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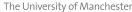






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ROAMER: A Roadmap for Mental Health and Well-being Research in Europe







Executive Summary

Mental Health and Well-being in Europe

Mental disorders place immense burdens on individuals, their families and society. This burden is increasing in Europe, especially when compared to the relative burden of physical health problems. The cost of mental disorders in Europe is estimated as €461 billion per year and is predicted to rise.

Mental health research can help to resolve these burdens. However, **funding for mental health research in Europe is much lower than the population impact of mental disorders**, with spending being less than half the disability burden. Mental disorders represent between 11% and 27% of total disease burden, while investment across countries and FP7 is about 6%. Nonetheless, there is evidence of a large return on investment – for every one euro spent on mental health research there is a **0.37** euro return per year, which is similar to the return for cardiovascular disorder research and other areas of health.

Why Europe? Europe is home to some of the world's best mental healthcare and research centres. Europe's diverse and comprehensive health systems also produce rich and representative datasets not available elsewhere in the world. European research networks are gaining momentum, and a coordinated strategy for mental health will help to realise the EU's full research potential.

ROAMER (ROAdmap for MEntal health and Well-being Research in Europe) has developed a **comprehensive and integrated mental health research roadmap**, focused on improving the mental health of the population and increasing European competitiveness. ROAMER analysed existing resources in European regions, and involved **input from over 1000 individuals and stakeholder organisations**. Evidence-based recommendations were prioritised through iterative feedback, consensus meetings, international advisory boards and surveys of researchers, experts and wider stakeholders in Europe.

ROAMER designed research priorities to take advantage of Europe's existing infrastructures and research strengths and to address timely challenges in European society. The answers to these research questions can guide European policy, mental health service provision and treatments. This will also provide the highest return on research investment, improve the lives people with mental health problems and their families, and increase European productivity.



ROAMER Aims and Approaches

ROAMER reviewed and summarised the excellent European mental health research landscape, and its recommendations will shape the direction of future research. ROAMER's three guiding principles are:

- · To provide guidance for mental health research across Europe (and the rest of the world)
- · To focus on high quality scientific research
- To base the guidance on the priorities of the 2009 European Parliament Resolution on mental health, i.e. "prevention, early detection, intervention and treatment of mental disorders"

Crucially, the roadmap emphasises the **interdisciplinary nature of research** in mental health and well-being. It covers lifespan and geographic variation, research capacity and infrastructure, biomedicine, **clinical research**, psychological therapy, social and economic issues, well-being and public health as well as taking account of stakeholder interests. The ROAMER method involved three stages:

- Reviews of different areas of mental health research, used to generate lists of future research options
- Integration of these research options into 20 research priorities that spanned all areas of mental health and well-being
- · Refinement of these 20 priorities into 6 high-level research priorities for policy action in Europe

In the first stage, expert panels conducted state-of-the-art reviews of mental health research literature. Workshops and surveys were conducted, and consensus decision-making meetings were held comprising ROAMER work packages and two (stakeholder and scientific) advisory panels. These processes generated recommendations for future research to fill the gaps in knowledge identified by reviewing the literature.

In the second stage, recommendations from all work packages were integrated and prioritised through iterative feedback processes and consensus meetings in order to produce 20 priorities. Finally, following a large survey of experts and wider stakeholders in Europe together with face-to-face consensus meetings, these 20 priorities were refined into a set of 6 high-level priorities for research policy action. All recommendations and priorities were conceived with Europe's competitive strengths in mind to ensure they are effective and deliverable within a European context.

ROAMER emphasised a participatory approach throughout, with the **involvement of key stakeholders** including: researchers, service users, industry, public health experts, funding organisations, policymakers, families of people with mental health problems, healthcare workers, education workers and others.

Output of the ROAMER Project

List of 20 ROAMER consensus priorities

The 20 ROAMER priorities are summarised in the graphic at the beginning of this report, and fall into 5 main priority areas:

- A. Supporting mental health for all
- B. Responding to social values and issues
- C. Life course perspective of mental health problems
- D. Research towards personalised care
- E. Building research capacities



High Level Research Priorities for Policy Action

From the 20 ROAMER recommendations, **six high-level research priorities for policy action** were selected: these are practical, targeted and actionable and build on a European legacy of excellent science to tackle societal challenges. Each priority was chosen to be resolvable in the next 5 to 10 years as part of coordinated European approaches to improve the mental health of European citizens. The six research priorities for policy action in mental health and well-being research are:

- Research into mental disorder prevention, mental health promotion and other interventions in children, adolescents and young adults
- Focus on the development and causal mechanisms of mental health symptoms, syndromes and wellbeing across the lifespan (including older populations)
- Developing and maintaining international and interdisciplinary research networks and shared databases
- Developing and implementing better interventions using new scientific and technological advances
- · Reducing stigma and empowering service users and carers in decisions about mental health research
- Health and social systems research that addresses quality of care and takes account of socio-cultural and socioeconomic contexts and approaches





Introduction

Why does mental health need research evidence? Mental disorders¹ represent a huge burden to Europe, affecting individuals, families, and society as a whole. Mental health problems are costly, with negative impacts on EU competitiveness, growth and jobs (Gustavsson et al., 2011; Wittchen et al., 2011). The most recent estimate of cost in Europe is €461 billion in 2010 − excluding dementia and other organic brain disorders. This cost is due to effects of mental health problems on health services, social welfare, employment, well-being and economic output. Current research investment in mental health and well-being² is disproportionately small in comparison to the size of these costs.

With recent advances in research methods and technologies, now is a key moment to recognise mental health and well-being as a public health issue of comparable importance to physical health. There is therefore a pressing need to coordinate research strategies across Europe and begin an ongoing, truly European dialogue on mental health that will have further implications worldwide.

Europe is home to expertise across the spectrum of mental health research – from **basic biological and neural sciences** to **clinical research**, and on to socioeconomic research into stigma and unemployment. By capitalising on this existing infrastructure, Europe is well-placed to develop and implement effective, targeted research policies to alleviate some of the heavy burden of mental health problems.

What is ROAMER trying to do? The "ROAdmap for MEntal health and Well-Being Research in Europe" (ROAMER) project outlines a clear set of priorities for mental health and well-being research in Europe. ROAMER summarises European research and provides guidance for future work that would best serve the needs of European society.

What is the EU context? ROAMER's aims align with wider European agendas. A coordinated European strategy on mental health has developed over the past decade: from the 2005 EC green paper (European Commission, 2005), to the 2008 European Pact on Mental Health and Wellbeing (European Commission, 2008), and the European Parliament Resolution of 19 February 2009 on Mental Health (European Parliament, 2009)³. ROAMER represents the culmination of this strategy, guiding a proactive and evidence-based European agenda for mental health research.

How does this fit into the wider EU growth agenda? ROAMER's recommendations support Europe 2020's priorities for sustainable growth (European Union, 2013). Many concerns in mental health research are shared with the 7 Europe 2020 'flagship initiatives' (European Union, 2013), particular examples being: reciprocal relationships between mental health and employment; the importance of socioeconomic inequalities in determining both mental health and access to care; the potential for digital innovation in mental health care through <u>eHealth</u> initiatives; and public well-being and health promotion.

Better understanding of mental health will encourage greater participation in society by individuals with mental health problems. Such individuals may have been forced out of participation in society due to stigma or disability. The role of mental health research in these issues has become especially important in the last decade, as noted in the DG-SANCO Green Paper on improving mental health of the population (European Commission, 2005).

^{1.} Throughout this roadmap the terms 'mental disorder' and 'mental health problem' are used, in preference to terms such as psychological disorder, psychiatric disorder etc. Our usage is based on the Global Burden of Disease study (World Health Organization, 2008), and a detailed account of these definitions in comparison to their alternatives is given in the glossary, **Appendix I**.

^{2. &}lt;u>Well-being</u> is a nebulous term that overlaps to some extent with <u>mental health</u>, but is understood very differently by different people. For the definitions of both 'well-being' and 'mental health' that we have used across the current roadmap, please see the glossary, **Appendix I**.

^{3.} In particular this resolution's focus on "prevention, early detection, intervention and treatment of mental disorders".



Well-being research is particularly relevant to new economic models of growth. There has been a wave of reports from sources as diverse as the Organisation for Economic Cooperation and Development (Organisation for Economic Co-operation and Development, 2013) and the New Economics Foundation (Michaelson et al., 2009) emphasising the importance of well-being in conceptions of growth, going beyond gross domestic product (GDP). This is not a trade-off between 'new' and 'classical' concepts of growth, as research has also emphasised that increases in public well-being and mental health are associated with greater productivity (Dolan, Peasgood, & White, 2008).

How does ROAMER align with the Horizon 2020 programme? The European Commission's proposal for implementing Horizon 2020 lays out three components: 1) excellent science; 2) industrial leadership and competitiveness; and 3) responding to societal challenges (European Commission, 2011, 2013). ROAMER has been shaped by similar guiding principles, and the current roadmap addresses each of these. The project has, first and foremost, been driven by the excellent science taking place in Europe, and the exciting possibilities now afforded by these developments. Sections of the roadmap summarise state-of-the-art research in mental health and well-being (Section 5), identify gaps in extant research and the advances need to progress beyond these (Section 6), and identify the most pertinent emerging priorities for research (Section 2; Section 3).

Many of the ROAMER advances offer opportunities for innovation in line with Horizon 2020's priorities. For example, **eHealth** and drug development have been identified as exemplary industrial opportunities. The research advances described in **Sections 2**, **3** and **6** are indicative of specifically European competitive strengths⁴ – e.g. taking advantage of existing research or healthcare infrastructure in Europe. Finally, ROAMER considers mental health and well-being research within the context of public health, addressing societal challenges associated with mental disorders, mental health and well-being.

Structure and Approach of the Roadmap

Scope of the ROAMER project

ROAMER was designed to span all EU-28 countries, with a focus on excellent science, **stakeholder** engagement and a consideration of the life-course aspects of mental health and well-being. ROAMER covers all mental and **behavioural disorders** included in the 2010 Global Burden of Disease study (Whiteford et al., 2013) and excludes neurological (e.g. epilepsy, migraine, Parkinson's disease) and neurodegenerative disorders (Alzheimer's disease and other dementias) ⁵. It encompasses population and public health, monitoring of health services and service implementation, social and cultural contexts, **clinical trials**, individual traits and risk factors, and research at cellular levels.

ROAMER structure

The ROAMER project was organised into nine themes (5 scientific and four cross cutting – including a cross-discipline Clinical Research Task Force), which spanned different sub-disciplines of mental health research. These were embedded in work packages that were led by experts in their respective fields:

- 1. Geographical representation, clinical perspective, and multidisciplinary and life-course integration (WP2)
- 2. Research capacity, infrastructures, capacity building and funding strategies in mental health research (WP3)

^{4.} As well as discussions of the specifically European strengths and issues of each of the proposed research advances throughout the roadmap, these issues are given especial elaboration in **Appendix III**.

^{5.} Please note that the current roadmap deals exclusively with mental disorders, and so the impacts, burdens and costs discussed are specific to these, as far as possible. This means that figures exclude burdens due to related issues, such as dementia and substance abuse. The exclusion of these issues from the current roadmap is by no means to marginalise their importance – conversely these issues are of sufficient importance to warrant their own roadmaps. Accordingly, rather than discuss these issues in insufficient detail within the current roadmap, we would direct readers to the FUTURAGE and ALICE RAP roadmaps for issues of dementia and substance abuse respectively.



- 3. Biomedical research (WP4)
- 4. Psychological research and treatments (WP5)
- 5. Social and economic aspects (WP6)
- 6. Public health research (WP7)
- 7. Well-being (WP8)
- 8. Stakeholder involvement (WP9)
- 9. Clinical Research Task Force

More specific details of these work packages, their methods and their organisation are described in **Section** 4 of the current roadmap – 'ROAMER Method'⁶. All ROAMER work packages used a similar methodology of expert-led literature mappings of European and global mental health research⁷, and made recommendations on the basis of a consensus decision-making process within the work package. Each work package performed the same three tasks (which correspond to **Sections 5**, **6**, and **2** of the roadmap, respectively):

- · Identifying recent high quality research and the impact this has had on theory and practice in mental health
- · Showing what is still lacking, and what needs to happen next
- Prioritising among potential future research directions, to coordinate focus in Europe

Stakeholder Involvement: As well as expert researchers, ROAMER strove to involve all key <u>stakeholders</u> in its processes of reviewing literature, generating recommendations for future research and prioritising among these recommendations. <u>Stakeholders</u> included service users and other individuals with mental health problems⁸, industry, funding organisations, policymakers, families of people with mental health problems, healthcare workers, education workers, and others. This wide-ranging participation was adhered to throughout the project, in order to ensure that ROAMER's recommendations are socially relevant as well as scientifically excellent.

Impact

The ultimate aim of ROAMER is to reduce the high burden of mental health problems on EU society. However, in order to properly address this burden there first needs to be an adequate acknowledgement and consideration of the burden's size and scope, what aspects of European society it affects, and its variation (both within Europe, and for Europe as a whole viewed in comparison to the rest of the world).

Global and EU impacts on health and DALYs

Mental disorders are the most critical public health issue in the world today. This is not hyperbole: mental disorders are among the primary causes of disability worldwide (Murray et al., 2012). Severe mental disorders represent risk factors for mortality two to three times higher than in the general population (Chang et al., 2010; De Hert et al., 2011), and having a serious mental disorder reduces life expectancy by between 8 and 17 years (Chang et al., 2011). More recent estimates have suggested that the increased mortality risk of schizophrenia could be as high as 4.5 times the rate of the general population (Hoang, Goldacre, & Stewart, 2013). This vastly increased risk is ascribable to a number of factors, including **comorbid** physical illnesses, lifestyle factors, medication side-effects, and access to and use of healthcare services.

^{6.} Full lists of the members of each work package are also given in **Appendix V.**

^{7.} Full accounts (including search terms) of the literature searches conducted by each work package are given in **Appendix IV**.

^{8.} Our preferred terms in the current roadmap, based on consultation with various stakeholders, are 'service users' or 'individuals with mental health problems'. Occasionally throughout the roadmap we also use other terms such as 'patient' or 'survivor', when these terms are most appropriate given the context in which they are being used. For greater detail on our use and definition of these terms, please see the glossary, Appendix I.



Addiction is an important comorbid feature. Substance abuse is highly prevalent as a **comorbid** feature in those who already have mental health problems and this has a large influence on mortality rates (Alonso et al., 2004; Merikangas et al., 2004). Substance abuse is a critical issue in research, requiring nuanced considerations of sociological, economic and equality issues. For these reasons substance abuse problems have been accorded their own European roadmap: ALICE RAP⁹. While the social impacts of substance abuse are important to research and policy, and often intimately linked to aspects of mental health and well-being, the current report will not address these issues in detail as they will be given due consideration in ALICE RAP.

Mental disorders account for 28% of the world's Disability-Adjusted Life Years. The World Health Organization has developed a measure known as the <u>Disability Adjusted Life Year</u>, or <u>DALY</u> (World Health Organization, 2008). The <u>DALY</u> measures years of healthy life lost as a consequence of suffering from a given health problem through premature death, but also due to ill health and disability. It therefore represents an extremely useful statistic for looking at disability levels over time and across a wide range of health problems – including comparisons between physical and mental disorders. The worldwide disease burden of mental disorders – as measured by <u>DALYs</u> – among non-communicable diseases is 28% (Prince et al., 2007). Moreover, this disability burden is increasing. Estimates from the Global Burden of Disease Study 2010 indicate that between 1990 and 2010, DALYs attributable to mental and behavioural disorders increased by 37% (Murray et al. 2012) – see **Figure 1.1**.

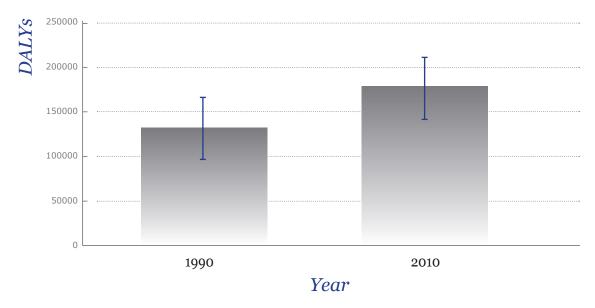


FIGURE 1.1 Global increase in health burden (measured in DALYs) due to mental and behavioural disorders between 1990 and 2010. Data taken from Murray et al. (2012)

The European mental health burden. Superimposed on the global burden of mental health are specific European problems. Wittchen et al. (2011) report that over 38% of the European population experience mental health problems in any given year. This is to say nothing of those who will be affected indirectly (e.g. carers, family members, healthcare, education and social workers, employers etc.).

While mental disorders are not necessarily more prevalent in Europe than in the rest of the world, their associated contribution to all European disease burden (as measured by **DALYs**) is 26.6% – the largest single contributor to European disease burden (Wittchen et al., 2011). This is considerably higher than in any other region in the world, and over double the worldwide average of 13% (Collins et al., 2011).

^{9.} http://alicerap.eu



Other studies have noted that **DALY** burdens of mental disorders are systematically underestimated, as calculations fail to take account of the added disability that mental disorders contribute to health problems. Based on recalculations taking account of this **comorbidity**, Prince et al. (2007) estimated the worldwide proportion of **DALYs** attributable to mental disorders as 28%, far higher than the 13% figure reported by Collins et al. (2011). If these calculations are correct, then the specific European burden would also likely exceed the 26.6% proportion of all-cause disability reported by Wittchen et al. (2011).

Economic burden

The most recent estimate of cost of mental disorders in Europe is €461 billion per year (as of 2010) – excluding any costs of dementia and other organic brain disorders (Gustavsson et al., 2011). This dwarfs even the total costs of the Fukushima disaster (€86.4 billion – Russia Today, 2014) and GDP of Denmark (€206.7 billion in 2010), and is greater than the GDP of Sweden (€358.2 billion in 2010) – illustrated in **Figure 1.2** below (International Monetary Fund, 2013). This cost includes the direct costs of treatment, but mental health problems (especially when they endure across the life-course) are also associated with substantial indirect costs, including employment problems (DAK-Gesundheit, 2013; conservative calculations suggest costs of around €220 billion per year – Dewa & McDaid, 2011), **comorbid** physical disorders (De Hert, Correll, et al., 2011; estimated at €10-16.5 billion per year in the UK alone – Naylor et al., 2012), poverty and economic deprivation, costs to family and friends, social exclusion (Huxley & Thornicroft, 2003; social exclusion may increase public service costs by up to tenfold: Scott, Knapp, Henderson, & Maughan, 2001) and **comorbid** substance abuse (estimated to increase costs associated with mental disorders by up to 80% – Clark, Samnaliev, & McGovern, 2009; De Hert, Cohen, et al., 2011; Merikangas et al., 2004). Since indirect costs are difficult to estimate, figures for the costs of mental disorders to the European Union may be severely underestimated (Knapp, 2003; Wittchen et al., 2011).

There has been some recent acknowledgement of the problems posed to society and economic growth in the European Commission's Horizon 2020 framework programme for research and innovation (European Commission, 2013), as part of the "health, demographic change and wellbeing" challenge. However, considerations of growth and innovation have not yet recognised the enormity of the influence of mental health on the European economy.

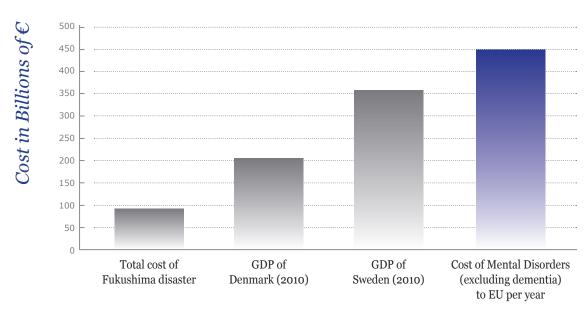


FIGURE 1.2 Illustration of the total costs of recent global expenditures and European GDP compared to yearly costs of mental disorders in Europe – all data as of 2010



The European Commission – as outlined by the Europe 2020 strategy – has a stated commitment to pursue a growth model that is "*smarter*, *more sustainable*, *and more inclusive*" (European Union, 2013). Considerations of mental health and well-being directly bear upon four of the five key Europe 2020 targets for the next decade:

- Employment via reduced opportunities to work, workplace discrimination and effects on productivity while at work
- **Education** via missed educational opportunities and limited expectations, especially in adolescence as mental health disorders start early and last a long time
- Research and innovation via improved understanding driving research leading to treatment opportunities for industry
- Social inclusion via well-known stigma that leads to disengagement or exclusion from society
- Poverty reduction mental disorders contribute to poverty (via barriers to employment, housing, education etc.) and poverty exacerbates mental health problems

Furthermore, mental health research – especially in its current state – is relevant to the 7 EU flagship initiatives: **innovation**, **the digital economy**, **employment**, **youth**, **industrial policy**, **poverty**, **and resource efficiency** (European Union, 2013). Some of the specific ways in which mental health research is linked to such initiatives are outlined below.

Employment

As noted above, mental disorders represent a barrier to employment (as well as progression to worthwhile or engaging work) through societal discrimination and workplace stigma. There is a popular myth that people with mental disorders either do not seek work, or are happy never to work. However, this is often completely untrue, and is used as an argument to reinforce workplace discrimination against people with mental health problems. For example, while only 8% of individuals with schizophrenia are employed, the majority express the desire to work (The Schizophrenia Commission, 2012). However, such individuals are overwhelmingly turned down for jobs due to stigma against workers with mental health problems (Baldwin & Marcus, 2011).

Even if such individuals do find work by hiding their mental health status from potential employers, they may then face discriminatory behaviours from their employers and co-workers (e.g. social exclusion, loss of career progression opportunities) if they subsequently disclose their problems. Individuals with mental health problems who are not in employment may also anticipate further discrimination following one or more negative experiences and so stop seeking work (Manning & White, 1995; Stuart, 2006). Often these problems stem from a lack of knowledge (more so than a lack of willingness) on the part of employers about how to provide support for well-being and mental health issues in the workplace (Manning & White, 1995; Stuart, 2006).

Mental health problems also interfere with an individual's ability to work (Schultz & Rogers, 2011). Mental health problems are associated both with increased <u>absenteeism</u>, and with going to work and not contributing 100% (<u>presenteeism</u>) – both of which are associated with substantial losses in work productivity and economic costs (Dewa & McDaid, 2011). In Germany they are the single greatest cause of loss of work productivity via <u>absenteeism</u> (DAK-Gesundheit, 2013). This can be seen in **Figure 1.3**, where the overall level of missed work days in Germany remains constant, but the number of days missed due to mental health problems more than doubles between 1997 and 2012. Together, <u>absenteeism</u>, <u>presenteeism</u>, stigma and discrimination enhance workplace difficulties for individuals with mental disorders, reducing their meaningful contributions to European economic activity.



Increasing missed days due to mental disorders vs. non-increase in other health problems

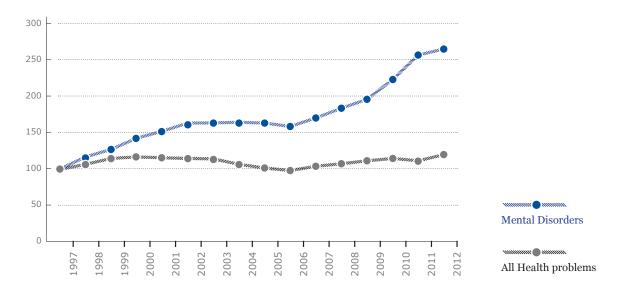


FIGURE 1.3. Mental disorders account for increasing numbers of work days missed due to sickness, while missed days due to all health problems remain constant. Year-on-year changes in missed work days as a result of mental disorders (blue) and all health problems (grey). Y-axis values are expressed as proportions of the baseline value from the year 1997. Data taken from DAK-Gesundheit, 2012

Finally, mental health and well-being research could foster growth and job opportunities in Europe. Recent advances in mental health intervention research have led to greater activity and engagement of both larger companies and SMEs in the pharmaceutical (via drug treatments) and ICT and telecoms sectors (via **eHealth** and **mHealth** initiatives)¹⁰. This is in addition to the sustainable employment offered by national infrastructures such as mental health care and research.

Avoiding the costs of mental health problems

Estimates of the direct (treatment) and indirect costs of mental disorders in Europe are of the order of hundreds of billions of Euros. However, the measures currently used in Europe and globally often underestimate the true impact of mental health problems. For example, while the **DALY** measure is an extremely useful tool, it is limited insofar as it is always a retrospective analysis. That is, it can only estimate costs that have already occurred or are currently occurring. As a result, focusing on measures of burden such as direct treatment costs and **DALYs** underestimates the costs of a health problem that might be avoided through preventative, early intervention, or health promotion initiatives (Knapp, McDaid, & Parsonage, 2011). Additionally, focusing on the costs of mental disorder rather than the avoidable costs overlooks the social and economic gains that can be achieved by preventing mental health problems and encouraging greater well-being in the population.

One crucial example of avoidable costs is the external healthcare costs produced by **comorbidities** with mental disorders. Mental disorders represent risk factors for a wide range of physical health problems (De Hert et al., 2011) and substance abuse (Merikangas et al., 2004). **Comorbid** physical health problems become more pronounced and severe – and therefore, costly – with age. **Comorbid** mental health problems have been estimated to increase healthcare costs by 45-75%, and they account for between 12 and 18% of all spending on long-term conditions (Naylor et al., 2012). In the UK alone, **comorbid** mental disorders

^{10.} The most notable example of this in Europe (for both pharmaceuticals and eHealth) is in the case of the Innovative Medications Initiative (IMI): http://www.imi.europa.eu/



in individuals with long-term conditions account for between €10 billion and €18 billion of health spending (Department of Health, 2010). For these reasons, it is vital to understand mental disorders in considerations of long term conditions and health across the lifespan.

Unlike many physical disorders that develop later in life, mental health problems start early and commonly persist over the lifespan (Prince et al., 2007). Both the number of individuals with mental disorders and the disability experienced as a result of mental disorders increase with age (Brenes et al., 2008), especially for disorders that first become apparent in childhood or adolescence (Gregory et al., 2007). This is of great direct concern to Europe given its ageing population (European Commission, 2006). The recent FUTURAGE roadmap (FUTURAGE, 2011) eloquently reviews the issues faced by older people and society and so these issues will not be repeated at length in the current report. Nevertheless, ROAMER has adhered to a life-course approach to mental disorders, spanning issues pertinent to children, adolescents, adults and older people. The increased rates of physical ill health associated with **comorbid** mental disorders are comparable to dementia in terms of costs and severity (Gustavsson et al., 2011), but are not commensurably represented in existing research and policy. In particular, the current roadmap aims to illustrate the additional value of early detection, intervention and prevention in avoiding more substantial mental health care costs further down the line.

Other examples of avoidable costs include disability benefit or unemployment benefit costs to individuals with mental health problems. These represent large sources of spending for European countries: in the UK, mental disorders are the primary cause of disability and unemployment benefits (Department for Work and Pensions, 2012). Disability and unemployment benefits are absolutely essential for individuals suffering from mental health problems, however if robust preventative and health promotion programmes for mental disorders are put in place, then these secondary costs (unfortunately generally invisible to measures of disease burden) will dissipate. Put simply, appropriate research into early detection and intervention will be far less costly than the current illness/treatment focus.

Burdens on society, families and individuals

Well-being and good mental health are linked to greater social and cultural capital and citizen engagement. These have all been identified as fundamental for a healthy and prosperous society, since they address the shortcomings of measures such as GDP in models of sustainable growth. Such theories are exemplified by the work of the New Economics Foundation (NEF)¹¹, particularly the socioeconomic value of well-being that is missed by predominant growth metrics (Michaelson et al., 2009). These ideas are accepted in Europe and many have argued that well-being assets be used as primary indicators of the growth and sustainability of a society. As articulated by the French government's Commission on the Measurement of Economic Performance and Social Progress:

"the time is ripe for our measurement system to shift emphasis from measuring economic production to measuring people's well-being. And measures of well-being should be put in a context of sustainability"

Stiglitz, Sen and Fitoussi (2009), page 12

Along the same lines, the first World Happiness Report (Sachs, Helliwell, & Layard, 2012) states that: "In addition to specific measures of economic, social, and environmental performance, governments should begin the systematic measurement of happiness itself, in both its affective and evaluative dimensions" (page 8). Though concerns have been raised about the usefulness of well-being as a concept or outcome in policy (Davies & Mehta, 2014), these are largely based on a current lack of valid and reliable population measures of well-being. Systematic considerations of what well-being measures are most useful and valid are ongoing, but what this area now most needs is comprehensive **translation research** and **knowledge exchange** between researchers and policymakers (McDaid, 2014).

^{11.} http://neweconomics.org



Furthermore, the burdens associated with mental health problems in Europe exacerbate and reinforce other existing socio-political issues, and inequalities in particular. Perhaps the most pronounced example of this is in terms of gender, which is featured prominently in the Europe 2020 document (European Union, 2013), the Horizon 2020 challenges for health and well-being (European Commission, 2013) and in a comprehensive report from the European Economic and Social Committee (Agudo i Bataller & Attard, 2013).

There are pronounced gender inequalities for a number of mental health problems. The incidence of many mental disorders is substantially higher among women than men (Alonso et al., 2004). In particular, Wittchen et al. (2011) highlight that unipolar depression is the single most debilitating health problem in Europe (in terms of impact on work, life and health), and that it is 30% more prevalent in women than in men. **Trans*** individuals are also at greater risk than the general population for debilitating mental disorders and socioeconomic deprivation of all varieties (Haas et al., 2011; Takács, ILGA-Europe, & IGLYO, 2006). A large part of this burden is probably due to such individuals being subjected to multiple sources of inequality (Verloo, 2006) and social exclusion (Takács et al., 2006).

Mental health problems also represent burdens to families and caregivers, for example via constraints on time, employability, and economic productivity (Schultz & Rogers, 2011). Of note, no financial support for carers available in Europe matches the value of the equivalent number of hours of formal employment that are taken up by caregiving (Bettio & Plantenga, 2004). **Informal carers** – usually, family members and disproportionately female (Dahlberg, Demack, & Bambra, 2007) – additionally have higher rates of stress and common mental disorders than the general population (Hammond, Weinberg, & Cummins, 2014; Stansfeld et al., 2014). As well as having to provide care, families (and other **informal caregivers**) may experience stigma themselves, which serves to accentuate the stressors they face (Foresight Mental Capital and Wellbeing Project, 2008). Once more, these issues exacerbate existing inequalities, placing a disproportionate burden upon women, and individuals with lower socioeconomic status or from minority ethnic backgrounds.

Social inclusion – Social support and social isolation are associated with mental disorders in different ways. Social support has consistently proved to be one of the most predictive **resilience** factors for mental health (Cohen, 2004), and access to robust social support networks greatly improves treatment outcomes across a wide range of disorders (Coplan et al., 2013; Huxley & Thornicroft, 2003; Rothon, Goodwin, & Stansfeld, 2012; Thoits, 2011). However, those individuals who would most benefit from social support often have the least access to it. The development of mental disorder symptoms is associated with social withdrawal and isolation across the lifespan in a range of disorders (Fombonne, Wostear, Cooper, Harrington, & Rutter, 2001a, 2001b; Shankar, McMunn, Banks, & Steptoe, 2011; Yan & Dix, 2014). This absence of social support then amplifies negative outcomes. Stigma and discrimination are also important considerations here as they are strong contributing factors to decreased social support for individuals with mental health problems (Lauber, Nordt, Falcato, & Rössler, 2004).

Relevance

Investment

Although the costs associated with poor mental health are a large problem for the EU, there is little evidence that adequate research funding has been attributed to finding solutions. The average funding across all health problems in Europe is €25 per **DALY**. However, funding for research into mental disorders is far lower, with the funding for depression research in Europe being €4 per **DALY**, and funding for research into bipolar disorder only €2.9 (Catalá López, Álvarez Martín, Gènova Maleras, & Morant Ginestar, 2009). The only mental disorder that is not lower than the average is schizophrenia, with €35.8 per **DALY**. Schizophrenia is, however, a special case where it is clear that the actual lifetime care costs per individual is much higher than for other disorders – estimated at €123,000 per year as of 2012 (The Schizophrenia Commission, 2012).



Recent health economic models have showcased the value for money of investing in mental health research. For every euro spent on mental health research it is estimated that there is a recurring 0.37 euro return per year (Cyhlarova, McCulloch, McGuffin, & Wykes, 2010). Public investment in mental health research is a timely concern, as private funding for developing new treatments and interventions in psychiatry is decreasing — not least because of the withdrawal of pharmaceutical companies from the mental health arena. This withdrawal has exacerbated existing difficulties for conducting mental health research, namely low levels of national funding and limited coordination of mental health research initiatives at the European level (Cyhlarova et al., 2010). Perhaps the most pertinent feature of the lack of coordination of mental health research and policy is the relative absence of strategies aimed at mental health at a population-wide level, which are necessary considerations for questions of public health (Haro et al., 2014).

There is variability in spending on the treatment of mental health problems, but this spending is always below the level of disability unlike in other health areas. The same holds for spending on mental health research, as shown by **Figure 1.4**.

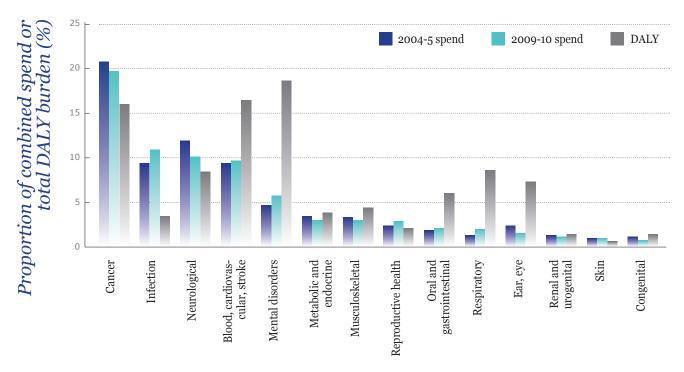


FIGURE 1.4. Spending on research for different health problems as a proportion of national research budget in the UK, compared to the percentage of disability they account for across all health problems. Figure taken from Kingdon and Wykes (2013)

Nature and scope of mental health research

ROAMER represents all approaches to mental health from a variety of academic disciplines. Its scope encompasses issues of public health, sociological and economic considerations, and **basic** psychological and biomedical theory. It also takes into account the interests of **stakeholders**, including individuals with mental health problems, their families, employers, healthcare providers, healthcare workers, education workers, policymakers and industry.

A key issue throughout this roadmap, as well as in other notable European documents on health (e.g. European Commission, 2013; European Parliament, 2009), is the importance of the personalisation of healthcare. The potential of **personalised and person-centred care** to revolutionise health has been eloquently



addressed by previous roadmaps for diabetes (DIAMAP: A road map for diabetes research in Europe, 2010)¹² and ageing (FUTURAGE, 2011)¹³ – and the opportunities for coordinated European research in the field of personalisation of mental health care and treatment are no less promising.

