Comparative Effectiveness research on Psychiatric Hospitalisation by record LINKage of large administrative data sets

Final Report Summary - CEPHOS-LINK (Comparative Effectiveness research on Psychiatric Hospitalisation by record LINKage of large administrative data sets)

Executive Summary:
Making comparisons of re-hospitalisation rates using routine data began in the 1960’s, revealing large differences observed between countries. However, the actual reasons behind these differences are not entirely clear. It is important to distinguish how much of the variation in re-hospitalisation rates can be explained by methodological artefacts, and how much is “real” representing actual differences in patient population, health system dynamics and so on.

The CEPHOS-LINK project aimed to clarify these discrepancies striving to identify factors related to re-
hospitalisations by comparing psychiatric re-hospitalisation rates and identifying their predictors in unselected patient populations from six European countries (Austria, Finland, Italy, Norway, Romania and Slovenia), all with differently organised health care systems. Employing a retrospective cohort design, patient-level data was linked using large national electronic administrative health care registries, according to a common protocol. Ensuring genuine comparability of these electronic health care registries was a central component of the study.

Following comprehensive interoperability procedures a total of 225600 patients were available in the CEPHOS-LINK study cohort. As well as ensuring interoperability, analyses were performed both in terms of psychiatric re-hospitalisation, and in relation to how the reduction of methodological noise when making cross country comparisons.

Psychiatric re-rehospitalisation: The highest risk for re-hospitalisation was found to be in the early days after discharge, and it is this is where preventive measures are best placed. Long length of stay had inconsistent effects across the six countries, albeit with a small effect found in three countries (Austria, Italy and Slovenia), and a very strong positive correlation in Romania. In contrast, a negative association in Finland and Norway, with a longer length of stay decreasing re-hospitalisation rate. Physical comorbidity was found to slightly decrease psychiatric re-hospitalisation rates. Degree of urbanicity and regional Gross Domestic Product (GDP) indicated no consistent pattern, which may be due to NUTS 3 regions being too large for making comparisons in this context. The effect of continuity of care on psychiatric rehospitalisation rates suggests that early psychiatric outpatient contacts tended to reduce re-hospitalisation rates. In addition to the quantitative studies, results from the qualitative focus group study indicate the importance of paying special attention to the first hospitalisation, recognition of the importance of the admission being voluntary, and of the importance of active outpatient follow-up, including focus on social and activity needs.

Reduction of methodological noise: Rendering large national electronic health care databases genuinely interoperable and comparable across countries is essential for comparing patterns of pathways of health service utilisation. The CEPHOS-LINK project has produced tools which can be used for increasing interoperability of national databases in other projects harmonising terminology and concepts on a European level.

Re-hospitalisation rate as an indicator/measure: In international comparisons, re-hospitalisation within 30 days after discharge from a psychiatric ward is used as a performance indicator of mental health services. Our results show that this indicator is linked to level of development of the mental health system.

Project Context and Objectives:
Mental health services have undergone significant reforms since the 1950’s with the closure or downsizing of large psychiatric hospitals inherited from the 19th century giving way to smaller psychiatric departments within general hospitals and an array of community mental health services. This process of deinstitutionalisation is one which has been endorsed and promoted by major international organisations, such as the WHO, the OECD, and the Council of Europe.

Despite widespread endorsement and obvious benefits, this process is far from simple. Although the
number of psychiatric beds has decreased in most countries, psychiatric hospitalisations have not diminished and have in fact increased in some places. A substantial proportion of such hospitalisations are re-hospitalisations, and the telling term “revolving door psychiatry” has been coined to describe this phenomenon of frequent hospitalisation which is especially prevalent within psychiatry. This phenomenon often comes with negative consequences constituting significant interruption in patients’ lives. Therefore more clarity is needed both to ameliorate patients’ outcomes, and to provide an evidence base for policy and decision makers to build more adequate services.

