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## **Mental Health Research Priorities for Europe**

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## **Abstract**

Mental and brain disorders represent the greatest health burden to Europe—not only for directly affected individuals, but also for their caregivers and the wider society. They incur substantial economic costs through direct (and indirect) health-care and welfare spending, and via productivity losses, all of which substantially affect European development. Funding for research to mitigate these effects lags far behind the cost of mental and brain disorders to society. Here, we describe a comprehensive, coordinated mental health research agenda for Europe and worldwide. This agenda was based on systematic reviews of published work and consensus decision making by multidisciplinary scientific experts and affected stakeholders (more than 1000 in total): individuals with mental health problems and their families, health-care workers, policy makers, and funders. We generated six priorities that will, over the next 5–10 years, help to close the biggest gaps in mental health research in Europe, and in turn overcome the substantial challenges caused by mental disorders.

## **Introduction**

### **Costs and burdens of mental and brain disorders**

A strong need exists 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 Europe.<sup>1</sup> More than one in three Europeans experience mental health problems each year,<sup>1</sup> and even more will be affected indirectly, including family members, health systems, and the wider society. The increasing age of the European population means that the long-term mental health burden is greater now than it has ever been.<sup>2</sup> As of 2010, the estimated yearly cost of mental disorders in Europe is €461 billion,<sup>3</sup> excluding any costs of dementia and other neurological disorders. Beyond direct costs to health services, this figure is mainly due to indirect costs to social welfare, employment, wellbeing, and economic output. These costs are not decreasing. For example, disability benefits in the UK and Germany have been fairly stable, but the proportion accounted for by mental health disorders continues to rise.<sup>4,5</sup>

People with mental health problems experience earlier death<sup>6</sup> by as much as 20 years.<sup>7</sup> Such a reduction in lifespan might be due to an increased risk for physical health problems such as cardiovascular disease,<sup>8</sup> or because individuals with mental health problems do not seek early treatment for their mental or physical health.<sup>9</sup> Alongside 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 it.<sup>10</sup> In England and Wales, suicide is the top cause of death for women and men aged 20–34 years and for men aged 35–49 years,<sup>11</sup> and it is a leading cause of death in men aged 19–30 years in Europe and worldwide.<sup>12</sup>

Most mental health problems are chronic and begin early in life (50% before the age of 15 years and 75% before the age of 18 years),<sup>13</sup> and this realisation is fuelling calls for interventions in childhood to avert the development of long-term problems. However, the best possible interventions or which groups of children are most at risk of developing long-term problems are unknown.

### **Mental health problems increase other health costs**

The costs of care increase strikingly if individuals with physical disorders have a comorbid mental health problem, so cost estimates are conservative because they do not take this comorbidity into account. For people with rheumatoid arthritis, the costs of care nearly double if they have depression,<sup>14</sup> and for asthma the increase is 140%.<sup>12</sup> People with depression also face a higher risk of developing heart disease than individuals without depression; following a heart attack, each additional depressive symptom that develops increases the risk of another heart attack by 15%.<sup>15</sup> Individuals with diabetes who develop a foot ulcer and also have depression have a high early-mortality rate (30% within 18 months of developing foot ulcer, three times higher than in those without depression).<sup>16</sup> Therefore, successful treatment of mental health problems 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 mental disorder being increasingly associated with high costs, evidence also exists that research into mental health has demonstrable positive effects. For example, the RAND Mental Health Retrosight project shows that, over 20 years, developments in basic and clinical research in schizophrenia (eg, locating  $\gamma$ -aminobutyric-acid-A receptors in the brain, early-intervention research, and trials of supported employment) have a beneficial effect on patient care and positive wider social and economic effects.<sup>17</sup>

### **Investing in mental health research**

#### **A good return on investment**

Funding mental health research generates a good return on investment. For every pound sterling spent on mental health research in the UK, the yearly recurring return is estimated to be £0.37, which is similar to the return for research on cardiovascular disorders<sup>18</sup> and cancer.<sup>19</sup> Giant steps have been made in research into the mechanisms of and treatments for cardiovascular disease and cancer, and marked improvements have been reported

subsequently to health services and lifestyle advice offered for patients with these disorders. These improvements resulted in the 20% decrease in cancer mortality seen over 1993–2013.<sup>20</sup> For mental health, a boost in research investment could have similar large effects within a fairly short time, reducing not only the burdens on individuals and families but also the costs of care and support in the long term.

