

Mental Health Research Priorities for Europe

Til Wykes^{1,2}, Josep Maria Haro^{3,4,5}, Stefano R Belli², Carla Obradors-Tarragó^{3,4}, Celso Arango^{3,6}, José Luis Ayuso-Mateos^{3,7}, István Bitter⁸, Matthias Brunn^{9,10}, Karine Chevreul^{9,10,11}, Jacques Demotes-Mainard^{11,12}, Iman Elfeddali^{13,14}, Sara Evans-Lacko², Andrea Fiorillo¹⁵, Anna K Forsman^{16,17}, Jean-Baptiste Hazo^{9,10}, Rebecca Kuepper¹⁸, Susanne Knappe¹⁹, Marion Leboyer^{9,11}, Shôn W Lewis²⁰, Donald Linszen¹⁸, Mario Luciano¹⁵, Mario Maj¹⁵, David McDaid²¹, Marta Miret^{3,7}, Szilvia Papp⁸, A-La Park²¹, Gunter Schumann², Graham Thornicroft², Christina van der Feltz-Cornelis^{13,22}, Jim van Os¹⁸, Kristian Wahlbeck^{16,17,23}, Tom Walker-Tilley², & Hans-Ulrich Wittchen¹⁹ on behalf of the ROAMER consortium

¹ Corresponding Author: til.wykes@kcl.ac.uk +44(0)207 848 0596

Correspondence address: Psychology Department, Institute of Psychiatry, Psychology & Neuroscience, Denmark Hill, London, SE5 8AF, UK

² Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, UK

³ Centro de Investigación Biomédica en Red de Salud Mental, CIBERSAM, Madrid, Spain

⁴ Research and Development Unit, Parc Sanitari Sant Joan de Déu, Fundació Sant Joan de Déu, Sant Boi de Llobregat, Barcelona, Spain

⁵ Universitat de Barcelona, Barcelona, Spain

⁶ Hospital General Universitario Gregorio Marañón, Instituto de Investigación Sanitaria Gregorio Marañón, Facultad de Medicina, Universidad Complutense, Madrid, Spain

⁷ Department of Psychiatry, Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IP), Universidad Autónoma de Madrid, Spain

⁸ Department of Psychiatry and Psychotherapy, Semmelweis University, Budapest, Hungary

⁹ Fondation FondaMental, Créteil, France

¹⁰ URC Eco Ile-de-France (AP-HP), Paris, France

¹¹ Institut National de la Santé et de la Recherche Médicale (INSERM U955), and Department of Psychiatry, Henri Mondor Hospital, University Paris-Est-Créteil, Creteil, France

¹² ECRIN Coordination Office, Paris, France

¹³ Tilburg University, Tranzo Department, Tilburg, The Netherlands

¹⁴ Department of Health Promotion/School of Public Health and Primary Care, Maastricht University, Maastricht, The Netherlands

¹⁵ Department of Psychiatry, University of Naples SUN, Naples, Italy

¹⁶ The Nordic School of Public Health (NHV), Gothenburg, Sweden

¹⁷ National Institute for Health and Welfare (THL), Vaasa, Finland

¹⁸ Department of Psychiatry and Psychology, South Limburg Mental Health Research and Teaching Network, Euron, Maastricht University Medical Centre, Maastricht, The Netherlands

¹⁹ Institute of Clinical Psychology and Psychotherapy and Center for Epidemiology and Longitudinal Studies, Technische Universität Dresden, Dresden, Germany

²⁰ University of Manchester; Manchester Academic Health Science Centre, Manchester, UK

²¹ PSSRU, LSE Health and Social Care, London School of Economics and Political Science, London, UK

²² GGz Breburg, Tilburg, The Netherlands

²³ Finnish Association for Mental Health, Helsinki, Finland

Summary

Mental and brain disorders represent the greatest health burdens to Europe - not only for directly affected individuals, but also for caregivers and wider society. They incur substantial economic costs through direct (and indirect) healthcare and welfare spending, and via productivity losses - all of which significantly affect European development. Funding for research to mitigate these effects lags far behind the cost to society.