Studying and making comparisons of re-hospitalisation rates using routine data began already in the 1960’s, with large differences observed between countries. Typically, re-hospitalisation studies suffer from several shortcomings. Firstly, they often study rather small patient samples using selected diagnostic groups and only rarely cover whole populations and whole health care systems. These studies often assess re-hospitalisation to the same hospital, use different predictors and indicators for re-hospitalisation, do not carry out comparisons across different countries, and seldom use record linkage methodology in population based registries. Additionally, systematic reviews of the literature on psychiatric re-hospitalisation are often inconsistent predominantly due to different study designs as well as differences in the case mix of patient populations studied.

Hence, it is not entirely clear how much the variation in psychiatric re-hospitalisation rates between countries with different health care systems can be explained by methodological artefacts, and how much of it is real. The CEPHOS-LINK project proposed to take on these limitations by combining large scale health register data from six different countries Austria, Finland, Italy, Norway, Romania and Slovenia in relation to the four objectives below.

Objective 1: Making comparisons of psychiatric re-hospitalisation outcomes of adult patients discharged from psychiatric hospital using a registry based observational record linkage study design, as well as identifying specific patient-level and contextual predictors of psychiatric re-hospitalisation the six countries.

Objective 2: Exploring the additional influence of continuity of care on psychiatric re-hospitalisation, using the first psychiatric outpatient contact after the discharge as a measure.

Objective 3: Improving the evaluation of mental health care systems in Europe by developing a methods toolkit for conducting European record linkage studies within the field of mental health.

Objective 4: Producing policy recommendations, guidelines and a decision support tool for decision makers in order to increasing their understanding of factors that influence psychiatric re-hospitalisation.

The CEPHOS-LINK study can be seen to be especially important on many levels, with far reaching impacts. First and foremost it is important considering that psychiatric re-hospitalisations are not conducive with an optimal quality of life in the community, and constitute profound interruptions in a patient’s life. Psychiatric hospitalisations may also in themselves be traumatic, and lead to stigmatization for individuals involved. Therefore, from a patient-centred point of view, reducing psychiatric re-hospitalisation could indeed be a positive thing to do. Re-hospitalisation rates (particularly unplanned ones) are often used as a metric for hospital performance, with high re-hospitalisation rates generally
regarded as an indicator of poor quality of care. High re-hospitalisation rates are also associated with poor cost effectiveness and, finding ways of avoiding re-hospitalisation would save costs which could be diverted into improving community based services.

Project Results:
The lack of clarity around how much variation in psychiatric re-hospitalisation rates can be explained by methodological artefacts, and how much of it is based on ‘real’ factors relating to the patient population or the health care system, spurred the CEPHOS-LINK research project to embark on a series of comparative studies on the subject. Comparisons of psychiatric re-hospitalisation rates and associated predictors were conducted in unselected patient populations from six European countries with differently organised health care systems (Austria, Finland, Italy, Norway, Romania, Slovenia).

Employing a retrospective cohort design allowed for patient-level data in large national electronic administrative health care registers to be explored using a common protocol. While it was clear from the beginning that the number and quality of variables contained in the routine health care databases would be limited, the sheer size of the patient populations which could be included in the study cohorts was encouraging.

The cohort was defined by way of clear inclusion and exclusion criteria. Firstly, the patient population which was followed up over a period of one year was restricted to adults (aged 18+ years) who had been discharged from hospital having spent at least one night in a psychiatric bed. In order to reduce heterogeneity, main diagnoses were restricted to so-called functional mental disorders including among others schizophrenia, affective and personality disorders (ICD-10: F2-F6). Organic and substance abuse disorders were excluded.