### **Uneven research funding distribution**

Public funding for mental health research available at the European level is disproportionately low compared with the effect of mental disorders on population health. Mental disorders account for between 11%<sup>21</sup> and 27%<sup>1</sup> of the disability burden in Europe<sup>22,23</sup> but receive less than 5% of the overall health research budget of the European Commission's Seventh Framework Programme (FP7).<sup>24,25</sup>

For national funding, the figures are no more encouraging: the percentages of funding for mental health research compared with the overall health research funding are 2% in France and 7% in the UK.<sup>26</sup> In England, mental disorders cost between £70 billion<sup>27</sup> and £105 billion per year,<sup>28,29</sup> but only £115 million—which could be as low as a thousandth of the yearly cost of mental disorders—is invested in mental health research in the UK.<sup>30</sup> For comparison, cancer research received more than 4·5 times as much funding (£521 million) as mental health research in 2011,<sup>31</sup> although cancer accounts for only 15·9% of the UK's total disease burden, compared with 22·8% for mental disorders.<sup>32</sup> In France, mental disorders cost €108 billion per year, but only €25 million is allocated to psychiatry research.<sup>29</sup>

Although physical health research can attract substantial third-sector funding, the case is not the same for mental health research. An analysis<sup>30</sup> showed that for every pound sterling that the UK Government spent on research in cancer, circulatory problems, and mental health, the research funding from charities was £2·75, £1·25, and £0·0003, respectively. We suspect that this pattern is the same across Europe. With such a low charitable investment, years of campaign building will be needed 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.

Preventive research could be especially useful to offset the costs of mental disorders,<sup>33</sup> but this area receives especially low levels of funding at present. For example, in the UK, only £4·5 million (0·17–0·28% of the total yearly spend on health research) is spent on preventive mental health research per year.<sup>30,34</sup>

### **Poised for action**

Europe is now well placed to respond to the challenges resulting from mental health problems.

### **Scientific advantage**

In the past 10 years, ground breaking advances have been made in biological and brain sciences (eg, biomarkers from -omics research, developments in brain mapping such as the connectome, fast genome- wide association studies, high-throughput and next- generation DNA sequencing), eHealth and technology (eg, web-based treatments, applications to monitor symptoms on smart phones and tablets), psychological therapies (use and implementation of cognitive behavioural therapy), and research infrastructure (open-access publication, European research networks).<sup>35</sup> These developments should be used to generate more evidence along the whole translational pipeline from biological mechanisms to clinical implementation and preventive interventions, allowing the delivery and promotion of improved treatments.

### **European research advantage**

Europe's diverse health systems with near-universal coverage offer the ability to collect so-called big data, with access to health registers and oversight of paths to care.<sup>36</sup> These features collectively produce rich and representative datasets that are not available elsewhere. An added advantage is that Europe is home to many initiatives for inclusion of individuals with mental health problems in the design and management of research.<sup>37,38</sup> Service user involvement

improves research feasibility,<sup>39</sup> 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 in the next 5–10 years. This fact, in addition to the need for research into the prevention of mental disorders, has been recognised by the European Parliament and European Commission.<sup>40,41</sup> All that is required is an agenda for action, which is the focus of this Personal View.

### **A comprehensive and inclusive priority development method**

ROAMER (Roadmap for Mental Health Research in Europe)<sup>42,43</sup> was set up to develop the agenda for mental health research with immediate and long-term priorities (panel 1). It covers the mental disorders named in the 2010 Global Burden of Disease study<sup>21</sup> but not neurodegenerative disorders (eg, Alzheimer's disease and other types of dementia).<sup>21</sup> ROAMER was given ethical approval by the European Commission's FP7 ethics review process.

The ROAMER programme consisted of multi-disciplinary work packages and advisory boards that covered the broad range of approaches to mental health research (figure).<sup>43</sup> 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 (ie, work packages 4–8 and the clinical research task force) were complemented by the stakeholder and scientific advisory boards,<sup>44</sup> who provided input and direction across the entire course of the ROAMER project to map the types of mental health research (eg, randomised controlled trials and epidemiology), capacity, funding, and infrastructure geographically across the EU-27 countries. Work package 2 mapped the numbers of studies conducted in five different areas of research within mental health (epidemiology, clinical randomised controlled trials, biological: genetics and imaging, psychological therapy, and mental health stigma) in each of these countries. All groups were advised to take into account the European (not just national) perspectives in research, funding, and societal needs, demographic changes occurring in Europe,<sup>2,41</sup> and gender aspects of mental disorders.