However, there is ambiguity in terms relating to 'personalisation'. Throughout this document the term 'personalised care' has been used to cohere with common European terminology in Horizon 2020. As 'mental health research' encompasses population and public health research (including clinical research), monitoring of health services and service implementation, individual traits and risk factors, as well as biological research, a term such as 'personalised care' can have very different connotations depending on what contexts it is used in.

For example, 'personalisation' or '**personalised care**' can, at the clinical level, mean identifying clinical profiles to predict specific treatment outcomes for an individual. These will likely vary across the lifespan or the course of a disorder. Patient-centred research can establish clinical risk profiles for different individual service users or groups. These can then be used to tailor treatment to an individual. For example, different treatments may be recommended for service users with a sole diagnosis of depression versus individuals with **comorbid** anxiety and depression, or different interventions may be recommended for individuals experiencing their first versus their fourth psychotic episode.

By contrast, when considering risk factors at genetic or cellular levels, 'personalised care' may be closer in meaning to terms such as 'stratified medicine' or 'precision medicine' – approaches that use genetic and/or endophenotypic measures to allow more precise diagnostics and better targeting of treatments (see examples in Owen, Rupprecht, & Nutt, 2013; Robbins, Gillan, Smith, de Wit, & Ersche, 2012; Schumann et al., 2014). Here rather than clinical profile, treatments would be based on the presence of certain alleles – for example whether an individual has a short or long serotonin transporter gene in the case of depression.

At the public health level, 'personalised care' encompasses 'person-centred care' — personalisation resulting from developments in care and treatment that take account of wider (social, economic, infrastructural) effects on an individual's mental health and well-being as well as making that individual central to decisions about their own care and treatment (i.e. "Shared Decision Making" Laugharne & Priebe, 2006; Loos et al., 2013). Relatedly, clinical research has methods to include patient perspectives by the use of service user preferences in Randomised Controlled Trials (RCTs), as well as measuring how closely clinicians, therapists and service users adhere to treatment guidelines or best practice.

European Competitive Advantage in Mental Health

A central consideration of the current report is to highlight European strengths in the field of mental health research. This refers not only to existing expertise – e.g. of individual nation states or research groups – in Europe, but also of organisational structures and research infrastructures that afford high quality, influential and impactful research now and in the near future.

Recent reviews have looked into what kinds of research have the greatest impact. One example (though focused on the Anglophone countries of the UK, the USA and Canada rather than Europe) is the recent RAND Mental Health Retrosight report (Wooding et al., 2013). This report followed schizophrenia research forwards from its inception to potential translation, as well as backwards from notable developments in interventions, over a 20-year period. It examined research outcomes in academic, health, social and economic

^{12.} http://www.diamap.eu/

¹³ http://www.futurage.group.shef.ac.uk/



terms, as well as translation into policy and practice. A key finding was that **clinical research** has the greatest impact on subsequent changes to clinical care both in the short and long term. **Basic research** was also important, but its impact was felt in different ways – for example over longer timeframes than **20** years, or through providing the theoretical base for other **clinical research**. Another key finding was that the greatest social and health benefits of research were achieved by interdisciplinary research teams.

Accordingly, Europe would be well served by research that capitalises on its strengths in **clinical**, **translational** and **basic science** research in mental health, together with existing infrastructure that supports these efforts. Capacity building would also be necessary to ensure that this infrastructure continues to be supported in future. Encouragingly, the European Commission has recently noted the importance of **translational research** and of coordinated **implementation science** for mental health practice and policy (European Commission, 2014a). In order to coordinate this kind of impactful research, we need to first develop an understanding of the existing strengths in mental health research, and how these vary across Europe ¹⁴. This has been a central theme in ROAMER, as first illustrated in interim report **D11.1** "First report on the state of the art" (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Schumann, et al., 2013).

Figures 1.5-1.9 illustrate the geographical variation in mental health research published in Europe during a 5 year period from 2007-2012. Based on pre-identified areas of interest in research, ROAMER Work Package 2¹⁵ mapped the numbers of studies conducted in 5 different areas of research within mental health (epidemiology; clinical **RCTs**; biological: genetics and imaging; psychological therapy; and mental health stigma), across different European countries ¹⁶. These figures show that the most prevalent forms of mental health research in Europe currently are epidemiological (**Figure 1.5**) and biological/biomedical studies (**Figure 1.6**). These are followed by clinical and psychological studies (**Figures 1.7** and **1.8**). Finally, studies of mental health stigma are currently the least prevalent form of mental health research of those we compared (**Figure 1.9**).

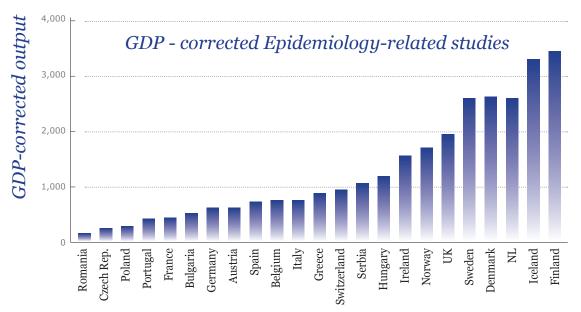


FIGURE 1.5: Output of mental health epidemiology papers by European country 2007-2012, scaled by GDP

^{14.} i.e. EU-28 countries, plus EU Candidate countries and other European countries.

^{15.} The work package dedicated to examining "Geographic, multidisciplinary and lifespan viewpoints" of mental health research. See **Section 4** of the roadmap (**ROAMER Method**) and **Appendices IV** and **V** for more details.

^{16.} A more detailed account of the literature mapping process is given in **Section 4** of this roadmap. A full account of the literature mapping process and results is given in **D11.1** (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Schumann, et al., 2013). Full search terms for the literature mappings are given in **Appendix IV**.



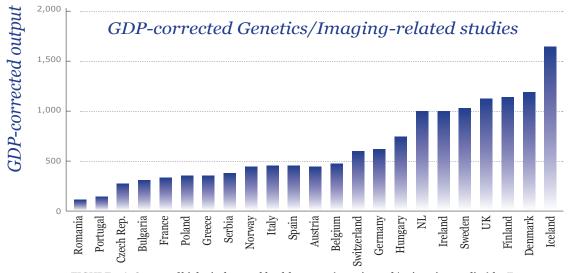


FIGURE 1.6: Output of biological mental health papers (genetics and/or imaging studies) by European country 2007-2012, scaled by GDP

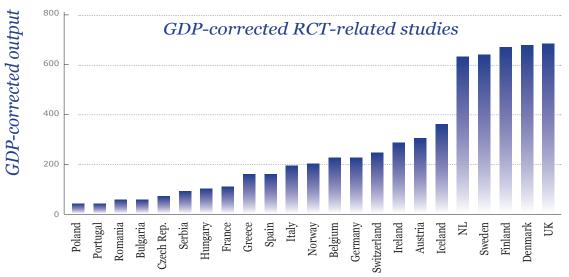
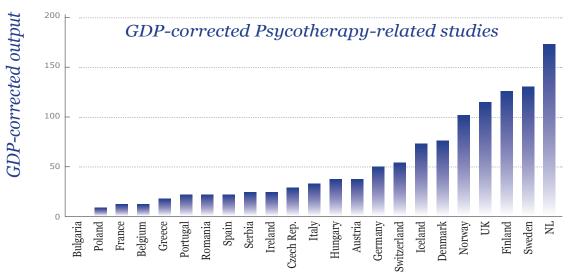


FIGURE 1.7: Output of mental health clinical RCT papers by European country 2007-2012, scaled by GDP



FIGURE~1.8:~Output~of~mental~health~papers~on~psychotherapy~by~European~country~2007-2012,~scaled~by~GDP~and the country~2007-2012,~scaled~by~GDP~and the~2007-2012,~scaled~by~gDP~and t



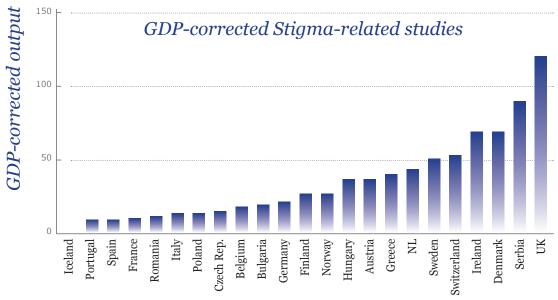


FIGURE 1.9: Output of mental health stigma papers by European country 2007-2012, scaled by GDP

Figures 1.5-1.9 illustrate the diversity in mental health research across different European countries after correcting for a country's GDP. Some countries produce more research output in all areas: namely, the UK, Sweden, Denmark, Finland and Norway. However, the graphs also reveal that some countries are disproportionately strong in some research areas. For instance, while Iceland produced no output relating to mental health stigma from 2007-2012, it is the most prolific producer of biological and epidemiological research in Europe (after controlling for GDP). This is driven by the fact that deCODE's genetic mapping projects ¹⁷ are based in Iceland, to take advantage of its small population that has been well genetically profiled. The Netherlands is disproportionately strong in research into psychotherapy. Serbia, which has low general mental health research output, is the near-leader in Europe for publications relating to stigma. These complementary strengths allow us to see the immense potential value added by collaboration across European member states.

As different countries have different research cultures and uses of vocabulary we have tried to standardise terminology to some extent through our creation of a comprehensive glossary for key terms. Key technical terms throughout the report are denoted by bold and underlined text, and the glossary is included as **Appendix I**.

European research capacities

ROAMER's priorities for mental health and well-being research aim to build upon a European legacy of excellent science and, in doing so, tackle pertinent societal challenges. This requires a comprehensive overview covering the breadth of scope of European mental health research identified above.

European research is perhaps singularly well-placed to address many issues in mental health, as it has research strengths and world leading **centres of excellence** spanning academic disciplines, from molecular biology to epidemiology and public health and thus encompassing all the requirements for developing research along the **translational** path to **personalised care**. This expertise is competitive on a world stage.

One of Europe's unique advantages is its excellent public data registries and isolated populations for study. European Reference Networks¹⁸ are existing structures that can help with the coordination and sharing of new and longitudinal mental health datasets, as well as standardising databases and measures across Europe. Moreover, the value and utility of European Reference Networks in personalising health care has already been noted by Horizon 2020 (European Commission, 2013).

^{17.} http://www.decode.com/map-of-the-human-genome/

^{18.} http://ec.europa.eu/health/ern/policy/index_en.htm



The organisation of healthcare in Europe greatly facilitates **clinical**, **translational**, **implementation** and public mental health research, relative to other parts of the world. Stable healthcare systems providing almost universal care in Europe ensure comprehensive, lifespan datasets (European Parliament, 2009). But a further advantage is that health and welfare systems differ across countries. This allows for natural experiments on the implementation of different mental health care treatments and policies and for comparisons of different existing systems.

Europe's health systems also offer the ability to collect 'big data' from universal healthcare systems. The comprehensive European public health registers avoids skewed data as datasets are anchored to epidemiological variables, unlike in mixed-market health systems which have more reliance on the private sector, e.g. as in the United States. This means that research in Europe has access to more representative samples, and greater external validity in terms of population treatment and generalisation. The systems also allow easier follow up via national health services so that longitudinal data are available or can be accessed over considerable lengths of time.

Summary

- Mental health problems represent a huge burden to the EU, felt across all of society
- The current response to these issues is disproportionately small mental health problems account for 11-27% of Europe's disability burden, but only receive 6% of funding
- Europe is home to world leading expertise and infrastructure in the many areas that contribute to mental health and well-being research
- Healthcare systems are a benefit that would facilitate world-leading mental health research conducted in Europe

In this context, ROAMER has developed a comprehensive mental health research roadmap, orientated to **translational research**, sensitive to potential shifts in future needs in light of demographic changes, aligned with the policies of the Horizon 2020 programme, and addressing a pragmatic approach to matching mental health research to needs.

The remainder of the roadmap presents and justifies a list of priorities for mental health research in Europe. Suggestions have been considered by the scientific community as well as by **stakeholder** groups. Their likely costs and chances of impact on mental health burdens and the European agenda of competitiveness, growth and jobs have been assessed, and the results of this procedure are elaborated over the course of this report and its appendices. The final recommendations will balance the priority levels of each of the identified gaps in research.





2. ROAMER List of Priorities for Mental Health and Well-being Research

he priorities for mental health research listed below are structured such that they begin with research at the population level, becoming gradually more specified to the individual level, on to biological and other **basic research**, and then finally outlining the necessary research capacities and infrastructures to realise these needed research advances. Proposed advances are grouped thematically into 5 general headings. The order of presentation does not reflect the priority or prominence assigned to any given research advance.





A) Supporting Mental Health for All

- Research is required into the quality of mental health services across Europe. This requires
 quantitative and qualitative interdisciplinary research across countries with different health systems
 and cultures, to investigate how these systems affect service users and population-level mental health
 outcomes.
- 2. Research is required into patient treatment and intervention preferences, as well as how to support and empower people with mental health problems, their families and other carers to improve well-being. The evidence base, particularly for younger carers, needs to be strengthened and the disproportionate burden of care that falls upon women should be investigated. Research on continuation of non-effective treatments should harness the involvement of healthcare staff and service users.
- 3. Research is needed that focuses on improving access to mental health resources, in reducing inequality in service provision, and in encouraging health systems to make better use of community assets. Implementation research is a useful but under-utilised tool in ensuring access and adherence to service users' preferred, tolerable treatments and interventions. In addition to disorder prevention, services should aim to promote mental health and well-being.
- 4. There should be **more research into preventative measures**, **resilience factors**, **and buffer interventions** for positive mental health and well-being, as part of a wider focus on positive mental health and well-being. This requires investigating both societal (e.g. economic crises) and personal factors (e.g. lifestyle and behaviour change). Novel interventions research (e.g. eHealth and self-management of disorders) will elucidate these factors and their relationship to each other for instance relationships between psychopathology and subjective well-being.
- 5. There should be a **focus on developing novel**, **safe**, **and effective interventions** using new scientific and technological advances (e.g. Technology-enabled interventions). Interventions and diagnoses will be based on developments in mental health research. Studies are required of applications for routine health care settings, investigating increasing adherence and evaluating new interventions as they are implemented. This research needs a participatory approach including target groups together with research on translation into policy and wider dissemination.

B) Responding to Societal Values and Issues

- 1. Research is needed that uses economic approaches to measure benefits in interventions for the promotion and protection of mental health and well-being across Europe. This should range from low-level behavioural economics (e.g. behaviour change, motivation/incentives), to determining the cost-effectiveness of different ways of funding, regulating and organising mental health services. These analyses are especially needed to investigate the costs of comorbidity.
- 2. Research **outcomes should be expanded to include useful new indices of wider social and economic outcomes** (e.g. employment, housing, education, social life, happiness), and interventions need to be developed that directly target these. Policy implementations (including those addressing e.g. education, parenting and schooling) and any changes to the delivery of care must be robustly evaluated, for instance by systematic natural-experiment methodology. There especially need to be closer links between policymakers and researchers with regards to evidence-based policy in mental health and well-being.
- 3. There is a need to address the international, social and cultural context which results in mental health disparities, with especial reference to under-researched groups such as at-risk,



- **disadvantaged, or marginalised populations**. These contexts include economic inequality, lifestyles, population well-being, effects of public and economic policy, ethnicity, religion, and nationality.
- 4. There needs to be more research into **protection of the rights of people with mental health problems, including a consideration of the effects of stigma and discrimination**. In particular the potential reciprocal relationship between stigmatisation (including self stigma) and mental ill health can be addressed in evidence-based interventions, especially randomised trials. This should lead to research and interventions aimed at increased social inclusion, as well as secondary stigma effects on carers.

C. Life Course Perspective of Mental Health Problems

- 1. There needs to be a greater focus on the aetiology, development and progression of symptoms, syndromes and well-being across the lifespan. This requires research on conceptualising developmental risk and resilience factors and outcomes on various levels, including proxy and intermediate outcome measures (e.g. transcription, gene-environment relationships, epigenetics, stress exposure, cognitive control). Potential causal associations between mental health and cognition should be considered in terms of ageing, especially how this might inform interventions.
- 2. Analyses of existing datasets should be carried out, as well as new longitudinal and clinical cohort studies (with nested RCTs), including children and older adults. This would be especially valuable in pan-European collaborations, so that larger cohorts would be formed. In addition a focus on significant or stressful events, transitions (e.g. return to work, adolescence, transition to older age, suicidal behaviour) and chronic issues across the life-span (e.g. absenteeism/presenteeism, employability of individuals with long-term illness or disability) with regards to mental health and subjective well-being would be useful.
- 3. Research and interventions for children and adolescents (including parenting) are crucial to understand how early experience and wider social influences affect health over the life-course, including identifying risk factors. This research will require age-appropriate measures and should guide the development of new, early and preventative interventions to help improve outcomes in these populations.

D. Research Towards Personalised Care

- Research is required into the aetiology and mechanisms of mental disorders, mental health
 and related behaviours through use of '-omics' and bio-markers (adapted from validated biological/animal models) and other basic (psychological and social) science. This research should be directed towards developing novel interventions and understanding their therapeutic mechanisms.
- 2. There needs to be more research into **diagnostic strategies and the stratification of mental disorders**, discovering valid subtypes and individual variations with differential treatment outcomes. These should be based on neurobehavioural or cognitive markers and other validated empirical findings rather than commercial or professional interests including findings at the (epi-) genetic level, through endophenotypes, neuroimaging, experimental psychobiology, and identified progressive stages of disorders.
- 3. Research is needed concerning the comorbidity of mental disorders with one another, and with somatic disorders. Improvements in understanding can only be achieved through adhering to agreed common standards (e.g. outcome measures, methods of measurement), and addressing comor-



- bidity in terms of progression, underlying physiological and cognitive mechanisms, and risk factors. Clinical research is required for a thorough consideration of the treatment implications for comorbidity.
- 4. Research on **standardising methodologies for mental health treatment research** (including economic analysis) is essential to ensure better design of randomised trials of pharmacological, psychological and combined and complex interventions. Where appropriate, this would involve close working with industry in a pre-competitive framework. Better understanding is needed of the mechanisms of treatment response (e.g. to CBT), and of whether alternatives to randomised designs may be possible for such research.

E. Building Research Capacities

- Shared databases (biobanks, specialist cohorts, mental health registries, status surveys, normative data of subjective well-being etc.), should be strongly encouraged across Europe. These should be open access, and as visible as possible. Research outcomes, databases and terminology (e.g. 'well-being', 'mental health', 'personalised care') should be standardised to facilitate data-sharing and collaboration.
- 2. **International and interdisciplinary research networks** should be developed and maintained for knowledge exchange and rigorously standardised and coordinated research training and practice. Networks should make use of common research infrastructures, including genetic and neuroimaging resources. Specifically collaborative research and large European initiatives should have access to adequate funding.
- 3. There needs to be a greater focus on a **strong and interdisciplinary empirical research base in mental health**, and consideration of mental health issues in training courses such as public health and epidemiology. Career opportunities should be created for academics with research training, with funding infrastructure that can quickly respond to emergent issues, as well as sufficient long-term funding dedicated to mental health research.
- 4. **Stakeholders need to be involved in research, and this includes individuals with mental health problems**. This could be achieved by greater transparency and horizontal organisation in mental health research strategy and agenda-setting, with service users identifying problems and proposing research outcomes. Basic research training should be provided to all healthcare professionals.





3. High Level Priorities for Policy Action

After generating the 20 priorities above, ROAMER conducted an evaluation of their relevance and of the capacities of the EU (and its member states) to achieve them. This process produced six high-level priorities, listed below. The priorities were chosen using an extensive survey of more than 700 participants representing research scientists from many disciplines, service users, carers, psychiatrists, psychologists and other health-care professionals, public health and education sector associations, and industry. Survey participants were asked to rate each of the 20 ROAMER priorities (see **Section 2**) in terms of the relevance of likely impact of the research, and how feasible/appropriate this research would be to conduct in Europe. Further details of the ROAMER survey are given in **Section 4**: 'ROAMER Method' and **Appendix VI**. This extended survey process gave rise to the following six high-level research priorities for policy action:

- 1. Research into mental disorder prevention, mental health promotion and other interventions in children, adolescents and young adults
- 2. Focus on the development and causal mechanisms of mental health symptoms, syndromes and well-being across the lifespan (including older populations)
- 3. Developing and maintaining international and interdisciplinary research networks and shared databases
- 4. Developing and implementing better interventions using new scientific and technological advances
- 5. Reducing stigma and empowering service users and carers in decisions about mental health research
- 6. Health and social systems research that addresses quality of care and takes account of socio-cultural and socioeconomic contexts and approaches

Justifications and Relevance of High-Level Priorities for Policy Action

Each of the 6 ROAMER high-level research priorities for policy action can be resolved in the next 5 to 10 years with a coordinated approach to capacity building in addition to funding opportunities at the European level. Each high-level priority is presented below with accounts of their relevance and deliverability in Europe, as well as highlighting the specific implications for policy, social and economic objectives. For clarity, each priority is also presented with example illustrative research questions (or actions) generated by ROAM-ER work packages. A more comprehensive list of suggestions for future research and infrastructural projects and questions is given in **Appendix II**.

All priorities contribute to objectives 3, 4 and 5 of the Europe 2020 growth strategy (European Union, 2013): "getting 3 % of the EU's GDP invested into research and development", "reducing school dropout rates to below 10%, with at least 40% of 30–34-year-olds completing tertiary education" and "ensuring 20 million fewer people are at risk of poverty or social exclusion". Additionally, all priorities contribute to 'The demographic future of Europe – from challenge to opportunity' objective 3 –"raising productivity and economic performance through investing in education and research" (European Commission, 2006).



1) Research into mental disorder prevention, mental health promotion and other interventions for mental disorders in children, adolescents and young adults

Overview: Research into the understanding of mental health needs to cover the whole lifespan. Childhood and adolescence deserve particular attention as this is when (neuro)developmental disorders become apparent, and is a high-risk period for other mental disorders. Research on interventions for children, adolescents and young adults (including family and education system interventions) is crucial for understanding how early experience and wider social influences affect health across life. This research will require age-appropriate measures. There should be more research into preventative measures, **resilience** factors, and buffer interventions for mental health both in early life and across the lifespan, as part of a wider focus on positive mental health and well-being.

Impact, economic benefits and avoidable costs: Interventions targeting the early years and parenting have potential for long-term beneficial effects. Early interventions are cost-effective by preventing the economic and public health burdens associated with mental disorders. As well as improving treatment options for younger people, research focused on childhood and adolescence is necessary to address missed educational opportunities as a result of experiencing mental health problems early in life.

The impact of disorder prevention and health promotion research would be considerable, both clinically and from a public health perspective. The estimated returns on a one euro investment could be as high as €10.27 for early screening, €17.97 for mental disorder prevention and €83.73 for mental health promotion (Knapp et al., 2011). Subjective well-being is an important European policy outcome because of its potential effects on economic productivity, especially among younger people (Jeffrey, Mahony, Michaelson, & Abdallah, 2014; Miret et al., 2015).



- 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 years 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)

Overview: This advance requires research on the mechanisms by which known risk or **resilience** factors bring about mental disorder or mental health. Investigations of **aetiology** (causes, development and progress) of mental disorders should make use of **basic** (**biological**, **psychological** and **social**) **science**. Associations between mental health and cognition should be considered in terms of ageing, especially how this might inform interventions in older adults. This question encompasses research on **comorbidity** of mental disorders with one another and with physical health problems. In particular, **clinical research** is needed to determine the treatment implications of **comorbidity**.

Analyses of existing longitudinal datasets and the development of new longitudinal and clinical cohort studies will provide valuable evidence about **aetiology**. In addition, a focus on significant or stressful events, transitions (e.g. return to work, adolescence, transition to older age) and chronic issues across the lifespan (e.g. **absenteeism** and **presenteeism**, employability of individuals with long-term illness or disability) in relation to mental health and subjective well-being would be very useful.

Impact, economic benefits and avoidable costs: Understanding specific mechanisms underlying mental health problems will allow more effective targeting of treatments and interventions and more personalised care, thereby reducing disability and unemployment at the population level. Stratification of service users using markers from basic science will bring about more intelligently focused use of healthcare resources – including combinations of treatments or complex interventions. This is of particular relevance to comorbid disorders, which greatly increase disability as well as treatment and care costs. For depression, comorbidity (having 2 or more disorders at the same time) has been shown to result in health costs between 17% and 46% higher than in individuals without depression (Chisholm et al., 2003). Experiencing depression while having asthma increases medical costs by 140% (Naylor et al., 2012). Understanding the interactions between mental disorders and physical health will have a positive impact on the leading causes of mortality in Europe (e.g. cardiovascular disease) as well as on chronic, disabling mental disorders.

Basic science markers can also improve the cost-effectiveness of intervention studies. Markers are particularly useful for extracting information about likely outcomes while longitudinal studies are ongoing – i.e. before the final follow-up. Making fuller use of longitudinal, cohort and **biobank** studies (and adding new measures to these) is not only feasible, but an extremely cost-effective use of existing data.

- 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 to 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

Overview: Adequately funded, large-scale, collaborative projects provide the easiest way to build research capacity across Europe. Shared and <u>open access</u> databases (<u>biobanks</u>, specialist cohorts, mental health registries, status surveys, normative data of subjective well-being, etc.), should be strongly supported and facilitated across Europe. Research outcomes, databases and terminology (e.g. '<u>well-being</u>', 'mental health', '<u>personalised care</u>') should be standardised to facilitate data-sharing and collaboration.

Improving training capacities is an important step for maximising Europe's research potential. We need researchers trained in the variety of disciplines involved in mental health research, including service user involvement. Education for healthcare professionals, together with this researcher training, would ensure an understanding of treatments, research outputs and contexts to ease the translation into health services.

Impact, economic benefits and avoidable costs: The wide variety of disciplines conducting mental health research in Europe offers an opportunity to pool complementary resources into **networks of excellence**, stimulating **translational medicine** and preventative interventions for mental disorders. This would provide the knowledge base for the development of novel drugs, psychosocial programmes and other interventions.

A systematic knowledge exchange in Europe would be a step towards reaching the 'critical mass' for a leading position in mental health research worldwide. **Knowledge exchange** networks would greatly benefit from including service users, healthcare workers and other **stakeholders**, in terms of generating the most effective means of translating research into practice. Establishing clear and visible research projects and infrastructure with opportunities for international and interdisciplinary collaboration would also make the area of mental health more attractive to young researchers.

Standardising results and information across databases would facilitate meta-analyses across Europe, allowing comparisons across nations, healthcare systems, cultures and research backgrounds. This would allow for cost-effective Europe-wide systematic reviews and meta-analyses and would maximise the usefulness of existing data through secondary analyses.



Illustrative Research Infrastructure Needs:

- 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 for mental health and well-being, using new scientific and technological advances

Overview: Investigations of the efficacy of interventions and treatment adherence are needed, with a particular focus on scalability – i.e. ensuring that breakthroughs in research can be effectively implemented in health services. This research needs a participatory approach, including target groups of service users or healthcare workers in the design and management of projects. Scalability is especially important for **translational research** where interventions are not directly delivered through healthcare systems (e.g. in the case of public campaigns or social or educational policy), which would need the involvement of appropriate **stakeholders**. There should also be a focus on developing new and better interventions using scientific and technological advances (e.g. **eHealth**, **mHealth** and other technology-enabled interventions).

Impact, economic benefits and avoidable costs: Appropriate translation of new research knowledge into interventions will ensure the most effective **personalised treatment**. Rigorous evaluation of novel interventions as they are implemented will improve the understanding of how variations in usual care practices affect service user outcomes. This will aid the design of culturally and socially adapted interventions. For example, the divide in digital literacy must be taken into account to ensure that technological advances do not contribute to widening health inequalities.

There is a need for improved models of how research breakthroughs are transferred into routine care. This process must take into account the needs of healthcare professionals, individuals with mental health problems and their families. The European Commission has recently acknowledged the importance of translation of research findings for improving decision-making in healthcare, education and social policy (European Commission, 2014a).

The development of new interventions can also positively influence European growth and job creation, for instance in the social services, pharmaceutical and ICT sectors. **eHealth** and **mHealth** platforms could improve both the effectiveness and cost-effectiveness of care by improving healthcare professionals' adherence to evidence-based guidelines, or in some cases by supplementing more expensive face-to-face interventions with cheaper, effective **eMental health** applications.

- Strengthening research on new approaches and technology for mental health promotion, disorder prevention, mental healthcare and social service delivery
 - Testing the value of internet-based treatments as automated versions of standard psychological treatments in specialized 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 patients' 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 and empowering service users and carers in decisions about mental health research

Overview: Research is required on treatment and intervention preferences, as well as how to improve the well-being of individuals with mental health problems, their families and other carers. Burdens of care are borne disproportionately by individuals and groups who experience marginalisation or are otherwise of lower socioeconomic status. Two such groups that require special attention are younger caregivers and female family members.

Mental health research strategy and agenda-setting should include service users to identify problems and propose research outcomes. There are good examples of this kind of agenda-setting in Europe (Rose, 2014; Thornicroft & Slade, 2014). For example, the Database of Uncertainties about the Effects of Treatments (DUETS), set up by the James Lind Alliance, has a structured approach to include **stakeholder** research questions and concerns about different interventions (Cowan, 2010). There also needs to be more research on protection of the rights of people with mental health problems and their families, including a consideration of the mechanisms and consequences of stigma and discrimination (Evans-Lacko et al., 2014). This should lead to research and interventions aimed at increased social inclusion, as well as secondary stigma effects on carers.

Impact, economic benefits and avoidable costs: Service user involvement in research would increase treatment adherence and enhance the development of policies that encourage service user autonomy. Autonomy – both within and outside the health sector – has been identified as a key priority in recent documents produced by both service users and international human rights organisations (United Nations, 2008). Research on discrimination and the protection of the rights of people affected (directly or indirectly) by mental disorders is also needed in order to avoid discrimination and protect fundamental rights. This research (and its dissemination) will promote social inclusion, contribute to the removal of stigma surrounding mental health problems, and advance public awareness of – and participation in – mental health promotion.

Demographic and economic changes across Europe make it clear that there will be an increased reliance on **informal care**, which is typically provided by female family members. The available research suggests that caregiving involves a considerable loss in happiness; however, not all caregivers show such a decrease. More comprehensive research should take account of the community and social contexts that predict well-being outcomes for carers (especially young caregivers) and support rational decisions by public health policy-makers.

- 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 determine how they can be evaluated and by whom, along with their cost-effectiveness



6) Health and social systems research that addresses quality of mental health care and takes account of socio-cultural and socioeconomic contexts and approaches

Overview: Research on mental health service quality across Europe requires quantitative and qualitative interdisciplinary research across countries with different health systems. The international, social and cultural contexts of health and social services may affect mental health disparities, especially in at-risk, disadvantaged, or marginalised groups. These contexts include economic inequality, lifestyles, population well-being, ethnicity, religion, gender, sexuality, nationality and public and economic policy. Policy implementations (including education and parenting) and any changes to the delivery of care must be robustly evaluated, for instance by systematic natural-experiment methodology – thus promoting closer links between researchers, policymakers and those affected by these natural experiments.

Impact, economic benefits and avoidable costs: Reorganisation of healthcare systems may be forced on Europe by external events (e.g. ageing populations). Policymakers will need evidence-based models to inform their decisions, such as the use of economic approaches to assess the avoidable costs to society by providing appropriate prevention and mental health promotion strategies.

Poverty reduction, family and parenting support, health promotion in schools and universal access to care have all been linked with reducing mental health inequalities. A broadened scientific scope will contribute to better public mental health actions to improve the mental health of Europeans. New models of mental disorder incorporating socioeconomic contexts can underpin new approaches to care and rehabilitation.

Research in this area will improve social cohesion and inclusion, which is a European social policy aim. There is both a need and a willingness to pursue this research track – as clearly stated in the objectives for the Europe 2020 growth strategy.

- Investigating the impact of differences in the organisation and delivery of national healthcare systems and social services on the 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





4. ROAMER Method

ROAMER Overview

Scope of the ROAMER project

ROAMER covers all mental and behavioural disorders included in the 2010 Global Burden of Disease Study (World Health Organization, 2008) and excludes neurological (e.g. epilepsy, migraine, Parkinson's disease) and neurodegenerative disorders (Alzheimer's disease and other dementias). It encompasses population and public health, monitoring of health services and service implementation, social and cultural contexts, **clinical trials**, individual traits and risk factors, and research at cellular levels. Substance and alcohol use disorders were excluded from ROAMER, given that the contemporary ALICE RAP roadmap is exclusively dedicated to such issues.

Design of the ROAMER project

ROAMER was designed to span all EU-28 countries, with a focus on excellent science, **stakeholder** engagement and a consideration of the life-course aspects of mental health and well-being. It sought to be as inclusive and participatory as possible – incorporating not only the views of an array of research scientists from many disciplines, but also individuals with mental health problems, carers, education workers, social workers, family organisations, industry, policymakers, public health experts, funding institutions and others. The project started in October 2011 and has taken place over a 3.5 year period, with the final report being delivered in March 2015.

As noted in the Introduction (**Section 1**), ROAMER addresses a number of issues that characterise mental health and well-being research in Europe. To re-iterate, these are:

- Mental health issues represent a huge burden to the EU
- This burden is felt across all of society
- The current response to these issues is disproportionately small
- Europe is home to expertise in the many areas that contribute to mental health and well-being research, and this existing infrastructure must be capitalised upon

Towards these goals, ROAMER established six domains of research: i) Infrastructures and capacity building, ii) Biomedicine, iii) Psychological research and interventions, iv) Social and economic issues, v) Public health, and vi) Well-being. These themes are embedded in the ROAMER scientific Work Packages 3-8. Each work package comprised renowned scientists, and was led by experts in their respective fields. Participants were selected based on their expertise and complementarity, also taking into account gender and geographic representation. Work package participants defined the scope of their respective domains of research within mental health, deciding the main issues to be covered.

These work packages were reviewed and guided by two advisory boards: a **Scientific Advisory Board** comprised of expert researchers, and a **Stakeholder Advisory Board** comprised of associations representing individuals with mental health problems, families, healthcare workers, psychiatrists, policymakers, social workers and other groups (see **Figure 4.1** and the list of advisory board participants at the end of the document).