The CEPHOS-LINK project explored psychiatric re-hospitalisation in a multifaceted way, leading to an array of outcomes. The main results from the CEPHOS-LINK project are described under six main headings:

1. Ascertaining interoperability of databases, describing the fundamental process of identifying which national electronic health registers were to be used.
2. Results of local studies, pertaining to analyses exploring selected questions thought to be relevant for health care planning and especially in relation to how to reduce methodological noise and in order to make findings from different countries comparable.
3. Pooling of data, describing the processes involved in pooling data from single country study cohorts into a pooled dataset.
4. Simulation modelling, using mathematical modelling techniques in order to allow for forecasts and analysis of psychiatric re-hospitalisation in the future.
5. Focus groups, exploring mental health service users’ own positive and negative experiences of hospitalisation and re-hospitalisation and their suggestions about how one can avoid them.
6. Methods toolkit, built for the purpose of conducting record linkage studies in the mental health care field in and across European countries, and to improve the evaluation of mental health care systems in Europe.

These six areas are discussed in more detail below, and are the focus of the CEPHOS-LINK Final
Ascertaining interoperability of databases:
A challenging and innovative aspect of this project was to ascertain how to include data from large
electronic health care registries from the six very different countries, all with different health care systems
and data collection routines. In contrast to most other studies and systematic reviews of psychiatric re-
hospitalisation, this approach has its disadvantages but also several major advantages.

The main disadvantage of using existing routine data from health care registers is that the type and quality
of the data is determined by what information the health registers contain. Hence, analyses are not
necessarily based on what researchers wish to study, but determined by what variables are available for
study. Moreover, even if potentially relevant or interesting variables are available, the quality or
consistency of that data might make it problematic or non-comparable across countries.

Nevertheless, there are also considerable advantages of this kind of approach. One major advantage is
that very large and unselected patient populations can be studied including tens or even hundreds of
thousands of participants. Additionally it is possible to conduct studies using a common design and
protocol, which can be applied to all countries. This fundamental advantage may counter-balance one of
the main disadvantages of traditional systematic reviews, namely that different designs and methodologies
of the included studies make it difficult to decide to what extent differences between study results are “real"
and which are due to methodological differences. This dilemma was also reflected in the systematic
reviews carried out by the CEPHOS-LINK project. The systematic reviews all focused on specific aspects
deemed relevant in the study of psychiatric re-hospitalisation, and provided a solid base upon which to
develop further.

   for analysing hospital readmission of discharged psychiatric patients: a systematic literature review. BMC
   Psychiatry 16:413, 2016.
   association with environmental and health system characteristics: a systematic review of the literature.
4. Šprah L, Zvezdana Dernovšek M, Wahlbeck K, Haaramo P. Psychiatric readmissions and their
   association with physical comorbidity: A systematic literature review. BMC Psychiatry 17:2, 2017.
   Overview of post-discharge predictors for psychiatric re-hospitalisations. A systematic review of the
   literature. BMC Psychiatry. (in press)

Alongside the systematic reviews, and bearing in mind the opportunities and challenges of using large
health registers in a comparative study, first steps also included ascertaining the interoperability of the
available databases. Relevant national databases and potential variables were identified and described in
each country. For this purpose a set of templates were developed collecting information from each country
specifying relevant databases, the variables encompassed within these databases, detailed coding rules,
Once pre-discharge variables included age, gender, psychiatric diagnosis and length of stay, with special emphasis placed on pre-discharge physical comorbidity. Furthermore, two contextual variables were chosen, level of urbanicity and Gross Domestic Product (GDP). Both contextual variables related to the patients’ Nomenclature of Territorial Units for Statistics (NUTS) 3 region of residence. Finally, post-discharge psychiatric outpatient contacts were chosen in order to address continuity of care.

Furthermore, re-hospitalisations to any hospital, and re-hospitalisations to a hospital with psychiatric beds covering a period of 30 days to a maximum period of 365 days were chosen as outcome measures for carrying out multiple regression analyses.

Results of local studies:
Once the above details were deemed interoperable, a combined total of 225 600 patients from all six countries were included in the final study cohort. National differences existed within this study cohort, for example in terms of differences in size and case mix.