The ROAMER project consisted of two phases. The first phase provided a mapping and gapping report based on systematic reviews of published work and was done by the scientific work packages and work package 2.<sup>45–48</sup> 70761 articles were retrieved, of which 28188 were used in the final mapping, highlighting the volume of different kinds of mental health research across Europe. For example, 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 establish, for each work package, the major research advances that had been achieved worldwide in the past 10 years and the further developments that 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 reports<sup>43,44,48–52</sup> provide details on each work package. All research priorities were justified in consensus meetings on the basis of their likely efficacy and effectiveness, European effects and economic benefits, deliverability and answerability in Europe, and relevance to European strengths. These justifications ensured that all output of the ROAMER project took into account social, political, and economic contexts in Europe and existing European infrastructure, while strongly representing priorities of stakeholders.

The 151 priorities generated by the individual work packages were integrated into a single list of 20 priorities. Feedback via a survey was gathered on these 20 priorities from 486 scientific experts and 245 stakeholder organisations across Europe (figure). Survey participants rated each priority on a ten-point scale for their relative relevance (ie, the likelihood that the advance will result in an effective intervention to improve mental health) and feasibility (ie, the

likelihood that the advance can be achieved) in Europe. Strong agreement was reached about the most highly rated priorities between different stakeholders, albeit in slightly different orders.

The process of prioritisation was based on input from more than 1000 expert researchers and stakeholder organisations. For comparison, the prioritisation exercise used to determine the Grand Challenges in Global Mental Health involved only 422 individuals<sup>53</sup> and, unlike ROAMER, did not include service users. This breadth of input, together with the comprehensive and systematic mapping process, makes ROAMER the most inclusive and comprehensive prioritisation process in mental health research so far.

This consensus-based decision-making process has generated six overarching research priorities that are targeted, actionable, and built on excellent European science (panel 2). Moreover, research dedicated to these priority areas would result in a substantial reduction of the costs and burdens associated with mental health in Europe within the next 5–10 years.

### **Where Next?**

Many issues highlighted by the ROAMER project will be familiar to individuals who are concerned with mental health for either personal or professional reasons. Other governments and scientific communities—including WHO<sup>53</sup> and the US National Institute for Mental Health<sup>54</sup>—have developed priorities for mental health, some of which overlap with the ROAMER priorities—eg, the development of new interventions, and lifespan and aetiological research. However, the content of the ROAMER priorities differs in meaningful ways, not least in the prominence of priorities that relate to stigma reduction, those that involve stakeholders in research, and those that take into account social, cultural, and economic contexts, and comorbidity and eHealth applications. We expect that these additions are representative of the input from service users and other stakeholders in ROAMER, and no doubt the technological advances and scientific understanding gained over the past 10 years.

Two main differences exist in the present landscape of mental health compared with that of the past, which make the ROAMER research priorities both particularly urgent and ready for translation, and which might promote their imminent uptake by researchers and decision makers.

The first issue is that the costs of mental disorder have increased and are set to continue rising, such that inaction on evidence-based mental health policy is no longer an option. ROAMER's priorities are similar in part to the priorities of the past 10 years; these priorities could and should have been answered decades ago, but poor investment and the absence of a coordinated research strategy have hampered the evidence-gathering process. A boost to investment in mental health research can help to resolve research questions, inform policy, improve mental health care and, in the long term, reduce their burden to individuals, their families, and the society. In particular, an increase in government funding is needed at both the national level and the European level for mental health research to address the present shortfall compared with 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 was not previously possible. Open-access publication, open-data policies, and European research networks mean that, for the first time, the opportunity to develop shared databases and international networks has become real. Genome-wide association studies and next-generation sequencing (eg, whole-exome or whole-genome sequencing) are now quick and inexpensive enough that systematic identification of biomarkers to drive treatment development is a real possibility.<sup>35</sup>

Research questions identified by ROAMER are closely aligned with the Horizon 2020 priorities in personalised care—ie, mental health care that takes into account individual variation in and between service users in terms of care, diagnosis, and service provision. ROAMER's priorities for preventive measures have also been advocated by the European Parliament,<sup>40</sup> the European Commission (notably, in the identification of the particular importance of “Effective

health promotion, disease prevention, preparedness and screening” in Horizon 2020),<sup>41</sup> and in many European countries. Scientists now have a coordinated and highly applicable research strategy from the ROAMER project, and they need to be encouraged to engage with policy makers and funders to implement this strategy. By making timely use of the resources that Europe has at its disposal, European researchers will be able to address some of the biggest societal challenges that mental disorders represent at present.



