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Public mental health research in Europe: a systematic mapping for the ROAMER project

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Background: As part of the ROAMER (ROAdmap for MEntal health Research in Europe) project, aiming to create an integrated European roadmap for mental health research, we set out to map the hitherto unmapped territory of public mental health research in Europe. **Methods:** Five electronic databases (CINAHL, Health Management, Medline, PsycINFO, Social Services Abstracts) were used for identifying public mental health research articles published between January 2007 and April 2012. The number of publications for each European country in five research domains (i.e. mental health epidemiology, mental health promotion, mental disorder prevention, mental health policy and mental health services) was analysed by population size and gross domestic product (GDP), and mean impact factors were compared. **Results:** In all, 8143 unique publications were identified. Epidemiology research dominates public mental health research, while promotion, prevention and policy research are scarce. Mental health promotion is the fastest growing research area. Research targeting older adults is under-represented. Publications per capita were highest in northwestern Europe, and similar trends were found also when adjusting the number of publications by GDP per capita. The most widely cited research origins from Italy, Switzerland, the UK, the Nordic countries, the Netherlands, Greece and France. **Conclusion:** In Europe, public mental health research is currently a matter of the affluent northern and western European countries, and major efforts will be needed to promote public mental health research in south and east Europe. In spite of a smaller public mental health research output, some Mediterranean countries produce highly cited public mental health research.

Introduction

Public health challenges in Europe are changing. Physical health is improving and life expectancy of Europeans continues to increase. Thus, the burden of disease increasingly originates from mental and behavioural disorders.¹ In Europe, it is estimated that 38% of the population suffers from some kind of mental disorder every year.² Mental disorders cause not only great suffering at the individual level but are also connected to societal factors such as social inequalities,³ discrimination⁴ and decreased productivity.^{2,5} The total cost of mental health problems, including both direct and indirect costs, was estimated to be more than € 400 billion in Europe in 2010.⁶

Public mental health aims at promoting mental health and preventing ill-health at a population level through policies and large-scale interventions. There is evidence that interventions to promote positive mental health and prevent mental health disorders are effective.^{7–10} Taking steps to improve mental health of the population is important, as it contributes to the nation's well-being and social, humane and economic capital.^{11,12} Public mental health actions need to be underpinned by valid research on the distribution of mental health and the magnitude of mental disorders in the population, as well as research on effective interventions to promote mental health, prevent mental health problems and improve mental health service provision. Further, public mental health research policy needs to be based on and adapted to the current state of research and the research needs in the field.

We set out to map the field of public mental health research in Europe, based on the methods of the SPHERE (Strengthening Public

Health Research in Europe) project, which reviewed the public health research conducted in Europe during a 10-year period. The definition of public health research established for that project¹³ emphasizes research on how population health is influenced by determinants and the identification of effective interventions for improving population health and reducing health inequalities. Public health research encompasses research undertaken at population or health service levels, as compared with biomedical and clinical research that is conducted at laboratory and patient levels.^{14,15}

The ROAdmap for MEntal health Research in Europe (ROAMER) project (2011–14)¹⁶ was designed to develop a comprehensive, consensus-based roadmap to promote and integrate mental health and well-being research in Europe, covering various areas and disciplines in the field. The final roadmap will provide a coordinated research action plan outlining the research needed to establish an evidence base for national mental health policies and a European Union (EU) mental health strategy. To establish the current state of the art, systematic mappings of European public mental health research were performed within ROAMER. Further, the current state of the art was examined by researcher and stakeholder surveys and by organizing workshops in which experts in the field from all over Europe participated to discuss research gaps and advances needed.

Within the ROAMER project, public mental health research is not understood as merely mental disorder research, but encompassing a broad spectrum of research areas, i.e. mental health and disorder epidemiology research, mental health promotion research, mental

disorder prevention research, mental health policy research and mental health services research.

The aim of this article is to present an overview of the current state of public mental health research in Europe.