Study cohort sizes differed between countries. In fact the size of the national cohort varied more than 20-fold at times, ranging from 4 536 in Slovenia to 101 834 in Romania. This most certainly influenced inference on significance in the regression analyses.

In addition to the size of the national cohorts, also the case mix in terms of diagnostic compositions varied. Depressive disorder was found to be the most frequent single diagnosis in study cohorts from Austria, Romania and Norway, while schizophrenia most frequent in the study cohorts of Finland, Italy, and Slovenia. This was accounted for by introducing the variable psychotic diagnosis as a predictor for the regression analysis.

Also within country factors were found. For example Italy has a rather large private (but publicly funded) sector in addition to the public system. These two sectors can be seen to treat different diagnostic
spectrums, with depression and personality disorder dominating in the private sector, and schizophrenia dominating in the public sector. It can be suspected that specific provider payment mechanisms play a role here.

The way physical comorbidity was recorded in the health care registers also varied greatly. Additional diagnoses were recorded in Norway in 3.9% of cases and in Slovenia in 5.4% of cases. In contrast to 37.6% in Austria, and 43.1% in Romania. Whether these differences reflect factual information or are results of artefacts and different motivations of hospital staff to document secondary diagnoses cannot be established.

In terms of age differences, the rates of psychiatric hospitalisation of 18+ population per 1 000 varied, with Italy having the lowest rate (1.28‰) and Norway (4.40‰) and Romania (6.24%) the highest.

Re-hospitalisation rates were found to differ substantially between the six countries. Between one-third (Italy, Slovenia) and nearly half of all patients (Norway) were readmitted to a psychiatric inpatient service within a period of 12 months after discharge. These figures are quite high and are also present when considering 30 day re-hospitalisation rates. However, these differences between countries are notoriously difficult to interpret. For instance, even though Italy and Norway are similar in having well-developed community mental health services, their 12 –month re-hospitalisation rates look very different.

When analysing re-hospitalisation rates to any hospital, i.e. also including re-hospitalisation to somatic hospitals in the analyses, the patterns for re-hospitalisation are similar although rates are understandably higher. However, these patterns are also seen to vary between countries. Austria for instance was seen to have a high percentage of patients with physical comorbidity, but also had the largest discrepancy in relation to psychiatric re-hospitalisation (plus 20% at 365 days).

A strange phenomenon was observed in Romania where re-hospitalisation rates climbed in the last few months of the one-year follow-up period. One explanation put forward by local experts was that patients who are in receipt of disability pension must prove that they still are in need of it by way of a period of hospitalisation once per year.

*Insert figure 1 here

**Figure 1: Cumulative percentages of first psychiatric re-hospitalisation up to 365 days for the six CEPHOS-LINK partner country cohorts**

A major proportion of first re-hospitalisations were seen to occur within the first few weeks. When comparing re-hospitalisation rates within 30 and 365 days, it was evident that roughly one-third of the re-hospitalisations occurred within the first 30 days. Therefore the highest risk for re-hospitalisation appears to be in the early days following discharge, and it is here where preventive measures are best placed. A seamless transition from inpatient care to community care could be of particular importance here.

Two patient-level predictors i.e. age and diagnosis, proved particularly relevant, albeit with rather large effects in all countries. It was found that a psychotic diagnosis increases psychiatric re-hospitalisation
rates (when measured at 30 days) in all countries, except for Slovenia. Age on the other hand measured at or above the median was found to decrease re-hospitalisation rates, more so when measured at 365 than for 30 days.

Gender had no specific effect on psychiatric re-hospitalisation rates in any of the countries. Long length of stay had inconsistent effects across all six countries. A small effect was found in three countries (Austria, Italy and Slovenia), while a very strong positive effect was found in Romania in contrast to a negative association in Finland and Norway. If anything, physical comorbidity was found to slightly decrease psychiatric re-hospitalisation rates.