## **Contributors**

TW, JMH, and CA conceived and designed the ROAMER project, and took part in consensus meetings and integration processes for the ROAMER priorities. CO-T and SRB designed, oversaw, and analysed priority surveys, and took part in the integration processes. MB, IE, SE-L, AF, AKF, J-BH, RK, SK, MLu, MMi, SP, A-LP, and TW-T did the systematic literature mapping and review process for a work package, analysed its findings, interpreted findings from their review, and used these findings in the consensus decision-making processes to refine the final set of ROAMER priorities. JLA-M, IB, KC, JD-M, MLe, SWL, MMa, DM, GS, GT, CvdF-C, JvO, KW, and H-UW jointly conceived and designed the ROAMER project, directed the systematic literature mapping and review process for a work package, interpreted findings from their review, and used these findings in the consensus decision-making processes to refine the final set of ROAMER priorities. DL directed the scientific advisory board, led consensus meetings, and took part in integration processes for the ROAMER priorities. TW, JMH, SRB, and CO-T jointly drafted this Personal View. All authors reviewed and provided final approval for this paper.

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### **Panel 1: The ROAMER project**

Before the ROAMER (Roadmap for Mental Health Research in Europe) project, agenda-setting processes for mental health research (eg, the Grand Challenges in Global Mental Health or the WHO's Mental Health Gap Action Programme Intervention Guide) used expert panels of scientists and clinicians to establish research priorities, but they did not include input from wider stakeholders. Therefore, these processes have been restricted in scope and implications for future effects because of the absence of interdisciplinarity. The ROAMER project aims to overcome these restrictions.

ROAMER work packages systematically mapped and reviewed published work to describe mental health research in Europe. PubMed and PsycINFO databases were searched for scientific reports published between Jan 1, 2007, and Dec 31, 2011, in different knowledge areas comprising mental health, mental and behavioural disorders, and wellbeing conducted in any European country. The areas were defined on the basis of the work package structure of the project—namely, research into biomedicine; psychological treatments; social and economic issues; public health; wellbeing; geographical, multidisciplinary, and lifespan viewpoints; and research funding, infrastructures, and capacity building (figure). Studies were selected either if they were set in or if they had a corresponding author based in one of the (as then) EU-27 countries.

ROAMER is the largest agenda-setting exercise in mental health research, involving more than 1000 individuals and associations. Unlike previous work, our project was not restricted to scientists but included a wide range of stakeholders, such as individuals with mental health problems and their families, clinicians and other health-care workers, policy makers, and industry. The project's focus on interdisciplinarity (figure) also ensured that findings assessed the wide remit of mental health research and are therefore both comprehensive and of broad interest.

Our findings highlight the need to increase mental research funding and to coordinate research policies, and they point to a series of robust and feasible research actions that can be taken at the European level. These actions will be able to overcome identified gaps in research knowledge within the next 5–10 years, and in doing so address the increasing societal challenges associated with the burden caused by mental disorders.

### **Panel 2: The six research priorities for policy action in mental health and wellbeing research\***

#### **Research into mental disorder prevention, mental health promotion, and interventions in children, adolescents, and young adults**

- Perform and sustain long-term prospective cohort studies on the determinants of mental health and wellbeing to study risk and protective factors of mental disorders
- Develop pharmacological and psychological treatments for children and adolescents
- Improve mental health promotion and social exclusion prevention in schools
- Investigate whether prevention of depression in pregnant women protects against later mental disorder or dysfunction (eg, depression) in children, and the cost benefits of doing so
- Perform longitudinal observational studies to analyse the effects of intense use of new forms of media (eg, the internet, gaming, and social media) in early age and adolescence on later emotional and cognitive competence