In addition, a Clinical Research Task Force was set up following a review at the halfway stage of the project by ROAMER's Scientific and Stakeholder Advisory Boards (see **Figure 4.1**). This was in response to feedback from scientific experts and **stakeholders** that the organisation of work packages in the early stages of the project did not represent **clinical research** strongly enough. Accordingly, a cross-work-package Clinical Research Task Force was established to produce reports and research priorities (in a way analogous to

^{19.} A full list of participants in all 11 of the ROAMER work packages (and advisory boards) is given in Appendix V.



individual work packages), but with a particular focus on **clinical research** that spanned the remits of other work packages. For example, **clinical research** practices and findings are equally applicable to testing outcomes of new drugs (Work Package 4), new psychotherapies (Work Package 5), or changes in access to services (Work Packages 6/7). The Clinical Research Task Force therefore ensured that this breadth of relevance was captured. The process also reflects the centrality of **clinical research** to mental health and well-being research — especially as it relates to practice and policy.

There were also a number of other ROAMER work packages complementing this research and ensuring that it was successfully translated into an effective and useful resource. As noted in **Section 1**, decisions were made at the onset of the project to examine all European countries. Another cross-domain focus was that of lifespan aspects of mental health and well-being: addressing dynamic changes in symptoms, **comorbidity** and severity of impairment at different ages. Work Package 2 addressed these cross-domain issues, as well as geographical variation in research and practice spanning different disciplines.

Given the strong emphasis of the ROAMER project on **stakeholder** involvement and collaboration beyond academia, Work Package 9 coordinated the involvement of **stakeholder** groups (including service users, psychiatrists, psychologists and other healthcare workers, family organisations, charities, industry, and others). Work Package 11 was responsible for drawing together the output of other work packages, and using this to produce the final roadmap. Work Package 10 was responsible for the dissemination of the final roadmap (as well as interim reports over the course of the project) to academic and **stakeholder** audiences. Finally, Work Package 1 was responsible for managing the project as a whole, coordinating the actions of individual work packages, organising meetings and conferences, and overseeing the final ROAMER survey. This therefore gave rise to 11 work packages, which are listed below:

- **WP 1** Coordination and project management
- WP 2 Geographical representation, clinical perspective, multidisciplinary and life-course integration
- WP 3 Research capacity, infrastructures, capacity building and funding strategies in mental health research
- WP 4 Biomedical: neurobiological, pharmacological and clinical research
- **WP 5** Psychological research and treatments
- **WP 6** Social and economic aspects
- **WP** 7 Public health research
- **WP 8** Well-being
- WP 9 Coordination of stakeholders' involvement
- **WP 10** Dissemination of results
- **WP 11** Translation of results into single reports to be submitted to the European Commission, and on into the final roadmap

Each of the scientific Work Packages 2-8 (plus the Clinical Research Task Force – see below) reviewed research to have taken place in their field in the recent past, with a particular emphasis on Europe but including any relevant global research. This information was then (by process of face-to-face meetings guided by consensus decision-making and review by other experts and stakeholders) used to generate individual accounts for each work package in terms of:

- i) State of the art research
- ii) Current gaps in research and advances needed
- iii) Priorities for future research

These processes are elaborated below.





ROAMER Process

Across the entire ROAMER project, a variety of approaches were used to gather information, including webbased surveys, scientific workshops, scientific advisory board meetings, **stakeholder** meetings, consensus meetings, and policy meetings. This process is depicted in **Figure 4.1** and described in detail below.

Work Packages: State of the Art; Gaps and Advances; Priorities

State of the Art

The first phase of the ROAMER project was for the scientific work packages (3-8) and Work Package 2 to conduct systematic literature mappings, based on the methodology described in Curran, Burchard, Knapp, McDaid and Li (2007). Individual work packages generated a set of search terms that would encompass relevant literature in their research domain²⁰. These search terms are given in their entirety in **Appendix IV**. These searches were constrained to studies conducted by groups or researchers based in Europe (though they did not have to be EU member states) within the past 10 years. The studies returned by these searches were then used by individual work packages to review geographical variation in their research area. Work packages also used the studies they gathered to provide detailed accounts of the most prolific researchers and groups in their respective research domains, the languages that such research were published in, variation in publication rates over time, and differential sources of funding across research domains. This review process retrieved 70,761 scientific articles, of which 28,188 were used in the final mapping of expertise in different countries in Europe.

These systematic mappings were used by work packages as the basis for generating accounts of the 'state of the art' of their research domain. However, unlike the mappings, these reviews of state of the art research (based on consensus discussions rather than systematic review methodology) took global research into account.

Individual work packages discussed the findings of their systematic literature mapping in survey consultations and workshops with the most relevant European scientists in their field. All work packages also took great care in maintaining extensive input from relevant **stakeholders** and feedback from external bodies. The full findings from these literature mappings and reviews are presented in the ROAMER document **D11.1** (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Schumann, et al., 2013).

As well as face-to-face discussions and iterative report-writing, a key method used to achieve consensus in decision-making both within and across some work packages was the Delphi method (Linstone & Turoff, 1975; Scheibe, Skutsch, & Schofer, 1975). This is a technique for structuring communication processes among many individuals to gain consensus on certain subjects. A Delphi survey begins with an open-ended questionnaire that serves as an open starting point in order to investigate selected experts' opinions on a certain

^{20.} These search terms are presented in full in Appendix IV.



topic. The results are used to make a structured second-round questionnaire, which is presented to a larger group of panel members. As well as aiding consensus decision-making, this process also served to keep different work packages well-informed about the content and progress of each other's work.

Other work packages (and the ROAMER project as a whole) used a semi-Delphi process. The first phase (open questions) was done by means of a debate during the first round of workshops (see **Figure 4.1**), rather than by means of a survey, and the second phase (achieving a consensus regarding the list of advances needed within the work package) being done either by means of a survey or also by means of a debate during the 2nd round of workshops, following online discussion.

Gaps and Advances

The consensus-based accounts of state of the art global research for each of the ROAMER work packages were used to identify gaps or shortcomings in extant research. Based on these gaps, work packages produced lists of the advances needed in European research to resolve these gaps in a time frame of 10 years. These decisions were made as a result of the extensive discussions and meetings that took place comprising the panels of experts within each ROAMER work package, and based upon the reviews of recent European research detailed above and in the report **D11.1** (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Schumann, et al., 2013). The individual sets of gaps and advances needed produced by each work package are presented in their entirety in the ROAMER report **D11.2** (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Chevreul, et al., 2013).

Priorities

These accounts of gaps and advances were extensive, discussing wide-ranging issues within each research domain. As a result, each work package also produced a set of 20 research priorities, which outlined the work package's specific suggestions for future mental health and well-being research²¹.

These priorities were justified by each work package according to a set of four common criteria that reflect the goals and aims of the ROAMER project:

- **Efficacy/effectiveness**: Likelihood that the advance results in an effective intervention to diminish the appearance of a disorder or its consequences, or to solve a concrete problem.
- Impact / deliverability / economic benefits in Europe: Likelihood that the advance could be
 provided to Europeans and impact on society (i.e. to decrease disease burden, to improve well-being,
 or to produce economic benefits).
- **Answerability/feasibility in Europe**: Likelihood that the advance can be achieved in Europe (lead to new knowledge, enabling development or planning of an intervention).
- **European research strength**: Relative competitiveness of Europe to other regions to achieve and implement the advance.

Once again, the justifications for each advance proposed by the individual work packages are given in the report **D11.2** (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Chevreul, et al., 2013). The processes involved in the production and refinement of these work package outputs – culminating in the **D11.1** and **D11.2** reports – are shown in **Figure 4.1**.

^{21.} The full sets of these priorities were presented in the report **D11.2** 'Official Report on Gaps and Advances Needed in Mental Health and Well-Being Research in Europe' (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Chevreul, et al., 2013), and are reproduced in **Appendix II**.



Initial Meetings

Development of guidelines

Agreement upon methodology

WP Literature Reviews WP participants survey

Establishment of Work Packages

WP4 WP2 WP3 WP6 WP7 WP8 WP5 Infrastructure Funding Biomedical Psychological Soc. & Econ. Public Health Well-being 1st Scientific Workshop Workshop Workshop Workshop Workshop Workshop Workshop

1st Advisory Boards, Councils and Consensus Meetings

WP11. Report Writing



Stakeholder

Report on State-of-the-art (11.1)

WP2 WP6 WP7 WP8 WP3 WP4 WP5 Well-being Infrastructure Funding Biomedical Psychological Soc. & Econ. Public Health 2nd Scientific Workshop Workshop Workshop Workshop Workshop Workshop Workshop

WP Reports on Gaps & Advances

Report on Gaps and Advances (11.2)

List of Priorities

 2^{nd} Advisory Boards, 1^{st} Gov. & Fund. Inst. Council and Consensus Meeting

WP11. Report Writing



ROAMER Prioritisation Survey

Report on Gaps, Advances and Priorities (11.3)

Draft Roadmap

View of Roadmap by Stakeholders

Final Consensus Meeting with all relevant parties

Final Roadmap (11.4)

FIGURE 4.1: Overview of the process of the ROAMER project

Dissemination via WP10 Stakeholder Input and Engagement via WP9



Integrated ROAMER output

Outputs from the individual work packages were integrated into an over-arching account of mental health and well-being research in Europe. Naturally, there was significant overlap in the priorities and themes identified by different work packages. Therefore the integration effort, led by Work Package 11, sought to re-organise the full list of priorities produced by each individual work package (see **Appendix II**), grouping together related themes and proposals from different work packages, and organising these emergent themes in an intelligible way. The finalised results from this effort were 20 priorities for mental health and well-being research for the next 15 years in Europe.

These 20 priorities were presented in **Section 2**. Their rationale, based on integrated output from the ROAMER work packages' accounts of the State of the Art of research and Gaps and Advances Needed is discussed more extensively in **Sections 5 and 6**. These sections are also informed by work packages' justifications for their proposals based on the common criteria outlined above, i.e. efficacy/effectiveness; impact / deliverability / economic benefits in Europe; answerability/feasibility in Europe; European research strength. A full list of these justifications for each of the 20 priorities is provided in **Appendix III**.

Advisory Boards and Councils

As well as providing feedback for the ROAMER priorities in the later stages of the project, the **Scientific** and **Stakeholder Advisory Boards** were vital in guiding ideas in the earlier stages of the ROAMER project, for instance contributing to the proposal for setting up the additional cross-package Clinical Research Task Force. These boards were made up of individuals who were independent from the project itself, and provided input on ROAMER's methodology, general philosophy, results, and dissemination activities. The timings of meetings with these boards in relation to the ongoing processes of generating and refining priorities for research are illustrated in **Figure 4.1** (as 'Advisory Board Meetings').

To ensure that ROAMER complied with its stated aims of deliverability and feasibility in policy terms, the ROAMER project also met with a **Government and Funding Institution Council** (see **Figure 4.1**). This council was formed of European Commission officers and European national representatives of policymakers and funding agencies. The council met with the project to discuss the needs for mental health research in Europe and explore the possibility of a tighter collaboration between EU member states to coordinate their research programmes.

Additional stakeholder involvement

ROAMER took account of the role of industry in mental health and well-being research as part of the ROAMER survey process. Extra efforts were made on the part of ROAMER to consult with bodies with direct experience of private-public partnerships in mental health research. ROAMER consulted SMEs and larger companies in various industries (including information and mobile technologies, pharmaceuticals, health technologies, media and private-sector research, amongst others) that were either directly involved in ongoing private-public collaborations funded through the European Commission's Directorate-General for Research and Innovation²², or who were involved in collaborations as part of projects in the Innovative Medications Initiative²³. These industry contacts gave feedback on the ROAMER process and outputs through the ROAMER survey (described in more detail below), and also consulted for their more extensive input and feedback about the set of priorities generated by the ROAMER project.

ROAMER also drew on wider feedback through mail and web-based surveys of scientists and **stakeholders** across Europe who were not otherwise involved in the ROAMER project. Surveys were used by individual work packages to arrive at consensus regarding their list of priorities via a modified Delphi method (Scheibe et al., 1975).

^{22.} http://ec.europa.eu/research/index.cfm?pg=dg

^{23.} http://www.imi.europa.eu/



A first <u>stakeholder</u> survey of 108 European national associations of mental health professionals and trainees, and of users and/or carers was conducted in 2012 to explore their views about the priorities for mental health research in Europe and the level of development of various research areas in the 28 EU-countries. This survey provided key input to Work Package 9 in particular (Fiorillo et al., 2013) and informed many of the other <u>stakeholder</u> considerations in the project as a whole, for example informing the priority of features such as quality of care for the final recommendations made by the roadmap.

Prioritisation survey

The final ROAMER survey sought feedback on the 20 priorities generated by the ROAMER project (see **Section 2**), and to determine their relative perceived effectiveness/relevance and deliverability/feasibility by different groups (e.g. academics, service users, healthcare workers, industry, and other **stakeholders** described above and throughout the project).

Decisions on the number of researchers from each country who were approached to complete the survey were weighted by the amount of mental health research produced by each country as a proportion of the EU total. In total 486 researchers, spanning all EU countries, completed the survey. Of these 486 researchers 394 (81%) provided their views in an individual capacity, while 92 (19%) answered on behalf of research associations. The survey was also completed by representatives of 245 **stakeholder** associations, representing service users, families, carers, healthcare workers, academic and non-academic researchers, national policymakers, public health experts, funding bodies and industry.

Survey participants provided feedback (ratings on a 10-point scale) on each of the 20 ROAMER priorities as to 1) its Relevance (i.e. likelihood that the advance results in an effective intervention to improve mental health); and 2) its Feasibility in Europe (i.e. likelihood that the advance can be achieved in Europe). Participants were also able to give more extensive feedback if they wished. An example item is given below in **Figure 4.2**. The agreement between the **stakeholder** groups and researchers was high, and consensus on the rated importance of items was verified using quartile confidence intervals around the mean ratings for each of the 20 ROAMER priorities. The ratings and consensus scores were used to structure and rank the order of importance for the 6 high-level research priorities for policy action (**Section 3** of the current report). More detailed survey output (including these consensus scores), as well as the selection method for survey participation, is given in **Appendix VI**.



FIGURE 4.2: Example item from ROAMER survey



5. ROAMER State-of-the-art in Mental Health Research

he priorities identified in the preceding sections are informed both by promising recent developments in mental health research, and questions that remain unanswered in light of research to date. The current section of the roadmap details important research that either has been or is currently being conducted in Europe, or else research conducted elsewhere that has directly influenced important currents in European research. It primarily concerns research advances that have taken place over the last 10-15 years, as well as giving an indication of the current state of mental health research.

A) Supporting Mental Health for All

A.1 Quality of mental health services across Europe

Research into mental health services has recently started to gain traction in Europe – evidenced by the current roadmap, as well as numerous other European projects²⁴. This research has resulted in increasing knowledge of the ways in which mental health services can perform poorly – namely in terms of the proportion of untreated cases through limited access to care. Recent research has reflected the paradigm shifts over the last few decades in how mental health services are provided. These include moves from hospitals to community care, integration of mental health and general health, and increasing roles of primary care, **collaborative care**, and stepped care.

Similarly, the means of collecting data and analysing care have changed over recent years. The methodological rigour of mental health services research has vastly improved, with emphasis on theory-led research (e.g. the UK Medical Research Council's guidance for the development and evaluation of **complex interventions** – Craig et al., 2008). Research has increasingly focused on evidence-based treatments, outcome studies, and **quality of life** and care in health services (Bond, Drake, & Becker, 2008; Phillips et al., 2001). Perhaps the most significant development has been the inclusion of measures of mental health services' quality of care, which has been shown to be of utmost importance to **service users** (Fiorillo et al., 2013). The importance of quality of care has been established as a direct result of advances in the field of **service user** research, including research into non-traditional forms of service provision, and spanning qualitative and quantitative approaches.

Some EU countries are additionally using economic evidence to inform decision-making. For example, NICE in the UK has a formal health technology assessment process where economic analyses of treatments, prevention and promotion actions are undertaken to inform national guidelines (National Institute for Health and Clinical Excellence, 2012). This and similar work has shown that integrating care for physical and mental health problems has many benefits, and has fostered the development of new models of cost effective health-care, such as **collaborative care** (Gilbody, Bower, Fletcher, Richards, & Sutton, 2006).

A.2 Empowering people with mental health problems, their families and other carers

User perspectives have become more prominent through the involvement of user organisations in planning of mental health care, and evaluative methodologies such as **User Focused Monitoring** (Kotecha, Fowler, Johnson, Shaw, & Doherty, 2007; Rose, 2003a). Advances in the field of **service user** research have increased recognition of the need to include service users and families in study designs (Ennis & Wykes, 2013; Trivedi &

^{24.} An encouraging selection of such research is detailed in the recent briefing report "Public Mental Health Research" (European Commission, 2014a). Of particular note is the REFINEMENT project: http://refinementproject.eu



Wykes, 2002). In particular this has greatly helped the development of gender perspectives when considering burdens of care (Ostman, Hansson, & Andersson, 2000). Other research has used service user-defined outcome measures for evaluations of interventions (e.g. treatment tolerability) to go beyond the more prescriptive measures favoured in earlier mental health research (Crawford et al., 2011; Thornicroft & Tansella, 1996).

Individualised and **recovery-focused** treatments are associated with shifts in power from professionals to **service users** and greater approval of services (Thornicroft & Slade, 2014). There is now an emphasis on functional outcomes in research, especially in **service users** with severe mental disorders – focusing on what an individual does and does not have difficulty with, rather than simply on categorically reducing symptoms. This approach has informed clinical practice and process. For example, antipsychotic drugs can facilitate individuals with chronic mental disorders residing in the community rather than being institutionalised, and have been shown to compare favourably in terms of efficacy with medications used in other fields of health (Leucht, Hierl, Kissling, Dold, & Davis, 2012). However, antipsychotics are associated with a variety of undesirable physical effects, the tolerability of which will vary between individuals. Examples of side-effects include lithium-induced thyroid dysfunctions (Lazarus, 2009); valproate-associated hormonal dysregulations and polycystic ovary syndrome (Hu et al., 2011); antipsychotic-induced weight gain, adverse metabolic influences (De Hert et al., 2009); hyperprolactinemia (Cookson, Hodgson, & Wildgust, 2012) and movement disorders (Dayalu & Chou, 2008). The incorporation of individuals' preferences and feedback as outcomes in intervention research goes some way to improving the tolerability of treatments, ideally towards empowering **service users** and healthcare workers to stop treatment if it is non-effective for an individual.

The concomitant use of several drugs ('polypharmacy') is common in clinical practice, and this increases the risk of additive side-effects. This has therefore sparked interest in research into metabolic drug effects which are believed to contribute to a reduced life-expectancy of about 25 years (Fleischhacker et al., 2008; Tiihonen et al., 2009), and cardiovascular diseases account for the majority of these premature deaths (Chang et al., 2010; De Hert et al., 2009). Psychotropics – and antipsychotics in particular, notably clozapine and olanzapine – have numerous adverse effects on metabolic health, but the mechanisms involved are only partially understood (Rummel-Kluge et al., 2010). As this research has expanded and become more sophisticated, the information available to individuals with mental health problems (and their families or carers) about the relative efficacy versus risks of their treatment has become more comprehensive than ever before. This has greatly elevated the level of dialogue about empowering individuals' health decisions, and of taking treatment preferences into account.

A.3 Improving access to mental health resources

Europe has some of the best mental health resources in the world, with an overall good (though regionally variable) supply of trained professionals. However, progress towards accessible treatments is gradual, and there is a great deal still to be done. Encouragingly, the first major steps have now been taken, for instance by the World Health Organisation mental health GAP Action Programme Intervention Guide (WHO, 2010) to support the implementation of treatment for mental, neurological, and substance-use disorders in primary care settings. Research is progressing into how mental health service provision might be best supported by and integrated into existing health infrastructures. For example, an increasing number of evidence-based treatments are becoming available, and are being evaluated by outcome studies as they are implemented (Proctor et al., 2009).

In particular, at the interface between health, mental health, social outcomes and communities, there is considerable evidence for the effectiveness of community-based, multi-level interventions targeting primary care providers, gate keepers, general populations, individuals with mental health problems and their relatives in reducing suicidal acts (Hegerl et al., 2009). Efforts have also been made in regard to research on process variables (e.g. courses of treatment, continuity of care etc.) combined with compliance issues for interventions. Other aspects of increasing access to interventions have been well-received, for instance advances in the dissemination of Cognitive Behavioural Therapy (Shafran et al., 2009).



As research into the understanding of the relevance and importance of stigma and discrimination has improved, its conclusions have also affected the implementation of mental health services. Policymakers have linked stigma with health inequalities, and there is burgeoning research into how exposure to stigma varies with access to health services (Henderson et al., 2014). We know that stigma and discrimination associated with mental disorders make individuals less likely to admit their difficulties to others and seek help, as well decreasing the effectiveness of services when they are accessed (Thornicroft, 2008). A relatively recent (and promising) research development here is on examining staff attitudes – both on the receiving and giving ends of stigma (Schulze & Angermeyer, 2003; Schulze, 2007).

A.4 Preventative measures, resilience factors, and buffer interventions

Recent years have seen wider acceptance of the importance of prevention in mental disorders, for example in the European Union's green paper towards a strategy on mental health (European Commission, 2005) and European Mental Health Pact (European Commission, 2008). Increasing evidence for possibilities of preventing depression and suicidality (at the population level) has emerged. Findings related to risk and protective lifestyle factors, stigma reduction, risk behaviour and psychosocial interventions have opened promising new areas of prevention research (Cuijpers, Van Straten, & Smit, 2005).

The last decade has seen the emergence of studies investigating the economic benefits of prevention of mental health problems (European Parliament, 2009) and encouraging well-being ('mental fitness'). Considerable resources are used for depression screening in primary care (e.g. the PHQ: Kroenke, Spitzer, & Williams, 2001, and other questionnaires). Although there has been some encouraging research (Kessler et al., 2010; Möller & Henkel, 2005) there is currently no professional consensus on the use of such screening approaches.

Mental health promotion is now included in the broader health agenda, for example via well-being and stress in the workplace (Jeffrey et al., 2014; World Health Organization Regional Office for Europe, 2010), at schools (Pinfold, Thornicroft, Huxley, & Farmer, 2005), and more widely in society (Kramers, 2003). Emerging concepts in mental health promotion focus on the connectedness of social, physical and mental aspects of health. The increased research focus has yielded a greater number and wider use of measures of positive mental health – for instance, coping skills, and quality-of-life scales²⁵ – instead of measuring health by negative outcomes. Advances in individual aspects of mental health promotion include the concepts of 'positive psychology' (Seligman & Csikszentmihalyi, 2000), and **mindfulness**²⁶.

Focusing on positive mental health, coping ability and **resilience** is an alternative perspective to a focus on symptoms and negative emotions. European research and treatment delivery has evolved towards **personalised care** with an emphasis on the **recovery concept**. The **recovery concept** focuses on increasing individuals' daily functioning and participation in society, even if their symptoms do not completely go away. This concept of increased functioning and mental well-being is reflected in work such as the Person-centred Integrative Diagnosis (PID) model (Mezzich et al., 2010) and the 'patient-reported outcomes approach' (Hays, Bjorner, Revicki, Spritzer, & Cella, 2009). This paradigm shift in disability research from a focus on negativity to a focus on positivity may also be conceptualised as a change from viewing disability as an individual shortcoming to a collective shortcoming on the part of a society that fails to cultivate and emphasise the strengths and well-being of all its citizens.

A.5 Developing novel, safe, and effective interventions

European mental health interventions have advanced greatly in recent years, including drugs (e.g. antidepressants, atypical neuroleptics), psychological treatments, and online therapy. The use of internet and mobile technologies in healthcare and disorder management in particular has seen large and wide-ranging developments. **eHealth** and **mHealth** have generated a great deal of literature focusing on well-being as

 $^{25. \} A\ prime\ example\ being\ the\ Eurofond\ quality-of-life\ survey:\ http://eurofound.europa.eu/surveys/eqls/2011/index and the example\ being\ the\ Eurofond\ quality-of-life\ survey:\ http://eurofound.europa.eu/surveys/eqls/2011/index and the example\ being\ the\ Eurofond\ quality-of-life\ survey:\ http://eurofound.europa.eu/surveys/eqls/2011/index and the example\ being\ the\ Eurofond\ quality-of-life\ survey:\ http://eurofound.europa.eu/surveys/eqls/2011/index and the example\ being\ the\ Eurofond\ quality-of-life\ survey:\ http://eurofound.europa.eu/surveys/eqls/2011/index and the example\ being\ the\ Eurofond\ quality-of-life\ survey:\ http://eurofound.europa.eu/surveys/eqls/2011/index and the example\ being\ the\ example\ property and the example\ pr$

^{26.} http://www.institute-for-mindfulness.eu/homepage.html http://oxfordmindfulness.org/



well as disorder management (see: the Netherlands-based "All Your Life"; Bolier et al., 2013) and spanning innovations for clinicians and service users alike (European Commission, 2014b; Zentner, Busse, & Schlette, 2006). European researchers are at the forefront of new developments in online-supported treatments. Europe is also leading research into the role of new technologies such as smart phones, web applications, ecological momentary assessments, serious gaming, Avatars, and social media for designing interventions to change behaviour (European Commission, 2014b). Recent European research projects (PREDI-NU; SU-PREME; ICT4Depression; INTERSTRESS) have developed ICT and **eHealth** interventions to support self-management and access to care online or via mobile.

Despite encouraging research evidence and the potential of **eHealth** being enthusiastically embraced by European researchers, there is still a lack of understanding of the specific advantages as well as the effectiveness and cost-effectiveness of such treatments. Differences in digital literacy within and across European countries also mean that new technologies may exacerbate existing socioeconomic inequalities if they are implemented without robust research.

Many novel drug treatments developed over the last decade have failed in large scale trials and this has led to a reconsideration of the investment strategies of the pharmaceutical industry as a whole, despite the manifest unmet clinical needs. Nevertheless, there have been some exciting recent developments that can support advances in research into psychopharmacology. One exemplary European body is EATRIS-ERIC, the European Advanced Translational Research Infrastructure in Medicine²⁷. EATRIS encourages the development of drugs for unmet clinical needs, creating direct links between industry, clinical need and research. Another promising approach in drug development has been to consider compounds as treatments for specific symptoms or groups of symptoms ('symptom clusters'). When coupled with translational neuroscience (based on endophenotypes and intermediate phenotypes) such an approach has the potential to improve the discovery and validation of novel drug targets as well as providing biomarkers to stratify service users and conduct personalised psychiatry.

European projects have produced manuals for standardised psychological interventions in applied settings, guided by research into clinical outcomes and progress monitoring (European Commission, 2014a) in order to aid implementation. Other notable examples are the evidence-based practices in Individual Placement and Support (IPS)²⁸ and Acceptance and Commitment Therapy (ACT)²⁹, and interventions to improve well-being, specifically **mindfulness**³⁰. There have also been improvements in methodological rigour (see e.g. Craig et al., 2008) of **translational** and **implementation research**, e.g. in the case of the SEYLE intervention for suicide prevention (Wasserman et al., 2015).

B) Responding to Societal Values & Issues

B.1 Economic approaches

There has been an increase in health economics knowledge in recent years and increased acceptance of the importance of macro-economic policy for mental health. Cost-benefit analyses have been increasingly used to show the value of investing in service delivery and evidence-based policy guidelines at national (e.g. NICE in the UK³¹), EU and global levels (Cyhlarova et al., 2010; Mihalopoulos, Vos, Pirkis, & Carter, 2011; World Health Organization, 2013). Much of this work has been encouraged by the development of techniques to estimate the costs of resources for mental health and of scaling up interventions (World Health Organization,

^{27.} http://www.eatris.eu/

^{28.} http://sites.dartmouth.edu/ips/

^{29.} http://contextualscience.org/act

^{30.} http://www.institute-for-mindfulness.eu/homepage.html http://oxfordmindfulness.org/

^{31.} http://www.nice.org.uk/



2006). In particular, economic arguments highlighting the value of promoting the mental health and well-being of children and young people (and preventing the incidence of disorders) have resonated with policy-makers (Cuijpers et al., 2005; Currie et al., 2012).

Economic evaluations are currently underway for <u>eHealth</u>, <u>mHealth</u> and other technological innovations. These interventions offer potentially cost-effective ways of engaging with hard-to-reach populations. Present economic circumstances in Europe have increased funders' interest in eHealth and mHealth, and economic analyses have in some cases been built into funding for trials (European Commission, 2013). For example, online approaches to preventing burnout, stress and anxiety disorders have used economic evaluations of the impact on absenteeism and withdrawal from the labour force (Learner et al., 2011; Wald, 2011). This coincides with the recent emergence of studies looking at aspects of comorbidity between mental and physical health, in particular the (hidden) costs associated with comorbidity (Naylor et al., 2012).

B.2 Wider social and economic outcomes

Mental health research has expanded beyond symptom-based measures to consider the effects of interventions on wider social and economic outcomes. Outcomes such as employment, housing, physical health, educational achievement and social adjustment have been identified as crucial functional indicators in mental health research. These outcome measures have been particularly useful for mental health economics research, and have helped highlight how economic analyses typically undervalue the benefits of public wellbeing and mental health (McDaid, 2014; Michaelson et al., 2009).

There is also an emerging evidence base on the consequences of poor mental health in workplaces. This includes insight from economic analyses, for example days lost due to sickness, and loss of productivity (Schultz & Rogers, 2011). Additionally – and crucially – research recognising workplace stigma has highlighted the importance of employment policies such as graded sick-leave and supported employment. Such studies have examined a variety of outcomes, including the impact on stigma, changes in work performance due to the introduction of such policies, and the relationship between employment policies and well-being (World Health Organization Regional Office for Europe, 2010).

New terms such as **emotional intelligence** and **resilience** are being integrated into research and emphasise the importance of an individual's ability to function as part of society (World Health Organization, 2001). Important measures of functioning include measures for burden of disease (e.g. **DALYs** in World Health Organization, 2008), loss of productivity and **quality of life** (e.g. employment and **quality-of-life** outcomes central to IPS³² and ACT³³).

The development of novel mental health impact assessment tools has become an important way of assessing the effect of policies, interventions and environments. This is part of an ongoing trend towards evidence-based policies, services, and priority setting (European Commission, 2014a; Haynes, Service, Goldacre, & Torgerson, 2012). In mental health policy this trend has been reflected in the recent political legitimation of well-being and the inclusion of mental health and well-being on the agendas of international health organisations (World Health Organization, 2013), governments (European Commission, 2008; European Parliament, 2009), and other international organisations (e.g. UNICEF; Organisation for Economic Co-operation and Development, 2013). An emblematic example of the effect this has had upon social agendas and policy design is in The New Economics Foundation (NEF)'s policies regarding social determinants of well-being (Michaelson et al., 2009).

B.3 International, social and cultural contexts for mental health disparities

We now have a better understanding of socioeconomic determinants of mental health, for example in recent work by Wilkinson and Pickett (2009). These socioeconomic determinants include social and economic

^{32.} http://www.dartmouth.edu/ \sim ips/page29/page31/page31.html

^{33.} http://contextualscience.org/act



inequalities, housing, and transport. Research has also demonstrated the role of families (Garnefski, 2000), primary care (Gopinath, Katon, Russo, & Ludman, 2007), and psychosocial environment in the workplace (World Health Organization Regional Office for Europe, 2010) in predicting outcomes of mental disorders.

A particularly important development in mental health research (including ecological and epidemiological studies) is the recognition that burdens associated with mental health problems may be unequally distributed across populations – not least because of persistent differences in social capital between groups of different genders, socioeconomic strata, or migrant status (Lin, 2000; Webber et al., 2014). More cross-country and cross-cultural comparisons are underway, a prominent example being the REFINEMENT study of European variation in health services³⁴. Studies are also being conducted on developing countries' influences on Europe in different ways, for example through migration (Lindert, Schouler-Ocak, Heinz, & Priebe, 2008; Priebe et al., 2008).

B.4 Stigma, discrimination and rights of people with mental health problems

There has been increasing acknowledgment of the rights of individuals with mental disorders, reflected by the UN Convention on Rights of People with Disabilities (United Nations, 2008). Research instruments have been developed to assess how well psychiatric institutions comply with human rights (e.g. ITHACA; Randall et al., 2013) and research has identified important connections between human rights, stigmatisation, and social exclusion (Thornicroft & Slade, 2014), as well as other important outcomes. For example anti-stigma initiatives help to prevent suicide but interventions directed primarily towards suicide prevention can also help to reduce stigma (Hegerl et al., 2009; Mann, Apter, Bertolote, & Al, 2005).

Improvements have been made in understanding social exclusion and mental health by considering developmental factors such as intergenerational transmission and the importance of early intervention (Bynner, 2001). There is also an acknowledgment that social exclusion and stigma affect most areas in which an individual functions. For example, applied research has been conducted into reducing the negative effects of stigma in the workplace via supported employment and graded sick-leave (Manning & White, 1995; Stuart, 2006), which has proven to be an effective way of implementing anti-stigma research. Research has also demonstrated the importance of working with small groups of similar people and of social contact in antistigma work (London & Evans-Lacko, 2010).

Stigma research has changed in the past few years, both resulting from and giving rise to a number of surveys on attitudes to mental health (Corker et al., 2013). Improved stigma paradigms have distinguished between self-stigma and anticipated discrimination, as well as between expressed attitudes and realised behaviours (Brohan, Elgie, Sartorius, & Thornicroft, 2010; Lasalvia et al., 2013; Schomerus, Matschinger, & Angermeyer, 2009; Thornicroft, Brohan, Rose, Sartorius, & Leese, 2009). There is also now greater user involvement in anti-stigma research, driven by an understanding of the fact that stigmatised persons must take an active role in fighting stigma (Henderson, Evans-Lacko, & Thornicroft, 2013; Patterson, Trite, & Weaver, 2014; Pinfold et al., 2005).

C) Life Course Perspective of Mental Health

C.1 Aetiology and development of mental health and disorders

There is a growing understanding of multiple developmental pathways leading to mental disorders in psychological and neurobiological terms, the specification of risk factors and the characterisation of disorders at different ages or developmental stages. There has also been recent research on mediators, moderators and mechanisms in modelling the life-course development of mental disorders (Kenny et al., 2004; Rutter, 2009). This has been supported to a great extent by increased sophistication of techniques in neuroimaging and data analysis.





The importance of gene-environment interactions and epigenetics across development is now acknowledged. For example, dysregulation of stress and arousal systems has been identified as a key vulnerability factor for the development of a range of mental disorders (de Kloet, Joëls, & Holsboer, 2005). Research has examined how learning and changes in behaviour arise as responses to stressful experiences (Chrousos, 2009; de Kloet et al., 2005) and the neurobiological changes that underlie this process (Feder, Nestler, & Charney, 2009; Franklin, Saab, & Mansuy, 2012; Gillespie, Phifer, Bradley, & Ressler, 2009; Joëls & Baram, 2009; McEwen & Gianaros, 2011).

