to a higher burden of mental health disorder. Furthermore, there was no correlation between Mental Health Index and Percentage of the CEPHOS-LINK cohort by HD, also dissuading a patient level explanation based on psychiatric morbidity.

In order to establish what kind of service level aspect may be behind this occurrence remains to be seen, and would necessitate further study on grass root level. As mentioned above, it could relate to a stronger adherence to hospital based care for mental health care, or it could indeed relate to service level factors such as availability of care. For example the Länsi-Pohja Hospital District is the home of the Open Dialogue technique developed by Jaakko Seikkula, which bases its practice on patient-centred principles including

prioritising immediate help, an emphasis on minimising hospital care if possible, and multi-professional working practices.¹²⁸ In fact, the Länsi-Pohja Hospital District describe their health services on their website as follows *“With about 70,000 inhabitants, Länsi-Pohja is Finland’s second smallest healthcare district. Being small is also an advantage. Over 90 % of the area’s population lives within a half-hour drive of our hospital. This means that our specialized medical treatment services are very close to the people.”*¹²⁹ Such area specific practices could potentially affect the aggregated results and could benefit from further and more detailed study.

This also echoed by on self-referral, where patients themselves determine their need for inpatient care without referred from health professionals. Findings suggest that this could help patients seek help at an early stage and reduce the rate of acute or involuntary admission to specialised care without leading to increased use of healthcare services.^{130 131}

Length of Stay

Length of Stay is a frequent measure when it comes to psychiatric inpatient care, modern practice leaning towards more focus on community services and shorter hospital stays. length of stay can be an indicator of health needs of patient due to severity of illness, or reflect system level factors such as capacity, structure or treatment. Recently reviewed by Kalseth et al.³⁸ length of stay was systematically found to be negatively associated with re-hospitalisation rate potentially attributed to hospital practices such as premature discharge.¹³²

Average length of stay can be seen to vary between counties¹³³ and was also seen to vary between hospital districts in the current study. Length of stay was seen to moderately correlate with re-hospitalisation, with hospital district's with higher re-hospitalisation rates having lower length of stay (Fig.5). This would appear to be in line with previous research suggesting shorter length of stay are associated with higher re-hospitalisation rates as reviewed by Kalseth et al.³⁸

Shorter length of stay has also been associated with a higher patient turn over. Studies indicate that, in order to retain a high patient turnover event with a reduction in psychiatric beds, hospitals may have resorted to shorter length of stay.¹³⁴ This trend where hospitals attempt to resolve high patient turnover by way of shorter length of stay appears to be in line with findings from the current study. As well as finding a correlation between length of stay and re-hospitalisation rate, the current study also found length of stay to correlate with Percentage of CEPHOS-LINK Cohort per HD (Fig.7). Hospital district's found to have a had higher percentage of their population included in the CEPHOS-LINK cohort, exhibited lower length of stay suggesting more pervasive use of short term hospitalisations.

Specialist Medical Care vs Primary Health Care Use

Community outpatient services have been at the foundation of psychiatric reform initiatives. Mental health outcomes including psychiatric re-hospitalisation rate has been positively associated with the receipt of community based aftercare.¹³⁵ In line with the Current Care Guidelines in Finland, evidence based clinical practice guidelines for medical treatment and the prevention of disease, outpatient contact should be made within a week of discharge from hospital. Mental health outpatient care in Finland can be administered within both in specialised care and/or in primary care. CEPHOS-LINK data on specialised and primary care data was included in the current study allowing for the assessment of how different hospital district's coordinate outpatient care following discharge (Fig.9). On average, outpatient contact within a week was achieved in 51% of hospital districts. Of this 51% of outpatient visits in a week, 37% occurred in

primary care and the remaining 63% in specialised care. As expected, these figures varied among hospital districts, a reflection of Finland's decentralised healthcare system and variation in service structures. Although no direct correlation was found with re-hospitalisation rate, some interesting correlations were found in relation to aspects of outpatient care.

Firstly, although it could appear to be an obvious finding, percentage of outpatient visits within a week in specialised care was found to be strongly correlated with percentage of outpatient visits within a week in primary care. This finding indicating that areas arranged first outpatient visits either in specialised care, or in primary care with little overlap between the two. Additionally, population density was found to correlate negatively with primary care visit within a week, indicating that areas with lower population density made more use of primary care services following discharge, with areas with higher population density being more likely to arrange the first visit following discharge within specialised care, entirely plausible considering the geographical composition of Finland.