No consistent effect in terms of the contextual predictors of urbanicity and GDP were found on re-hospitalisation rates. Including contextual predictors on the NUTS 3 level according to patients’ residence in multilevel logistic regression analyses did not change the effect of the person-level predictors found in the standard regression analysis without context variables. Some country specific effects of the degree of urbanicity and regional GDP could be observed, although no consistent pattern emerged across all countries. One reason behind the lack of effect may stem from NUTS 3 regions being too large in this context. Unfortunately these variables were not available on a lower geographical level for all countries.

Finally, the continuity of care variable showed mixed effects on re-hospitalisation. The influence of continuity of care (measured as early psychiatric outpatient contact after the index discharge) on psychiatric rehospitalisation rates was studied only in Austria and the Veneto region in Italy. Outpatient data from Finland and Norway were available and entered in national analyses, but were not included in comparative analysis. This was largely due to interoperability problems in defining continuity of care when several hospitalisations occurred immediately after each other.

A ‘correlational’ approach compared the cumulative rates of the first psychiatric outpatient contacts in the first few weeks after the discharge with corresponding cumulative curves of the psychiatric rehospitalisation rate. The main results indicated low re-hospitalisation rates in the Veneto Region of Italy where a large proportion of patients had received psychiatric outpatient contacts soon after discharge. In Austria the opposite is found, with fewer early psychiatric outpatient contacts and substantially higher psychiatric rehospitalisation rates. However, when analysed using a ‘pre-post’ approach with a smaller patient cohort, results showed a clear effect in terms of psychiatric outpatient contacts increasing psychiatric re-hospitalisation rates in Veneto, but showed no effect in Austria.

The interpretation of the findings in the Veneto region is difficult. Firstly, as the severity of individual cases is not captured by the data it is not clear whether this distort the findings. It is for example possible, that the psychiatric outpatient contacts occurred because the patient’s state was deteriorating, leading to re-hospitalisation. Additionally, lack of access to the correct data could be the culprit. For example Austria lacked both access to data for contacts with psychiatrists without a social health insurance contract, and access to data from contacts with tax funded psycho-social services. In contrast all types of psychiatric outpatient contacts were included in the data base in the Veneto. This lack of available data could have an effect the above result in terms of outpatient contact for Austria.

Pooling of data:
After ascertaining the interoperability of national databases and performing local analyses according to a common study protocol in each country, the following stage was to pool data from all countries into one combined, or pooled, dataset. The process of pooling is described in detail in Part 5 of the Final Scientific Report and involved the secure transfer, quality check, integration and analysis of defined datasets from each participating country. This process in itself provided additional value including further quality checks, reproduction of local analysis, establishing the foundation for the simulation models, as well as allowing for the application of more sophisticated statistical analysis on a larger and more diverse dataset.

The pooling process covered sensitive data which necessitated complex preparatory procedures. First and foremost, legal and organisational prerequisites had to be established. This involved obtaining approval from local ethical committees from all countries, authorisation from data owners, the exchange of data protection and non-disclosure agreements in addition to substantial technical preparation in terms of the database infrastructure. All participating countries agreed that patient level information without k-anonymisation can be provided. Data privacy statements and non-disclosure agreements were also collected. Essential security aspects of the data transfer and storage procedures also included secure encryption and data transfer, as well as the secure storage and processing infrastructure. Furthermore, a comprehensive pooling protocol describing the entire process in detail had to be designed, coordinated and executed iteratively. Various data quality checks were performed during loading the delivered datasets into an integrated database. The end result was a pooled data set including 225 600 patients.