Another particularly useful advance in the area of vulnerability factors for mental disorders has been the development of the concept of 'allostasis' – the brain's ability to adapt to a prolonged period of stress (McEwen, 2000). Changes in cortisol reactivity (Holsboer & Ising, 2010) have been linked over time to emotional and cognitive dysregulation (Yehuda & Seckl, 2011). Other research has implicated stress-response in some age-related neurodegenerative disorders, for example pro-inflammatory states (Schwab & McGeer, 2008; Smith, Das, Ray, & Banik, 2012). Findings such as these have been instrumental to the growing focus on preventive work among older adults in Alzheimer's disease and related disorders, together with insights from other disciplines such as cognitive science, and contributions from well-being research to conceptions of healthy and active ageing.

The importance of other cognitive factors to vulnerability and **resilience** to mental disorder across development can be seen from the early successes of training interventions to improve working memory, across multiple mental disorders (Jaeggi, Buschkuehl, Jonides, & Perrig, 2008). Working memory training is the beginning of a new research field exploring the possibilities of enhancing other **executive functions** such as self-control, with the help of computerised training methods possibly combined with neuroimaging and pharmacological treatment (Klingberg, 2010).

C.2 Longitudinal and clinical cohort studies

Birth cohort studies have increasingly been undertaken in Europe to inform lifespan models of mental health. Cohorts have been developed using large samples to combine DNA-<u>MRI</u>-cognition-phenotype and provide insights into the development of <u>mental disorders</u> and brain disorders at the interface of cognitive and biological science (Boomsma et al., 2012; Byrne et al., 2012). Other cohorts and longitudinal studies continue to provide novel insights to both biological and societal impacts on mental health and well-being, after being originally set up 20 or even 40 years ago (e.g. the 1970 British cohort study, or the more recent TEDS cohort:



Trouton, Spinath, & Plomin, 2002). Longitudinal research has also shown the positive and long-lasting effect of well-being on health outcomes (Foresight Mental Capital and Wellbeing Project, 2008; Taulbut, Parkinson, Catto, & Gordon, 2009).

A particular benefit of cohorts is that they generate a very large amount of longitudinal data that is generally made freely available to other researchers, including those in other countries, and so they encourage collaboration across Europe. Infrastructural considerations for longitudinal datasets have become easier to realise in recent years. Linking together records of routinely collected service utilisation data greatly facilitates longitudinal studies of register-based data. A specific example here can be seen in Scandinavian studies based on data from mental health registers, which have examined the range of prevalence rates observed for schizophrenia and psychotic experiences, highlighting the role of social environment factors, and fostering further epidemiological work (Cantor-Graae, Pedersen, McNeil, & Mortensen, 2003; Eaton et al., 2006).

Another key advance, unique to longitudinal research conducted in Europe, has been to produce estimates of the economic impacts of poor mental health in childhood and across the life course. The Netherlands in particular have been at the forefront of much of this work, looking increasingly at impacts beyond the health system, such as in schools, workplaces and in the criminal justice system (Bartels et al., 2012; de Graaf, ten Have, van Gool, & van Dorsselaer, 2012). There is also a growing literature on the short-, mid- and long-term social and economic benefits of early interventions for the treatment and prevention of mental health problems, particularly focused on children and young adults (Kieling et al., 2011).

C.3 Research and interventions for children and adolescents

Up to a fifth of children and adolescents develop mental health problems, and a significant proportion of these are referred for psychological treatment (Belfer, 2008; Kessler et al., 2007). There is now a more robust understanding of child mental health – in terms of epidemiology, needs, disorders, **aetiology** and mechanisms that cause and maintain child mental disorders (Patel, Flisher, Hetrick, & McGorry, 2007). This reflects a growing interest in well-being in children, as well as acknowledgement of the value of psychotherapy and early intervention. Findings in neuroscience have greatly informed understanding of the development of mental disorders across childhood, adolescence and young adulthood, identifying a critical developmental period spanning 12-21 years. A meta-analysis of over 250 studies spanning a variety of mental disorders by Mana, Paillère Martinot and Martinot (2010) identified neurophysiological signatures of both affective disorders and cognitive deficits in adolescence. Such findings are extremely promising for identifying potential targets for early intervention and preventative work.

Epigenetic research represents a promising area for understanding links between neurodevelopment and mental health. Epigenetic changes (which may involve DNA methylation, histone acetylation and phosphorylation) have been identified that underlie programming of emotional and stress reactivity during critical times of brain development, with lasting consequences over the lifespan (Meaney, 2010). This complements research that has examined the role of maternal influences in modulating the outcomes of early adversity (Nederhof & Schmidt, 2012), and the intergenerational transmission of social exclusion (Hadwin & Field, 2010), suggesting that mismatches between early life experiences and later life context enhance vulnerability to disorder.

Ecological and epidemiological models used for understanding the complexity of child mental health problems have greatly improved in recent years (Costello, Egger, & Angold, 2005). It is now possible to differentiate levels and complexity of child mental health needs, and to understand variability within diagnoses within and across time (Kim-Cohen et al., 2003). Relatedly, a better understanding of the concept of well-being as it relates to young people has been developed by The Good Childhood Inquiry in the United Kingdom (Rees et al., 2013; Rees, Goswami, & Bradshaw, 2010). This focus has yielded increasing evidence of the role of early childhood and prenatal factors as determinants of well-being, highlighting the need to start preventions in childhood and adolescence.



D) Research Towards Personalised Care

D.1 Mechanisms and markers of mental disorders and mental health

The last decade has seen the sophistication of techniques in neuroimaging, biomedicine and analysis, which have led to enormous advances in understanding the structural and functional connectivity and plasticity of the brain (Akil et al., 2010). In particular, new concepts such as the '**connectome**' (Sporns, Chialvo, Kaiser, & Hilgetag, 2004; van den Heuvel & Sporns, 2011) have superseded earlier neuroscience models that dealt solely with brain structure and regional activity. Such work has led to reconceptualised 'disconnection syndromes' models of disorders such as Alzheimer's disease, stroke, obsessive-compulsive disorder and schizophrenia, as well as greatly influencing disciplines beyond mental health – as is the case with the Blue Brain Project (Markram, 2006).

There is a growing literature on the relationship between **hedonic** and **eudaimonic well-being**, described in terms of its physiological parameters, e.g. cortisol and fibrinogen (Layard, 2009; Ryff et al., 2006; Steptoe, Demakakos, de Oliveira, & Wardle, 2012). Arousal and stress systems – particularly the hypothalamic-pituitary-adrenal (HPA) axis – are crucial for **resilience**, and their dysregulation enhances vulnerability to mental disorders (Etkin & Wager, 2007; Holsboer & Ising, 2010; Joëls & Baram, 2009; Sapolsky, Romero, & Munck, 2000; van den Heuvel et al., 2005). HPA response and function (e.g. in terms of threshold and sensitivity) varies greatly with **ultradian and circadian rhythms** over the course of the day, as well as over the lifetime (Lightman & Conway-Campbell, 2010).

There has been progress in understanding the human genome and the role of epigenetics (e.g. immunological and inflammatory factors) in mental and **somatic disorders**. Studies of '**-omics**' (genomics, metabolomics, proteomics etc.) have gone some way to explaining biological risk and resilience factors in certain disorders (de Kloet et al., 2005). Other research has highlighted the interactive process that may result in differential mental health outcomes in response to environmental contexts: including cell-cell adhesion molecules, cytoskeleton, synaptic molecules, neurotransmitter and amino acid transporters, neurosteroids, second messenger systems, transcription factors and others (Canli & Lesch, 2007; Eroglu & Barres, 2010; Graeber, 2010; Haramati et al., 2011).

Basic psychological and cognitive science has implicated deficits in cognitive processes such as perception, attention and memory as fundamental to aspects of a number of mental disorders (Fett et al., 2011; Goschke, 2014; Marchetti, Koster, Sonuga-Barke, & De Raedt, 2012). Higher level cognitive deficits – namely in decision-making and executive function – are seen in virtually all mental disorders. Research into decision-making and its deficits has drawn on behavioural findings from the field of economics ("neuro-economics"; Glimcher, Fehr, Camerer, & Poldrack, 2008), to investigate why humans depart from rational, normative accounts of decision-making (such as expected utility theory) when performing value-based choice tasks (Kahneman, Knetsch, & Thaler, 1991). Models of these cognitive deficits in mental disorders have been developed through computational (Murray et al., 2008) and Bayesian approaches (Fletcher & Frith, 2009; Frith, 2012).

Psychological processes have also been investigated at their interface with biology, for instance identifying their associated electrophysiological **biomarkers** (Fair et al., 2008) and biological substrates (Phillips & Swartz, 2014; Price & Drevets, 2012). Understanding the molecular mechanisms of cognitive markers for mental disorders highlights such processes as platforms for intervention, for example through the development of 'cognitive enhancing' drugs to improve **resilience** (Milton & Everitt, 2010). These ideas are indicative of 'neurocognitive systems' – analysing markers using interdisciplinary techniques that integrate cognitive and behavioural science with functional neuroimaging. These approaches will enable the identification of cognitive and psychiatric **endophenotypes** that transcend categorical boundaries of mental disorders.



Social cognitive processing systems (including metacognition) are also implicated in many mental disorders (Insel et al., 2010). The term 'social brain' has been developed to describe the cortical and subcortical network of regions that develop both pre- and post-natally, and prepare individuals for social interaction (Brothers, 1990). Social neuroscience and cognitive science have used this and similar models to investigate genetic (Ebstein, Israel, Chew, Zhong, & Knafo, 2010) and psychosocial (Sanfey & Chang, 2008) influences on characteristics such as empathy, altruism, sense of equity, love, and trust, in terms of the role that these characteristics play in well-being.

D.2 Diagnostic strategies and the stratification of mental disorders

Models (and, as a result, treatments) have been developed for mental disorders that had previously proven difficult to assess: namely personality disorders, somatoform and sexual disorders, and certain forms of psychosis. While most studies still rely on traditional diagnostic categories, psychological models have been supplemented by **transdiagnostic** and approaches (Loth, Carvalho, & Schumann, 2011). This has led to a nuanced change in the focus of research in this area – to that of considering how genetics are expressed through the levels of anatomy, biochemistry, physiology and behaviour (influenced by **endophenotypic models**), and how these influences interact with the environment to produce phenotypes at the extremes of normally-distributed characteristics.

There is a growing understanding that there is continuity, not discontinuity, between optimal (normal) and non-optimal (psychopathological) functioning. Two key models based on individuals' personal levels of functioning and/or impairment are the Person-centred Integrative Diagnosis (PID) model (Mezzich et al., 2010) and the patient-reported outcomes approach (Cella et al., 2007). These and other developments have incorporated a broader understanding of **recovery** beyond symptom improvement, in line with sentiments expressed in The International Classification of Functioning, Disability and Health (World Health Organization, 2001).

Cognitive markers of functional impairment may also inform diagnostic criteria and systems. In the past two decades substantial progress has been made in research on the neurocognitive basis of decision-making and cognitive control, but this has only recently begun to be applied to the development of symptom-based classifications of disorder models based on underlying mechanisms (Cuthbert, 2014; Maia & Frank, 2011; Morris & Cuthbert, 2012).

Positive and negative valence appraisals (Noonan, Kolling, Walton, & Rushworth, 2012; Volkow, Wang, Fowler, & Telang, 2008) have also begun to be incorporated into diagnostic formulations (O'Connell & Hofmann, 2011). In particular, maladaptive positive and negative valence appraisal systems have been implicated in anxious and affective disorders, as well as substance and behavioural addictions (Everitt & Robbins, 2005). For example, adolescent drug use can be conceptualised as a behavioural manifestation of reward responsiveness, but these valence systems in the brain are not specific to substance abuse (Whelan et al., 2012).

The downstream effect of these **symptom cluster** approaches is that they allow treatment to be personalised to individuals (e.g. selecting a more sedating drug for a more agitated and anxious individual). Certain compounds are also indicated for particular symptoms rather than diagnoses. For example, benzodiazepines are used for (short-term) treatment of anxiety and insomnia, in many different diagnoses. European precedent for the use of the **symptom cluster** approach in diagnosis has been encouraging in terms of the new pharmacological treatment options it offers for different **symptom clusters** within depressive syndromes (Nutt et al., 2007) and schizophrenia (Millan et al., 2012). Although developments in molecular biology and neuroimaging provide many candidate **biomarkers** for **personalising care**, so far there are only a few circumstances in which **biomarkers** are clinically useful to psychiatrists.



D.3 Comorbidity

<u>Comorbidity</u> in individuals with mental health problems is associated with high costs and burden of disease (Naylor et al., 2012). Common neural risk factors have been identified across disorders that tend to show <u>comorbidity</u>, for instance similar patterns of maladaptive stress appraisal across anxious and mood disorders (Shin & Liberzon, 2010; Somerville, Jones, & Casey, 2010).

The relationship between affective disorders and physical illness is reciprocal (Kupfer, Frank, & Phillips, 2012). People suffering from chronic physical illnesses are almost three times more likely to be depressed than individuals without long-term health problems (Egede, 2007; Moussavi et al., 2007). Depression also predicts later onset of coronary heart disease (Kendler, Gardner, Fiske, Gatz, & Associa, 2009), stroke (Everson, Roberts, Goldberg, & Kaplan, 1998), obesity and metabolic syndrome (Luppino et al., 2010), diabetes (Campayo et al., 2010), birth defects (Goldberg, 2010), and many other illnesses (Krishnadas & Cavanagh, 2012; Kupfer et al., 2012; Leboyer et al., 2012; Moussavi et al., 2007). Similar breadths and severity of comorbid physical illness are seen for anxiety disorders (Härter, Conway, & Merikangas, 2003; Sareen, Cox, Clara, & Asmundson, 2005) and psychotic disorders (Laursen, Munk-Olsen, & Gasse, 2011; Oreški, Jakovljević, Aukst-Margetić, Orlić, & Vuksan-Ćusa, 2012) – in all instances, physical health problems are far higher than expected compared with the general population.

Recent work by Jakovljević et al. (2010) has provided an overview of the factors explaining **comorbidity** between mental disorders and somatic diseases. These include: shared predispositions (genetic, temperamental and personality traits), shared risk factors (stress, trauma, food intolerance, lifestyles, social support, negative emotions), and shared mechanisms (coping, **resilience** or defence mechanisms, endocrine and immune disruption). The causal mechanisms for these **comorbidities** may, however, differ between disorders (Osby, Brandt, Correia, Ekbom, & Sparén, 2001).

Mental disorders are also highly **comorbid** with substance abuse and addiction (Nunes & Rounsaville, 2006; Schuckit, 2006). **Basic neuroscience research** has implicated **allostatic** changes of the brain reward system in the **comorbidity** between mental disorders and substance abuse (Eshel & Roiser, 2010; Koob & Le Moal, 2008). However, the view that certain substances are 'addictive' specifically because they activate dopamine systems is reductive in light of the fact that under some circumstances individuals can develop addictive-like behaviours towards natural stimuli such as food or sex (Lutter & Nestler, 2009; Volkow, Wang, Fowler, & Tomasi, 2012). The magnitude of substance abuse and addiction go far beyond the scope of ROAMER, but fuller discussions of their impact on mental and physical health are given in the separate ALICE RAP roadmap³⁵.

Mental disorders are associated with a mortality rate 2-3 times higher than the general population (and rising), with most of this effect being due to **comorbid** physical illness (De Hert, Cohen, et al., 2011; De Hert, Correll, et al., 2011; Osby et al., 2001). These effects are seen for a diverse range of both physical and mental disorders (McWilliams, Goodwin, & Cox, 2004; Oud & Meyboom-de Jong, 2009; Rogers et al., 1994), and are due to many factors, including unhealthy diet, inadequate provision of healthcare, high levels of cigarette smoking, and side-effects of (especially chronic) pharmacological treatment (Cookson et al., 2012; De Hert et al., 2009; Hu et al., 2011; Lazarus, 2009; Leboyer et al., 2012). This latter point is particularly important, as **polypharmacy** (the concomitant use of several drugs) is common in clinical practice, which increases the risk of additive adverse somatic effects (Barbui et al., 2006; Broekema, de Groot, & van Harten, 2007). Increased knowledge of the physical side effects of drug treatments for mental disorders has made reappraisals of their use central to discussions about **comorbidity**, especially in terms of service user preferences.





D.4 Standardising methodologies for mental health treatment research

There has been a vast improvement in the methodological rigour of mental health services research, with emphasis on theory-led research (Aiken et al., 2012; REFINEMENT, 2014). There has been increased emphasis on the importance of replicating clinical findings, and evaluating methods and interventions in mental health research more systematically (Schooler, 2014). This is indicative of a focus in mental health research that now not only aims to investigate whether a new intervention is more effective than control treatment, but also which intervention (or combination of interventions) is the most effective out of a set of alternatives.

Standard **randomised controlled trials (RCTs)** are difficult to apply in real-world situations and need adaptation as interventions become more personalised. Evaluations have become more complex, making use of multiphase approaches, and increasing qualitative and **mixed-methods approaches**. The increased complexity of **clinical trials** has been recognised and supported by European bodies, for example via the UK Medical Research Council's guidance for the development and evaluation of **complex interventions** (Craig et al., 2008).

The efficacy of antidepressants relative to placebo has been validated in **RCTs** (Möller et al., 2012), and similar evaluations have been performed for antipsychotics (Konradi & Heckers, 2001). Complementary **basic scientific** work has highlighted mechanisms that may drive the efficacy of psychopharmacological treatment, implicating diverse effects of neuronal plasticity and neurotransmission (Baudry, Mouillet-Richard, Launay, & Kellermann, 2011). Though not based in Europe, initiatives from the US National Institute of Mental Health have sought to better inform the personalised use of drugs in treatment. The Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) Study's (Stroup et al., 2003) **clinical trials** directly tested multiple drug treatments against each other in multi-arm trials. Large-scale trials like these are a gold standard for comparative efficacy research, but this comes with the costs of large sample sizes and accommodating infrastructure – both of which require high levels of investment.

Systematic reviews have greatly enhanced the evidence base in many areas of mental health research (Wykes, Huddy, Cellard, McGurk, & Czobor, 2011). However, such reviews rely on comparable data and an assessment of data quality. Fidelity measures are beginning to be used in the development and implementation of evidence-based treatments to validate their efficacy (e.g. Rowe et al., 2013; Wykes, Steel, Everitt, & Tarrier, 2008).



Though criticisms have been made of well-being research for its lack of specificity (Davies & Mehta, 2014), there have been numerous efforts to improve the standardisation and evaluation of well-being (McDaid, 2014). One example of improved, rigorous measurement of well-being has been carried out by the National Accounts of Well-being (Michaelson et al., 2009). The implementation of new psychometric methods has also improved the viability of future systematic evaluations of well-being, for instance through standardised use of measures such as the Warwick-Edinburgh Mental Well-being Scale (WEMWBS; Tennant et al., 2007).

E) Building Research Capacities

E.1 Shared databases

Increased feasibility across Europe for conducting register-based and register-linkage studies (i.e. obtaining **big datasets** from pooling data from health registers) has greatly benefited mental health epidemiology by allowing studies to use multiple data sources (Boomsma, van Beijsterveldt, & Hudziak, 2005; Eaton et al., 2006). Various projects are currently working on linking routinely collected data on service use and treatment, to allow the integration of health relevant data for use in future research. Data generated by other countries (or international research groups) from publicly-funded research can be made freely available for analysis, which increases the cost effectiveness of research. However, there needs to be further harmonisation of the data agreements between studies that will allow freely available databases for secondary analysis. For instance it is difficult to incorporate data from the EU and US into freely available databases. International systematic reviews have been facilitated by the development of research networks, and these reviews have been especially effective in providing an evidence base in relatively new areas – for example in health promotion research (Knapp et al., 2011).

Mental health research has drawn on larger international datasets, for instance the World Health Organisation calculations of burden of diseases (World Health Organization, 2008), the European Study of the Epidemiology of Mental Disorders (ESEMED; Alonso et al., 2004), and the European³⁶ and World Value Surveys³⁷ to gain insights into mental disorders' prevalence and epidemiology that would not have been possible with data from a single country alone. Notable examples of shared databases include the biological databases maintained by the pan-European Biobanking and Biomolecular Resources Research Infrastructure (BBRMI-ERIC)³⁸ and shared clinical databases of the European Clinical Research Infrastructures Network (ECRIN-ERIC)³⁹. Similar shared databases for well-being are available from studies such as the Gallup World Poll (Diener, Ng, Harter, & Arora, 2010) and the European Social Survey (European Social Survey, 2013).

Open access publication has become standard practice for publicly-funded research. Further, the **open data** philosophy is gaining popularity in the scientific community. The US and UK governments have implemented websites⁴⁰ where national databases are available to their citizens, and a number of journals and websites offer the possibility of publishing anonymised datasets. Many national funders already state that data should be publicly available unless they are particularly sensitive or non-anonymised. EU and national funders could be more specific in funding arrangements about the process to produce such data sharing. One step is the Open Data Research Pilot in Horizon 2020 (Horizon 2020, 2013).

The European network of Research Infrastructures (a leading example being the ESFRI roadmap: European Strategy Forum on Research Infrastructures, 2010) is now sufficiently developed that an online database of health databases and normative population data with free access for the research community could be estab-

^{36.} http://www.europeanvaluesstudy.eu/

^{37.} http://www.worldvaluessurvey.org/wvs.jsp

^{38.} http://bbmri-eric.eu/

^{39.} http://www.ecrin.org/

^{40.} http://data-archive.ac.uk/ http://data.gov.uk/; http://www.data.gov/



lished. As databases, data-collecting studies and international research and collaboration have become more integrated, this has brought a gradual process of harmonisation of technical and research terms – which is particularly useful for the developing research areas of well-being and stigma.

E.2 International and interdisciplinary research networks

International collaborative research networks have developed over time. In particular, the European Research Infrastructure Consortium (ERIC) has helped to coordinate pan-European research across a variety of domains, with a number of different initiatives. The European Clinical Research Infrastructures Network (ECRIN-ERIC)⁴¹ coordinates national clinical research networks. The pan-European Biobanking and Biomolecular Resources Research Infrastructure (BBMRI)⁴² aims to improve the accessibility and interoperability of existing collections of biological samples (biobanks and biomolecular resources) from different (sub) populations of Europe. The European Social Survey (ESS-ERIC)⁴³ has been charting changes in social values throughout Europe since 2001. It is a leading source of data on Europe's social, political and moral context and an authoritative monitor of societal change. Finally, the European Infrastructure for Translational Medicine (EATRIS-ERIC)⁴⁴ is building links with users from academia, the public sector and industry, to create a consortium of translational centres across Europe. All these networks span multiple European countries, and have been instrumental in the building of common platforms for pan-European research in mental health and well-being.

Knowledge exchange has been especially influential in the disciplines of cognitive, social and developmental neuroscience over the last decade. The sharing of complex or expensive infrastructures (scanning and biochemistry facilities in particular) allows for more efficient use of resources that will be costly to set up or maintain. There is a growing acknowledgement of the specific strengths offered by collaborative research projects and networks, including by bodies that are not primarily composed of researchers.

There have been encouraging movements towards funding necessary mental health research. Mental health research has been represented in FP7 (the EU's 7th Framework Programme⁴⁵) and Horizon 2020 in Europe and, at the global level, the Grand Challenges of Mental Health initiative to support a new generation of research (Collins et al., 2011). The CORDIS database⁴⁶ is an inventory of projects that has been set up and funded by the EU research and innovation directorate (DG-RTD). There is greater recognition of the necessity of funding mental health research (and collaborative and large-scale projects in particular) than 10 years ago, but funding is still limited.

Fast-emerging technologies can bring researchers from different European regions together in highly efficient, inexpensive and mutually beneficial ways. Collaborative projects have acknowledged opportunities to increase the involvement of Eastern European countries in health research. Strong **basic neuroscience** is present in some centres (see systematic literature mappings in Section 1), as well as an educated mental health workforce in Eastern Europe more widely.

E.3 Interdisciplinary empirical research base in mental health

Though still a slow and gradual process, there is some encouraging evidence that mental health research is gradually being mainstreamed into general thinking about public health. Mental disorders have been treated as health problems in recent years, and mental health is increasingly considered a key component of overall health (Collins et al., 2011; Prince et al., 2007; World Health Organization, 2010). Research advances have

^{41.} http://www.ecrin.org/

^{42.} http://bbmri-eric.eu/

^{43.} http://www.europeansocialsurvey.org/

^{44.} http://www.eatris.eu/

^{45.} http://ec.europa.eu/research/fp7/

^{46.} http://cordis.europa.eu/home_en.html



contributed to these changing conceptions, including new technologies such as functional brain imaging and the greater understanding of the inter-relationships between mental and physical health. In recognition of the contribution of myriad factors to mental health, research on well-being and mental health has become more interdisciplinary. This has opened up the opportunity to compare models of mental health, mental disorders and well-being across different disciplines. Efforts have been made in regard to the use of neuroimaging techniques to compare biomedical and psychological models of behaviour (e.g. Lindquist, Wager, Kober, Bliss-Moreau, & Barrett, 2012; Saxe, Carey, & Kanwisher, 2004), in the knowledge that such approaches are complementary and could provide one another with mutually beneficial insights. Dialogue between disciplines in this way has greatly improved the empirical evidence base of mental health research.

There is encouraging evidence of mental health research being incorporated into health and medical training in Europe. The European Medicines Research Training Network (EMTRAIN) is an initiative funded by both industries and research institutes aiming to "establish a sustainable, pan-European platform for education and training covering the whole life-cycle of medicines research, from basic science through clinical development to pharmacovigilance"⁴⁷. EMTRAIN attempts to bridge the academic and industrial careers of scientists, thereby allowing for transferability of skills and knowledge between sectors, enhancing the empirical evidence base in mental health, and facilitating its diffusion. The platform, among other things, provides a freely accessible online inventory of all biomedical postgraduate courses in Europe and proposes strategies to promote international mobility and interdisciplinary culture. Other health training programmes across Europe are also gradually incorporating aspects of both mental health and research practice.

E.4 Stakeholder involvement in research

There has been a paradigm shift in the involvement of individuals with mental health problems, their families, and healthcare workers in mental health research (Wykes, 2014). Opportunities have been given to healthcare workers to research and evaluate interventions as they are implemented (Proctor et al., 2009). Though these opportunities at present may be overly bureaucratic and focused on 'target-setting', they are the potential basis of an eventual infrastructure that would allow healthcare workers to design, direct and conduct evaluative research themselves. Family charities have created similar opportunities for families of individuals with mental health problems to direct research. The introduction of **mixed methodology** has been instrumental in incorporating the opinions of healthcare workers, families and individuals with mental health problems into more traditional researcher-led or top-down forms of mental health research. Such individuals are now more commonly included as **stakeholders** in policy documents and related reports and projects – the current roadmap being an emblematic example.

The most emphatic change to research in recent years has been the surge in work that puts individuals with mental health problems at the centre of research (Callard, Rose, & Wykes, 2012; Wykes, 2014). One of the first areas in which this approach was taken was in evaluations of treatments and service provision. Researchers and healthcare providers have recognised the need to include service users and families in the planning and design of evaluative and **implementation studies** of interventions, with user-defined outcome measures (e.g. SURE: Rose, 2003b). Interventions have also been developed that take into account the burden on the family as a factor affecting the outcome of treatment, in response to attempts to move beyond researcher and clinician-defined metrics (Schene, Tessler, & Gamache, 1996). Groups in the UK, Norway and Italy have established centres dedicated to research led by service users, as well as the development of '**survivor-controlled research**' (Beresford, 2005). For example, the setting up of a novel unit to employ service users in research (Service User Research Enterprise, SURE) at the Institute of Psychiatry, Psychology and Neuroscience, in the UK now shows the maturity of this process. These projects are shifting participator methodologies to the extreme, and have the potential to lead to a new theoretical model, analogous to the social model of disability.



6. ROAMER Gaps (and Advances Needed) in Mental Health Research

In response to the accounts of global State-of-the-Art research given in **Section 5**, ROAMER work packages detailed the gaps in current European mental health and well-being research. These were used as a basis for identifying the advances needed for the next 5-10 years in Europe. The identified gaps and advances are discussed in greater detail for each of the 20 ROAMER priorities below.

A) Supporting Mental Health For All

A.1 Organising and implementing health services and systems

There is a lack of theoretical frameworks (for example organisational theory) in research about service implementation. There is also a more general dearth of research on the interaction between research and policy, including qualitative research and **mixed-method** designs. There needs to be much more policy **implementation research**, especially analysing the barriers to implementation for evidence-based improvements for health services and systems. Evidence is needed about the organisational, managerial and clinician frameworks that can achieve effective care. This empirical knowledge can then guide how services should be organised and/or implemented.

There has been little comparative research on the performance – including technical and allocative efficiency – of different mental health systems in Europe. This stands in contrast to performance assessment of other aspects of health care systems. Moreover, when mental health systems are evaluated, there remains a reliance on relatively easy-to-obtain indicators, such as readmission rates and suicide rates. These are of limited used in benchmarking the performance of mental health systems (and to a lesser extent population-level interventions), especially compared to important non-health indicators such as rates of employment, housing, education status and well-being. There is a lack of comparative outcome measures that can be used as part of economic analyses, particularly for children and young people. For instance, there is little data in the OECD health database on these issues for some countries.

A.2 Participatory research and mental health beyond clinical settings

A tailored approach to (mental) health interventions that takes account of individual differences in order to improve outcomes is often referred to as 'personalised care' and definitions are provided in the glossary (Appendix I). The personalisation of mental health interventions should not be a passive process, where service users simply have tailored treatments imposed upon them. Service users should be involved in choosing treatment, monitoring outcomes and if needed, in choosing new treatment paths. Individual treatment outcomes and subjective well-being are influenced by service user empowerment probably to the same extent as targeted pharmacological or psychotherapeutic treatment and so it is important to examine the specific effects of service user choice and empowerment, as well as the mechanisms of influence.

Relatedly, there is a need to conduct more primary research in which user preferences and perspectives are taken into account. **Participatory research** constitutes a small minority of mental health research at present, and should be further developed. Bottom-up approaches in evaluation research should be encouraged, and there is a need for more systematic reviews where research designs and outcomes are investigated from a user perspective. Beyond encouraging stronger and more active participation of research participants (children in particular) within the research process, **survivor controlled studies** (i.e. research directed and controlled by individuals with first-hand experience of mental disorder) should be funded. There also





need to be investigations of shared decision-making about treatment between healthcare workers and service users.

The effects of mental health problems are often felt beyond the scope of clinical settings and so there is a need for research that is embedded in the context of family, social support, or cultural networks in addition to individual-focused research. In particular there is a lack of existing research into supporting parenting, especially for parents with mental disorders or addiction problems, and this shortcoming needs to be addressed if we are to alleviate inter-generational difficulties. Large scale social and economic interventions also need evaluation. As well as directly involving service users and their families, there is a need for research that includes social workers in order to best address outstanding questions here.

The roles of carers, usually family members, and mental health care professionals are vital to the efficiency of any mental health system. We need more studies investigating the physical, emotional and time demands involved in being a carer and the impact of stigma on carer well-being. Common and useful predictors of well-being in family members need to be developed and validated, along with interventions to improve their well-being. Similar issues apply to mental health workers, including the importance of well-being in the workplace and interventions to support it, and how well-being is affected by healthcare workers having more direct control of both service provision and their work.

A.3 Access, service delivery and barriers to treatment

A crucial part of improving mental health care is ensuring treatment is as accessible as possible. Accordingly there needs to be research and investment into models of service delivery and pathways to mental health care. This is vital for the delivery of mental health promotion in hard-to-reach disadvantaged groups such as those with low socioeconomic status, or those otherwise discriminated against on the grounds of gender, sexuality, ethnicity or immigration status. There are individual differences that affect how easily people can access services (e.g. mobility, financial barriers, stigma, digital literacy, cognitive impairment), so user-centred approaches are needed in researching the accessibility of services.

Research evidence suggests that stigma influences service use and vice versa but it is unclear how this operates. Firstly, baseline evidence is needed on the levels of discrimination within health services. Research into overcoming stigma-based barriers to service use might initially look at low-threshold primary contact points with mental health services, such as pharmacies. A greater research focus on help-seeking in different settings (e.g. primary care, **eMental health**) may help to reduce the negative impact of labelling.



New technologies such as **eHealth**, **mHealth**, virtual reality, and gaming all show great potential for diagnosis and intervention, especially for self-managing conditions. However, current evaluations of **eHealth** and **mHealth** in terms of service supplementation or substitution are poor or lacking. As mental and physical health have been shown to be interrelated it is important to examine how mental health care can be integrated into general healthcare – for instance by training non-mental-health staff to deliver mental health care. More widely, there needs to be more focus on the influence of human moderators on processes of care and care delivery and their outcomes. This is complementary to the use of **eHealth** interventions. Research is needed into policies that would provide safe, accessible and affordable mental health services in the community – complementing existing services rather than simply replacing them.

When new mental health programmes are introduced, there should be ongoing research into the efficacy of their implementation. This includes the need to develop implementation strategies in different cultural settings and outreach to more deprived communities. These implementation strategies need to be more closely informed by research into economic and social determinants of mental health and marginalisation. At present, research on inequalities in mental health outcomes between different sections of the population is limited, as is research on the effects of socioeconomic crises on mental health. Therefore there is a critical need for research on policies that will ensure equal opportunities for everyone to realise mental well-being and so maximise society's mental capital. Research on targeted interventions to improve well-being in people with mental disorders that are tailored to specific populations (age groups, gender, ethnicity, culture, diagnosis) and carers is currently missing from the evidence base.

A.4 Prevention, mental health promotion

Though there has been recent progress in models for preventing mental disorders and promoting mental health, there is still a great deal to accomplish in this area. Increasing the standardisation of screening and diagnostic tools and improving diagnostic precision will foster adequate screening and early diagnosis of mental disorders. Standardising screening and diagnostic tools will also facilitate **RCTs** of preventive interventions targeted at specific groups identified on the basis of risk factors or other markers, including **biomarkers**. It may be desirable to first coordinate screening and prevention efforts around a single identified issue, for example postnatal depression, first-episode psychosis, or suicide attempts. Beyond diagnostic screening in clinical settings, research is also missing into screening for certain types of behaviour, such as suicidal behaviour or self-harm.

Identifying high-risk individuals and groups will be useful in determining the best targets for preventative interventions – e.g. identifying individuals who may benefit from optimising sleep patterns in mood disorders, or from **eMental health** for self-managing chronic conditions. Research is also needed into developing coping strategies (e.g. to deal with the economic crisis in Europe) in order to prevent the development of mental disorders at a population level. This could include developing preventive educational programmes. We do not yet know what are effective community psychological strategies for mental health promotion and mental disorder prevention, but numerous methods and techniques have been produced in recent years that may be applicable to these issues.