We describe a comprehensive, coordinated mental health research agenda for Europe and the world. This was based on systematic literature reviews and consensus decision-making by multidisciplinary scientific experts and affected stakeholders (more than 1000 in total): individuals with mental health problems and their families, healthcare workers, policymakers and funders. We generated 6 priorities that will, over the next 5-10 years, help to close the most significant gaps in mental health research in Europe, and in turn overcome the substantial challenges we face as a result of mental disorders.

Mental Health Costs and Burdens

There is a strong need for parity in service provision and research between mental and physical disorders. Mental and brain disorders represent the single largest contributor to disease burden in Europe¹. More than one in three Europeans experience mental health problems in any given year¹ and even more will be affected indirectly – including family members, health systems and wider society. The increasing age of the European population means that the long term mental health burden is greater now than it has ever been². The most recent estimate of yearly costs for mental disorders in Europe is €461 billion, as of 2010³ – excluding any costs of dementia and other neurological disorders. Beyond direct costs to health services, this figure is largely due to indirect costs to social welfare, employment, well-being and economic output. These costs are not decreasing. For instance, disability benefits in the UK and Germany have been relatively stable but the proportion accounted for by mental health disorders continues to rise^{4,5}.

A shorter life: People with a mental health problem experience earlier death⁶ by as much as 20 years⁷. This may be due to increased risk for physical health problems such as cardiovascular disease⁸ or because individuals with mental health problems do not seek early treatment for either their mental or physical health⁹. To go with evidence of early mortality is the shocking statistic that in Europe an estimated 1.5 million people attempt suicide each year, and 100,000 complete it¹⁰. In England and Wales it is the top cause of death for women and men aged 20-34, as well as for men aged 35-49¹¹, and is a leading cause of death among 19-30 year-old men in Europe and worldwide¹².

Beginning early: We know that most mental health problems are chronic and begin early in life (50% before the age of 15 and 75% before the age of 18¹³) and this is fuelling calls for interventions in childhood to avert the development of long term problems. However, we do not know which interventions would be best or which children are most at risk of developing long-term problems.

Mental health problems increase other health costs: We are now also beginning to realise that the costs of care dramatically increase if individuals with physical disorders have a comorbid mental health problem so cost estimates are conservative because they do not take into account this comorbidity. For people with rheumatoid arthritis, the costs of care nearly double if they suffer from depression¹⁴ and for asthma the increase is 140%¹². People with depression also face a higher risk of developing heart disease, and following a heart attack each additional depressive symptom that develops increases the risk of another heart attack by 15%¹⁵. Individuals with diabetes who develop a foot ulcer and also suffer from depression have a high early mortality rate (30% within 18 months), three times higher than in those without depression¹⁶. Treating mental health problems therefore has potential advantages to individuals and to health services by reducing costs, morbidity and mortality associated with a wide range of physical disorders, in addition to reducing the direct costs of mental disorders.

As well as increased rates of mental disorder being associated with higher costs, there is also evidence that research into mental health has demonstrable positive effects. For example, the RAND Mental Health Retrosight project demonstrates that over 20 years basic and clinical research developments related to schizophrenia (e.g. locating GABA-A receptors in the brain; early intervention research; trials of supported employment) have a beneficial impact on patient care as well as yielding positive wider social and economic effects¹⁷.

Investing in Mental Health Research

A good return on investment: Funding mental health research generates good return on investment. For every pound spent on UK mental health research there is an estimated recurring £0.37 return per year, which is similar to the return for cardiovascular disorder research¹⁸ and cancer¹⁹. Giant steps have been made in research into the mechanisms and treatments needed to alleviate and understand cancer and cardiovascular disease and we have seen some dramatic changes subsequently to health services and lifestyle advice offered for these disorders. These changes produced the 20% decrease in mortality for cancer seen over the 20-year period ending in 2013²⁰. For mental health a boost in research investment could have similar large effects within a relatively short time, not only reducing the burdens on individuals and families but also reducing the costs of care and support in the longer term.