Simulation modelling:
An innovative challenge for the CEPHOS-Link project was analysing and modelling future psychiatric re-hospitalisations using only retrospective data in combination with knowledge of future burden of psychiatric and comorbid diseases and demographics. This process involved addressing three questions: a) how would psychiatric hospitalisations and re-hospitalisations change in the future due to demographic change? b) how would the theoretical changes of the care structure in certain NUTS3 regions alter psychiatric re-hospitalisation rates? c) what is the potential impact of rising diabetes prevalence on psychiatric re-hospitalisation rates?

Following a literature review on current methods of investigating psychiatric re-hospitalisations (see above) the pooled dataset data was then prepared for the modelling analyses. It was decided that an agent-based model was the most promising approach taking into consideration model data on patient level, including prognostic data, as well as study results and assumptions for structural changes (e.g. decrease of distance of service in selected NUTS3 regions), and changes in diabetes prevalence. Due to restrictions in the availability of the data only Austria, Slovenia and the Veneto region of Italy were included in the analysis.

A detailed population model was built as the basis of the simulation, the core of the model implemented in Python according to the Generic Population Concept (GEPOC), developed in the DEXHELPP project (supported by an unrestricted grant by FFG, project number 843550). The module for hospitalisations and re-hospitalisations was essential for all simulation runs. The model was parameterised for the population of Austria, Slovenia, and the Veneto region. The modules for the other two questions were implemented as being either used exchangeable or together. Then the parameterisation for the three regions was performed and validated with data of the pooled analysis.
The majority of the parameters for the three regions followed similar distributions, meaning that the countries shared the same characteristics concerning these variables. Results for the patient group are based at an individual level, meaning that we can follow the patients over time. For the macroscopic evaluations, events (relating to the patient) are then aggregated to numbers of index hospitalisations and re-hospitalisations up to the year 2039 in accordance with different patient characteristics. Results indicate an increase in both index- and re-hospitalisation rates for Austria and Veneto, especially for women and patients with psychotic diagnoses. Also, the costs in all three countries is expected to rise (e.g. especially in the Austrian age-group of the 50-59 year old people about 21 percent).

The simulation model’s main benefit is the allowing for calculations of what-if scenarios corresponding to questions on system changes. For example, fluctuating diabetes prevalence has an impact on psychiatric patients’ re-hospitalisations. If the same can be assumed for other comorbidities then it is clear that this is an area which should not be neglected. The model also provides a strong basis for the development of further modules allowing for more detailed results and particularly well suited for implementing sophisticated patient pathways, for example by including ambulatory treatment or multiple re-hospitalisations. The model is also particularly suitable to assess the impact of different kinds of interventions and due to the modular approach, can be easily extended to calculate further scenarios. The results can help decision makers to plan and optimise interventions for improving the treatment for psychiatric patients under certain conditions.

Focus groups:
In this qualitative focus group study, mental health service users’ own positive and negative experiences of hospitalisation and re-hospitalisation and their suggestions about how one can avoid re-hospitalisations were explored. Data based on eight focus groups from all six countries (Romania, Slovenia, Finland, Italy, Austria and Norway) included a total of 55 service users. Many of the participants had been in and out of mental health hospitals for several years, with half of them having been hospitalised during the last twelve months.

Overall, the participants in the focus group interviews expressed strongly negative experiences related to their experiences of psychiatric hospitalisation. Many described highly dramatic and traumatic experiences, particularly in connection to their first admission and in connection with involuntary admissions. Hospitalisation was described as something terrible and intolerable, as a shock and a trauma.

“For me, it was terribly traumatic, a really horrible experience, the worst I have ever been through in my life. Really terrible.”

These feelings were induced by both the mental illness, but also related to the process of hospitalisation. Some participants described their first hospitalisation in positive terms, although to a much lesser extent.

“It was very hard to be hospitalized... despite the fact that I felt good because I was hospitalized... I was feeling good... (...) I was making scenes [and] it was very hard, but it brought results.”

Feelings of relief after being hospitalised were also described by participants, particularly in terms of
accessing an ordered structure, which some described as a “lifeline” or “rebirth”, something that released their responsibility.