Learning from effective prevention strategies in physical disorders and testing them in mental health is a priority. This includes research at an individual level, as well as interventions on a societal level aimed at improving **resilience** and well-being. However, this is a complicated research topic as there is currently a lack of consensus regarding terminology and outcomes for mental health promotion. Both prevention and health promotion have been associated with well-being, though there is a need to clarify the extent of overlap in these areas. The concept of positive mental health should be well-defined, including the theoretical aspects and dimensions of interest for measurement and influence. Well-established scales for measuring aspects of positive mental health will need to be developed. Similarly, positive well-being measures need to be improved. At present there is a lack of normative data of subjective well-being from European countries across



the lifespan and for specific groups. For the normative and longitudinal data that do currently exist, there need to be meta-analyses in order to determine informative relationships between level of mental health, level of well-being and level of psychopathology.

There remains a need to systematically research the value and applicability of new ideas in the areas of prevention, well-being and health promotion (e.g. valuing of the positive over the negative, connections between mental and physical health, connections between individual and collective well-being, influences from eastern philosophy, **mindfulness**, mediation etc.) to either the general population or specific vulnerable groups. A longer-term aim would be to develop and validate macro-level mental health promotion interventions. A particular obstacle to this kind of research is that there is a lack of consensus on outcome indicators for positive mental health for use in economic analysis, which in turn it makes it more difficult to make the case for investing in mental health promotion.

A.5 Developing novel interventions and translating research findings into practice

There is an ongoing need for the development of effective novel interventions, be these pharmacological, psychological or somatic. Insights from neuroscience have implicated the treatment potential of transcranial magnetic stimulation, and brain stimulation for refractory mental disorders. Behavioural-economic-influenced literature has also shown some promise in encouraging protective or coping behaviours, but there now needs to be a more methodical evaluation of what motivates people to change their behaviour. There are likely to be different mechanisms of action for the onset, maintenance and change of human behaviour which are still poorly understood.

A central problem for research into novel interventions is the gap in translating **basic research** into **clinical science**, and then on into practice. Part of the issue is the lack of communication between disciplines and between research conducted at different levels of analysis – e.g. genotype, functional (including neural and neuroendocrine), personality/clinical, and health promotion at the societal level. Furthermore, it should be borne in mind that there is no single process of translation that can be followed. Rather, processes of adapting research findings into relevant and worthwhile clinical practice need to be able to take account of relevant findings together with individual differences, environment, and lifespan factors. A secondary problem is how to scale up interventions from promising pilot studies, and how to evaluate scalability when doing so. This issue is especially pertinent for interventions conducted at the level of population or public health.

At present there is no broad behavioural science platform that covers **basic research** and translation into **clinical research** and practice; findings are often communicated in peer-reviewed journals, to which the majority of the population has neither access, nor the capacity for high-level, fine-graded analyses. Dissemination processes following an initial research finding are not always especially effective. Useful advances might be made by tracking the impact of translated interventions over time. A potentially useful way to address this issue would be to generate lists of all effective interventions produced from research. There are various levels at which such lists could be generated, but a starting point could be to encourage the production and dissemination of such lists on the part of the bodies that funded the research that initially generated or enabled the end treatment. This is currently happening in places like the UK, but not across the EU as a whole. Such a practice would align completely with the interests of funding bodies, and they may be in a position to encourage the wider use of this kind of dissemination across Europe.

Effective translation and implementation is an ongoing process, and controlled trials are needed to evaluate routine care. With regards to psychopharmacological treatments, there is a need for more insight into factors that facilitate adherence to treatments, as well as investigations of the effectiveness of alternative methods of administrating treatments. With regards to psychological therapies, there is a need to establish a more diverse research base, as well as examining the relative effectiveness of different formats and frequencies of contact in treatment. For example, most data about psychological therapies' effectiveness are taken from



Northern and Western Europe, but there is no guarantee that the same techniques will be effective if implemented in the same way elsewhere in Europe.

Questions of dose-response associations and of optimal dosages and durations of treatment apply equally to pharmacological and psychological interventions. However, there is currently a lack of detailed information in the contexts of both pharmacological and psychological treatment. More widely, research into the effectiveness of treatments would be well-served by paying greater attention to mediating factors and an increased focus on reducing long-term chronicity – again these identified gaps in knowledge are equally applicable to psychopharmacological and psychotherapeutic interventions. There is also promise in research on effective interventions that are not dependent on health care professionals, e.g. peer-support and alternatives to conventional psychiatric treatment.

B) Responding to Societal Values and Issues

B.1 Economic and cost-effectiveness approaches

Economic impacts of mental health interventions are currently under-utilised as outcome measures, given the huge burden entailed by mental health problems. More use could be made of economic approaches in understanding risk factors for poor mental health, and why people present to (non-mental) health services with mental health problems. At present there is limited contact between health economics and other branches of economics, suggesting untapped potential in integrating economic techniques into mental health research.

While the use of economic evaluation in health policy and other decision-making is growing, this takes a long time to embed. This is not just in Eastern European countries: the EU-15⁴⁸ has previously provided significant funding to early intervention research, but no economic analysis was commissioned to evaluate outcomes. There is an urgent need for evidence regarding the organisation of mental health systems in times of economic crisis, which makes routine inclusion of economic analyses in health research a particularly pressing need.

Research is needed into the impact of financing mechanisms for health and social care services, and the effect of these funding mechanisms on the quality of care. In particular, there need to be robust considerations of the effects of economic decisions (e.g. closing or merging services) upon the quality of care provided. As a result, there are considerable ethical implications of mental health economics research, and there has been a lack of due attention conferred to these. There is a need for greater scrutiny of what happens with the results of health economic research, including whether actions taken as a result of such research are ethically justifiable. Pertinent and timely examples include questions of controversial decisions to deny access to an intervention as a result of economic analysis, and decisions to close necessary mental health services. More thorough and transparent accounts of how economic approaches are used in mental health are required to ensure against such events and similar misuses of research, and ethical guidelines for this kind of research would be useful resources to produce.

It is difficult to make cross-country comparisons in costing studies, often because of a lack of transparency in the cost of illness methodologies. Improving data comparability across countries and standardising the methods used for economic evaluation and analysis is essential. Costing studies and economic evaluations are further hampered in many parts of Europe by a lack of survey, epidemiological and registry data. As a result there are still many gaps in what is known about the costs of poor mental health across different European countries. Additionally, limited information is available on resource allocation and funding of mental health services in some parts of Europe, as well as on the unit costs of resources for mental health services. Further

^{48.} The 15 members of the EU prior to 1st May 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.



information about these resources would facilitate research on the cost-effectiveness of different forms of mental health interventions in future.

B.2 Wider outcomes of mental health and policy implications

As models in mental health become more detailed, it stands to reason that the outcomes considered in such research should also be revised, reconsidered and broadened. The efficacy of mental health services should be measured with new outcome variables looking at effectiveness in several dimensions, including well-being, satisfaction with treatment, **quality of life**, social inclusion, and the cost-effectiveness of treatment versus prevention.

Outcome measures should also take account of return-to-work, **presenteeism/absenteeism**, and other work and employment outcomes. The improvement of mental health outcomes for workers may be found to pay for itself, especially against the background of economic crises and mass unemployment. Appropriate research to investigate this possibility should be conducted. There is a need for more research on the prevention of mental health problems arising as a direct or indirect result of work, ideally set in workplaces themselves. There is also a complementary lack of knowledge on how to prevent sickness leave and loss of productivity due to mental health problems.

Policy is central to cultivating strong research, through funding, coordination and innovation. Research should also be able to influence social, educational and health policy dynamically. However, policy decisions that bear upon mental health and well-being (affecting schools, workplaces and communities) are regularly made without being systematically evaluated. Policy interventions represent prime opportunities for natural experiments or **randomised control trials** as methods of robust evaluation. Non-experimental social science methods can also take account of the currently neglected interdependence of other societal sectors, such as economics and welfare systems, in their impact on mental health service use and provision. Evidence-based policy needs to be constantly updated to ensure the fidelity of interventions when scaled up from pilot studies, or when translated from one setting/country/system to another.

The cost of mental disorders is insufficiently taken into account by policymakers, and unfortunately this is indicative of wider societal attitudes to mental health. There is now a need to give more prominence to mental health in all contexts, and the value of mental health and mental disorders should be made clear at all levels of society. Inclusion in the policy agenda would help mental health and its promotion to become more intersectoral. The societal relevance of mental health promotion needs to be emphasised by policy, highlighting its ability to facilitate coping with everyday life and to improve the productivity of societies.

B.3 Taking cultural and socio-political differences into account

European research and evidence-based policy needs to take stock of how geographical, infrastructural and cultural variation across the continent affects service use and provision, and mental health policy more widely. A large proportion of mental health research currently comes from a small number of countries, and understanding of the cultural context needs improvement. There is sometimes a lack of contextualisation of the evidence when transferring study findings between different regions/countries in Europe. This applies equally to studies employing psychological, behavioural, social, and economic outcomes, as long as such measures lack standardisation and transnational coherence. In order to adequately compare outcomes across Europe, there needs to be far greater recognition than is currently present of the diversity of European mental health systems.

There is a lack of research relevant for low- and middle-income countries and a lack of research into how mental health varies across Europe as a function of (cross-)cultural and lifestyle factors, and socioeconomic and migrant status. This deficit needs to be addressed. Another specific area of comparatively sparse research is that of social determinants of health in Eastern Europe. Such research also needs to be joined up with



wider research into the implementation of community based services, specifically with focus on **recovery** and user-led research, and policy research.

More concrete problems may arise from variation across Europe in the ways that research has previously been directed. For instance, the meanings of **well-being**, **mental health** and a 'mentally healthy society' differ somewhat between cultures, and these differences are reflected in national variation in measures of well-being and positive mental health. There is an absence of consensus on constructs of subjective well-being suitable for research, and a lack of appropriate measures for positive mental health, including protective factors and determinants. This could be addressed to some extent with a map of existing theories of well-being across Europe; there is a need to know which of the theories of well-being link to which measures and instruments, since not all questionnaires and measurement instruments link to theories. Advances have been made in this area, but there is a need for more measures of **resilience** and emotional well-being, adjusted for different age groups and genders. This also extends to a need to investigate how existing interventions and policies might have differing impacts on well-being and mental health in different countries, as well as within countries for individuals from different socioeconomic backgrounds. The wider pressing need for integrated and 'European' research that is sensitive to economic and cultural contexts is also a result of the current overrepresentation of US research adapted to European settings. To ensure that interventions fit European needs, a greater portion of interventions should be developed in Europe.

B.4 Stigma, discrimination and social inclusion

Primary research into experiences of stigma is lacking. Initially, efforts must be made to assess the level of stigmatisation (including self-stigmatisation) and social exclusion of individuals and groups with mental health problems and/or persons accessing care. However, there are a number of complications and difficulties involved in stigma research which need to be overcome. This area is currently dominated by social psychology. Complementary applied stigma research is emerging, but at present this is not well grounded in appropriate theory. There have been some recent advances here – including the development of implicit measures of stigma – but there needs to be more evidence-based guidance of interventions and effective policy.





There needs to be a consideration of the language and attitudes used when addressing stigma – the entire concept of 'stigma' itself may serve to reinforce negativity. Some potential suggestions for lines of enquiry here include considerations of whether it is relevant to explore the positive outcomes of experiencing mental disorder, and whether this could help both in reducing the perceived legitimacy of stigma among the individuals with mental health problems, and in fostering solidarity among them. Service user and **stakeholder** involvement is integral to any such research directions, ideally being user-led as far as possible.

A further issue is that both mental disorders and experiences of stigma are highly under reported. Social withdrawal and social exclusion are not well understood, partly because of the difficulties in reaching such populations. This highlights the need for innovative research measures to inform approaches to increasing access to treatment and social care for individuals experiencing social withdrawal and exclusion, as well as considering barriers to participation in the work market and social world.

There is a hypothesised role of poverty and privilege in exacerbating or buffering against the effects of stigma and social exclusion; research is needed to identify the most significant risks. Such an approach also includes the importance of an increased understanding of interpersonal relationships in postmodern society, including the potential support (or lack of) offered by computer-mediated communication and online social networks as well as more traditional social networks.

In light of the active and passive discrimination faced by individuals with mental health problems, there needs to be more (and more sympathetic) research into the protection of existing rights of such individuals, as well as renewed research into whether these rights are sufficient. This encompasses questions such as involuntary psychiatric treatment and inappropriate **polypharmacy**. Alternatives to coercion in treatment must be developed. There has been some investment into small scale research on participation in mental health systems, social inclusion and human rights in mental health settings, but this now needs to be scaled up.

There also needs to be complementary research into the public's awareness and understanding of mental health, as well as a consideration of how theoretical 'disease concepts' of mental disorders relate to stigma. For example, brain imaging (and associated medicalised models of mental disorder) does not necessarily reduce stigma, and can have the opposite effect. Though public awareness and understanding of mental health issues is related to stigma and discrimination, there is currently insufficient useful and detailed knowledge of mental health literacy in the general population and population subgroups.

C) Life Course Perspective of Mental Health Problems

C.1 Developmental trajectories and risk profiles

There is a need for more research that acknowledges the developmental perspective, improving the **staging** and subtyping of clinical trajectories, and thereby improving treatment and prevention outcomes. Such research should include developing robust outcome measures across the lifespan, including indices of well-being and cognitive deficits in mental disorders. This would facilitate the identification of protective and **resilience** factors for mental health, and so lead to better-targeted preventive strategies and mental health promotion.

Interventions (and preventative measures) can be best targeted through consideration of causal mechanisms of progressive disorders and syndromes. Objective measures of typical development will allow early risk factors for mental disorders to be more accurately identified. This type of research would be complemented by prioritising the development and validation of early diagnosis and screening tools, especially for developmental disorders. The efficacy of preventive interventions may vary across development, highlighting the need for research into the developmental trajectories of risk factors and symptoms of disorders. Truly longitudinal and lifespan research should take stock of prenatal and parental influences on critical periods in develop-



ment. There is a specific lack of current research on the effect of mental disorders and use of **psychophar-macy** during pregnancy, and its long-term impact on maternal and offspring health.

Although it may be assumed that 'the earlier the better' in regard to administering interventions, there needs to be more research on ways of affecting neural plasticity to encourage **resilience** later in life. Though the age range of 12-21 years is identified as a developmental 'hotspot', not all disorders will have the same risk factors occurring at the same stages. Consequently, targeted **translational** and **implementation research** should focus on other key transitions and salient risk factors throughout the lifespan, and making sure that preventive interventions are best suited to the relevant critical age-groups. Older people are not frequently identified as a 'developmental population', but more research in this group is crucial considering the ageing European population.

At present there is a huge gap in **basic science** on the (biological) mediation between environmental influences and mental disorders. As a result, developmental and **aetiological** models of mental health and mental disorder are incomplete. A key concern is the relative poverty of defining the 'environment' – e.g. 'losing a job' is an ostensible environmental factor that may act as a stressor or trigger for depression. However, the actual stressor effects of this event can vary hugely between individuals and contexts. Definitions of environments might therefore be better based on subjective experience and how an individual copes, rather than on discrete events.

Overlap between neurobiology and environment highlights the need for more research to focus on geneenvironment interactions, for instance in elicited mother-child interactions, family structures, and parental age at conception. 'Toxic stress' in infancy and early childhood might be a concept useful as a crossing point for environmental and biological mechanisms. Another useful concept may be the 'exposome' (the entire spectrum of chemical stimulation outside and inside an individual), which blurs the traditional boundaries between environment and biology.

C.2 Longitudinal studies

Longitudinal research assessing environmental influences and psychopathological burden across the lifespan is needed in order to understand developmental trajectories of mental health and mental disorder. It is important to note that the main psychopathological burden across the lifespan occurs in the transition from childhood to adulthood. In fact, 80% of the lifetime psychopathological burden can be detected during adolescence. Transition from adulthood to old age is another period of increased incidence of psychopathology. Therefore there should be a high priority for research focusing on transitional periods and markers/causes of shifts in vulnerability to symptoms and disorders across the lifespan. Such research cannot simply use cross-sectional studies of these age groups, but must involve longitudinal studies following individuals from pre-transition, through their transition period, and with detailed ongoing follow-up work. Owing to the fact that developmental trajectories and transitions vary between individuals, there is a great deal of detail that is potentially lost by trying to study development through a reliance on cross-sectional samples. Future research might then better consider **symptom clusters** or likely treatment responses based not on particular diagnoses, but on the effects of environment on transitional stages in psychopathology.

There is also an identified need to conduct more (and longer term) naturalistic studies – namely clinical cohort studies. These studies can be combined with **randomised controlled trials (RCTs)**, assessing the course of symptoms and functioning within an RCT control group. This highlights the potential for hybrid trial designs that maximise the efficiency of data collection and analysis. Dynamic models may also be useful in situations where outcome measures (such as symptom levels) are not stable over time, e.g. in longitudinal studies of **complex interventions**.

Intervention studies should develop and use new intermediate or proxy outcome measures (e.g. behavioural or cognitive markers) to maximise the richness of data collected. Existing well-being instruments require



further validation, but could then be included as outcome measures in cohort studies. This is important for understanding the effects of good versus poor mental health across the life course, including studies on the economic impact of lack of mental well-being.

Longitudinal and cohort research is well-placed to answer questions about long-term conditions, burdens and risk factors associated with mental health. One specific example of great importance is the current lack of comprehensive knowledge about suicidal and parasuicidal behaviour. Reliable tools to evaluate suicidal risks across the lifespan should be developed, based on an interdisciplinary biological, psychological and social approach. There is a need for comprehensive statistical data on suicides, in the form of suicide registers.

C.3 Children and adolescents

A crucial aspect of research for nearly all areas of mental health is that of early detection. Early detection of disorders or risk factors would serve to potentially ameliorate over- and under-diagnosis, which represent huge problems for mental health at present. Although knowledge is increasing there are still gaps in our understanding of mental health problems in the early years. Further research into early detection and early-years research would be extremely fruitful for both theory and practice. Key risk groups among children and young people include those without parental care or suffering abuse or neglect.

The reasons that child and adolescent research can maximise the efficacy of evidence-based interventions in mental health are twofold. Firstly, recent years have seen rising public health needs in child and adolescent psychiatry/psychology. These are not adequately matched by the attention of the scientific community, either in absolute terms, or relative to other medical fields or subjects with similar public health impact but rather higher publication activity. Secondly, developing early interventions aimed at children and adolescents offers the opportunity to minimise the disease burden (e.g. in terms of **disability-adjusted life years**), especially for high-burden chronic issues such as mood disorders. Interventions early in life may further serve preventative purposes if administered prior to the onset of disorders. Epidemiological data show that most (upwards of 80%) psychopathology begins its expression between the ages of 12 and 21, yet a minority of funding goes into this age range. Focusing on ages 12-21 may then be the most effective way to reduce psychopathology at the population level, maximising the efficiency, efficacy and cost-effectiveness of interventions aimed at improving well-being, **quality of life** and so on.

Development is dynamic rather than stable, and often unpredictable at the individual level. Therefore there is a need for a research base that considers differentiated responses to both positive and adverse life events instead of just average effects, as variation can be more informative than averages for issues of risk detection and prevention. The results of this kind of research will feed into implementation of interventions and policies by establishing for whom these would work well, and for whom less well, as well as defining the most effective developmental stages at which to intervene. There is a relative gap in developmentally sensitive research on mechanisms underlying disorders. Better understanding of how to optimise child mental health will inform mental health services, population, community, social and economic actions addressing mental health and well-being. In contrast to the more common focus on treatment and illnesses, prevention and early intervention work needs to address issues at the population level. This should be reflected in the targeting of populations by evidence-based intervention policy, i.e. advising midwives, paediatricians, new parents, educators and politicians rather than exclusively focusing on potentially at-risk children and adolescents.



D) Stronger Research Focus, Towards Personalised Care

D.1 Theoretical directions for basic science

There is a pressing need to understand the mechanisms of mental disorders, and to identify risk and resilience factors or markers (neurological, biological, psycho-social, consumption and lifestyle) for both subjective well-being and mental distress. Such understanding would inform the development of adequate screening tools for symptoms of mental disorders, and for identifying groups of individuals for targeted intervention strategies.

A number of disorder-specific gaps in knowledge and research have been identified. For example, the genetic architecture of depression is better delineated for bipolar than for unipolar depression; certain mechanisms are implicated in drug addiction that may or may not be involved in behavioural addictions; better understanding is needed of neurobiology behind acquired vulnerability for certain disorders (e.g. how to avoid PTSD); more knowledge is needed regarding risk factors for pre- and postnatal anxiety and depression from nationwide cohort and register studies.

A lack of understanding of the mechanisms and causal pathways involved in mental disorders also limits the ability of current models to explain wider issues that are not specific to single disorders. Two such examples are gender differences in the rates and expressions of certain disorders, and the role of intellectual functioning and cognition as a risk factor for mental disorders. There is a need for more research that takes a multivariate and symptom-led approach to risk factors and causal mechanisms that span multiple disorders, as in Kendler and colleagues' (2011) symptoms network approach.

Taking complex paths into account will require **basic research** to be integrated with large-scale epidemiological, psychological, and genetic research. Population-level research is needed to address the overall mental health of Europe, and to capture the complexity of mental health and its determinants across the lifespan. Research on biological and cognitive markers would be enhanced by a more considered use of the distinction between clinical and functional phenotype and genotype.

More research is required that explicitly uses mental well-being as an outcome measure, investigating the interaction of genetic, environmental and psychological influences upon **resilience**. One illustrative example would be into the consequences of (social) media use in children and adolescents on well-being, neurobiology, cognition and emotional functioning. Such research would benefit from the use of longitudinal studies.

Research into risk factors and developmental trajectories of mental disorders can also inform clinical practice, in particular the incorporation of risk profiles into individually targeted and optimised preventions, interventions, and treatments. Research that helps to establish the risk profiles of different service users will inform the development of guidance tools to help clinicians choose between treatment modalities based on the type of mental disorder, stage/progression, previous outcomes, comorbidity, age and other factors.

D.2 Diagnoses and basic research

The findings from recent advances in neuroimaging and **biomarker** research need to be developed, validated and integrated into the diagnosis and stratification of mental disorders, with particular reference to the insight that such information may hold for predicting treatment responses. Current clinical diagnoses may be less appropriate for genetic and biological investigations of mental disorders. There are common intracellular pathways and genetic variants that can cause different mental disorders – an analogy is that a house and a bridge may both be made from bricks but that the resulting constructions are very different.

A potential method of resolving this issue from the perspective of **basic, mechanism-level research** would be to define underlying mechanisms for **symptom clusters**, and consider diagnoses later. Use of epidemiological approaches to explain variance, together with individual differences research into the manifestations of different mental



disorders may help to define more valid end-points, markers, or **endophenotypes** with greater explanatory power for use in **basic research**. Any subsequent adaptations to diagnostic measures or strategies based on advanced knowledge of **biomarkers**, mechanisms and other **basic (psychological or social) science** would require research into the development and validation of diagnostic measures and questionnaires via psychometric and validation studies. Research embracing a more dimensional approach to mental disorders may also be relevant to clinical research and practice.

D.3 Comorbidity

Related to any research into <u>basic science</u> led reconsiderations of disorder boundaries and models is the underlying and under-researched issue of co- and <u>multi-morbidity</u>. Risk factors identified via biological and other <u>basic research</u> need to be considered in terms of fostering the development of screening tools for <u>comorbidity</u> in mental disorders. Shared mechanisms (e.g. of sensitivity to reward and punishment) underlie symptoms that cut across different mental disorders. This needs to be reflected in the <u>biomarkers</u> developed and used by research and clinical practice.

There is a need to investigate <u>aetiological</u> associations between physical and mental health further, and to understand their implications for physical and mental health outcomes. This is especially relevant to the handling of multidimensional problems of alcohol abuse and other problems with addiction. In addition, there needs to be more research into complications, coincidence and causal associations in overlapping disorders. The end point of such lines of enquiry would be an integrated psychosomatic model of mental and physical health and disorders.

A limitation of current intervention studies is that they are directed at the group level – e.g. "all individuals with anxiety". This means that many studies are unable to address variation within sub-groups or individuals in terms of treatment response. This lack of fine detail means that it can be difficult to predict treatment outcomes or make the most informed treatment decisions for specific individuals who show aspects of atypicality or **comorbidity** in their symptom presentation. As a result, there is a need for **implementation studies** that take into account and adapt interventions to the individual's **comorbidity** or symptom profile in terms of developmental stage, disorder progress (as many disorders show greater rates of **comorbidity** over time) and context. One such example would be individuals with schizophrenia-related disorders' likelihood to relapse, and therefore their personal need for antipsychotic maintenance therapy, which can cause varying side-effects with different **comorbidity** profiles. All such progress should ultimately be aimed at improving the well-being of individual service users.

D.4 Evaluating current interventions and methodological practice in research

There is a lack of knowledge of routine treatment outcomes and their effectiveness, and this needs to be addressed by psychotherapeutic and psychopharmacological intervention studies. Establishing the active components of effective interventions in current use would also help to improve treatment outcomes. There also need to be more thorough and systematic replications of findings in order to establish them as valid and useful. This is imperative to overcome the problem of approximate replications, which neither confirm nor refute research findings, particularly in neurobiological research.

Trials need to conform to a level of theoretical and methodological rigour that is currently lacking, especially for future multi-arm **clinical trials** necessary to develop evidence-based guidelines for psychiatric treatments. There is a need for registration trials for new medicines or medical devices. Active and control conditions within these trials need to be robustly randomised and more research needs to be conducted without pharmaceutical industry financing. The use of placebos needs to be evaluated, improved and standardised, giving evidence of how different placebos affect the observed effect size. Though **blinding** and placebo issues also exist in pharmacological studies (and accordingly need to be adequately addressed), control groups are effectively impossible to **blind** in psychotherapy interventions, making it difficult to measure effectiveness.



There is a need for a holistic approach to mental health service research, taking into account factors such as accommodation, occupation, family life, social relationships, etc. More caution needs to be exercised when using **randomised controlled trials**, as they are ideal designs often lacking in depth or detail with regard to actual implementation. An example is **polypharmacy**, where the interactions that may occur when using several drugs at once are seldom examined. Outstanding questions of side-effects, safety, efficacy, and (crucially) associated suicidality of treatments are relevant to explorations of treatment combinations. Interdisciplinary research coordination for the systematic evaluation of suicidality as a treatment side-effect can foster the links and infrastructure needed for evaluations of other psychotherapeutic treatment side-effects.

Another issue pervading current trial designs is sex differences. Research (**basic research** in particular) is biased towards the participation of men, with little consideration of sex or gender in the analyses. This highlights the need for more research that can identify both mechanisms and predictive outcomes related to gender in relation to mental health. An example is why marriage is so good for men (halving the rate of depression) but bad for women (doubling the rate of depression). As well as guaranteeing the inclusion of service users from all genders, more research is similarly needed that includes individuals of all age groups (in particular, clinical drug trials in children and adolescents), as part of an effort to incorporate more dynamic and nuanced predictions of outcomes.

Predictions of trial outcomes are also constrained by sample characteristics in other ways. The most prominent is of 'supernormal' controls being compared to heterogeneous groups of clinical cases. Implementation of mental health interventions will introduce a number of variables (e.g. matching therapist – method – service user) beyond those addressed in the **clinical trial** evidence base for the implementation. This means that there will not necessarily be one 'best way' to administer any given treatment. More research needs to take account of this likelihood in the design and how the evidence base is built. There also needs to be an increase in the attention paid to whether and how certain treatments are more effective in certain groups. A better integration of quantitative and qualitative research will aid the capture of the complexity of mental health. For example, experiential knowledge should become a legitimate source of knowledge and acquire a role in conceptualising services.

To complement examinations of research on the differential efficacy of single interventions, there is a need to conduct <u>experimental medicine</u> studies focusing on <u>complex interventions</u>. Examples include interventions combining psychotherapy and pharmacotherapy, and those combining approaches to treating physical and mental <u>comorbidities</u>, as well as the long-term chronicity of many mental disorders. Studies of <u>complex interventions</u> need to use more long-term outcomes, and there is a need to expand studies beyond the period of disorder onset to better research relapse prevention. Development and evaluations of <u>complex, long-term interventions</u> would need to work on many levels (e.g. biomedical, psychological, behavioural, social) and with input from many different scientific disciplines. Evaluations of complex long-term interventions also require the development of appropriate statistical models in analysis.

The need for detail in predicting outcomes demonstrates the necessity of exploring and developing extensions and alternatives to **RCTs**, as has been noted by the European Evaluation Society. One example is the growth-curve analysis or latent growth modelling techniques widely used in social science and public health. Within-person designs – such as ABABAB designs ('idiographic', or individual-centric designs) – conducted in addition to efficacy and effectiveness trials ('nomothetic' or general rule/law based approaches) would also inform individual-differences research into treatment outcomes.

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E. Building Research Capacities

E.1 Open access, data sharing and harmonisation of concepts

There is a need for internationally comparable data based on common methodologies, and for integrated databases enabling more comprehensive studies. Research networks and data-sharing initiatives are needed to ensure the storage, sustainability and protection of databases and to avoid research overlaps and redundancies throughout Europe. All publicly funded research should provide **open access** to its publications (not just abstracts), as well as anonymised **open data** (as far as this is ethically possible in light of sensitive data etc.), as withholding public access to the output of publicly funded research cannot be justified. At the European level, **open access** would necessitate a homogenisation of the language(s) used in databases. This comes together with a need to standardise classification systems and measurements used in research across countries and over time, as well as developing novel measures more appropriate to a transnational or European research focus.

Although there is overwhelming support for <u>open-access data</u> and research output, questions remain as to how such initiatives should be implemented – e.g. as a mandatory counterpart of any EU funding, or through creating incentives for data providers. Another key issue is that provisions should be put in place to extend beyond the end of a research project as designated by funding cycles. Databases or registries, for instance, should continue to be used by (potentially other) researchers after the end of a project to ensure the most efficient use of existing resources.

Other aspects of data-sharing (e.g. clinical data that might have been collected as part of routine medical care) present subtler issues to those that can be solved via **open access**. The EU and research infrastructures can be particularly useful for data gathering, management and access, especially in coordinating the standardisation and quality control of (raw) data. Mental health registries and databases in Europe could be mapped, detailed and provided by the EU. Initiatives such as Euroreach®⁴⁹ have been identified as good examples of what is needed, since access to private and public data in the EU is a bottleneck for research at present.

One issue that straddles research data and clinical registers is that of **biobanks**. Transnational repositories would be valuable to mental health research, and accordingly there is a need to look at existing initiatives such as the BBMRI (Salminen-Mankonen, Litton, Bongcam-Rudloff, Zatloukal, & Vuorio, 2009) to guide future policy. However, there are a number of logistical constraints upon truly integrated European **biobanks**. Firstly, most European service users are not treated in centres of **excellence**, and for many doctors the motivation to contribute **biobank** samples would be unclear. Secondly, stigma is a barrier and is probably one of the reasons why there has not been an uptake of mental health registers to the same extent as for **somatic disorders**. Thirdly, there are issues of regional organisation. The common result of many of these issues is that service users with certain disorders from provincial areas may not be included in research programmes, leading to biased samples of a small proportion of the population. Finally, data protection laws and political attitudes vary across Europe. Sufficient political support will likely help with the resolution of some of these issues (i.e. transnational **biobanks** mandated at a political level), but there is still a need for researchers to develop creative practical solutions to data collection and management.

Different research traditions use different key terminology and concepts. An indicative example is the disparate use of the terms mental and psychiatric 'disorder', 'disease', 'disease entities' and 'illness'. These concepts are in need of clarifying and coordinating across research groups and networks, especially if future multidisciplinary research into mental health is to be successful and worthwhile. Similar issues also apply to related theoretical concepts and distinctions between good mental health and well-being.





E.2 Research networks

Networks, platforms and collaborative spaces are necessary for European researchers and groups to collaborate more intensively, to balance the current competition-driven research field. Collaboration needs to occur across countries to develop mental health policy research capacity. Though the number of research networks in Europe is increasing, it still remains limited. Collaboration will also improve the efficiency of research. Research using common methodologies, coordinated by wider and more diverse collaborative networks (compared to small research groups) will serve to limit bias and increase the reproducibility of studies – which in turn improves the quality, transparency and credibility of European research results.

Collaborative networks should be researcher created and led. Researchers themselves should be able to contact each other and work together without the intervention of any supervision and without necessarily requiring funding. However, when first set up, research networks may be fuzzy, and so may need to focus on a particular need, e.g. reducing nicotine dependence, prolonging life and improving care in schizophrenia. There is a lack of visionary 'man-on-the-moon' projects (e.g. zero suicide mortality) – the encouragement of ambitious and targeted goals for mental health research could help to focus, motivate and coordinate large swathes of research with complementary skills and aims. Moreover, when designing new studies or choosing areas of research to focus on, the active involvement of individuals with mental health problems, healthcare workers and other stakeholders in such networks will be invaluable.

The process of setting up and developing mental health research networks requires organisation. Networks can be 'a harmless way to waste a lot of money', and doubts have been raised about the efficiency of such structures. At their worst, due to the high numbers of contributors, the research could lack innovation. These criticisms are best considered as avoidable mistakes rather than constitutive elements of networks, and several successful networks (e.g. **clinical trials** networks in the UK) have avoided such pitfalls. In light of this, there are three main criteria for research networks to guard against counter-productivity: 1) to be flexible enough to ensure innovation, 2) not to be 'invasive' and hinder research performed outside the network, and 3) to have a limited administrative burden and be sufficiently independent from the institutions that 'house' them.



Two main types of research networks have been identified: scientific networks and investigation networks. Scientific networks are inexpensive, and easily created and managed. They bring together scientists of different disciplines and nations in a common field of research, and allow them to discuss and elaborate projects together. Increased contact and familiarity between researchers in and of itself has been identified as a worthwhile outcome from any research network, whether informal or institutional. Scientific networks are dynamic and heterogeneous, and their mapping is difficult.

On the other hand, investigation networks allow small research units to share their research tools, instead of buying expensive facilities which would be underused in each research unit. Investigation networks afford the optimisation of facilities (e.g. offices), equipment (e.g. <u>MRI</u>), databases or infrastructures (e.g. cohorts). Insight into existing investigation networks could be gained by mapping them through initiatives such as the MERIL® project⁵⁰ and the ROAMER infrastructure survey.

Additionally, there is a growing need for eNetworks that allow researchers to identify each other and facilitate contacts and exchanges. These can be virtual and general (e.g. ResearchGate®⁵¹), or more specialised – for example specific to mental health. eNetwork contacts should also lead to real meetings and room for exchange, such as workshops or conferences. This requires a budget for networking activities. Examples of dynamic researchers networking have been demonstrated at the national level (e.g. in the UK, and Canada), and these should now be developed at the European level.