Uneven research funding distribution: Public funding for mental health research in Europe is much lower than the population impact. In England, mental disorders cost between £70²¹ and £105 billion per year^{22,23}, but only £115 million – which could be as low as a thousandth of the yearly cost of mental disorders – is invested in UK mental health research²⁴. For comparison, cancer research received over 4.5 times as much funding as mental health in 2011 (£521 million)²⁵, despite cancer accounting for only 15.9% of the UK's total disease burden, compared to 22.8% for mental disorders²⁶.

In France, mental disorders cost €108 billion per year, but only €25 million is allocated to psychiatry research²³. Mental health research funding available at the European level is also disproportionately low compared to the impact of mental disorders on population health. Mental disorders account for between 11²⁷ and 27%¹ of the disability burden in Europe^{28,29}, but receive less than 5% of the overall FP7 health research budget^{30,31}. For national funding the figures are no more encouraging: the percentage of mental health compared to overall health research funding are 2% in France and 7% in the UK³².

While physical health research can attract substantial third-sector funding, this is not the case for mental health. A recent analysis found that for every £1 that the UK government spent on funding research in circulatory problems, cancer and mental health, the research funding from charities was: £1.25, £2.75 and £0.0003²⁴ respectively. We suspect that this pattern is the same across Europe. With such low charitable investment, it will take years of campaign building to redress the gap in funding. In the meantime, substantial increases in government spending would help to bring funding for mental health research in line with the costs of mental health problems to society.

Preventative research could be especially useful in offsetting the costs of mental disorders³³, but this currently receives especially low levels of funding. For example only £4.5 million is spent on preventative mental health research in the UK, or 0.17-0.28% of the total UK yearly spend on health research^{24,34}.

Poised for action

Europe is now well-placed to respond to the challenges it faces as a result of mental health problems.

Scientific advantage: Recently, we have seen ground-breaking advances in biological and brain sciences (biomarkers from ‘-omics’ research, developments in brain mapping such as the connectome, fast genome-wide association studies, high-throughput / next generation DNA sequencing), eHealth and technology (web-based treatments, mobile apps for monitoring symptoms), psychological therapies (use and implementation of Cognitive Behavioural Therapy) and research infrastructure (open access publication, European Research Networks)³⁵. We need to take advantage of these developments to produce more evidence along the whole translational pipeline from biological mechanisms to clinical implementation and preventative interventions. This will allow us to deliver and promote better treatments.

European research advantage: Europe’s diverse health systems with near-universal coverage offer the ability to collect ‘big data’, with access to health registers and oversight of paths to care³⁶. Together these features produce rich and representative datasets not available elsewhere. An added advantage is that Europe is home to numerous initiatives for including individuals with mental health problems in the design and management of research^{37,38}. Service user involvement improves research feasibility³⁹, treatment acceptability and ease of transfer to the wider health system, and will only become more important over time.

As a result, European research is singularly well-placed to address many challenges in mental health over the next five to ten years. This fact – as well as the need for research into the prevention of mental disorders – has been recognised by the European Parliament and European Commission^{40,41}. All that is required is an agenda for action and that is the focus of this paper.

A Comprehensive and Inclusive Priority Development Method

ROAMER (ROAdmap for MEntal health and well-being Research in Europe⁴²) was set up to develop the agenda for mental health research with immediate and longer term priorities. It covers the mental disorders named in the 2010 Global Burden of Disease study²⁷, but not neurodegenerative disorders (e.g. Alzheimer's disease and other dementias)²⁷. An overview of the organisation of the ROAMER project is given in Haro et al.⁴³

The ROAMER programme was carried out by multidisciplinary **Work Packages and Advisory Boards** that covered the broad spectrum of approaches to mental health research⁴³ (see Table 1 for details). The areas covered by each of the work packages were decided by consensus in meetings of the ROAMER steering committee of scientific experts and advisory boards. Scientific work packages (work packages 4-8 and the Clinical Research Task Force) were complemented by the Stakeholder and Scientific Advisory Boards⁴⁴, who provided input and direction across the entire course of the ROAMER project. Geographical mapping of types of mental health research (e.g. RCT, epidemiology) and of European capacity, funding and infrastructure were carried out. All groups were advised to take into account the European (not just national) perspectives in research, funding and societal needs, as well as demographic changes occurring within Europe^{2,41} and gender aspects of mental disorders.