Methods

Systematic mapping technique¹⁷ was used to review the current state of European public mental health research. Systematic mapping aims at a broad overview of any research field to provide knowledge of the current situation, as well as guidelines and suggestions for future actions and development,¹⁷ hence appropriate for the aims of the ROAMER project.

Used databases and search strategies

The five bibliographic databases used for identifying studies were CINAHL, Health Management, Medline, PsycINFO and Social Services Abstracts. These databases were regarded as most suitable for mapping the public mental health research area, with many scientific disciplines being covered.

The search strategies included general terms for mental health, well-being and mental ill-health; public health research; and geographical search terms for Europe (Supplementary Appendix 1). The search terms were of a general nature to capture a broad area of public mental health research.

Inclusion criteria

The databases were searched for the period January 2007–April 2012, according to recommendations for bibliometric searches in the public health field.¹⁴ The studies included primarily targeted mental health or mental disorders, not physical health.

Procedure of data collection and analyses

The references retrieved from the literature searches were all processed in software specifically designed for this study to automatically categorize and code the references based on the information generated from the bibliographic databases. The following information was retrieved from each publication: corresponding author and affiliation; country and city of the corresponding author; year and journal of publication; publication title and keywords; public mental health research domain (i.e. mental health epidemiology research, mental health promotion research, mental disorder prevention research, mental health policy research and mental health services research); country of study sample; age group (children and adolescents; adults; older adults; more than one defined age group; and unspecified); gender of study sample and mental health measurements.

Information on the research affiliations and their geographical locations were retrieved from the corresponding author field of the databases, while information on research target group was systematically extracted from the keywords or the abstracts of the publications. The software extracted data from the identified publications and categorized them according to the five research domains based on the keywords and the abstracts of the publications. Ten percent of the retrieved data was also manually checked by the authors to measure the accuracy of the automatic coding and to make any software adjustments needed. Additionally, to test the reliability of the software, a random sample of 100 references were coded by a blinded researcher ($k=0.60$, 95% confidence interval = 0.41–0.79).

Impact factors were gathered for 54% of the publications where the corresponding author had a European affiliation. These were used to calculate a mean impact factor score for each European country. To ensure representativity of the impact factor scores, only countries with impact factor data available from at least 10 publications were included in the analyses. The number of

publications for each country was adjusted by population size and gross domestic product (GDP) for the year 2011.¹⁸

Results from the systematic mapping of public mental health research

The searches in the five literature databases provided 10 016 records (Supplementary Appendix 2). After exclusion of duplicates, the number of identified records was reduced to 8143. Most of these could be categorized into one of the five research domains of interest ($n=7643$). The 500 references that the software could not process into any of the five areas were manually assigned to the research areas.

The distribution of research by public health research area

Among the research domains, epidemiology largely dominated (5527 records), followed by mental health services research (1439 records). A total of 443 records dealt with mental disorder prevention, while 134 and 130 records were defined as mental health promotion and mental health policy research, respectively. Both promotion and prevention areas were assigned 156 references, while the combination of mental health services and policy research areas contained 314 references.

Despite the limited number of studies, the share of mental health promotion research increased by 53% and the combination promotion/prevention research by 65% from 2007 to 2011 (figure 1). Epidemiology research increased by only 2% during the same period.

Targeted age groups

A majority of the conducted research focused on children and adolescents (~25%), while publications targeting older people were under-represented (7%). Nearly half of the screened records could not be categorized into one of the specific age group categories, but targeted a general population with various age groups represented (labelled as 'unspecified' in figure 2). This might also explain the small amount of studies that could be categorized as specifically targeting adults in our material, as working-age adults often are in majority in studies targeting unspecified age groups.

Looking at the targeted age groups within the five public mental health research areas (figure 2), it was found that children and adolescents were in focus to a large extent within mental health promotion and mental disorder prevention research, reflecting the general suitability of children and young people for early promotion and prevention measures.