At present there is a split between research units and technical facilities, and this can lead to disjointed progress in research and practice. Infrastructure and sustainability of European mental health research could be greatly enhanced by a dynamic and adaptive trans-European network of **centres of excellence** with specific competencies and a sustained perspective. Their remit could include acquiring, linking, analysing and sharing data at a coordinated level (e.g. access to high throughput genotyping, creation of functional **-omics** and neuroimaging centres), and maintaining resulting repositories of methodological and procedural expertise that otherwise tend to get lost between successive waves of national network funding. They would also facilitate **knowledge transfer** within networks and to the wider scientific community.

Transnational collaborative (infra)structures should take into account the competitive advantages of different European regions, collaboration with existing institutions, European research infrastructure projects, national cohorts etc., as well as capacity building across Europe. The scope of the effort to establish structural and infrastructural advances is considerable and includes the establishment of dedicated centres for data acquisition and analysis, as well as research networks. Together dedicated centres and networks may contribute to developing and supporting a research infrastructure to maximally benefit from Europe's unique near-universal access to healthcare and its cultural diversity which allows differentiated analysis of environmental and cultural influences.

When considering the competitive advantages of different European regions in collaboration, Eastern and Central Europe (which encompass a huge part of Europe) must be included. There needs to be a clearer focus on the comparative strengths and advantages that these regions have – e.g. large populations, large cohorts, appropriate centres and registers. Iceland is another example of a region highly competitive in research that should be included. Such collaborations cannot and must not be reduced to Western European countries; it would be more desirable for collaborative networks to be horizontally organised and reciprocal. As a guiding principle, the actions of any transnational collaborative network should serve not to worsen the West/East gap, but on the contrary to facilitate its closure.

^{50.} http://portal.meril.eu/converis-esf/static/about

^{51.} http://www.researchgate.net/



E.3 Capacity building for a multidisciplinary research base

Beyond medicine and psychiatry, there is a need for other fields (such as sociology, anthropology, economics, psychology, philosophy, biology, nutrition and exercise policy among others) to be consulted in mental health services research, as well as in the translation of research findings into practice. However the integration of different areas of (mental) health research will likely not be simple or straightforward – research capacity will need to be expanded in order to bridge these areas.

The multidisciplinary approaches now central to mental health research should be enhanced in masters and PhD programmes devoted to mental health research, and new programmes should be created with this feature in mind. New postgraduate research training programmes should involve several universities, in order to more readily foster coordination of training content across Europe. Such coordination would help to address certain other issues in European mental health training – for example some countries do not have the critical size to create relevant training programmes in mental health research. Inequality in training capacity between East and West also creates a brain drain which damages new member states and eastern countries.

Administering multidisciplinary training to mental health researchers would also require considerations of the content of such training. This is important for research areas that are not yet fully defined, such as health promotion and prevention research. eLearning may be of particular use to bridge training gaps. The EU could provide guidance to harmonise this landscape, help to coordinate larger training projects, and set up robust infrastructure to monitor and evaluate initiatives. Currently it is difficult to obtain information indicating what research training researchers working in mental health have undertaken. Similarly, it is not easy to follow the trajectory of students after graduation, all the more so as there is no clear-cut career path after research training programmes in mental health. These issues must be borne in mind by any attempts to set up more effective mental health research training in Europe.

Prior to designing and implementing new forms of training, there needs to be a systematic investigation of what mental health research training is currently available, as well as its quality. The current scope of European training programmes in research is not sufficiently known, and there is often little indication of how many disciplines are covered by any available courses related to health. For example, there are differences between countries regarding the contents of psychiatry, psychology, nursing and paramedic courses. In some countries medical schools offer mandatory or dedicated research or mental health training, but this is not the case in others. A minimum of research training should be required for academic posts in mental health, as this is not currently the case in all EU countries. Future research training should concentrate on the quality of the researchers more than on their quantity.

Owing to rising workloads and increasing levels of responsibility, it is more and more difficult for mental health professionals to find time both for research and clinical practice. More generally the question has been raised about whether or not physicians should continue to pursue a dual research and clinical practice career. However, the gap between clinical practice and research must be reduced; including mental health professionals in research seems to be a meaningful way to facilitate the required knowledge transfer between practitioners and researchers. It would not be practical to provide highly detailed research methodology training to each clinician, but European practitioners should ideally have consistent training in knowledge transfer and be able to understand and implement evidence-based medicine outcomes in their day-to-day practice. Taking part in research should be an accepted and routine part of the use of mental health services, as is currently the case in cancer services for example.

Funding for research is still very limited, and there is no European fund dedicated to mental health. In the context of the economic crisis, national research funding has been decreased, and research has to compete with other EU priorities. However, mental health research is not sufficiently funded in comparison to other health fields given the burden of mental health problems.



Methods and strategies are needed to stimulate innovation and creativity, to encourage unconventional research and to overcome potential reviewer criticisms of such unconventional approaches. There is a need for programmes and funding to encourage research that is not 'more of the same', including funding for **proof-of-concept** pilot studies with lower probability of success. In the US for example, foundations provide specific funding for studies with high risk and low probability of success, which if successful can then apply for conventional grants. These are not large grants but are sufficient for **proof-of-concept** pilot studies. Since it is difficult for novel research in its early stages to demonstrate its wider applicability (Wooding et al., 2013), a viable alternative would be for researchers to be more able to propose projects themselves with less strict conditions in Horizon 2020 and future funding calls.

E.4 Including stakeholders in research

The dialogue between researchers and policymakers – though extremely important – is not the only dialogue that needs to be encouraged in the area of mental health. Service users, their relatives, professionals, the public and decision-makers all need to contribute more to the discussion of what directions mental health research now needs to take. There has been an encouraging movement towards greater stakeholder involvement in mental health research – in particular, the European Commission has recently outlined a number of ways of fostering greater <u>stakeholder</u> involvement in conducting and translating research (European Commission, 2014a) – but there is still a long way to go. There is a need here to take a Europe-wide view for the sake of comparability and for maximising the strength and usefulness of mental health research and the resources it draws upon. For instance, research networks can go some way to harmonising clinical re**search** in Europe, but promoting the standardised practices developed by these networks at the policy level could be invaluable. There is a great deal of scope to improve communication between the research community and the EU Directorate-General for Research and Innovation (DG-RTD), with both groups working collaboratively on setting up calls for research. Involving service users and families in this process would also greatly enhance the relevance of future research to the needs of European society. In order to realise these goals it may be necessary to develop new bottom-up methods of writing funding calls for European research. Fast and flexible funding processes should be developed in order to perform rapid research when necessary and relevant.

Both research and evidence-based policy would benefit from more transparent consulting processes or ways for **stakeholders** and researchers to voice their research questions and wishes. The methodology of calls for research has also been criticised on the grounds that it is too time-consuming and expensive. Given that research budgets' spending plans are often difficult to accurately predict three years in advance, introducing more flexibility in the allocation of funding would benefit the research output of future funding calls.

Furthermore, due to the particular funding modalities – i.e. mainly through projects – concerns have also been raised about the instability of research careers. After generally long studies, researchers are hired through repeated fixed-term contracts with few guarantees in term of salary and career. This job insecurity could be reduced by increasing the part of core funding in research, at both national and European levels. However this is an issue that varies in its extent across Europe (due to differences between institutions and research infrastructures across the EU), and so priority should be given here to those areas identified as having the least stable career prospects.



7. Conclusion

Mental disorders represent the single greatest social and economic burden on European society. The cost of mental disorders (excluding dementia and other organic brain disorders) in 2010 was estimated at €461 billion. This is the lowest current estimate for this figure, as it does not take into account the large additional costs associated with having co-occurring mental and physical disorders. Building on excellent science in Europe to tackle important societal challenges, ROAMER has identified the most pressing mental health research that takes advantage of Europe's infrastructure and research strengths.

In doing so, the roadmap has highlighted a number of timely considerations for research, including: mental health promotion, prevention and early targeted intervention; treatment and rehabilitation of mental disorders; plus care and recovery and social inclusion across the lifespan and for all societal groups. At the same time, the roadmap has outlined considerations of mental health with the greatest relevance to sustainable growth, in line with new socioeconomic currents and post-crisis economic models in Europe.

Basic science (biological, psychological and social) has made many advances in the last decade and has completely changed what we know about mental health and well-being. These developments, together with technological advances (not least among them **eHealth** opportunities) can contribute to a revolution in personalising mental health care, if given sufficient opportunity by funding bodies and decision-makers. It is imperative the European Union provides strategic guidance to such developments in a way that most benefits society.

The roadmap has included considerations of infrastructure, funding and capacity building, as well as fundamental socioeconomic characteristics of European society and their associated inequalities. This breadth of focus is reflected in the project's 5 priority areas:

- A. Supporting mental health for all
- B. Responding to social values and issues
- C. Life course perspective of mental health problems
- D. Research towards personalised care
- E. Building research capacities

Answers to the research questions identified by ROAMER will benefit:

- Individuals and their families, through:
 - Reducing the incidence and impact of mental disorders
 - Reducing burdens on carers
 - · Reducing stigma
 - · Promoting social inclusion
- The public purse, through:
 - Reducing healthcare costs
 - Reducing the costs on social services necessary to support European citizens
 - Sustainable growth and productivity gains
- European industry, through:
 - Creating opportunities for drug development and technological innovation
 - Developing a skilled young work force



The effects of mental health reverberate throughout society, and are relevant beyond academia, to individuals with mental health problems, their families, employers, healthcare providers, healthcare workers, education workers, policymakers and industry. Europe has the potential to become world-leading in mental health and well-being which would benefit all facets of European society.

We need a coordinated and multidisciplinary effort that includes policymakers, research funding bodies, professionals, researchers, individuals with mental disorders, carers and civil society to achieve proper funding of mental health research, at least tripling the current amount.





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Alliance for Biomedical Research in Europe

EuroHealthNet

European Brain Council (EBC)







European Council of Neuropsychopharmacology (ECNP)

European Federation of Associations of Families of People with Mental Illness (EUFAMI)

European Federation of Psychologists Associations (EFPA)







European Health Management Association (EHMA)

European Joint Action for Mental Health and Well-Being

European Psychiatric Association (EPA)







European Public Health Alliance (EPHA)

European Public Health Association

European Social Network (ESN)







European Society for Child and Adolescent Psychiatry (ESCAP)

Federation of European Neuroscience Societies (FENS)

Global Alliance of Mental Illness Advocacy Networks (GAMIAN-Europe)







Mental Health Europe (MHE)

Union Européenne des Médecins Spécialistes
– Section of Psychiatry

WONCA World Working Party on Mental Health



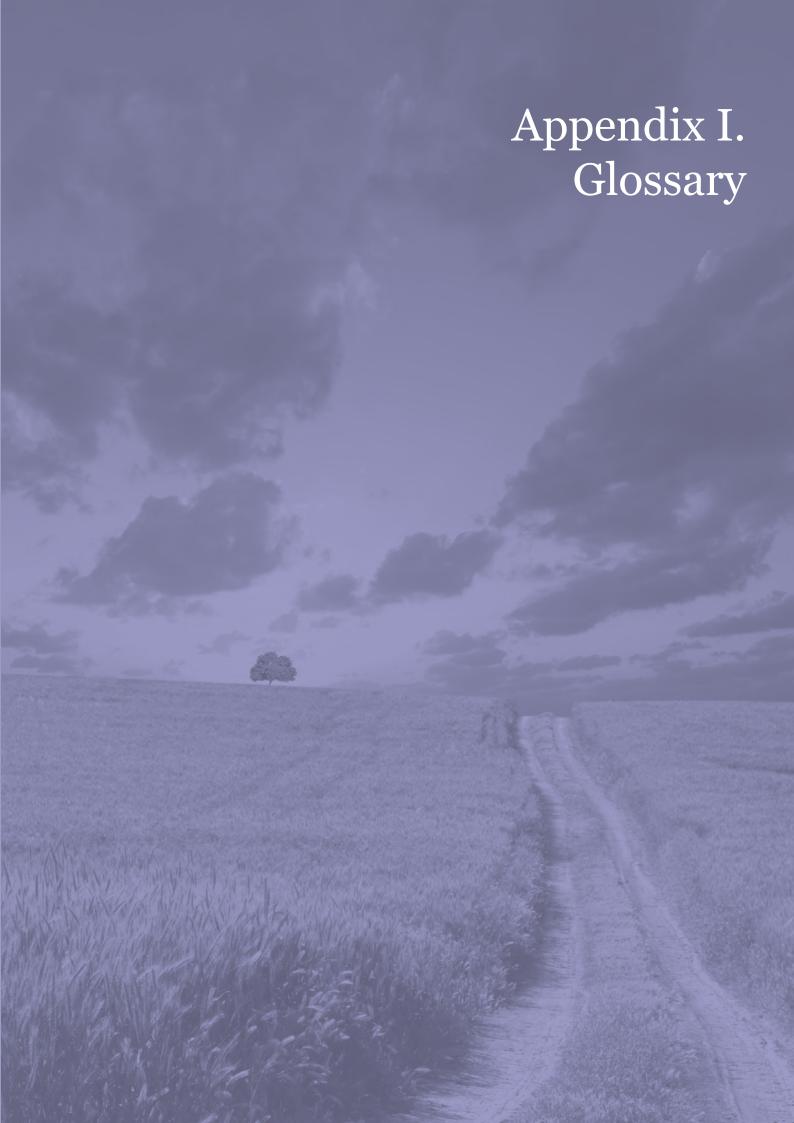


International Union for Health Promotion and Education

World Health Organisation European Office for Mental Health

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Glossary

Absenteeism

Frequent and ongoing absence from work, referred to in the context of chronic (mental) health problems.

Aetiology (Aetiopathogenic)

The cause or set of causal factors of a medical condition. Can also mean the study of this area. Aetiopathogenic is a related term, but directly concerns the cause(s) and emergence of disorders or maladaptive conditions.

Alleles

Various forms of the same gene that differ slightly in DNA sequence and so give distinct information to define a specific feature/characteristic of the organism.

Allostasis (Allostatic Load)

Bodily systems coordinating allocation of energy required to meet the cost of coping with stress, and the recovery process (via biological and psychological adaptations) aimed to restore <u>homeostasis</u> (maintain consistent internal bodily conditions) and promote storage of energy resources for future needs. The cost of allostasis is termed 'allostatic load'.

Basic Science/Basic Research

Research conducted 'for research's sake' - to build a strong and consistent empirical research base.

It aims to expand knowledge about a process or its constituent mechanisms without its findings necessarily having any immediate practical applications beyond the scientific enquiry itself. In mental health research, basic science may include biochemistry, neuroscience, psychology and behavioural science.

Basic science findings in mental health research are applied to clinical settings and practice by means of further <u>Clinical Research</u> and <u>Translational Research</u>.

Behaviour Change

This term corresponds to two distinct entities in two distinct academic literatures. In behavioural science, behavioural economics and decision science, the term can be taken fairly literally – corresponding to changes in behaviour, normally as a result of an intervention.

In some circles of European academic psychiatry, the term 'behaviour change' is also used in as a synonym for 'mental disorder' or onset of a mental disorder or mental health problem.

For clarity, only the former (behavioural science) meaning of this term is used over the course of the roadmap.

Behavioural Disorders

A set of disorders characterised by abnormal, maladaptive or disruptive behavioural function, with the implication of otherwise relatively intact cognitive or emotional functioning. This includes disorders such as conduct disorder, oppositional defiant disorder and antisocial personality disorder. In different diagnostic classifications (e.g. DSM, ICD) these may be viewed as either a subset of mental disorders, or as a related class of distinct disorders (e.g. in the way that autism spectrum and other developmental disorders may be viewed as a distinct class of disorders). See also mental disorders.

Big Data

Particularly large datasets, typically captured passively (e.g. through logged website use, large-scale health data etc.) rather than actively collected through a single study – or else achieved by pooling an extremely large set of datasets. Given their sheer scale, these data will be rich in detail but will require dedicated storage, transfer and processing applications or systems beyond typical data management services and programs.

Biobank

A physical repository of (typically human) biological samples collected on a large scale, to act as a resource for biological research and medical science.



Biomarkers

Objectively measurable biological variables used as indicators of normal or abnormal biological processes. Typically these are necessary steps in a cascade of changes which produces the symptoms of a disease (in the general health literature), and may be measured to predict disease events, prognosis or response to treatment. As applied to mental health, they are typically signifiers of symptoms of mental disorders, and may also include signature physiological responses to a given stimulus. Understanding of the processes underlying biomarkers may also allow for more effective or better targeted treatments.

Blinding

Making researchers or study participants 'blind' to the treatment/experimental conditions in a study or trial, in order to avoid any effects of subjectivity on the results. 'Single-blind' means that participants are not aware which condition they are in (e.g. whether they are receiving a placebo or active treatment). Double-blind additionally means that the researcher administering the intervention is unaware what intervention or experimental manipulation they are providing to participants.

Centres of Excellence

Training-centric institutions that focus on a particular area to provide guidelines or best practice. Such centres will also generate research into their area of focus, in order to support evidence-based initiatives in the training or leadership they aim to provide. These can take the form of physical buildings or facilities, or of looser networks/teams.

Circadian Rhythm

Bodily cycle or rhythm that repeats or loops with a frequency of once a day (e.g. sleep/wake cycle in humans). These are self-sustained, but adjusted to the local environment by external signals such as sunlight.

Clinical Research/Clinical Trials

Applied research of <u>basic science</u> findings to test the efficacy of a potential intervention prior to its adoption into practice. For pharmacotherapy, clinical trials proceed in numerous phases (with analogous phases for non-pharmacological treatments):

Preclinical – Establishes that a drug/intervention is non-lethal and functions correctly to a specific end in non-human testing (via in vitro or animal testing) thus being a good candidate for human use

Phase I – A new drug is tested on a small group of healthy volunteers, starting with very low doses, in order to establish its safety, the most frequent and serious side effects, and appropriate ranges of dose sizes that can be correctly metabolised and excreted

Phase II – The new drug is tested with a wider population of ill participants to give a preliminary examination of its effectiveness (e.g. in comparison with another drug or with an inactive substance called a 'placebo'), to continue validating its safety, and to examine short-term adverse effects

Phase III – The drug that has successfully passed phases I and II is trialled in a large sample (order of magnitude of ~1000) of different ill populations and in different dosages to examine viability, safety (including side-effect tolerability). The drug is also compared to alternative treatments to test its relative efficacy.

Phase IV – The drug is monitored in public usage after being approved for marketing and thus being available on prescription. This phase serves to keep track of the drug's ongoing safety, especially in light of prolonged use, and provides information on its efficacy, or optimal use. Any unanticipated adverse drug reactions are closely investigated (see <u>Pharmacovigilance</u>)

Clinimetrics

A systematic approach to calibrating and refining measures and indices used in clinical practice, based on verifiable evidence.

Collaborative Care (also Integrated care)

A model of healthcare for long-term conditions (including mental disorders) where there are efforts to integrate



across primary care, mental health and physical healthcare. So primary contacts may work together with clinicians, psychiatrists, nurses, social workers and service users themselves to follow individuals through the health and social care system monitoring the individual's progress and responding to arising needs in care.

Comorbidity

Co-occurrence of two or more health issues or pathological conditions within the same individual. Such issues can include psychological/mental disorders (e.g. depression, autism, addiction), physical illnesses or symptoms (e.g. diabetes, cancer, high blood pressure), or pathological behaviours (e.g. self-harm, substance abuse).

Complex Interventions

These are interventions which, rather than featuring a single treatment (e.g. a cognitive behavioural therapy programme or a specific drug), are made up of multiple interacting components. Including more components can improve the quality of intervention, but at the same time can often make them difficult to evaluate and research owing to the uncertainty regarding which components, interactions of components, or contextual elements of the complex intervention are giving rise to which outcomes at various stages along the chain of service delivery.

Connected Health

This refers to (mental) health care delivered remotely, outside of primary care and traditional healthcare settings, and facilitated by communication technology. It encompasses remote care and management of lifestyles and chronic symptoms, using developments from eHealth, mHealth, telehealth and so on. There is also an emphasis on integrating across existing e-resources and databases in order to facilitate these processes, by maximising the availability of existing health information.

Connectome

(Functional) model of the human brain as a comprehensive map of neural connections – rather than based on e.g. physiological structures.

DALY

'Disability-Adjusted-Life-Year'. This is a measure developed by the World Health Organisation (WHO, 2008) to provide a unitary index of disability and disease burden that would be comparable across different health problems. For instance, comparing mortality rates across cardiovascular disease and depression would not give full accounts of the disability caused by each disorder. DALYs take into account years of healthy life lost directly (i.e. due to premature death), but also as a consequence of suffering and/or impairment through disability or ill-health. This allows the measure to compare across different mental disorders, as well as between mental and physical disorders in terms of both level of disability and how long it endures.

Discovery Science

An approach that uses existing empirical and experimental data on a large scale to gain new insights. Rather than being hypothesis-driven or inductive (as in e.g. <u>Basic Science</u>), Discovery Science is data-driven and deductive, looking for novel and apparently meaningful patterns in existing findings (e.g. by modelling or data-mining) in order to drive future research, largely irrespective of established hypotheses.

eHealth (eMental Health)

A broad term referring to health services facilitated by the use of software or internet services. This includes for example psychological or self-management interventions administered via internet or browser programs, as well as the coordination and integration of patient databases to improve access to information. This also widely encompasses <u>mHealth</u> and <u>Telehealth</u>. When relating exclusively to mental health (as opposed to physical health or <u>comorbid</u> problems), the term <u>eMental health</u> may be used.

Emotional Intelligence

A conception of (an aspect of) intelligence that is based on ability to identify and understand emotions and interactions with others, drawing on empathy and emotional problem-solving. It can be contrasted with more typical views of intelligence (e.g. IQ) that focus predominantly on speed of cognitive processing.



Endophenotype

In contrast to overtly measurable behaviours, symptoms or markers ('exophenotypes'), endophenotypes are shared cognitive, neural, and behavioural underpinnings of a health problem which are hypothesised to be more reliable markers of genetic risk. Endophenotypes for mental disorders are generally agreed to satisfy four criteria: 1) they are associated with phenotypic outcome measures for their respective disorder, 2) they show genetic influence at a population level, 3) they are enduring and independent of state manifestations (e.g. depressive episodes) of their associated disorder, and 4) they are meaningfully inherited together with aspects of their respective disorder.

Executive Function

The monitoring, control and regulation of cognition. This constitutes 'higher' cognitive functions such as problem solving; task switching, planning and execution; and working memory.

Experimental Medicine

An umbrella term referring to the use of scientific methods (specifically, experiments) in developing and implementing medical treatments and interventions. This comprises <u>Basic Research</u>, <u>Clinical Research</u> and <u>Translational Research</u>. More specifically the focus of Experimental Medicine differs from e.g. incremental improvement models of drug development, in that it is explicitly human-focused (as opposed to based on animal research and models) and aims to develop interventions that specifically target <u>Biomarkers</u> or neurocognitive factors previously identified as pertinent to certain disorders.

Eudaimonic well-being

A concept of well-being that is not based on subjective happiness, but on satisfaction of needs (rather than desires), living well, and human flourishing. Derived from the Aristotelian concept of eudaimonia, and may be contrasted with heldonic well-being.

fMRI (MRI)

Acronym for 'functional Magnetic Resonance Imaging'. A form of brain (or biological) scanning that allows for monitoring of brain activity over time in response to specific stimuli, by detecting associated changes in blood flow in specific brain regions. It is used to infer the function and dysfunction of different brain regions, in either research or clinical settings. MRI is an imaging technique used to investigate the anatomy and physiology of the body organs. It is concerned with structural representation (of brain regions in the case of the current research focus), rather than dynamic or functional activity over time.

Hedonic well-being

Subjective happiness or positive feeling, which can be contrasted with <u>eudaimonic well-being</u>.

Homeostasis

The control and balance of internal (biological) conditions within an organism in response to external influences. For example, maintaining a constant internal body temperature in response to changing environmental temperatures, or maintaining resting levels of neurotransmitters.

Implementation Science/Implementation Research

This refers to research into influences on how scientific findings are implemented into practice and policy. As well as investigating factors which influence the uptake of scientific findings and ideas, such research is also concerned with logistics of implementation, e.g. whether an intervention's efficacy is sustained when implemented or whether this drops off after a period of time, how the same intervention performs in different healthcare settings etc.

Informal Carer

An individual who provides care to a service user or individual with a (mental) health problem, but is not employed to do so - i.e. not a social worker, care worker or other (mental) health professional. In the overwhelming majority of cases, this will be a family member.

Integrated Care

(see Collaborative Care)



Knowledge Translation / Knowledge Exchange

Knowledge translation refers to the transmission of empirical findings and knowledge from researchers to 'implementers' such as policymakers or service providers. However, in recent years this concept has been revised and superseded by 'Knowledge Exchange', which recognises that the transmission of knowledge for evidence-based policy or practice should not be a one-way route from researchers to others – but rather a set of reciprocal exchanges of expertise between researchers, service users, service providers, policymakers and others.

Medical Device

An instrument, item of technology, piece of apparatus or chemical that is used in the diagnosis, prevention or treatment of health problems.

Mental Disorder

Mental disorders, as defined by the World Health Organisation⁵², comprise a broad range of problems with different symptoms, which are generally characterised by some combination of abnormal thoughts, emotions, behaviour and relationships with others.

'Mental disorder' is used as a unifying term across the current roadmap, encompassing terms (or aspects of terms) such as 'psychological disorder', 'psychiatric disorder', and 'behavioural disorder' but without being constrained to a single diagnostic system (i.e. ICD, DSM or RDoC). The term mental disorder as used in this roadmap is informed by the terminology of the Global Burden of Disease study (WHO, 2010), and an exhaustive list of the disorders and problems that the current roadmap refers to by the term 'mental disorder' is given in the common 'mental health' search terms reported in Appendix IV. Of note, our definition of mental disorder excludes organic brain disorders, trauma related brain disorders and neurodegenerative disorders such as Alzheimer's and dementia. Our conception of mental disorders also excludes substance use disorders and addiction, though we do recognise these as a very large and common comorbid problem in mental disorders.

See also mental health problem.

Mental Health

Mental health is the degree of physical, mental and social well-being experienced, and not merely the absence of disorder. When experiencing mental health, individuals can realise their own potential, cope with the normal stresses of life, work productively and fruitfully, and are able to make a contribution to their community⁵³.

Mental Health Problem

Used in the current roadmap in a manner similar to <u>mental disorder</u>, again referring to problems with mental health, behaviour, or psychological and social functioning that exclude organic brain disorders. However the specific implication of the term 'mental health problem' is that there is a greater focus on subjective experience, or personal or social functioning rather than clinical diagnosis. That is to say that an individual may have a mental health problem to a varying degree without necessarily meaning that they do or do not have a diagnosis of a specific mental disorder.

mHealth

Broad term for healthcare facilitated by mobile technology (e.g. mobile phones, laptops, tablets etc.). Apps and programs can be used to facilitate remote access to treatments and interventions, as well as in-depth and real-time collection of multi-modal health and well-being information from service users. See also <u>eHealth</u>.

Mindfulness

A psychological intervention, adapted from Buddhist philosophical and meditative practices to apply to managing experiences of mental disorder. Service users are encouraged to accept their experiences in a non-judgemental way, as a more positive and coping-focused way of thinking about the subjective experience of their disorder.

^{52.} http://www.who.int/topics/mental_disorders/en/index.html

^{53.} http://www.who.int/mental_health/en/



Mixed methodology

A research methodology that uses both qualitative and quantitative methods.

Multimorbidity

Used interchangeably with <u>comorbidity</u>, when describing the co-occurrence of more than two pathological conditions.

-Omics

A general term referring to all technologies within biological science that aim to conduct an exhaustive characterisation and quantification of the entire set of specific biological molecules (e.g. proteins, genes, RNA transcripts, metabolites, etc.) contained within an organism, organ, biological system or cell type in a specific time frame. They all end in the suffix –omics: proteomics, genomics, transcriptomics, metabolomics, etc.

Open Access

Free (gratis and libre) access to research output (generally research articles and other publications) for all citizens. Typically referred to in terms of publications that have resulted from publicly-funded research.

Open Data

Free (gratis and libre) access to research output – typically in the form of datasets hosted online and made freely available for download. Generally referred to in terms of publications that have results from publicly-funded research. A subset of <u>Open Access</u>.

Participatory Research

Research involving the active participation of the population under investigation – in this case, individuals with mental health problems, healthcare workers (when researching service delivery), families and carers (when researching community care), etc.

Person-Centred Care

(Mental) health care that emphasises the role played by service users, in contrast to them being treated as passive participants or 'subjects' of care. This involves users making active decisions about their own care, as well as focusing on 'human' outcomes (e.g. well-being, social engagement) that are pertinent to the individual, as opposed to more generic health indicators. See also: personalised care.

Personalised Care

Treatment or interventions (including pharmaceuticals, psychotherapy and interventions in any other modality, not limited to medicine – e.g. \underline{m} Health) that are specifically suited or tailored to an individual, rather than a standard approach to treating a given disorder. The personalisation of treatment may take account of any or all of the following: biomarkers or genetic risk factors, the individual's pattern of $\underline{comorbidity}$, individual's age / developmental profile / personal or medical history, socioeconomic status, treatment history, and numerous other factors.

In the current roadmap, this term subsumes the following terms: <u>personalised medicine</u>, <u>stratified medicine</u>, <u>tailored treatment</u>, <u>person-centred care</u>.

Personalised medicine

As defined in by Horizon 2020: "Personalised medicine refers to a medical model using molecular profiling for tailoring the right therapeutic strategy for the right person at the right time, and/or to determine the predisposition to disease and/or to deliver timely and targeted prevention"

This definition is effectively a synonym for <u>stratified medicine</u>. Personalised medicine is also sometimes used to take account of other forms of profiling (e.g. socioeconomic status, gender, personal history of health problems) to tailor or personalise treatment. In the current report this term is subsumed by the term <u>personalised care</u>.

Polypharmacy

Receiving pharmaceutical treatment that consists of more than one drug at the same time. This is especially common for mental disorders due to their high rates of <u>comorbidity</u> with other <u>mental disorders</u>, as well as with <u>physi-</u>



<u>cal or somatic disorders</u>. This issue is of particular importance in terms of considering side-effects from medication and interactions between different drugs.

Presenteeism

Attending work, but not fulfilling requirements or working at full or near-full productivity - i.e. attending work just for the sake being present. Referred to in the current roadmap in the context of chronic (mental) health problems.

Proof-of-concept

An early or small-scale version of a prospective larger study, to demonstrate that the effects or phenomenon of interest can be found. Normally performed to justify funding a larger or more expensive subsequent study.

Psychiatric Disorder

A mental health problem with a clinical (psychiatric) diagnosis. This term is subsumed by the term 'mental disorder'.

Psychological Disorder

A disorder that represents a form of psychological dysfunction. This term is subsumed by the term 'mental disorder'.

Pharmacovigilance

Ongoing monitoring of a pharmacological treatment to ensure that it remains safe and tolerable in long-term public health use, with no drop-offs in efficacy. (see <u>Clinical Trials, Phase IV</u>).

Psychopharmacy

Pharmaceutical treatments or interventions that affect aspects of psychological functioning.

Quality of Life

A term referring to a broad concept of well-being of individuals and societies, which has been operationalised into a number of qualitative and quantitative measures. The concept of quality of life encompasses aspects as broad as (physical and mental) health, wealth, employment, education, physical and social environment, and leisure time.

Randomised Controlled Trials (RCTs)

The 'gold standard' for <u>clinical trials</u> and tests of other interventions (e.g. policy trials, <u>basic psychological and social science</u>). Here participants are randomly allocated in equal numbers to a group who will receive the intervention (50% of the original sample) and a control group who will not (the other 50% of the sample). The outcomes for the two groups are compared to allow for a clear indication of the effects of the intervention. RCTs can also be applied to test between different types of interventions, e.g. where 1/3 of the sample are randomly allocated to one intervention, 1/3 to a second intervention and 1/3 to a control group.

Recovery Concept/Focus/Model

An approach to mental health that, rather than focusing on disorders and curing symptoms instead focuses on improving individuals' subjective functioning, well-being and efficacy. The aim of this approach is to help people with mental health problems to have as much control over their life as possible as part of an ongoing holistic process for the person as a whole, rather than just the presence/absence of symptoms at a given time.

Resilience

The ability of an individual to cope with changes and adversities (e.g. the experience of stress, in the context of mental health). This is normally based on coping mechanisms or strategies. The term 'resilience' can be thought of as the inverse of 'vulnerability' to mental disorder – with the analogy of 'resilience factors' (e.g. supportive social environment, steady employment) that protect individuals from the negative effects of mental disorder in the same way that 'vulnerability factors' (e.g. genetic predisposition, negative life events) may put individuals at risk.

Salutogenic

Factors that cause or support positive mental health and well-being, as an alternative to focusing on disorder-centric models of mental health. Can be contrasted with 'pathogenic' factors, which would be the causes of a disorder.



Service User

Generally, an individual with a health problem who is accessing (or has accessed) some form of health care or intervention. In the context of mental health research, and this report in particular, this is taken to mean an individual with a mental health problem who has some form of engagement with the healthcare system or social services.

Somatic Disorder / Physical Disorder

A physical health problem of identifiable physical origin that does not primarily affect mental health.

Staging (of mental disorders/clinical trajectories)

A way of modelling health problems or disorders where early features or symptoms of the disorder can be distinguished from later features. As such the disorder can be separated into distinct stages that most or all individuals experiencing the disorder will pass through in succession – typically from stage o (at-risk or latency stage) to stage IV (late or end-stage disease). This approach is widely used in physical disease and health problems, but more recent efforts have tried to apply it to mental disorders.

Stakeholders

The term is used to describe all groups of people or institutions with interests in mental health and well-being research due to political, financial, professional or personal reasons. This includes European or national associations of professionals related to mental health, service users and their families, healthcare workers and providers, academic institutions, funding bodies and governments, ICT and pharmaceutical companies, and non-governmental organisations active in the mental health field at the European level and in individual European countries.

Stratified Medicine

An approach to psychological and psychiatric medicine that aims to associate specific and operationalised outcomes associated with psychological and mental disorders (including positive/negative affect, social behaviour, motor behaviour, cognition and physical symptoms) with specific neural and biological markers. Interventions for the identified outcomes are then predicated on changing the state or action of their identified biological underpinnings.

Survivor Controlled Studies

Research directed and controlled by individuals with first-hand experience of mental health problems or psychiatric treatment. A term that typically carries implications of being more critical of existing health systems and care pathways than the otherwise synonymous 'service user-led research'. The term 'survivor' also negates the need for an individual to have received or be receiving health care or other interventions, in contrast to the term 'service user'.