Many considered re-hospitalisation to be difficult and upsetting in many ways, although subsequent hospitalisations were experienced by many as less frightening. This was mainly because they had been through the situation before, and thus felt more in control of the situation in terms of knowing what to expect and more aware and capable of developing coping strategies for themselves. Re-hospitalisation was discussed in the same dramatic terms as when they described their first hospitalisation. Re-hospitalisation was often considered a relief and a means to obtain the necessary help.

“The second time, I simply already knew what would happen, and that was okay then.”

A common view among the interviewees across countries is that one must accept the need for re-hospitalisation, even though it may be associated with both good and bad experiences. The interviewees perceived their illness as a chronic condition and that they would sometimes need to be re-hospitalised to ease the crisis. However, some participants described their re-hospitalisation as something happening “by default” and without any healing effect.

Most of the participants were receiving outpatient treatment, and saw their psychiatrist or psychologist for treating symptoms and controlling medication.
Several participants referred to problems such as not seeing their psychiatrist often enough, or the discussed the need for a type of service to monitor their mental state. There was a feeling that someone or something more is needed—someone who could identify changes and care for the patient when he/she cannot do so. The actions which participants considered helpful for preventing re-hospitalisation varied between participants and over time. The most important was the availability of different kinds of meeting places, day centres or activity centres with various activities, workshops and seminars.

The results indicate the importance of increased focus on the first hospitalisation (in addition to the problem of re-hospitalisation), as well as recognising the significance of the admission being voluntary. The results also indicate that for avoiding re-hospitalisation, follow-up is needed to safeguard the patient’s social and activity needs. Ideally, this should be facilitated as a close collaboration between the hospital, municipality/primary care and mental health service user.

Methods toolkit:
The primary feature of the CEPHOS-LINK project was to use a retrospective cohort study design, using routine data available in large electronic national databases. A substantial amount of time and resources had to be invested into ascertaining interoperability between the databases. A set of twelve toolkits were developed as models for similar projects and to support capacity building in comparative effectiveness research using large electronic national databases. These toolkits are part of the Final Scientific Report and are intended to improve the evaluation of mental health care systems in Europe.

Tool 1 - Questionnaire on Administrative Databases
Tool 2 - Questionnaire on Master LEEARs
Tool 3 - Questionnaire on additional information for the continuity of care study
Conclusions:
The CEPHOS-LINK project has carried out pioneering work rendering large national electronic health care databases interoperable and thus comparable across countries. This complex process is essential for effectively comparing patterns and pathways of health service utilisation in different countries.

By ensuring interoperability, methodological noise can be reduced and differences can be attributed to real differences and not as a result of methodological discrepancies, so called “artefacts”. The CEPHOS-LINK project has demonstrated in the context of psychiatric rehospitalisation that reducing methodological noise is possible. Not only can the main findings stemming from the CEPHOS-LINK project be considered reliably comparable, the CEPHOS-LINK project has also produced tools which can be used for increasing interoperability of national databases in other projects, harmonising terminology and concepts on a European level ultimately facilitating future cross-country health care studies with common protocols and pooled data sets.

As well as findings relating to methodology of health register research, CEPHOS-LINK has uncovered important findings pertaining to psychiatric re-hospitalisation. Results from the pooled analysis indicate that between one third and half of all adult psychiatric patients return to hospital within one year, and that a large proportion of these re-hospitalisations occur during the first few weeks following discharge. This gives a good basis upon which to build preventive actions. Services should focus on these first few weeks after discharge if re-hospitalisation is to be reduced.

The CEPHOS-LINK project has also demonstrated the importance of including qualitative approaches in research. The CEPHOS-LINK focus groups study included people with lived experience of psychiatric rehospitalisation allowing for a more person centred approach. Both the quantitative and qualitative findings have made valuable contributions to policy recommendations around reducing the negative effects of psychiatric re-hospitalisation.