The distribution of public mental health research by European countries

Of 8143 records that were retrieved, 3752 records could be assigned to a specific European country, based on the affiliation of the corresponding author. When looking at study sample origin (i.e. country of origin of data material), 4722 records could be allocated to one or several European countries. The number of publications where both author and sample could be coded as European was 2161. In total, 6313 (78%) of the retrieved publications could be assigned to specific European countries.

Non-epidemiological public mental health research was rather strongly concentrated to Ireland, the UK, Iceland and Austria, while the share of epidemiological research exceeded the European average (68%) in all other countries. Of the 25 most productive research centres, 10 are based in the UK (table 1). The remaining 15 centres, except University of Athens, are found in northwestern Europe.

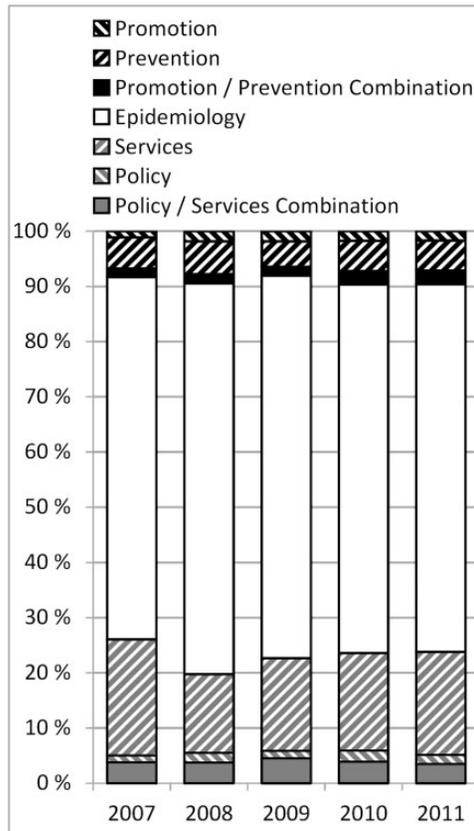


Figure 1 The distribution of European publications by public mental health research domain (2007–11)

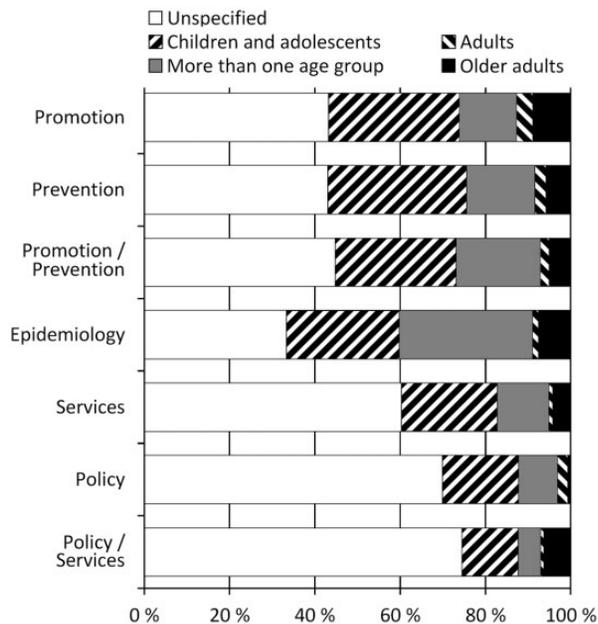


Figure 2 Age groups targeted in European research by public mental health research domain (2007–12)

The number of publications from each European country, based on corresponding author affiliations, was weighted by the population size of each considered country to obtain the number of authored publications by million population for each country for the 5-year period. It was found that the five Nordic countries and Ireland ranked high compared with other European countries with regard to the number of research publications per capita. The UK,

Table 1 The 25 most productive research centres within the area of public mental health research in Europe 2007–12 (based on 3752 records with identified European affiliations)