Symptom cluster

A set of symptoms that tend to co-occur, either within or across disorders. Using symptom clusters as part of a transdiagnostic approach has been central to the National Institute of Mental Health's "Research Domain Criteria" approach to mental disorders.

Telehealth/Telemedicine/Telepsychiatry

Meetings and appointments between service users and healthcare professionals (including psychiatrists) conducted via video conferencing software rather than in-person appointments held in the same physical room. This allows for remote interventions and reporting of symptoms. See also <u>eHealth</u>.

Trans*

Umbrella term for transsexual/transgender, more widely referring to the experience of gender dysphoria.

Transdiagnostic

Refers to theory or clinical approaches that span multiple disorders. For instance, problems with concentration are seen in many mental disorders, including anxiety, depression, schizophrenia and attention-deficit hyperactivity disorder. An intervention that aims to improve concentration across all these disorders would therefore be transdiagnostic – compared to separate, specific interventions for each individual disorder.



Translational Medicine/Translational Research

Research aimed at adapting <u>basic science</u> findings into <u>clinical research</u> and then on to their final, applied form as treatments and public health practice. This consists of two main componential practices, known as T1 and T2. T1 refers to research that adapts <u>basic science</u> into a final clinical intervention, and its final output is the intervention being 'brought to market'. This is widely known as the 'bench-to-beside' approach. T2 then follows this, addressing the on-going questions of how well the intervention is implemented – e.g. if there is sufficient access to treatments, and whether the treatment is meaningfully reaching the service users and populations for whom it was originally intended.

Translation(al) Gap, Translation

The theoretical or practical gap between <u>basic or theoretical research</u> and applied research. Typically in mental health research (and the current roadmap in particular), this refers to the gap between laboratory or field studies and <u>clinical research</u>. However, this can also refer to the gap between research evidence and (ostensibly) evidence-based policy. Translation is the process by which empirical findings are applied and implemented as practice.

Ultradian Rhythm

Bodily cycles or rhythms that repeat or loop with a frequency of greater than once daily (e.g. hormonal release, appetite, wakefulness, heart rate).

User-Focused Monitoring

This is an approach to evaluating mental health services that was developed by service user led research. Based on the idea that evaluations of services should reflect the concerns of users, it details a <u>mixed-methodology</u> approach where service users direct the study design, collect and analyse data and report and implement findings.

Well-being

Well-being reflects an individual's perception and evaluation of their own lives in terms of their affective states and psychological and social functioning. There are many different conceptualisations of well-being, those which understand well-being as an evaluative or affective state and those which conceptualise well-being as referring to one's psychological make-up, being equipped to deal adequately with adversity. Furthermore, some scientists distinguish between hedonic well-being (moods and feelings) and eudaimonic well-being, which is more concerned with factors such as self-realisation, social contribution and meaningfulness.

Subjective well-being fosters good health, both physical and mental. The effect on physical health appears most clearly in a longer life-time, the effect on mental health manifests in less morbidity and faster recovery.



Abbreviations/Acronyms

ACT Acceptance and Commitment Therapy

ALICE RAP Addiction and Lifestyles in Contemporary Europe Reframing Addictions Project

ASPEN Anti-Stigma Programme European Network

BBMRI Biobanking and Biomolecular Resources Research Infrastructure

CATIE Clinical Antipsychotic Trials of Intervention Effectiveness

CBT Cognitive Behavioural Therapy

CIBERSAM Centro de Investigación Biomédica en Red de Salud Mental

COST European Cooperation in Science and Technology

DALY Disability Adjusted Life Year

DG-RTD Directorate-General for Research and Innovation
DG-SANCO Directorate-General for Health and Consumer Affairs
DSM Diagnostic and Statistical Manual of Mental Disorders
DUETs Database of Uncertainties about the Effects of Treatments
EATRIS European Advanced Translational Research Infrastructure

EBC European Brain Council EC European Commission

ECRIN European Clinical Research Infrastructure Network

EEG Electroencelphalogram

EMTRAIN European Medicines Research Training Network

ENMESH European Network for Mental Health Service Evaluation

EPA European Psychiatric Association

ERIC European Research Infrastructure Consortium

ESFRI European Strategy Forum on Research Infrastructures
ESEMED European Study of the Epidemiology of Mental Disorders

EU European Union

FP7 The Seventh Framework Programme of the European Union for the funding

FUTURAGE Roadmap for European Ageing Research

GDP Gross Domestic Product
GP General Practitioner

HPA Hypothalamic-pituitary-adrenal

ICD International Statistical Classification of Diseases and Related Health Problems

IMI Innovative Medications Initiative

INSERM Institut national de la santé et de la recherche médicale

INTERSTRESS Interreality in the Management and Treatment of Stress-Related Disorders

IPS Individual Placement and Support

MERIL Mapping of the European Research Infrastructure Landscape

MHEEN Mental Health: European Economic Network

MRI Magnetic Resonance Imaging
NEF New Economics Foundation
NHV Nordic School for Public Health
NIMH National Institute of Mental Health



NICE National Institute for Health and Clinical Excellence

OCD Obsessive-compulsive disorder

OECD Organisation for Economic Co-operation and Development

PHQ Patient Health Questionnaire

PREDI-NU Preventing Depression and Improving Awareness through Networking in the EU

PTSD Post-traumatic stress disorder
RCT Randomised Controlled Trial
RDoC Research Domain Criteria

REFINEMENT Research on Financing and Quality of Mental Health Care in Europe

RI Research Infrastructure

ROAMER Roadmap for Mental Health and Well-Being Research in Europe

SEYLE Saving and Empowering Young Lives in Europe

SMEs Small and medium-sized enterprises
SURE Service User Research Enterprise

SUPREME Suicide Prevention through Internet and Media Based Health Promotion

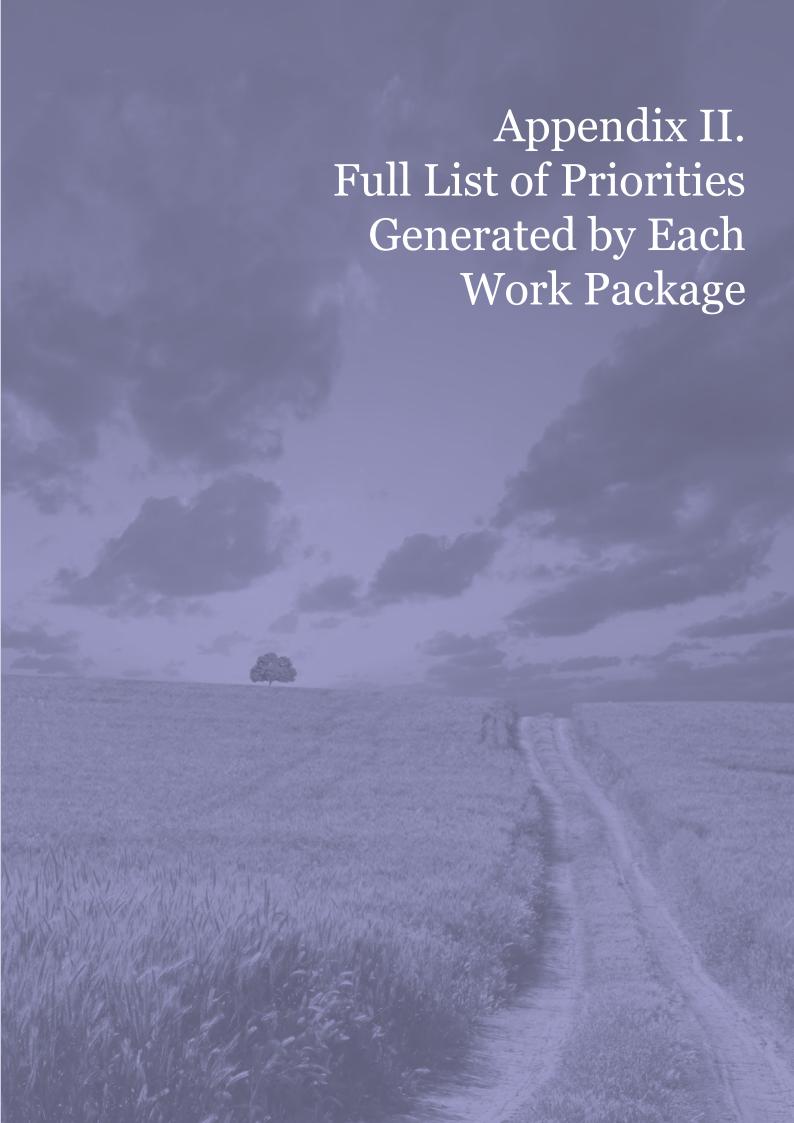
TEDS Twins Early Development Study

UK United Kingdom
UN United Nations

UNICEF United Nations Children's Fund

US United States

WHO World Health Organisation





ach of the scientific work packages of the ROAMER project (Work Packages 3-8), plus the Clinical Research Task Force, generated a list of 20 priorities for their area of knowledge within mental health research. This was done after reviewing the state of the art and collecting the views of 20-30 renowned European experts in the field in scientific workshops and surveys. The priorities from each work package were justified according to common criteria, as part of the ROAMER process (as outlined in **Section 4** 'ROAMER Method' in the main roadmap), so as to generate priorities that were effective, deliverable in the next 5-10 years, and that took advantage of the resources and competitive advantages available in Europe.

The 126 priorities generated by individual work packages were integrated into the over-arching set of 20 priorities presented in **Section 2** of the main roadmap. However, the full set of individual priorities (listed by work package) are also presented below, for reference. Full sets of the justifications for each work package's individual set of priorities are given in the ROAMER document **D11.2: First report on Gaps and Advances Needed** (Haro et al., 2013).

The priorities of Work Package 9 (reviewing the stakeholders' initial view) were generated and prioritised using a different method to Work Packages 3-8 and the Clinical Research Task Force. These priorities are included for reference in the order of importance that they were given in a survey of stakeholders at the end of this appendix. They were not integrated into the list of 20 ROAMER priorities in the same way as the output from Work Packages 3-8, as they were generated by a different approach, being more general and overlapping with the output of numerous other work packages – see Fiorillo et al (2013) for full details. Instead, they were used to weight and prioritise the integration of the 20 ROAMER priorities and 6 high-level priorities.

Work Package 3:

Research Funding, Infrastructures and Capacity Building

Goal 1: Optimise European research strengths

- 1. Create an infrastructure which maps the available databases of population, clinical and research data in mental health.
 - Promote mental health disease registries, mental health status surveys and the use of common indicators across countries
 - Implement open access to publicly-funded mental health research publications
 - Implement open access for publicly-funded mental health research data

Goal 2: Encourage collaborative and multidisciplinary projects so as to create the "critical mass" necessary

- 2. Increase visibility, access to and use of research infrastructures.
- 3. Increase the number, quality and efficiency of international and interdisciplinary networks.
- 4. Develop knowledge-exchange activities.

Goal 3: Develop access to mental health research training

5. Encourage and support the creation of European mental health research courses and share available training resources.

Goal 4: Close the gap between clinical practice and research

- 6. Provide basic research training to every healthcare professional.
- 7. Condition academic careers on the development of research skills.

Goal 5: Increase the attractiveness of mental health research.

- 8. Improve the "employability" of researchers and bridge the academic and industrial sectors in order to offer variety and opportunities for research-oriented careers.
- 9. Incorporate and/or promote mental health research in related research training tracks (health promotion, prevention, etc.)



Goal 6: Promote innovative, competitive and excellent research

- 10. Increase transparency in the development of calls for proposals and involve more researchers in the setting of research priorities.
- 11. Create faster and more flexible funding mechanisms, especially in the short term.
- 12. Increase the proportion of core funding and/or develop long-term calls.

Goal 7: Improve efficiency of mental health research funding

13. Create specific funding dedicated to mental health research.

Goal 8: Improve the level of funding dedicated to mental health research

14. Increase the link between policymakers and researchers and foster evidence-based policies in mental health and well-being.

Work Package 4: Biomedical – Neurobiological, Pharmacological and Clinical Research

Goal 1: Advances relevant to discovery

1. Functional characterisation of neurobehavioural mechanisms across the lifespan.

While the mechanism of action of single molecules or some specific chains of molecular events important for psychopathology have been elucidated, our understanding of how the many different types of molecules act in a concerted way is insufficient. One of the challenges in the coming years will be to explore the systemic context of such molecules on different cell types, investigate their relation to our current molecular understanding of the neural underpinnings of behaviour, and assess their function across the lifespan. Meeting this challenge will require harnessing the emerging methods of systems biology to model how molecular interactions and cellular networks contribute to form a self-organising ordered system with vulnerability and resilience to mental disorders.

2. Identifying behavioural patterns defined by neurobehavioural mechanisms and relating those to current diagnostic criteria.

Mental disorders are increasingly regarded as disorders of the brain as opposed to disorders of the mind; they are alterations in neurobiological brain circuits that are influenced by genetic and environmental factors. Nonetheless, diagnostic classifications are still largely based on clinical observation and symptom reports by patients, rather than biological evidence. Consequently, treatment is aimed at merely reducing and managing observable symptoms. This inability to target the causes of disorder results in suboptimal response rates and adverse effects of medication: for example, 30-40% of patients with depression do not respond to appropriate drug/therapy treatment and approximately a third of those with schizophrenia do not respond to standard treatments. Understanding the biological causes of mental disorders would therefore help to improve diagnostics and treatment efficiency, and reduce adverse side effects.

3. Identifying reliable biomarkers to predict and measure risk of mental disorders, their progression and response to treatment.

There is a need for reliable biomarkers that can be used to stratify patients based on risk, prognosis and predicted treatment response. Biomarkers may be based on knowledge of the biological mechanisms of mental disorders and forward translation from animal models. Certain mechanisms are implicated across mental disorders. Repeated exposure to stress may result in psychopathology or conversely may mobilise health protective psychosocial resources.

Better insight into these mechanisms of vulnerability and resilience may help to identify genes and epigenetic modifications influencing critical pathways that may serve to stratify patients by risk. Reward and punishment mechanisms are implicated across disorders including anxiety and mood disorders as well



as substance and behavioural addictions, and thus similarly have great potential for yielding pertinent biomarkers. Cognitive impairment is a feature of many mental disorders and is frequently inadequately addressed by current methods of assessment and treatment. Future research should include the development of neurocomputational models that will provide a foundation for the use of human electrophysiological responses as markers of cognitive impairment.

4. Understanding risk and resilience for mental disorders across the lifespan by investigating gene x environment interactions and gene-environment correlations (the genetic influences on environmental exposure) and their mediation through epigenetic and transcriptional mechanisms.

The majority of mental disorders are a product of nature and nurture. Variations in vulnerability among individuals within and between populations arise as a function of interactions among genetic and environmental (including psychological and social) factors that vary over the course of a lifetime. Therefore, there is a need to investigate the contribution of these factors to age-related resilience or vulnerability to mental disorder and well-being in different environments and populations across Europe. This is required to better understand the relation of individual vulnerability/resilience in adverse conditions as well as the consequences of a nurturing environment on mental health. Such studies will require massive datasets if current crude environmental measures are used, due to the modest effect sizes associated with single genes. Development of better and more relevant environmental measures is sorely needed. On the other hand, as more and more genes are identified to be associated, use of genetic risk scores and genome-wide scores will bring much more power to such studies, permitting analyses in samples of reasonable size (i.e. from a single study rather than combined over multiple studies).

5. Investigation of the exposome.

The exposome is a measure of the effects of lifelong environmental exposures on health. One of the most ubiquitous chemical exposures is ingestion of ethanol and smoking of tobacco. It is known that these compounds have different effects during pregnancy (e.g. foetal alcohol syndrome spectrum and low birth-weight among smokers, plus lasting effects on brain development have been reported that are still poorly understood). While there is good documentation in rodent models, the lasting effects of alcohol and tobacco have been poorly investigated in humans. In general little is known about the effects of several chemicals/medications/drugs over the life-course. It is therefore necessary to investigate the effect of these toxins on the exposome, implications for transgenerational transmission, and possible modulation by genetic and epigenetic factors. Ultimately, the same neuroplasticity that engenders vulnerability to toxins also provides the potential for focused interventions during transitional periods.

6. How does early life experience affect health over the lifespan?

To address this question it is crucial to understand how early experiences (e.g. perinatally and during puberty) can programme emotional and stress regulation for life. This requires insight into epigenetic and epistatic mechanisms that can change brain plasticity towards a vulnerable phenotype, which may become expressed under specific circumstances in later life and result in chronification. It remains unresolved why some individuals progressively fail to cope with adverse early life experiences and accumulate risks for mental disorder, while others gain strength even from seemingly abusive early life adversity, as if such conditions prepare for life ahead. In addition to human studies, humanised animal models are needed that test the mismatch or the cumulative stress hypothesis. Such models depend on modulations of gene-environment interaction in a living organism which will benefit enormously from technological advances in imaging, gene modification and cell biological technology. In fact, we are witnessing a constant renewal of technology to address the questions: Who is at risk? How do we prevent and cure disorders? How can the quality of life, particularly of the elderly, be improved?

7. What are the mechanisms underlying failures in social processes and how can interventions best be developed?

Failures in the brain systems for social processes are central to a large number of mental disorders, though because they contribute only modestly to differentiation between ICD categories they often go undiagnosed. While the behavioural phenomena of such failures have been described, there is a need for developmental



studies that chart these and describe their neurobiological bases, as well as integration of information from different approaches into unitary paradigms. Examples of areas for further research include imitation, a primary means by which children learn new skills. Whether failures in imitation (e.g. in autism) result from an abnormal mirror neuron system or from this system not being fed appropriate information due to direct gaze deficits remains to be established. Another example is interpersonal touch, the neural aspects of which have only recently begun to be addressed by demonstrating different patterns of brain activation in response to more perceptual versus more social touch. The role of oxytocin in the mechanisms underlying interpersonal touch suggest it may be investigated for its potential as a therapeutic agent in disorders characterised by fear, reduced trust and social avoidance. This is an example of a potential new treatment based on knowledge of biological mechanisms. It also raises ethical questions as to how to deal with new drugs that affect moral emotions.

8. Investigating mental disorders and physical health.

Brain-body interactions on the one hand reflect the impact of the environment on mental and physical health, and on the other hand the devastating influence of physical diseases on higher brain functions underlying emotion and cognition. It is therefore important to (a) understand how environmental circumstances such as physical or psychological deprivation can promote brain system dysregulations leading to disorders and likewise to elucidate the brain mechanisms of the beneficial effects of factors such as lifestyle, exercise and cognitive therapy; (b) understand how stress and other environmental mediators not only communicate neural information that aggravates cardio-metabolic-inflammatory disease conditions but also how these disease conditions can affect mental health, in interactions where hormonal and autonomic synergism are increasingly implicated.

9. Investigating allostatic load in relation to comorbidity.

There is an overarching need to better understand the causal relation between comorbid disorders. Allostatic load refers to the "cost of chronic exposure to fluctuating or heightened neural or neuroendocrine response resulting from repeated or chronic environmental challenge that an individual reacts to as being particularly stressful". Allostatic load provides a theory of comorbidity that spans levels of research. For example, at the population level it provides an explanatory framework for epidemiological associations between different mental disorders and between mental disorder and somatic diseases such as cardiovascular disease, diabetes and cancer. At the levels of physiology it implicates perturbations in the HPA axis and monoamine systems in the comorbidity of mood disorders and functional illnesses. At the molecular level it implicates mechanisms including oxidative and nitrosative stress, mitochondrial dysfunction and inflammation. Research should focus on further clarifying the mechanisms of allostatic load, including its epigenetic, inflammatory and neuroendocrine aspects. These mechanisms will provide novel treatment targets for mental disorders as well as their somatic comorbidities. These are urgently needed to address the increasing mortality gap between psychiatric patients and the general population.

10. Development of more valid animal models for behavioural and pharmacological studies.

These may be based on translated biomarkers of disease processes reverse translated from humans. Increased knowledge of the underlying biology of mental disorders will allow models based on mechanism. These will have greater construct validity than previous models based on superficial resemblance to human psychopathology (face validity) and response to compounds of known efficacy. More valid animal models will allow earlier 'go / no go' decisions to be made about candidate compounds, reducing the attrition cited as a reason for withdrawal of pharmaceutical companies from neuroscience research. Moreover such models will facilitate the development of truly novel drug mechanisms, as opposed to simply improving the tolerability and toxicity of prototypical psychiatric drugs. While rodent models have dominated drug development, there is a need for a cross-species approach including non-mammalian models as appropriate for different biological domains. The ideal would be models that recapitulate gene-environment interactions and model disease development so as to produce treatments that target transitional periods, rather than approximating ultimate symptoms in affected humans.



Goal 2: Advances relevant to infrastructure

1. Establishing centres of excellence and research networks.

The challenges associated with elucidating the neural bases of mental disorders are too great to be tackled by one institution alone. The scope of the challenge requires a coordinated approach within and across disciplines. For example, it requires standardised instruments, both psychometric and neurobiological (neuro-imaging), dedicated centres for data acquisition including access to high throughput –omics and neuroimaging centres, behavioural studies and pharmacological studies, as well as biostatistical and bioinformatic analysis. While there are already efforts at a European level to address some of the infrastructural issues on a general biomedical level, there is a lack of coordination in the mental health sector linking centres of scientific excellence with infrastructural projects, and creating infrastructure responding to the specific needs of mental health research. Research networks would combine expertise in relevant areas from molecular biology and genetics with the methodology of cognitive neuroscience for improved definitions of disease endophenotypes and assessment of new therapies. These groups would also set up experimental medicine studies combining clinical neuroscientists with basic neuroscientists, including those working with experimental models and cognitive neuroscience. Collaborative networks will increasingly be needed for investigating the large populations required to investigate mental disorders, in order to resolve the difficulties posed by their heterogeneity.

2. Sustained, renewable research funding for large European initiatives.

Current EU funding provides unprecedented opportunities for large scale collaboration among European research teams. The awarded projects often require a significant investment in the establishment of methods and infrastructure. Often the most informative data are acquired towards the end or after funding for the project has expired. In order to avoid incomplete data analysis and to ensure maximal benefit from methods and infrastructure that have been developed over the course of these large scale projects, it would be highly desirable to have competitive renewal of projects after the initial funding period.

3. Developing a comprehensive capacity building programme.

Capacity building across Europe is an important factor for a biomedical research strategy. It can be achieved through: (a) agile funding schemes targeting high-risk and high-impact pilot studies, aimed at testing creative hypotheses with great heuristic potential; (b) funding schemes targeting specifically interdisciplinary research, aimed at bringing together investigators with very different backgrounds and integrating them into problem-centred networks; (c) long training programmes for young investigators, to be spent in another centre belonging to the same EU-funded consortium; (d) shorter exchange programmes/sabbaticals for established investigators, to foster scientific and technological updating, as well as interdisciplinary cross-pollination within EU-funded consortia; (e) stimulation packages for the development of new technological poles for scientific investigation in countries with below-average participation in European funding programmes; (f) contribution to national programmes providing incentives for scientists to return to their home countries.

4. Public private collaborations.

The convergent translational approach described here requires a range of expertise and capabilities that lies beyond any single commercial or academic organisation. It requires cooperation that is incompatible with the traditional closed and secretive approach to drug development. Thus there is a need for further public-private projects such as the European Innovative Medicines Initiative (IMI). Such projects will harmonise complementary expertise and pool resources. They will allow the use of common assays and models between basic research and drug development, facilitating forward and reverse translation and reinvigorating neuropsychiatric drug development by reducing attrition and prompting development of novel therapeutic mechanisms.



Work Package 5: Psychological Research and Therapy

General issues of psychological research relevant to mental health

- 1. Promotion of basic psychological research aiming to identify the basic mechanisms involved in the initiation and maintenance of behaviour relevant for health Stronger emphasis and integration of research into basic psychological functions (i.e. attention), processes (i.e. learning) and higher-order cognitive factors (decision-making, memory, impulsivity, motivation etc.), relevant for healthy functioning and mental health. This should include research on the neurobiological underpinnings of these mechanisms.
- 2. Promotion of psychological (behavioural) research regarding change of health-related behaviour Identification of how psychological factors and mechanisms (including gene-environment interactions) influence health-related behaviours, their initiation, maintenance as well as change (spontaneous-natural and induced change). There should be a focus on determinants of critical trajectories from normal (adaptive) to abnormal/clinical dysfunctional patterns and their dynamic interactions (i.e. stress).
- 3. Adopting a stringent developmental perspective over the lifespan.
 - There is a strong need for improved developmentally sensitive models and approaches that allow integration of findings regarding normal and abnormal functioning within a developmental perspective. Such research should cover the whole lifespan but in particular childhood and adolescence as the core high risk period for onset of mental disorders. There is a need to specify how vulnerabilities and stress influence critical developmental trajectories of poor health and specific mental disorders.
- 4. Identification of core moderators, mediators and mechanisms involved in behaviour change
 - Particularly pronounced research gaps were identified with regard to the mechanisms, moderators and mediators involved in behaviour change in general and within the specific context of psychological interventions and treatments (i.e. CBT) in particular. Core questions are: What are the neural and neurobiological changes associated with effective CBT? What is the role of individual (e.g. genetic or experiential) differences?
- 5. Overcoming translational barriers (Translation of basic psychological research into application and dissemination)

Development of translational models on at least four levels:

- Improved aetiopathogenic research that systematically incorporates social-environmental context and determinants, as well as the neural underpinnings of mental disorders
- Improved broader (multi-level) assessment procedures targeting the core aetiopathogenic processes, rather than psychopathological features (as specified in imperfect diagnostic classificatory rules)
- Coupling of clinical efficacy/effectiveness randomised trials with mechanistic research to better identify
 the core active ingredients and core mechanisms of treatments
- Psychological intervention modules for prevention and treatment that target dysfunctional developmental processes
- Improved models of dissemination and transfer to routine care that take into account the needs of clinicians and patients

Functions and dysfunctions of cognitive control as core mechanisms in mental disorders

6. Cause or consequence?

There is a pressing need to identify whether impairments in decision-making and cognitive control are consequences (by-products) of mental disorders, or if they are antecedent vulnerability or even causal factors. This requires prospective-longitudinal designs, validating developmentally sensitive behavioural tasks to assess and functionally decompose decision-making and cognitive control, the establishment of latent-variable models of cognitive control and the incorporation of measures of behavioural, cognitive, and neural phenotypes.



7. Identifying commonalities and differences across disorders

There is a strong need to examine core questions like:

- Do dysfunctions of decision-making and cognitive control reflect shared neurocognitive mechanisms across mental disorders?
- Are different components of cognitive control (e.g. response inhibition, set shifting, goal maintenance) specifically impaired in different disorders and what are commonalities and differences in such patterns across disorders?
- How do multiple learning and valuations systems cooperate or compete in determining value signals and choice behaviour, and which variables moderate and modulate these interactions?

8. Competence or performance?

Do dysfunctions of decision-making and cognitive control in mental disorders reflect impaired competence (e.g. impaired inhibitory control ability) or performance deficits (e.g. insufficient recruitment of otherwise intact control resources)?

9. Motivational vs. volitional deficits? Under- vs. over-control?

Which phenotypical features of mental disorders (e.g. drug abuse, avoidance in anxiety disorders) reflect motivational deficits (e.g. maladaptive or biased decision-making due to an overly high delay discounting), and which reflect deficits in volitional control processes (e.g. impaired response inhibition) despite otherwise intact reasoning and decision-making capabilities? Which mechanisms are involved in impaired or insufficient control, and excessive or chronic over-control? Does 'over-control' (e.g. continuous suppression of emotional or reward processes; intrusive thoughts; rebound effects; alienation from basic needs) have other (detrimental) effects compared to under-control?

10. Identifying the role of dysfunctional control parameter settings

Are there systematic relations between specific phenotypical features of mental disorders and dysfunctional settings of meta-control parameters? Are dysfunctional control parameter settings shaped by genetic variation, learning history, and acute stress? A closer integration of computational models and psychopathology provides an avenue towards explanations of how phenotypical expressions of mental disorders emerge from nonlinear interactions among underlying neurocognitive mechanisms, dysfunctional meta-control parameter settings, and aberrant systems interactions on different levels of analysis. Computational models generate novel hypotheses about common mediating mechanisms across disorders.

The need for a comprehensive Behavioural Science programme

- 11. Conceptualisation of mental disorders as the outcome of maladaptive developmental processes on various levels

 There is a major need for reconceptualising the concept of mental disorders by:
 - Elucidating the 'normative' (adaptive) expressions of psychological functions and processes, their neurobiological, molecular and genetic substrates, and their interaction by developmental stage in welldefined 'normal' populations with theory-driven, tailored task paradigms
 - Modelling pathways and system interactions both at a structural (e.g. latent trait and growth; reduction
 of complexity, 'higher order constructs') and a 'mechanistic' level (e.g. circuitry processes, computational
 neuroscience)
 - Validating, challenging and improving the derived models using basic science experiments (e.g. cells, animal models) to derive improved models for further testing (e.g. systems biology)
 - Incorporating individual and contextual factors to determine how functions, processes and circuitries are developmentally influenced by learning, plasticity, emotional traits, and stress
 - Applying the derived models in defined risk cohorts to examine how, why, when and where system components are affected and prospectively associated with increased risk for onset of disorders
 - · Testing when, how and to what degree these dysfunctions can be altered by interventions



Advancing psychotherapy and evidence-based psychological interventions

12. Why does CBT work?

Adopting improved principles and heuristics in evaluating evidence-based psychological interventions. Exploiting basic experimental research to characterise commonalities and differences across disorders and optimise core active ingredients of cognitive-behavioural treatments (CBT).

Core high priority issues are:

- Which factors and mechanisms are diagnosis-specific and which are shared or common factors that apply to a wider scope of clinical problems and diagnoses?
- What are the core moderators and mediators of change in patients treated by CBT?

13. What is the role of individual variation?

Are there specific endophenotypes that allow the optimisation of choice and allocation of interventions to specific patient characteristics? Investigating such questions would involve:

- Using multi-level assessments to improve response prediction, such as using (epi-) genetics, neuroimaging, experimental psychobiology, objective behavioural measures (virtual reality EMA, actography, mobility), bio- and social-behavioural markers
- Testing putative endophenotypes and their respective neurobiological, psychological and behavioural markers that could more reliably guide clinicians' treatment choice and improve predictions of treatment outcome
- Identifying individual patient constellations associated with partial or non-response
- Identifying the role of concomitant and prior appropriate or inappropriate medication, i.e. examining what type and pattern of medication has successful impacts for a given individual (see also point 16)
- Reduction of exclusion rules in RCTs to include typical patterns of comorbidity in order to provide guidance as to what targets and procedures should be chosen for comorbid patients
- Identifying the needs of neglected or particularly vulnerable patient groups and incorporating matching treatment components
- 14. Overcoming the gap between science-based and evidence-based psychotherapy in research and its application in clinical routine settings

The continued and seemingly widening gap requires addressing a range of issues:

- Understanding how variations in usual care practices impact patient outcomes
- Employing RCT templates to address questions about real world service implementation and conducting explicit effectiveness and transfer trials
- Examining the impact of patient and provider preferences
- · Integrating constructs of organisational culture and climate into services and intervention research
- Designing culturally and socially adapted interventions
- Exploring how technology-based interventions and e-monitoring might increase adherence of state of the art methods
- Increasing the 'ecological validity' and clinical utility of CBT programmes by avoiding overly selective inclusion criteria and diagnostic fragmentation
- Examining when and to what degree therapist adherence to treatment protocols plays a role and investigating what type of individual modification might be allowed (i.e. comorbid conditions, or life events during treatment) without threatening the integrity of treatment

Psychological models and paradigms of mental disorders from a cognitive perspective

- 15. Focus on the dimensional nature of mental disorders
- 16. Linking psychological and psychopharmacological research for intervention
- 17. Increasing external validity of psychological models for mental disorders



Psychotherapy research in children and adolescents

18. Improvement of treatment outcomes in children and adolescents

Psychological interventions in children and adolescents imply a number of technical, procedural and ethical challenges that are relevant for improving outcomes. There is also a need to understand why a substantial proportion of young people do not respond to evidence-based treatments. Research priorities are:

- Identifying relevant and potentially developmentally specific mediating and moderating variables of evidence-based psychotherapies for youths with mental disorders
- Investigating the efficacy of psychotherapies in difficult-to-treat populations (e.g. young people with learning difficulties; children and adolescents with autism spectrum disorders)
- Evaluating the effectiveness of evidence-based psychotherapies for young people and parents who seek help in everyday clinical practice
- Exploring the additional value of motivational techniques and strategies to increase the efficacy of psychotherapy for youths with mental disorders and their parents/guardians

New insights into ongoing developmental psychopathology research should be employed:

- To further improve the efficacy of psychotherapeutic interventions that have already been shown to be effective
- To develop new psychological interventions targeting newly discovered vulnerabilities and protective factors of childhood psychopathology
- To develop more developmentally sensitive and appropriate treatment programmes
- 19. Exploiting developmental psychological and developmental neuroscience research

We know little about the aberrant processes underlying psychopathology in children and adolescents and in what way they can be changed by psychological interventions and psychotherapy in particular.

There is a need to implement knowledge and expertise derived from developmental neuroscience research in order to:

- Establish the links between childhood psychopathology and aberrant processes in the developing brain
- Explore whether and to what extent these processes can be corrected and modified by means of psychotherapy

eHealth and innovation of mental health care

- 20. How can evidence-based eHealth and innovative treatments be applied in routine (mental) healthcare settings?
 - Testing the value of internet-based treatments as automated versions of standard psychological treatments in specialized mental health care in "indicated" prevention and for use in primary care settings in particular
 - Examining the role of dosage and intensity of internet-based interventions on outcomes
 - Examining acceptability (to service users) as well as the immediate and long-term health- economic benefits
 - Examining the value of internet-based treatments for relapse prevention and cost-benefit balance
 - Exploring use in targeted preventive trials, for example in occupational and school settings
- 21. Further developing the improvement of internet-based treatments
 - Are self-guided internet-based treatments as effective as guided treatments?
 - Research about the logistical organisation of internet-based treatments, i.e. how many treatment sessions are needed, who can deliver the treatments, how many treatment sessions are needed, and what the best intensity?
 - Examining the role of internet-based treatments for bipolar disorder, psychosis and other understudied mental disorders



What are the benefits of internet-based treatments in terms of cost-effectiveness?