#### **Focus on the development and causal mechanisms of mental health symptoms, syndromes, and wellbeing across the lifespan (including older populations)**

- Identify factors underlying comorbidity and multimorbidity, extending aetiopathogenic research on single disorders to typical comorbid constellations
- Define the functional characteristics of neurobehavioural mechanisms across the lifespan
- Identify social and biological factors that underlie risk or resilience factors for mental disorders across the lifespan

- Study the effects of financial crises on mental health
- Understand how vulnerabilities and stress affect critical developmental trajectories for poor health and specific mental disorders across the lifespan (but particularly in childhood and adolescence)
- Study what brain abnormalities predict future mental disorder using longitudinal structural and functional neuroimaging

### **Develop and maintain international and interdisciplinary research networks and shared databases**

- Increase the number, quality, and efficiency of international and interdisciplinary networks
- Develop multidisciplinary training programmes for mental health research across different countries
- Implement standardised European research outcomes, databases, and terminology for mental health and wellbeing research
- Establish access to European mental health databases across different studies with standardised mental health outcomes

### **Develop and implement better interventions using new scientific and technological advances**

- Strengthen research into new approaches and technology for mental health promotion, disorder prevention, mental health care, and social service delivery
- Test the value of internet-based treatments as automated versions of standard psychological treatments in specialised mental health care, in so-called indicated prevention, and particularly for use in primary care settings
- Test 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 to promote better outcomes
- Examine acceptability and adherence of eHealth treatments (eg, for depression), the clinical improvement at 1-year follow-up, and the cost-effectiveness of the intervention in comparison with conventional psychological therapies
- Understand why some individuals do not respond to treatment by identification of relevant, and potentially developmental-phase-specific, mediating and moderating variables of evidence-based psychotherapies for youths with mental disorders

### **Reduce stigma and empower service users and carers in decisions about mental health research**

- Study how carers and family members of people with mental health problems might perceive and experience stigma by association
  - Identify the best methods to measure and value unpaid care
  - Pinpoint the most cost-effective elements of anti-stigma interventions
  - Study the role of stigma in the wider context of inequalities (eg, health inequalities) and implement interventions to assess and change the role of stigma in access to public services
  - Establish better national or local interventions to address stigma, social exclusion, and discrimination by a careful definition of the essential questions (ie, who should be targeted; how, by whom, and when should targeting be done) and to determine how and by whom they can be assessed

### **Establish health-systems and social-systems research that addresses quality of care and takes into account sociocultural and socioeconomic contexts and approaches**

- Investigate the effect of differences in the organisation and delivery of national health-care systems on wellbeing of individuals with mental disorders and their carers
  - Study, at the health-systems level, the cost-effectiveness of different ways to finance, regulate, organise, and provide services that promote and protect mental health



- Design and investigate methods to assess outcomes from mental health services that can be easily and reliably implemented

\*The order of priorities does not represent any ranking.

**Figure: Overview of ROAMER** ROAMER=Roadmap for Mental Health Research in Europe. WP=work package.

	Function	Members
<b>Scientific work packages</b>		
WP4	Biomedical research	Scientific experts from a range of backgrounds (eg, neuroscience, psychology, psychiatry, economics, sociology, medicine, social policy). Some experts held dual roles (eg, as clinician researchers, service users)
WP5	Research into psychological processes and treatments	
WP6	Research into social and economic issues	
WP7	Public health research	
WP8	Wellbeing research	
Clinical research task force	Clinical research	
<b>Other work packages to map research or generate priorities</b>		
WP2	Geographical, multidisciplinary, and lifespan research	Scientific experts from a range of backgrounds. Some experts held dual roles (eg, as clinician researchers, service users)
WP3	Research into funding, infrastructures, and capacity building of mental health research	
<b>Other work packages</b>		
WP1	Coordination and project management	Scientific experts
WP9	Coordination of stakeholder involvement	
WP10	Dissemination of results	
WP11	Report writing	
<b>Other work packages</b>		
Scientific advisory board	External specific and methodological advice and guidance	Scientific experts covering all areas within mental health who are not involved in ROAMER work packages
Stakeholder advisory board	Direction and input from non-academic stakeholders, coordinated by WP9	Representatives of European associations of service users, families and carer groups; psychiatrists; other health or mental health professionals; social workers; individuals in the public health sector; policy makers; and funders