[Table 1 about here]

There were two phases to the ROAMER process. The first phase provided a **mapping and gapping report** based on systematic literature reviews carried out by the scientific work packages and Work Package 2⁴⁵⁻⁴⁸.

We retrieved 70,761 articles and 28,188 were used in the final mapping which highlighted the volume of different kinds of mental health research conducted across Europe. For instance the UK is strong in clinical randomised controlled trials, Iceland leads genetic studies and Serbia is strong in stigma research. The systematic mappings were used together with expert workshops, consensus meetings, modified Delphi methods, and surveys to determine for each work package what major research advances across the globe had been achieved in the last 10 years and what further advances were needed to overcome extant gaps.

In the second phase **research priorities and advances needed were established** from each work package and integrated across the programme: scientific papers^{43,44,48-52} provide detail on each work package. All research priorities were justified in consensus meetings on the basis of their: **i) likely efficacy/effectiveness; ii) European impact and economic benefits; iii) deliverability and answerability in Europe; and iv) relevance to European strengths**. This ensured all ROAMER output took account of social, political and economic contexts in Europe, as well as existing European infrastructure, while strongly representing stakeholder priorities.

Over 125 non-duplicates priorities generated by the individual work packages were integrated into a single list of 20. Feedback via a survey was gathered on these 20 priorities from 486 scientific experts and 245 stakeholder organisations across Europe (see Table 1 for a list of stakeholder groups). Survey participants rated each priority on a 10-point scale for their relative i) Relevance (i.e. likelihood that the advance results in an effective intervention to improve mental health); and ii) Feasibility in Europe (i.e. likelihood that the advance can be achieved in Europe). There was strong agreement about the most highly rated between different stakeholders, albeit the order was slightly different. The final list contains the 6 priorities reported in this paper.

The process of prioritisation was based on input from over 1000 expert researchers and stakeholder organisations. For comparison, the prioritisation exercise used to determine the Global Challenges in Mental Health involved only 422 individuals⁵³ and, unlike ROAMER, did not include service users. This breadth of input together with the comprehensive and systematic mapping process make this project the most inclusive and comprehensive prioritisation process in mental health research to date.

The output of this consensus-based decision-making process has been 6 over-arching research priorities that are targeted, actionable, built on excellent European science. Moreover, research dedicated to these priority areas would result in a dramatic reduction of the costs and burdens associated with mental health in Europe within the next five to ten years. These priorities are shown in Table 2, where the numbering of priorities does not reflect any ranking.

[Table 2 about here]

Where Next?

Many issues highlighted by ROAMER will be familiar to individuals who are concerned with mental health for either personal or professional reasons. Other governments and scientific communities

have developed priorities for mental health – including the World Health Organisation⁵³ and the National Institute for Mental Health in the USA⁵⁴. There is some overlap with the ROAMER priorities and those of the past – for instance in recommending the development of new interventions and conducting lifespan and aetiological research. However, the content of the ROAMER priorities differs in meaningful ways – not least in the prominence of priorities relating to reducing stigma, involving stakeholders in research, taking account of social, cultural and economic contexts, comorbidity and eHealth applications. We expect that these additions reflect the input from service users and other stakeholders in ROAMER and of course the technological advances and scientific understandings gained over the last ten years.

There are two main contemporary differences in the current landscape of mental health which make the ROAMER research priorities both particularly urgent and ready for translation, and which may promote their imminent uptake by researchers and decision-makers.

The first is that the costs of mental disorder have risen and are set to continue rising – inaction on evidence-based mental health policy is simply no longer an option. ROAMER's priorities are in part similar to those we have faced for the last 10 years and could and should have been answered decades ago but poor investment and a lack of coordinated research strategy have hampered the evidence-gathering. A boost to investment in mental health research can help to resolve research questions, inform policy, improve mental health care and in the longer term reduce their burden to individuals, families and society. In particular, there needs to be an increase in government funding at both national and European levels for mental health research, in order to address the current shortfall compared to the cost that mental disorders pose to European society.