Primary Health Care Use

As well as exploring the use of re-hospitalisation rate as a measure in the Finnish context, an additional focal point of the current study was to examine primary care data from the AvoHILMO Register for Outpatient visits in Primary Care for the CEPHOS-LINK cohort (N 16 814). The analysis teased out different components of primary care for this cohort consisting of people with mental health disorders serious enough to require at least one psychiatric hospitalisation, an important distinction as it indicates that the study population would most likely be composed of people suffering from moderate to severe mental health disorders.

Primary care services were explored according to what data was available within the AvoHILMO registry in terms of the nature of visits made by the study cohort. Each visit is coded individually using predefined categories as detailed in the AvoHILMO user manual,¹³⁶ and defined by medical speciality depending on the nature of the visit. Aspects of primary care such as service type, means of contact, and professionals involved were care were looked at using two difference definitions, the broader definition including all included medical specialities (AMS), and the more restricted version including visits specifically coded as Mental Health Speciality (MHS).

A distinction between the broad and restricted definitions was made in order to examine if there were any differences in service provision in these two contexts. The reasoning behind also including the broader context was to be able to include the study cohorts' visits also to other health specialities, i.e. those not specifically coded using the mental health speciality code within Avohilmo. Taking a holistic view on mental health, it was considered important to include the broader definition. According to the Avohilmo manual, the mental health speciality code refers to visits pertaining very specifically mental health support, excluding more general visits which may relate to mental health needs, but not specifically be mental health support in the strictest terms. In order to be able to include such broader visits by this cohort, it was important to include the two definitions.

Service Type in primary care can be defined depending on whether the primary care visit was recorded as a Medical Care (MC), or Healthcare (HC). According to the AvoHILMO user manual, visits recorded as Medical Care refer to medical examinations, measures, treatment and rehabilitation in relation to symptoms,

illness, injury or disability. Visits recorded as Health Care on the other hand refers to health care functions with more public health undertones, such as health promotion and diseases and injury prevention.¹³⁶ Service Type was explored in the present study as a broad gauge in terms of the predominant nature or type of care in the hospital districts. The general assumption was that if a hospital district has a stronger emphasis on Medical Care within mental health it may be inclined to use more hospital based services. Alternatively, hospital district's with a stronger use of Health Care within mental health care was assumed to have a more promotional view of mental health care, potentially with a stronger adherence to more diverse forms of community care.

Re-hospitalisation rate was found to correlate with Service Type MC using the broad definition AMS, indicating that areas with a higher re-hospitalisation rate have a stronger focus on Medical Care as opposed to Health Care. Using the broad definition AMS, allows a broader range of medical specialities to be investigated. Although definite reasons behind the correlation between re-hospitalisation rate and Medical Care are outside of the scope of the current study, it could indicate a stronger focus on medical/hospital care in general, or it could also reflect the increased comorbidity of physical and mental disorders as highlighted by the recent systematic review by Sprah et al.⁴⁶ Higher levels of comorbid physical conditions are entirely possible within this particular study cohort potentially leading to a higher level of Medical Care visits within primary care.

Service Type MC was not found to correlate when using the restricted definition of including only the Mental Health Speciality (MHS). However, looking at the descriptive analysis it is apparent that the broad definition (AMS) had less emphasis on Medical Care (blue section in Fig.10) in comparison to the restricted definition including only the Mental Health Speciality (MHS) (blue section in Fig.11). This indicates proportionately higher levels of Medical Care contacts within the mental health care. Again, reasons behind this phenomenon would require further study, although it does appear to indicate a general tendency towards a medicalised view of mental health in comparison to other medical specialities where more Health Care practices were employed. Mental health visits were less likely to include Health Care practices where a stronger emphasis is placed on public health initiatives, such as health promotion and diseases and injury prevention.

Additionally, Service Type MC was seen to correlate with Mental Health Index using the restricted definition MHS (Fig.12). This indicates that areas with higher Mental Health Index (i.e. with a higher mental health burden), make more use of Medical Care practices within primary care. Again, this could be a product of more medically focused care model for mental health difficulties, or indeed a reflection of well-matched care for a population with higher mental health needs.