Institution	Number of publications
King's College, UK	115
Karolinska Institutet, Sweden	72
University of Manchester, UK	65
Erasmus University, the Netherlands	42
University of Oslo, Norway	42
University College London, UK	37
University of Nottingham, UK	35
Maastricht University, the Netherlands	33
Institut National de la Santé et de la Recherche Médicale (INSERM), France	32
University of Leipzig, Germany	30
University Medical Hamburg-Eppendorf, Germany	30
Lund University, Sweden	29
University of Athens, Greece	27
Uppsala University, Sweden	26
Ghent University, Belgium	24
University of Cambridge, UK	24
University of Aarhus, Denmark	24
Cardiff University, UK	22
University of Bergen, Norway	21
University of Freiburg, Germany	21
University of Groningen, the Netherlands	21
University of Leicester, UK	21
University of Bristol, UK	20
University of Oxford, UK	19
University of Birmingham, UK	18

the Netherlands and Switzerland were also high on the list. When adjusting number of publications by GDP, similar results were found, although with an addition of two southeastern European countries (figure 3); among the highest ranking countries were the five Nordic countries along with Ireland, the UK, Croatia, Montenegro and the Netherlands.

Journal impact factors were used to determine the spread and possible impact of the existing research. The overall mean impact factor for all publications was 2.3. Papers from Italy ($n=82$; 84% epidemiology) and Switzerland ($n=45$; 87% epidemiology) had the highest mean impact factors in our data set, followed by papers from the UK ($n=642$; 57% epidemiology, 31% services) and Finland ($n=90$; 86% epidemiology). The Netherlands, the Scandinavian countries, Greece and France were other high-ranking countries. The mean impact factor of papers from the top 10 countries had a range of 3.3–2.4.

Discussion

The main results from the systematic mapping suggest that epidemiology dominates public mental health research, while promotion and prevention research are scarce but growing. Based on the distribution of records according to research domain, it is evident that European public mental health research focuses on occurrence and distribution of mental disorders. Such research is often based on the medical paradigm. In comparison, few records were found in the field of mental health promotion, which often is set in a positive mental health framework.

Our results also indicate an under-representation of older people in current public mental health research. Although older adults represent 17% of the European population, they were the target group in <10% of the records. Previous research has found a similar under-representation of older people in other research areas, such as Parkinson's disease,¹⁹ cardiovascular diseases²⁰ or drug trials.²¹ Comorbidities, frailty, advanced age and ethical concerns have previously been mentioned as possible explanations for this under-representation, which may lead to health inequalities