The second issue is that infrastructure now exists in Europe to address issues in mental health in a way that simply was not previously possible. Open publication, data policies and European Research Networks mean that for the first time there is a real opportunity to develop shared databases and international networks. Genome-wide association studies and next generation sequencing (e.g. whole exome/whole genome sequencing) are now quick and inexpensive enough that systematic identification of biomarkers to drive treatment development is a real possibility³⁵.

Research questions identified by ROAMER are closely aligned with Horizon 2020 priorities in 'personalised care' – mental health care that takes account of individual variation in and between service users in terms of care, diagnosis and service provision. ROAMER's priorities for preventative measures have also been advocated by the European Parliament⁴⁰ and the European Commission (notably, in the identification of the particular importance of "Effective health promotion, disease prevention, preparedness and screening" in Horizon 2020⁴¹) and in many European countries. Scientists now have a coordinated and highly applicable research strategy from the ROAMER project. We now need to encourage them to engage with policymakers and funders to implement it. By making timely use of the resources that Europe has at its disposal, European researchers will be able to address some of the huge societal challenges that mental disorders currently represent.

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Ethical Approval

ROAMER was given ethical approval by the European Commission Framework Programme 7 (FP7) ethics review process.

Author statements

TW, JMH conceived and designed the ROAMER project, took part in consensus meetings and integration processes for the ROAMER priorities. CO-T and SRB jointly designed, oversaw and analysed priority surveys as well as taking part in the integration processes. They jointly drafted the manuscript and gave it final approval.

MB, IE, SE-L, AF, AKF, J-BH, RK, SK, ML (Mario Luciano), MM (Marta Miret), SP, A-LP and TW-T conducted the systematic literature mapping and review process for a Work Package and analysed its findings. They interpreted findings from their review and used these in the consensus decision-making processes to refine the final set of ROAMER priorities. They reviewed and provided final approval for the manuscript.

JLA-M, IB, KC, JD-M, ML (Marion Leboyer), SWL, MM (Mario Maj), DMD, GS, GT, CvdF-C, JvO, KW and H-UW jointly conceived and designed the ROAMER project and directed the systematic literature mapping and review process for a Work Package. They interpreted findings from their review and used these in the consensus decision-making processes to refine the final set of ROAMER priorities. They reviewed and provided final approval for the manuscript.

CA jointly conceived and designed the ROAMER process and took part in consensus meetings and integration processes for the ROAMER priorities, reviewed and provided final approval for the manuscript.

DL directed the scientific advisory board, led consensus meetings and took part in integration processes for the ROAMER priorities, reviewed and provided final approval for the manuscript.

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JMH has been a consultant or made educational presentations for Eli Lilly & Company and Lundbeck, and has served on advisory boards for Eli Lilly & Company, Lundbeck, AstraZeneca and Hoffman-LaRoche, Inc.

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Table 1. Overview of ROAMER Scientific Work Packages and Advisory Boards

	Name	Topic/Function	Members
Scientific work packages	WP4	Biomedical research	Scientific experts from a variety of backgrounds (e.g. neuroscience, psychology, psychiatry, economics, sociology, medicine, social policy etc.). Some experts held dual roles (e.g. as clinician-researchers, service users etc.)
	WP5	Psychological research and treatments	
	WP6	Research into social and economic issues	
	WP7	Public health research	
	WP8	Well-being research	
	Clinical Research Task Force	Clinical research	
Other work packages to conduct mappings or generate priorities	WP2	Geographic, multidisciplinary and lifespan research	Scientific experts from a variety of backgrounds. Some experts held dual roles (e.g. as clinician-researchers, service users etc.)
	WP3	Research funding, infrastructures and capacity building	
Other work packages	WP1	Coordination and project management	
	WP9	Coordination of stakeholder involvement	
	WP10	Dissemination of results	
	WP11	Report writing	
Advisory Boards	Scientific Advisory Board	External scientific and methodological advice and guidance	World-wide renown scientific experts covering all areas within the mental health field, not involved in ROAMER work packages
	Stakeholder Advisory Board	Direction and input from non-academic stakeholders, coordinated by Work Package 9	Representatives of European associations of Service users, families and carer groups; psychiatrists; other health or mental health professionals; social workers; public health sector; policymakers; funders