Means of Contact and Visits to Professionals

The nature of primary care visits are defined in terms of Means of Contact, and also in terms of the Type of Professional the visit is made to. Means of Contact was explored in order to ascertain the diversity of services available from primary care. Means of Contact was grouped into ten categories; visit at health care centre, home visit, visit at work, hospital visit, telephone contact, electronic contact, letter, consultation, documentation without patient contact and other contact. Visits were explored again, in terms the two definitions, broad (AMS) and restricted (MHS). Using the broad definition (AMS), Means of Contact taking place at the primary care centre constituted on average 20 % of all visits, with home visits constituting 63 % of all visits. Telephone contact constituted on average 9 % of all visits (Fig.14). Using the restricted

definition (MHS), Means of Contact taking place at the primary care centre constituted on average 56 % of all visits, with home visits constituting on average 15 % of all visits and telephone contact constituted on average 12 % of all visits (Fig.15). This constellation suggests that there is less diversity employed in terms of primary care mental health visits in comparison to all other medical specialities. Home visits were considerably less utilised in terms of mental health care, and a stronger emphasis on the patients attending appointments at the primary care centre was adopted more frequently.

This finding is interesting in itself considering the overall trend towards more mobile services within mental health. Programmes such as, and akin to Assertive Community Treatment (ACT), intensive case management, and early intervention approaches focus on the delivery of holistic, integrated services with good continuity of care to name a few showing positive results.^{137 138 139} Undeniably these kinds of services may more often be found within specialised services and therefore not visible in such detail within primary care datasets. However, one could argue that considering that one of the foundations of good primary care services is close proximity to its' community, aspects of these services, or adaptations of these practices could be well placed within primary care. Moreover, according to the data, it appears that services have been developed in this direction for the other medical specialities included in the broader definition, which begs the question why has this not taken place also within mental health care?

Primary Care Workforce

At the heart of any healthcare practice are people, the professionals who work within the service and their connection with the people that they meet. A positive and trusting relationship is frequently cited as a top priority.¹⁴⁰ The primary care workforce was explored in the current study with comparisons made between visits to professionals using the broad definition (AMS) (Fig.16), and visits to professionals using the restricted definition (MHS) (Fig.17) in order to examine how the professional workforce had been developed within mental health visits, and within other specialities.

There was variation in diversity of professionals both between hospital district's and also between the broad and restricted definitions. Using the broad definition AMS, more visits to General Health Care Assistants were noted. When using the restricted definition MHS, there was understandably higher use of Mental Health Care Assistants and Psychologists and Psychotherapists, but less emphasis on General Health Care Assistants. A positive correlation between Mental Health Care Assistants (MHCA) and Percentage of Primary Care Visit within a Week indicates that hospital district's (Fig.18) with more MHCA's also have a higher likelihood of receiving a primary care visit within a week following discharge. This could indicate that the presence of MHCA within primary care increases the availability of mental health support, potentially alleviating the treatment gap and improving the chances of patients receiving an outpatient contact within the recommended one week period following hospital discharge.

GP contact was not considered in detail in the present study. Visits to GP within primary care was seen to be higher when using the broad definition (AMS), in comparison to the restricted definition (MHS) focusing only on mental health visits. This could be due to these visits genuinely relating to somatic issues, or it could be an artefact created by coding practices. As stipulated by the AvoHILMO guidance document⁷⁷ visits to GP's in relating to mental health should be coded using a more generic code except for in very specific circumstances related to type of service and professional capacity of the GP.

Internationally the diversity of primary care workforce is expanding to include more non-physician professionals.¹⁴¹ In addition to different levels of nursing staff, the use of practice nurse or auxiliary staff has also increased internationally, commonly taking care of similar tasks such as administration and simple clinical or nursing procedures under the supervision of doctors or nurses.¹⁴² A UK based qualitative study explored the use such staff in mental health care within primary services with findings indicated that Primary Care Mental Health Care Workers appeared to provide a range of skills much valued by both patients and primary care teams. For example patients' reported that Primary Care Mental Health Workers allowed for contact in an atmosphere with less of the stigma which is commonly associated with mental health problems. Also factors such as feelings of increased continuity of care, and help with accessing services in the voluntary sector were reported, all important aspects of improved community support.¹⁴³

Strong, person centred services within primary care as well as collaboration with specialised secondary care services have frequently been highlighted as an ideal framework for mental health services. Reforms often cry out for increased healthcare spending and a more professionalised workforce. However, studies highlight the benefits that less specialised professionals can contribute with. Skills which are highly relevant to collaborative mental health services such as case management, coaching, psychoeducation and follow up can effectively be assigned to the non-specialist workforce, therefore scaling up existing services instead of reinventing the wheel completely.¹⁴⁴

Strengths and Limitations

Although shedding light on to what extent and what type of primary care services were accessed by a large cohort consisting of people who had undergone at least one psychiatric hospitalisation, this study suffered some limitations. Although the current study had a strong focus on general trends and health care systems, as opposed to detailed emphasis on practice or individual processes, but falls subject to several shortcomings with considerable areas for development.