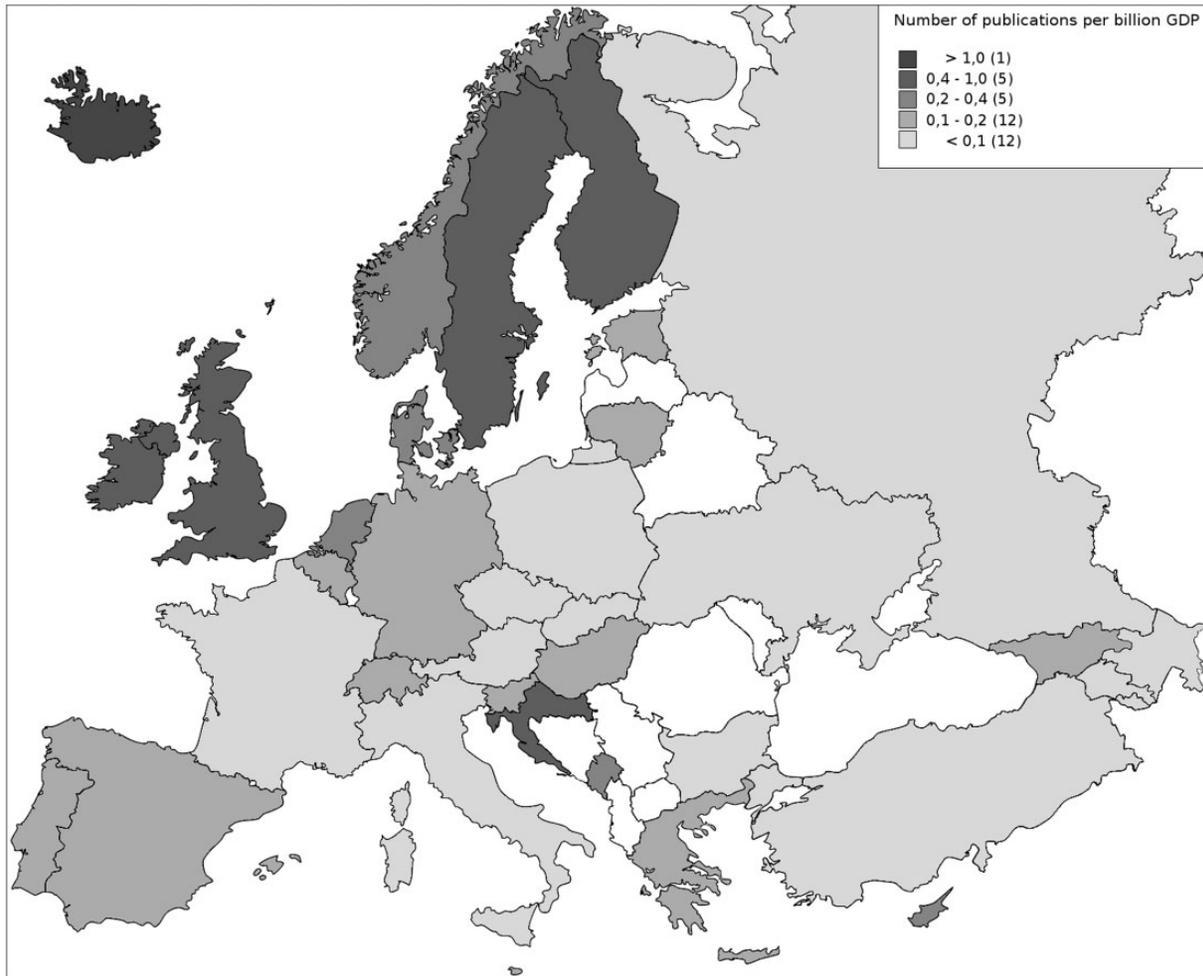


Figure 3 Distribution of public mental health publications by European country, weighted by GDP (2007–12)

due to lack of evidence for developing services.^{22,23} Under-representation of older people in public mental health research needs attention, as the share of older people in Europe is projected to increase.²⁴ Further, this increase is largest in southeastern Europe, where public mental health research overall is scarce.

Based on the analyses, public mental health research is currently a matter primarily of the affluent northwestern Europe, although the high prevalence of mental disorders across Europe² indicates a need to prioritize mental health research also in the other European regions. Therefore, major efforts will be needed to support and promote growth of public mental health research and the implementation of evidence-based public health interventions in south and east Europe. A similar trend was found when weighing by GDP, although two countries from eastern Europe (Croatia and Montenegro) were added to the list of the 10 most productive countries. This finding might mirror the significant investments in mental health infrastructures that have taken place since 2005, such as the recently established national institute for mental health in Croatia.²⁵ However, it should be noted that the papers from Croatia and Montenegro almost exclusively were classified as epidemiological research. This indicates that, although much research is produced considering the level of resources available, there is a need to broaden the scope of public mental health research in south and east Europe.

The findings also corroborate earlier reports on the scarcity of public mental health research in the German-speaking countries.²⁶ The findings are further in line with other bibliometric studies of biomedical²⁷ and public health research^{13,15} in Europe, which show that the Nordic countries are most productive, while new EU Member States generally have the smallest publication rates. An

explanation for the geographically skewed distribution could be the well-developed premises for public health research in the Nordic countries, such as the investment in welfare policies and public services²⁸ as well as the unique opportunities of using national registers in epidemiological research.²⁹

It has also been argued that this geographical pattern is not as evident when looking at specific public health research domains.¹⁵ For example, the findings from the SPHERE project pointed out that environmental health and infectious disease research are more frequently published in eastern Europe, while social science research is more frequently conducted in northern and western European countries.^{13,15} SPHERE focused on six fields of public health research, such as health services³⁰ and health promotion research.³¹ Further, since public health research often is context-specific, relevant research is commonly communicated to local public health stakeholders in non-English languages, causing a restricted international circulation of the evidence.³² However, no significant differences could be found regarding the geographical distribution when comparing the five public mental health research domains under study in this project. Instead, the dominance of research originated from northwestern Europe was apparent in all five research domains.