Potential Impact:
CEPHOS-LINK has developed knowledge on psychiatric re-hospitalisation, which will support policy making and health care system development in relation to psychiatric care, and also deciphered how comparative health register based studies can be performed using a single protocol.

Impact of methodological advances:
CEPHOS-LINK used a multi-method scientific approach, resulting in a variety of components including a
methodological toolkit for conducting record linkage studies in the mental health care field in and across European countries.

This toolkit provides guidance in relation to handling and analysing large administrative databases and performing data linkage between databases in the sense of comparative effectiveness research. The methods toolkit will impact future research allowing for analyse the effects of mental health policy actions on psychiatric rehospitalisation, and in a wider respect, rehospitalisation in general.

Impact on policy making:
Results from CEPHOS-LINK has been translated into both scientific and policy applications. Policy making and health care service planning has benefitted from CEPHOS-LINK results in the form of 8 policy briefs relating to psychiatric re-hospitalisation. These policy documents are based on evidence from all aspects of the project including the main study, the qualitative focus group study, as well as on the systematic literature reviews produced by the project.

CEPHOS-LINK Policy Briefs:
International Policy Brief: summarises the international findings of the CEPHOS-LINK project, drawing special attention to factors influencing international comparability and results.

The Service User Policy Brief: draws upon the qualitative focus group study and highlights how research can use expertise from lived experience in a meaningful way. The CEPHOS-LINK project had a strong technical emphasis and the service user policy brief is a way of translating this into real experiences allowing policy makers to consider psychiatric re-hospitalisation from a more person centred perspective.

The Austrian Policy Brief: details results on psychiatric re-hospitalisation distinctly from the Austrian perspective and health care system context.

The Finnish Policy Brief: details results on psychiatric re-hospitalisation distinctly from the Finnish perspective and health care system context.

The Italian Policy Brief: details results on psychiatric re-hospitalisation distinctly from the Italian perspective and health care system context.

The Norwegian Policy Brief: details results on psychiatric re-hospitalisation distinctly from the Norwegian perspective and health care system context.

The Romanian Policy Brief: details results on psychiatric re-hospitalisation distinctly from the Romanian perspective and health care system context.

The Slovenian Policy Brief: details results on psychiatric re-hospitalisation distinctly from the Slovenian perspective and health care system context.

Dissemination activities and exploitation of results:
The CEPHOS-LINK consortium has actively disseminated results through numerous channels. Updates
from the project have been easily accessible through the dedicated project website, and through regular newsletter sent to approximately 250 recipients consisting of notable scientific and policy stakeholders as well as the major international organisations such as the World Health Organisation and mental health organisations and NGOs.

Results have been presented in a total of 47 presentations at different events including the ENMESH and EUPHA Conferences with access to large international audiences. National dissemination events including Vienna University of Technology Austria, HYKS Psychiatry Centre Helsinki, and Ljubljana Faculty of Arts had a stronger focus on dissemination national results to national stakeholders such as representatives of hospital districts, technical stakeholders and clinicians.

CEPHOS-LINK published four systematic reviews in BMC Psychiatry, which is an open access peer reviewed Journal with an impact factor of 2.576. The fifth systematic review has been accepted for publication in March 2017. The CEPHOS-LINK Consortium have planned several further national and international publications to be written post project.

The final CEPHOS-LINK conference took place at THL headquarters in Helsinki on 23.3.2017 (CEPHOS-LINK conference photo). There was considerable interest in the seminar particularly from national participants and had an audience of 65 persons.

List of Websites:
The project website it housed within the THL website infrastructure to ensure longevity and quality even after the CEPHOS-LINK project has ended. www.cephos-link.org

CONTACT DETAILS:
Kristian Wahlbeck
Project Leader
tel: +358 40 065 9101
Email: firstname.lastname@thl.fi

Last update: 13 September 2017
Record number: 203131