Although Finland is has high quality and comprehensive registers, as with any register based studies the areas of interest were dependent on what data was available from the registers involved. Although data from the both AvoHILMO and HILMO registers can be considered to be of good quality and suitable for research purposes a certain degree of interpretation is needed in terms of deciphering the exact nature of the existing variables and how they may translate into research purposes. This true not only in terms of scrutinising how reliably the variables represent research objectives, coding is also an area for consideration. Although coding practices are stipulated both for HILMO and AvoHILMO use in official guidance books⁷⁶⁷⁷, there is an element of interpretation necessary by healthcare personnel which could result in variation. Although guidance documentation is well defined and clear, human error is an inevitable factor to consider. This type of erroneous coding is apparent when looking at the list of excluded codes, which include both apparent typographical errors in the form of 'nonsense' coding and also in terms of codes which are not related to health care. However, as has been done in the current study, these can be identified and removed from the data to avoid confusion. Additionally, when looking at results aggregated over hospital districts these potential fluctuations should be negligible when looking at trends and patterns of use rather than specific visits.

A further challenge in terms of coding which must be scrutinized is that the code inputted into the register may not always be an accurate description of the actual nature of the visit. For example visits coded using the mental health visits code (T71 in AvoHILMO), which was used to define the restricted definition Mental Health Speciality (MHS) should, according to the guidance document not be used by GP's unless in very specific circumstances. Any visits to GPs relating to mental health should be coded differently using a more generic code (T11 in AvoHILMO). This type of idiosyncrasy makes interpretation more difficult from a research perspective. The current study found some GP visits within the T71 code, although GP visits were not a large part of the current study it could indicate some erroneous coding. Or, it could refer to the previously mentioned specific circumstances as per the guidance document.

Additionally, the AvoHILMO register only came into country wide use in 2011 (following a period of piloting in selected hospital districts), only one year prior to the index year in the current study. A certain degree of teething problems could thus be assumed to exist in the data, especially if looking at fine details. This is in line with the most commonly cited limitation of register based studies as discussed in the literature review. This is an important limitation to consider but again, aggregated data over hospital districts could negate this factor.

Focusing on hospital districts did not offer the most precise level of analysis available, however, in order to ensure anonymity and commitment to ethical requirements, the study was not able to focus analyses on lower levels such as municipal or healthcare centre level. Hospital district level allows for some degree of precision, however services within hospital districts will no doubt vary.

The data included in the current study stems from 2012, meaning at the time of writing it was already 5 years old. A great deal has potentially changed during this period of time along with new forms of outpatient services. The current study could do with being replicated using newer data, in order to establish whether outpatient services have changed in this context. New developments in the availability of data for both AvoHILMO and Hilmo registers have also emerged, increasing opportunities for health service research.

The current study does however indicate the relevance of combining data from both primary and specialised care, and justifies focusing on health care system factors in relation to psychiatric re-hospitalisation.

Conclusion

The current study provides an in-depth overview on mental health services in Finland specifically in relation to how a) how psychiatric re-hospitalisation and outpatient services may be explored, as well as b) gives a synopsis of what primary care services the CEPHOS-LINK cohort accessed in 2012.

Although re-hospitalisation rate did not emerge as a strong indicator in relation to outpatient services in this study, exploring the determinants of health service use is an area which could benefit from further research. Combining data from both specialised care and primary care allows for a richer understanding of determinants of mental health service use and allows for a more precise allocation of resources and workforce roles. Using re-hospitalisation rate as a measure could be of interest and a topic of further study in this context and multi-level statistical analyses could further illuminate the influence and nature of specialised and primary outpatient care on people at risk of psychiatric re-hospitalisation. Re-hospitalisation rate could be used as a measure in combination with other factors. For example, using a framework such as the one Kringos et al.¹²⁷ presented for primary care could include re-hospitalisation rate as part of the outcome dimension. Using re-hospitalisation rate in combination with other measures as well as demographic and health system aspects could potentially be more beneficial than looking at re-hospitalisation on its own. Quality indicators for people with severe mental health disorders using routine data could improve and incentivise primary care.¹⁴⁵

Differences in service use between the hospital districts was apparent in this study, although perhaps not surprising considering the autonomy of municipalities to build their healthcare services independently. Results from the current study could go some way to illuminate how people with mental health disorders severe enough to require hospitalisation access outpatient care, particularly primary care. A stronger coordinating role for primary care is an important and cost effective way to deliver integrated care also for people with severe mental difficulties, and one which may go some way towards ensuring increased and equitable access to mental health care throughout Finland's sparsely populated country.¹⁴⁶ A stronger role for primary care could not only improve accessibility, it could provide health benefits especially in terms of comorbid somatic disease.¹⁴⁷