Strengths and limitations of the systematic mapping

For the systematic mapping, general and broad search terms were applied to capture a wide range of studies conducted in the field. A limitation related to this wide approach is that some specialized niches of research, for example, childhood mental health

promotion, might be under-represented in the search results. Instead, in that area of research, more specific, outcome-related search terms could be used, such as ‘mental or social development’, ‘attachment’ or ‘self-harming’, which are examples of key mental health outcomes in the early years and parenting interventions.³³ In addition, although no language limitations were applied in the literature searches, the possible exclusion of journals that are published in non-English languages from the databases used in this study should be considered.

Considering the interdisciplinary field of public mental health research, it is also important to acknowledge that traditions regarding the dissemination of research findings may vary across countries and disciplines. To map the current situation of public mental health research in Europe, the retrieved data was adjusted by population size and GDP of the countries, as well as by journal impact factors. However, conclusions regarding the quality aspects of the research under study should be interpreted with caution.

A possible limitation of our study is the use of automated extraction of data from the publications. Although the reliability of the software was adequate, we did find some discrepancies. For example, some errors were found regarding geographical distribution of published articles due to the geographical names being similar in several contexts (e.g. Georgia being both a US state and a European country). Other minor errors detected by the manual coding were missing information or incorrect allocation to one of the research domains, although these errors were found in only 7% of the screened references. A major strength of the automated extraction approach is that it enabled an objective extraction (i.e. not biased by researcher judgments) of information from the comprehensive data set.

The next steps

The systematic mapping has highlighted the European efforts in public mental health research so far. The next step is to develop recommendations on research priorities based on the gaps and advances identified in the systematic mapping. The European efforts should be viewed also in light of the Grand Challenges in Global Mental Health Initiative, which by a Delphi method approach—and by involving a large panel of mental health research experts—identified global mental health research priorities in the next 10 years.³⁴ This study lists five top mental health challenges, ranked by disease-burden reduction, impact on equity, immediacy of impact and feasibility. However, although these top-ranked global challenges support mental health services research capacity, the focus is not on the development of evidence-based initiatives to promote mental health and to prevent mental health problems, which is a corner stone of public mental health research. The public health research arena is also disregarded in the consensus document published by the European Brain Council in 2011 on European research in neuroscience.³⁵ Consequently, there is a need for increasing awareness of the need and extent of public mental health research, not only in the European context but also globally.

According to our results, research investments are especially needed in eastern and southern Europe to alleviate a geographically skewed distribution in the volume of European public mental health research. In addition, ageing research and research in the promotion, prevention and policy domains should be prioritized to balance the dominance of epidemiology and to gain evidence-based knowledge that supports the development of effective and feasible policies, strategies and actions to promote mental health and prevent mental health problems across settings and age groups. Key strategies to successful coordination and integration of public mental health research will be provided in the forthcoming European Roadmap of Mental Health Research.

Supplementary data

Supplementary data are available at *EURPUB* online.

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Conflict of interest: None declared.

Key points

- Epidemiology dominates public mental health research in Europe, while promotion, prevention and policy research are scarce but growing.
- Older people are under-represented in public mental health research in Europe.
- There are significant geographical disparities in public mental health research in Europe, with most research publications originating from northwestern Europe. Most strong research centres in the field are located in the UK and much of research on mental health promotion originates from the UK.
- Major efforts are warranted to support public mental health research in the underdeveloped research domains and less-affluent geographical contexts.

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