Table 2. The six research priorities for policy action in mental health and well-being research

Research Priority	Illustrative Actions/Research Questions
1. Research into mental disorder prevention, mental health promotion and interventions in children, adolescents and young adults	<ul style="list-style-type: none"> • To perform and sustain long-term prospective cohort studies on the determinants of mental health and well-being to study risk and protective factors for mental disorders • Developing pharmacological and psychological treatments for children and adolescents • How can mental health promotion and social exclusion prevention in schools be improved? • Does prevention of depression among pregnant women protect against later mental disorder or dysfunction (e.g. depression) among children? What are the cost-benefits? • Longitudinal observational studies to analyse the effects of intense use of new media in early age and adolescence on later emotional and cognitive competence
2. Focus on the development and causal mechanisms of mental health symptoms, syndromes and well-being across the lifespan (including older populations)	<ul style="list-style-type: none"> • Identification of factors underlying co- and multi-morbidity, extending aetiopathogenic research on single disorders to typical comorbid constellations • What are the functional characteristics of neurobehavioural mechanisms across the lifespan? • To determine what social and biological factors underlie risk or resilience factors for mental disorders across the life span • To study the effects of financial crises on mental health • How do vulnerabilities and stress influence critical developmental trajectories for poor health and specific mental disorders across the lifespan (but particularly in childhood and adolescence)? • To study what brain abnormalities predict future mental disorder using longitudinal structural and functional neuroimaging
3. Developing and maintaining international and interdisciplinary research networks and shared databases	<ul style="list-style-type: none"> • Increase the number, quality and efficiency of international and interdisciplinary networks • Multidisciplinary training programmes for mental health research across different countries • Implementation of standardised European research outcomes, databases and terminology for mental health and well-being research • Establish access to European mental health databases across different studies with standardised mental health outcomes
4. Developing and implementing better interventions using new scientific and technological advances	<ul style="list-style-type: none"> • Strengthening research on new approaches and technology for mental health promotion, disorder prevention, mental healthcare and social service delivery <ul style="list-style-type: none"> ○ Testing the value of internet-based treatments as automated versions of standard psychological treatments in specialised mental health care, in “indicated” prevention and for use in primary care settings in particular

- Testing ‘real time’ psychometric feedback over the course of treatment (supported by modern software) to adapt dosage and intensity of treatment to service users’ complexity and problem profile in order to promote better outcomes
 - To examine acceptability and adherence of eHealth treatments (e.g. for depression), the clinical improvement at one-year follow-up, and the cost-effectiveness of the intervention in comparison with conventional psychological therapies
 - Understanding why some individuals do not respond to treatment by identifying relevant, and potentially developmentally specific, mediating and moderating variables of evidence-based psychotherapies for youths with mental disorders
5. Reducing stigma, empowering service users and carers in decisions about mental health research
- How might carers and family members of people with mental health problems perceive and experience stigma by association?
 - What are the best methods for measuring and valuing unpaid care?
 - What are the most cost-effective elements of anti-stigma interventions?
 - Studying the role of stigma in the wider context of inequalities (health inequalities, etc.) and implement interventions to assess the place of stigma in public services
 - Establish better national or local interventions to address stigma, social exclusion and discrimination by carefully defining the essential questions (i.e. who should be targeted? how?, by whom?, when?) and to determine how they can be evaluated and by whom
6. Health and social systems research that addresses quality of care and takes account of socio-cultural and socio-economic contexts and approaches
- Investigating the impact of differences in the organisation and delivery of national healthcare systems on well-being of individuals with mental disorders and carers
 - Health-systems-level research on the cost-effectiveness of different ways of financing, regulating, organising and providing services to promote and protect mental health
 - Designing and evaluating methods to assess outcomes from mental health services that can be easily and reliably implemented
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