Further developing primary care by increasing the diversity of the workforce and types of services available for people in need of mental health care would be in line with current recommendations of adequate mental health care taking a more holistic or person centred view of mental health in general. This process requires investment not only in terms of healthcare, but also through general consensus and commitment by stakeholders within health and social sectors, the tertiary sector, as well as training and continued integration. Access to secondary services is vital for people in the need of more specialist care, and collaboration and consultation with primary care an important part of secondary services. Ensuring active collaboration between primary and secondary sectors ensures minimal overlap of services and resources. Collaboration between specialist and primary care services could be of particular importance for more rural areas where primary care services are generally more prominent.

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Annex 1

1. All included Medical Specialties

Comprised of all included medical specialties within primary care, medical specialties without obvious relevant for the study were excluded (totalling 15 medical specialties) such as for example dentistry and antenatal clinics. Included medical specialties:

Medical Speciality code in AvoHILMO	Explanation of code
T11	Open (general) medical care e.g. follow-up of chronic illness.
T29	Other Healthcare e.g. vaccination, certification
T30	Legislated occupational healthcare, prevention of illness and accidents at the workplace, health and safety aspects relating to occupation.
T31	Non-legislated occupational healthcare, relating to additional care forms on the basis of employers contractual agreements (occupational perk).
T40	Homecare, including both home medical care and home help.
T41	Homecare, medical care including 'home hospital care' such as administration of IV medication etc
T42	Home help, relating to support for daily functional needs
T54	Ergotherapy, a form of occupational rehabilitation in relation to daily functionality.
T58	Social work within healthcare, social work exists predominantly within the social sector and coded in its own registry.
T59	Other rehabilitation and specialist therapy

T71	Mental health care within primary care, relating to service in relation to crises or mental health problems. Visits to a GP or other related health/social care professionals should be coded as T11 (Open Medical Care) unless relating to visits made to specialised professional within mental health.
T73	Care in relation to substance abuse including prevention and rehabilitation. Visits to a GP or other related health/social care professionals should be coded as T11 (Open Medical Care) unless relating to visits made to specialised professional within substance abuse.
T80	Day activities within primary care, specifically for older or in relation to long term illness to improve daily functionality.
T81	Day hospital care - relating to medical care or rehabilitation which healthcare need is considered bigger than what can be offered at the primary care centre.

2. Visits to different professionals

AvoHILMO records to what type of professional visits are made to. Visits to a total of 121 different professionals were coded in the study cohort. For the purpose of this study, these professionals were grouped into seven groups to according definitions by Statistics Finland.¹⁴⁷

Grouping (for study purposes)	Included professional codes (Statistics Finland)
Excluded codes - missing/wrong code	513, 3431, 4114, 4115, 4190, 4222, 5132, 22310, 51323, 41, 411, 2321, 3120, 4112, 4131, 24311, 24462, 32121, 32313, 32314, 32316, 76162, 3225, 51324, 3414, 4121, 76950, 34809, 2139, 51327, 312, 34752, 2223, 51312, 91322, 91, 9132, 913, 51325, 2443, 12291, 1232, 2131, 22225, 223, 22306, 22307, 22308, 22800, 22977, 235, 3115, 3228, 34801, 4113, 41421, 419, 512, 51311, 51419, 3228, 51419, 2, 4, 9, 998, 22214, 22215, 22303, 22305, 22311, 24454, 32310, 44602, 222131, 222132, 222133, 323116, 999, 81100, 82000, 222111, 1573, 8, -2, 24464, 22210, 24455, 223038, -1, 32317, 323115, 323126, 997, 22291, 22298, 1105, 22221, 22222, 22223, 22224, 22299, 223037, 223052, 244515, 244611, 32251, 323117, 34194, 513215, 513216, 5139, 671107, 99100, 22224, 671113
Nurses & Midwives	2222, 3231, 3232, 32311, 22211, 22212, 32312, 222, 22301
General Health Care Assistants	5133, 22302, 51321, 51331, 323, 2230, 2221 91321, 51322, 567, 9131, 51332, 22803
Mental Health Care Assistants	51332

Social Work	3460, 12292, 24461, 2446, 34602, 48325, 24463, 34601, 51326
Ergotherapy	3226, 3223, 24453, 32261, 32262, 32269, 34603, 51413, 2229, 32315, 346, 22309
Psychologists and Psychotherapists	24451, 24452, 2445
Doctors	22213