22. Incorporating technological innovations

- Improving outcome measurement by implementing new forms of technology-assisted clinical tools (e.g.
 virtual reality applications or minimal contact therapies) and by supplementing traditional treatment
 modalities with psychometric feedback tools
- Testing 'real time' psychometric feedback over the course of treatment (supported by modern software
 tools as well as data entry systems like touch screens) to adapt dosage and intensity of treatment to
 patients' complexity and problem profile in order to promote better outcomes
- Examining the value of combining Ecological Momentary Assessment tools (i.e. sensors in mobile devices such as: accelerometers, GPS, audio, contact with other phones) with personal information from the user (Where are you? What are you doing? How is your mood? How did you sleep?) to examine mental health problems in real time, and allow actual assessment during day-to-day life
- Examining the value of telepsychiatry using television sets and allowing the provision of face-to-face treatments and support from a distance (without travelling). Together with the improved possibilities to recognize emotions through webcams, it may be possible to develop avatars which can replace human contact more and more.
- · Virtual reality applications for mental disorders

Critical issues in the evaluation of comorbidity of mental disorders and future research needs

23. Agreeing on standards of comorbidity research

The lack of consensus about methodological standards in comorbidity research hampers progress and requires agreement on methodological standards on various levels. Further needs are the development of clinical and research methods for the assessment and evaluation of comorbidity within mental disorders as well as with regard to relationships with somatic diseases and social functioning/disability. This would be facilitated through the use of innovative approaches like clinimetrics.

24. Treatment implications of comorbidity

This would include examination of the clinical implications of comorbidity with regard to treatment effects, side effects, clinicians' judgement and patient preferences within appropriate clinical trial designs. Examinations of moderators (including developmental and socio-cultural factors and the incorporation of patients' perspectives) are also necessary.

25. Identification of factors underlying co- and multimorbidity

There is a need to extend aetipathogenic research on single disorders to typical comorbid constellations (see above).

Work Package 6: Social and Economic Issues

Top 3 priorities for social inclusion

- Research on access to and continuity of employment (including effective procedures and practices related
 to disclosure when applying for a job, absenteeism and presenteeism), especially for people with long-term
 illness and disability.
- 2. We need effective interventions against public stigma supported by rigorous empirical research on: (i) who should be targeted; (ii) how interventions work; (iii) by whom; (iv) when; (v) evaluated by whom and how and (vi) their cost-effectiveness.
- 3. Research into the identification and development of support systems for family members and carers of people with mental health problems.



Additional priorities for social inclusion

- 4. Improved physical healthcare and physical health outcomes (access to physical healthcare and assessment, treatment and outcomes of physical health conditions and reductions in secondary effects of medications and treatments).
- 5. We need to increase research on service user (and carer)-oriented involvement in treatment choice through use of shared decision-making and provision of evidence-based information.
- 6. We need more thorough research and randomised controlled trials in different populations on what kinds of interventions successfully reduce self-stigma and increase empowerment, and in which populations.
- 7. We need a better understanding of the determinants, processes, costs and consequences of stigma and multiple stigma (including mediators and moderators) and to investigate the early impact of stigma and discrimination and the relevance for timing of interventions and/or early intervention.
- 8. We need more research to better understand the relationship between stigma and service use, and facilitate appropriate care pathways.
- 9. Need to revisit psychopathology and associated concepts and to consider to what extent some symptoms may be secondary to stigmatisations, possibly leading to reclassification of some symptoms.
- 10. Impact of mental disorder on social life, social functioning and personal relationships.

Top 3 Economic Priorities

- 11. Health systems level research on the cost-effectiveness of different ways of financing, regulating, organising and providing services to promote and protect mental health
- 12. Developing methods to calculate the budgetary and economic implications of task shifting, changing responsibilities and new mechanisms for the delivery of care.
- 13. There is a need for more economic evaluation of complex programmes involving different combinations of interventions and new modes of service delivery.

Additional economic priorities

- 14. We need to more accurate capture quality of life measures as well as developing positive mental wellbeing (including potential proxies like happiness) for use in economic evaluation. Measurement should take into account the appropriateness of measures for population sub-groups such as young children and those with cognitive problems.
- 15. More information is needed on the efficiency/performance of mental health systems in Europe for health and non-health indicators such as employment, housing and education.
- 16. We need to draw on more mainstream economics to look at the economics of mental health for instance, using the theories and mechanisms from behavioural economics and psychology to advance research around behaviour change and including motivation and incentives for change.
- 17. Timely research is needed on different aspects of the impact of current and past economic shocks (e.g. booms, recessions) on mental health and well-being. Do they lead to any positive impacts on mental health and well-being as well as negative impacts? What factors cushion individuals from the most adverse impacts of crises?
- 18. There is a need for work on developing methods to better estimate the economic impacts of comorbid physical and mental health problems, as well as the cost effectiveness of interventions to prevent/alleviate comorbidity.



Work Package 7: Public Health

General research priorities

- 1. Positive mental health and well-being and protective factors should be increasingly addressed in public mental health research
 - How do we strengthen mental health / well-being?
 - What are the genetic, environmental, developmental and cultural determinants of positive mental health?
 - What is the relationship between mental disorders and mental well-being?
 - Do universal interventions, aimed at strengthening positive mental health, contribute to reduced incidence of common mental disorder (e.g. depression, anxiety disorders, eating disorders)?
 - What are the links between positive mental health and working ability / retirement age?
- 2. Public mental health research should build on interdisciplinary perspectives in order to understand the complexity of mental health
 - Can different perspectives of spiritualism and/or different cultural values contribute to European mental health?
 - What are the links between macroeconomics and population mental health (e.g. suicides)?
 - Can new findings in political sciences (e.g. theory and practice of politics, analyses of political systems) contribute to our understanding of quality of mental health systems?
 - Can lessons learned from ethnographics and anthropology reduce mental health disparities?
 - How can additional perspectives be used in a systematic way to extend the biopsychosocial model to understand complex mental health issues?
 - What do semantic analyses and data mining techniques in large health datasets tell us about the determinants of mental health and well-being?
- 3. To strengthen the understanding of the cultural factors (i.e. ethnicity, religion and value systems, and nationality) relevant for public mental health
 - · What are the culture-specific and different understandings of mental health?
 - What are the trans-cultural aspects of mental well-being?
 - · What are the protective and mental health risk factors in minority groups and subcultures?

Methodological priorities

- 4. To perform and sustain long-term prospective cohort studies to investigate the determinants of mental health and well-being and to study risk and protective factors for mental disorders and suicidal behaviour
 - What are the determinants of mental health in a life-course perspective in different geographical contexts?
 - How can we better use the existing register and biobank data?
 - What are the interaction effects between individual and societal factors in the processes leading to population mental health?
 - What is the comparative effectiveness of population-level risk-factor-based targeting vs. universal prevention of mental disorders?
- 5. To strengthen research on mental health of disadvantaged groups, marginalised populations and populations at risk
 - How can the determinants of mental health, mental health problems and metal health literacy best be addressed in disadvantaged groups?
 - What measures are effective in reducing social inequalities in mental health?



- How can culturally sensitive methods increase research participation of marginalised groups?
- How best to improve uptake of mental health promotion and preventive interventions in disadvantaged and minority populations?
- How best to address mental health needs of transnational groups with high cross-border mobility, such as Roma people?
- What are the positive factors that contribute to mental health for migrant populations?
- 6. To develop systematic evaluations utilising natural experiments
 - What reforms within the mental health sector, or other reforms affecting population mental health (e.g.
 education, legal and tax systems, substance use policies, changes in infant and family care), have been
 implemented in European countries and how does their impact on mental health differ?
 - What are the best financing mechanisms for mental health services?
 - Do restrictive alcohol policies protect children from abuse, neglect and other mental health risks?
 - What is the mental health impact of restrictions in alcohol availability?
 - What is the mental health impact of alternative allocations of austerity measures, based on comparisons between European countries?
 - Does legislation restricting access to firearms reduce violence (e.g. school shootings) and suicides?
 - How can complex models be designed to enable valid evaluations of natural experiments?
 - Which preventive interventions should be used for developing mental health policies in European countries?
 - · Which public policies are most effective in reducing mental health inequity?
- 7. The theoretical base for public mental health research should be strengthened, including definitions and validity of concepts
 - · What is the difference between mental health and mental ill-health?
 - · Is current measurement of mental well-being valid and comprehensive enough?
 - · How is mental well-being of children best measured?
 - What are the definitions and concepts of mental well-being in different cultures and languages in Europe?
 - Are there differences between the pre-existing assumptions and definitions of mental health in the research community and the public?
 - What is the range of lay and professional concepts of mental health, and what is the understanding behind them?
 - Which concepts would underpin a mentally healthy society?
- 8. To identify or develop intermediate outcome measures that are predictive of long-term outcomes and can be used as proxy measures in intervention studies where long-term outcomes are difficult to measure
 - What childhood outcomes predict good mental health in adulthood?
 - Does reduction in self-reported hopelessness predict reduction in suicide mortality?
- 9. Robust and standardised measures and typologies for public mental health research and validation of existing measures should be developed across Europe
 - How can important mental health concepts (e.g. sense of identity, sense of mastery, social support, family dynamics, resilience or coping) be adequately measured across European countries?
 - · How can mental health interventions and services best be classified?
 - Can equally valid measurements be achieved more economically using shorter versions of existing measurement instruments?
 - Are mental health measurements valid across European countries and cultures?



- 10. Quantitative and qualitative research should be used in combination when relevant for capturing the complexity of public mental health and for enhanced understanding
 - How best to integrate quantitative and qualitative research methods in public mental health research?
 - · How do different cultural concepts of mental health problems affect prevalence and incidence rates?
 - Why do people drop out of mental health promotion or preventive interventions?
 - How can qualitative results be integrated in a systematic way with quantitative results in defining evidence-based practice?
 - What are the obstacles for uptake and scaling up of public mental health interventions?

Research topic priorities

- 11. To strengthen research on implementation, dissemination and sustainability of mental health promotion, mental disorder prevention and service delivery interventions
 - How can practitioners implement new interventions developed by researchers in public mental health?
 - How can effective interventions be widely disseminated?
 - · How can newly implemented interventions be sustained over a longer period of time?
 - How can implementation best be supported by new technology and social media?
 - What are the barriers to successful implementation among healthcare professionals?
 - Which factors are sufficient to promote mental health throughout childhood, adolescence and adulthood?
- 12. To strengthen research across the lifespan and with regard to sensitive time windows of human development, including developmental and environmental salutogenic factors pertinent to public mental health
 - How is population mental health development impacted by community factors (e.g. schools, built environment) across the lifespan?
 - · Why do age-specific suicide risks differ among males and females?
 - Do male and female coping strategies differ?
- 13. To strengthen research on the influence of families, public policies and services on mental health throughout the life-course of children and adolescents
 - How can we train primary care practitioners (e.g. GPs, midwives, nurses, psychologists, social workers) in effectively providing infant mental health promotion for parents and young families?
 - How can mental health promotion and social exclusion prevention in schools be improved?
 - How can we effectively bridge the gap between child health services and adult health services during the vulnerable phase of adolescence?
 - What are the effects of intense use of new media in early age and adolescence on later emotional and cognitive competence?
 - Can a system of mental health indicators for families, childcare centres, schools, workplaces and old peoples' homes, respectively, on an organisational level contribute to public mental health?
 - How could maternal mental health in pregnancy and the postpartum period be improved by universally applied programmes of psycho-education?
 - How can mother-child relations in infancy be improved by parent training programmes?
 - How can mental health at preschool age be improved by parenting programmes?
- 14. To develop appropriate participatory approaches for evaluation of complex public mental health interventions

Research on complex or multimodal interventions should address efficacy and effectiveness but also the interaction of the parts of the intervention, including mediators and moderators, and their contribution to the whole. Particularly important are:



- Research on the relationships between professionals/practitioners/lay workers and patient/participants/public
- Research on public and target group engagement and empowerment in complex interventions
- Research on the best methods to enhance active participation of target groups (including children) in research
- What are the most effective ways of engaging deprived communities in mental health promotion?
- How can individual and community assets best be taken into account in public mental health programmes?
- What are the most effective means for implementing mental health promotion in schools?
- What are the links between working conditions, social capital at work, individual resilience and productivity?
- How can children, young people and older people best be involved in research?
- How can mental health promotion interventions best support active ageing?
- 15. To strengthen the understanding of the links between physical and mental ill-health, and on their implications for services
 - What is the role of payment systems in promoting integrated systems?
 - Does increased physical activity in childhood reduce the incidence of depression in adult life?
 - · What is the impact of childhood trauma on physical and psychiatric morbidity?
 - Does mental health promotion lead to a somatically healthier population and reduced mortality from non-communicable diseases?
 - Are psychosocial factors (e.g. sense of identity, meaning, mastery, belonging and affiliation, social support, social networks) that protect against mental health problems also protective against non-communicable diseases?
- 16. To strengthen research on new approaches and technology for mental health promotion, disorder prevention and mental health service delivery
 - Which mobile applications are effective in supporting a mentally healthy lifestyle?
 - Are eMental health modes more effective in suicide prevention than traditional phone helplines?
 - Can mental health promotion interventions be embedded in electronic games in order to reach young people?
 - Can social isolation be reduced by new communication forms?
 - Are cross-border eMental health services effective in providing services in the users' own languages?
 - What are the harms and benefits of the new technologies on mental health, including virtual reality and online social networks?
 - How can non-users of new technology in postmodern society be reached to promote, prevent or protect their mental health?
- 17. To strengthen research on mental health promotion in all policies
 - What are the barriers to mental health development and well-being?
 - How do mental health inequalities develop?
 - What are the barriers and facilitators for getting mental health on non-health policy agendas?
 - Which policy measures are most effective in reducing mental health inequity?
 - Is there a correlation between pension age and general mental health in society?
 - How do initiatives for extended labour-market inclusion affect mental health in older adults?
- 18. To strengthen research on the efficiency and quality of mental health systems and community-oriented interventions



- How can community interventions be linked with primary care and special mental health care interventions (including liaison and consultations, collaborative care and general healthcare and mental health care)?
- Does prevention of depression among pregnant women protect against later mental disorder or dysfunction (e.g. depression) among children? What are the cost-benefits?
- Which public mental health interventions have the best cost-benefit balance for whom, in what situation
 and at what stages (i.e. universal or targeted interventions; pre-natal, infant, early childhood, adolescence vs. adulthood)?
- How can complex research design in mental health services research increase our understanding of the balance and interaction between community mental health services and inpatient mental health care?
- 19. To strengthen research on the protection of rights of people with mental health problems
 - How can innovative strategies be developed to reduce or prevent coercive measures in involuntary treatment for people with mental health problems?
 - · Why do we see coercive services and legislation as socially progressive in principle?
- 20. To strengthen research on the frameworks to achieve effective mental health care at organisational, managerial and clinical levels
 - Which models of organization and management are most effective in mental health care?
 - · How can conceptual models be used in the application of research evidence to policy and practice?
 - Which funding mechanisms support upstream promotion and prevention actions best?

Work Package 8: Well-being

Consensus on conceptual issues and measurement

- 1. To reach a consensus on the constructs for subjective well-being that are useful for mental health research.
 - The research community must agree on a classification of kinds of subjective well-being and on the differences of these constructs with notions of mental health, in order to maximise the potential of research and clinical impact in this area. This consensus can build on a map of existing conceptualisations, linked to measurement instruments. An agreed-upon classification of concepts and related measures will open the door to the establishment of a 'findings archive' in which the available research findings are sorted by subject matter and become available for synthetic analysis. A firm conceptual foundation, moreover, will increase the effectiveness of subjective well-being as a clinical outcome for mental health interventions.
 - What is the comparative validity of current concepts of subjective well-being?
 - To what extent can current valid concepts of subjective well-being be harmonised?
 - What are the best procedures for enabling effective harmonisation of current valid concepts of subjective well-being?
 - To what extent can findings be compared cross-culturally?
 - Do special groups need special measures, or special modules?
 - What relationships exist between subjective well-being and (the absence of) mental health problems?
 - What differences and similarities exist between various groups within a diverse population (in terms of sex/gender, ethnicity, SES etc.) regarding content, level and predictors of subjective well-being?
 - Do different rater perspectives (the individual themselves, relatives, staff, researcher) agree?
 - How is the notion of subjective well-being different from (or similar to) concepts such as quality of life, life satisfaction, happiness, meaningfulness etc.?
 - Which reliable and valid measurement instruments already exist and what is known about their relationships to one another?



- When well-being is approached as a multidimensional construct, which dimensions are core dimensions
 of well-being and which should be treated as factors influencing well-being?
- How can cultural variations in lay conceptions of well-being be included in research on well-being across countries?
- What is the difference between subjective enjoyment of life (life satisfaction) and perceived meaning in life? Do these things necessarily go together? Which is most predictive for mental health?
- Is there a difference between cognitive evaluation of life and affective experience? Which is most predictive for mental health?
- How could an open-access bank of measures of subjective well-being with data on their research properties and usability for researchers be created?
- 2. Increase knowledge on the relationship between the level of subjective well-being and psychopathology.

A targeted research priority involves the relationship between subjective well-being and the levels of psychopathology associated with different disorders at different stages. A findings archive would be an invaluable resource to identify gaps in our understanding of the association between levels of subjective well-being and different levels of psychopathology. From this starting point, more focused research questions relying on different expertise across European mental health research centres could target research to specific disorders and stage of disorder in order to more effectively increase our clinical knowledge in this important domain.

- Is subjective well-being simply the converse of psychopathological symptoms?
- Does subjective well-being vary between diagnostic groupings, even when controlling for levels of symptomatology and psychosocial functioning?
- What are the mutual relations between well-being and mental health problems over time?
- Do existing treatments for psychopathology result in increases in well-being?
- Which kinds of subjective well-being are part of the mental health syndrome and which are not? e.g. can a happy person have a mental disorder?
- Under what conditions does unhappiness result in psychopathology?
- What ways of coping with unhappiness strengthen mental health?
- Does mental health education result in better coping with unhappiness?

Identify antecedents and consequences of well-being

3. Collect normative data of subjective well-being from European countries across the lifespan and for specific groups.

Relying on findings archives and other tools, both those existing and those that can feasibly be developed, it will be possible to develop standards of comparison based on stratified information and from this to select appropriate reference points. Once gaps in these normative data have been identified and categorised by country and age-related population groups, the next step would be to develop and conduct population surveys designed to complete the normative data. The end result would be a truly lifespan understanding of the trajectories of subjective well-being associated with mental health problems, which would greatly enhance intervention strategies. In Europe, there are several research centres with expertise in the required survey methodologies, and this research would further extend the European research experience and worldwide reputation in this area.

- · How does subjective well-being vary between European countries?
- How does European subjective well-being vary by key demographic variables including age, gender, social class and ethnicity?
- The developmental perspective: how do prenatal/perinatal and early childhood experiences contribute to later subjective well-being?
- How do physical disability and chronic somatic diseases impact on subjective well-being?



- Which developmental trajectories of well-being can be found from childhood and adolescence to early, middle and late adulthood?
- How happy was the average citizen in each of the European countries around the year 2010?
- Which sub-groups in the population deviated significantly from the national average?
- Was the lag in happiness of people with mental disorders similar in all European nations?
- 4. Maximise the use of new and existing longitudinal datasets regarding the relationships between mental health and subjective well-being.

We need longitudinal data for establishing the causal links between well-being and mental health. Since the effects will differ across sub-groups, we need large panels. Several large-scale panel studies are already available in Europe and most of these involve measures of both subjective well-being and mental health. A first step is to locate and harvest this existing information. A next step is to add measures in future waves of ongoing panel studies. This approach is not only feasible but is a cost-effective and highly efficient use of existing research funding. Several centres across Europe are well-positioned to take the lead in the development of suitably powerful longitudinal datasets, and developing this existing research capacity across Europe will have a direct impact on the clinical and public health usefulness of these data.

- What methods/techniques are needed to ensure the location and harvesting of existing European datasets on subjective well-being?
- Which differences and similarities exist between various groups within a diverse population (in terms of sex/gender, ethnicity, SES etc.) regarding content, level and predictors of subjective well-being across the lifespan?
- How can subjective well-being predict future mental health?
- How do well-being and mental health problems mutually influence each other over time?
- What follow-up data do we need; what do we have already; what do we not?
- Does the effect of subjective well-being on mental health differ across subgroups? In which groups is the effect most pronounced?
- How long does the effect of subjective well-being on mental health last?
- 5. Establish evidence on biological, psychological, sociological and life-style determinants of subjective well-being, as well as on the socioeconomic consequences and equity impacts of the interaction between mental health and subjective well-being.

Identifying the determinants of subjective well-being is essential to make effective interventions feasible. Depending on the nature of the determinant, the research strategy will differ: biomarker and epigenetic effect identification for biological determinants, instrument development and application for psychological determinants (e.g. the role of resilience), and large-scale surveys for lifestyle (e.g. work-life balance) and broader social determinants. The relevant expertise for all these methodologies is well-represented in Europe, and further research targeting well-being determinants can greatly strengthen the European global position in this area. Moreover, existing research, although fragmentary, points strongly to the differential impact on subjective well-being of socioeconomic factors on those with and those without mental health problems. With an appropriate sampling design – including cohorts from different age groups and taking into account economic, social and cultural differences – it would be possible to form the basis for a multicentre study to address this central question across Europe.

- What biological, psychological and social factors are important in determining variation in subjective well-being across Europe?
- What are the relationships between genetic, psychological, social and lifestyle factors and subjective
 well-being what influences what? What are possible third factors that have an impact on both determinants and on subjective well-being?
- Room for the developmental perspective: which early childhood experiences impact on subjective wellbeing?



- How does well-being impact on health and functioning across the lifespan?
- What are the determinants of post-traumatic growth?
- How much activity is optimal for happiness? Does that optimum differ across the family life cycle?
- To what extent is the stress of an active lifestyle compensated by positive effects on happiness?
- What is the effect of later retirement on average happiness and mental health among older people? What kind of people benefit from the rising retirement age? What kind of people lose out?
- 6. Use of economic techniques to support analyses of the benefits of improved subjective well-being and scope for looking at whether there are additional benefits from a reduction in mental health problems in the future as a result of better subjective well-being now.

Longitudinal studies are needed in order to show whether interventions to improve well-being have an impact on the health (both physical and mental) of the population, and lead to a reduction in healthcare expenditure, improvements in the labour market and economic benefits for society. Europe is already developing and implementing interventions to improve the well-being of the population, but the benefits of these interventions need to be evaluated. The use of economic techniques can help inform policymakers of the benefits of improving the subjective well-being of the population.

- What are the benefits of improving the subjective well-being of the population?
- Will an improvement of subjective well-being at the population level lead to a reduction in mental health problems?
- 7. Establish a 'findings archive' on subjective well-being and mental health.

There is already considerable research on the relation between subjective well-being and mental health, but the results are not yet available in an organised body of knowledge. This has several reasons. One is the conceptual Babel. A second reason is that research reports are published in different languages and different research traditions across which there is little communication. A third reason is that even the technical jargon used is not identical, and the measures used are incomparable. The fourth and most important reason is that scientific bodies invest in primary research rather than in synthesis of available findings. As a result the heap of research findings is growing by the day, but understanding does not see commensurate growth, since we typically only see the findings at the top of the heap. This problem can be tackled with a 'findings archive' such as the World Database of Happiness (http://worlddatabaseofhappiness.eur.nl). Such an archive will not only capitalise on past research but will also increase the yields of the new research.

- How can we ensure that all the findings available in European countries are entered?
- · How can we ensure that periodical state-of-the-art papers are produced?
- How should the software of the World Database of Happiness be adapted for this particular purpose?

Advance the implementation of well-being interventions

8. Establish evidence on the impact of the differences of the organisation and delivery of national healthcare systems on well-being of service users with mental disorders and carers.

At the policy level, and to meet the demographic and economic challenges that Europe will face in the future, it will be necessary to explore innovations in the organisation and delivery of healthcare. This exercise will be forced on Europe inevitably by events, but policymakers will need models to consider, and evidence on which to base their suggested health system innovations. A typology of healthcare delivery systems across Europe and elsewhere and targeted investigations into, for example, the relative benefits of community care versus inpatient care, will be helpful research contributions. However, it is essential that mental health and the issues associated with problems in mental health, are not overlooked as these debates are conducted. What is needed, in particular, are instruments that can reliably measure not only satisfaction with the healthcare system, but the impact of healthcare encounters on subjective well-being for individuals with mental health problems. These same instruments would also be useful to determine the relationship between social investments in mental health services and the general well-being of the population, in order to support additional policy innovations.



- How can the impact of healthcare systems on subjective well-being be reliably measured?
- What elements of healthcare systems (e.g. primary care focus, free at point of access) have the greatest effect (positive and negative) on subjective well-being of service users with mental health problems?
- What elements of healthcare encounters (e.g. ease of access, role and attitude of reception staff, attitude and actions of health professional during clinical encounter) have the greatest effects (positive and negative) on subjective well-being of service users with mental health problems?
- What kind of service users' lives might be happier in an institutional context?
- Is time-sampling of happiness practicable among service users? If so, does that inform us about the effects of different kinds of care?
- Are service users happier in nations where mental health care is integrated in the wider healthcare system or does specialisation yield greater happiness for these people?
- 9. Increase evidence of population well-being interventions impacting mental health outcomes.

For similar reasons to those noted above, it is essential to increase Europe's evidence base regarding the impact (and cost-effectiveness) of public health interventions designed to improve subjective well-being and the impact of such interventions on mental health outcomes. This research provides the important link between recent European endeavours to use subjective well-being as a general population indicator of policy effectiveness, and the urgent work that is required to investigate effective public health promotion measures targeting mental health. In this case as well, retrospective research on past public health interventions would be the most feasible start, but this research needs to be enhanced with more prospective investigations.

- What is the strength of current evidence for effectiveness and cost-effectiveness of interventions at the population level to enhance subjective well-being for people with mental health problems in Europe?
- What are the gaps in existing evidence, and hence what new studies are needed?
- What was the effect on average happiness of the cuts in welfare spending in European nations since the 1980s? Can that explain the rising use of mental health care?
- Did increased spending on mental health care add to average happiness in Europe?
- Does greater spending on mental health care result in greater happiness and better mental health? How about absolute spending and spending relative to somatic health care?
- · Which existing well-being interventions have been successful in impacting mental health outcomes?
- 10. Establish evidence on the impact and cost-effectiveness of clinical interventions to improve, protect and promote subjective well-being.

Using existing experience, it would be possible to design and perform randomised controlled trials on subjective well-being interventions, or carry out meta-analyses of such interventions, in order to empirically substantiate the impact of these interventions on the subjective well-being of service users. Cost-effectiveness analyses can then be performed, suited to the nature of the intervention. This important research provides a crucial input into policy decisions, and there is certainly European expertise in this area that can be channelled to research targeting subjective well-being interventions. Meta-analysis requires first of all that the available data are presented in a comparable way in a findings archive.

- What is the strength of current evidence for effectiveness and cost-effectiveness of interventions at the individual level to enhance subjective well-being for people with mental health problems in Europe?
- What are the gaps in existing evidence, and hence what new trials are needed?
- How can resilience be fostered in children and older people?
- How can post-traumatic growth be promoted?
- How can new technologies, e.g. eHealth and mHealth, be used to enhance and maintain the effects of well-being interventions?
- · There is a need for more insights in the processes involved in well-being interventions: how and for



whom do well-being interventions work best?

- What is the long-term effect of 'happiness lessons' in school on life-satisfaction and mental health?
- Which 'happiness trainings' are effective among what kinds of people?
- Does the use of happiness tracking websites (such as the HappinessIndicator.com) add to happiness and mental health?
- What kinds of interventions have been used to improve subjective well-being? How were the results
 measured? What was found among service users, the general population, parents, children, and adolescents?
- 11. Develop the mechanisms to best translate research results on subjective well-being to mental health care delivery and policies.

Techniques of knowledge translation and evidence-based policy development are essential tools for moving research into the domain of practice, both at the micro clinical level, and the macro policy level. Research about these techniques is greatly needed, especially as it relates to getting research about subjective well-being into practice across the mental health sector. European researchers are well-versed in both the need for knowledge translation and its methodologies, although most of this research has been directed to bio-medical results. There is an urgent need, however, to extend Europe's expertise in this area to the translation of results on the interaction between subjective well-being and mental health to practice. This requires experimental studies on a much larger scale than performed up to now.

- How can health promoting and rehabilitation-oriented interventions be developed to promote subjective well-being in the general population and in vulnerable groups?
- What are the best strategies for implementing subjective well-being interventions and policies?
- What are the barriers and facilitators to translation of best evidence on interventions to improve subjective well-being into policy and practice? How can Normalization Process Theory (http://www.normalizationprocess.org/) and other toolkits help us understand the dynamics of implementing, embedding and integrating new interventions?
- To what extent can interventions be implemented outside the context of the healthcare system, but rather at schools, workplaces, etc.?
- How can different stakeholders (governments, nongovernmental organisations, researchers, practitioners, clients) best be represented in the translation from research to practice?
- Which technological innovations, e.g. eHealth, can help to implement well-being policies for a broad public?
- Do we need particular mechanisms for this subject or are professionals sufficiently attended to by the mass media?
- Is this subject adequately covered in professional education? Is the available information on the relation between happiness and mental health accessible on professional websites?
- 12. Increase knowledge on service users' empowerment and its relationship to subjective well-being.

One of the prominent issues addressed by patients' groups and recent international statements of the human rights of persons with disabilities and health problems is the central importance of preserving and promoting autonomy, both within and outside of the health sector. Europe is a leader in the area of mental health human rights, and research building upon this expertise on the psychological determinants of empowerment and related notions (such as locus of control and autonomy, and in particular the linkages between these factors and subjective well-being) is a key European priority. The impact of such research would be felt not merely in increasing participation in and compliance with mental health interventions, but also in the development of mental health policies designed to further patient autonomy.

- Which kind of interventions aimed at enhancing patient empowerment lead to improved subjective wellbeing?
- How can service users be involved as stakeholders in the development of well-being interventions?



- Do well-being interventions increase service user empowerment?
- What kinds of service users benefit from autonomy? By comparison, what kinds of service users need guidance?
- What degree of guidance is optimal for what kind of service users? How well does practice meet the optimum in European nations?
- How can the political lobby for mental health care be strengthened?
- 13. Check and broaden evidence on the effects of subjective well-being upon prevention of mental disorder and recovery.

Together with considerable speculation on this issue, there is some empirical evidence for causal effects of subjective well-being on both prevention of mental health problems and recovery from these problems. These effects should be replicated in long-term follow-up studies that analyse the entire lifespan. Application requires that we know in which sub-groups these effects are most pronounced. The impact of this research would be profound, both clinically and from a public health perspective, since it would not only increase our scientific knowledge of the effect of subjective well-being on mental health, but it would also assist in the development of suitable interventions, whether these be generic public health interventions, or targeted clinical interventions.

- To what extent can mental disorders be prevented by interventions targeted at enhancing subjective well-being?
- To what extent is it necessary to attune such interventions to specific groups (sex/gender, ethnicity, SES)?
- What is the role of subjective well-being in recovery-oriented mental health care?
- Do happy service users recover faster? If so, among which kind of service user is this effect most pronounced?
- Is the incidence of mental disorders lower in European nations where average happiness is highest?
- 14. Establish evidence on the impact on subjective well-being of informal caring for persons with mental disorders and on potentially effective interventions.

Evidence of demographic and economic changes across Europe make it clear that more and more reliance will be put on informal care, typically women family members. The available research suggests that caregiving involves a considerable loss in happiness. Still, not all caregivers get unhappy and there is as yet little perspective on the reasons for that difference. Extensive European research on caregiver socioeconomic burden has typically ignored this issue. In the future, however, European social services will be required to promote subjective well-being and prevent mental health problems in this important population of informal caregivers, and it will be essential to base these policy initiates on sound evidence.

- How can subjective well-being in informal carers best be enhanced or maintained?
- What support practices are effective in sustaining subjective well-being among informal carers?
- What are the possibilities for a systems approach (e.g. family systems) in well-being interventions?
- How often does caring for family members with a mental disorder involve a loss in happiness? What is the total loss in 'happy life years'?
- For which conditions is loss of happiness most pronounced? Which of these conditions can be influenced by social policy?
- Do carer support groups help?
- Which existing interventions improve the mental and physical health of the carers?

Work Package 9 – Stakeholder Involvement

Priorities from Work Package 9 are presented below in the order of importance that they were given by Work Pack-



age 9's prioritisation process. Full details of this process are given in Fiorillo et al. (2013).

- 1. Quality of mental health services
- 2. Suicide prevention
- 3. Early detection and management of mental disorders
- 4. Rehabilitation and social inclusion
- 5. Prevention of mental disorders
- 6. Increasing access to available treatments
- 7. Stigma and discrimination
- 8. Social and economic impact of mental disorders
- 9. Relationships between mental and physical health
- 10. Users' perception of illness and treatment impact
- 11. New psychological interventions for mental disorders
- 12. Mental health and well-being in the general population
- 13. Environmental risk/protective factors for mental disorders
- 14. Health and well-being of carers
- 15. New medications for mental disorders
- 16. Improving adherence to available treatments
- 17. Epidemiology of mental disorders
- 18. Clinical characterisation of mental disorders
- 19. Cognitive dysfunction in mental disorders and its neural bases
- 20. Resilience and mental health
- 21. Mental health consequences of trauma
- 22. Culture and mental health
- 23. Genetic risk/protective factors for mental disorders
- 24. Neuroimaging of mental disorders
- 25. Molecular bases of mental disorders
- 26. Animal models of mental disorders

Clinical Research Task Force

Goal 1: New, safe and effective treatment interventions (pharmacological, brain-related, psychotherapeutic, systemic, psychosocial, eHealth/mHealth approaches and virtual reality/gamification, etc., or a combination of these)

- To increase research on new intervention approaches in order to gain more insight into their working
 mechanisms and to successfully develop effective new interventions. This research can/should specifically
 focus on:
 - Exploring strategies in order to foster adherence to treatments/interventions
 - · Exploring mediation factors
 - Exploring the role of these new treatments as add-on interventions



- Conducting more research in order to identify the best diagnostic measures for complexity (of the interventions) and treatment outcomes
- · Assessing differential treatment effects: are specific approaches more effective for specific subgroups?
- Conducting more research on eHealth/mHealth approaches and assessing the level of human contact
 that is needed to motivate individuals towards sustained use of eHealth/mHealth based treatments
- Conducting research that incorporates patient perspectives in treatment
- Better trial design (see below)

Goal 2: To understand the mechanisms of diseases

- 2. To conduct more research in order to reach a wider understanding of different mechanisms (e.g. psychological mechanisms, biological mechanisms, brain mechanisms, molecular mechanisms and environmental interactions) that may underlie mental disorders.
- 3. To conduct longitudinal clinical cohort studies with nested RCTs.

Goal 3: To evaluate treatment effects

- 4. To conduct more research on different approaches to evaluate treatment effects. Specifically, more research is needed on:
 - · Standardisation of psychotherapeutic treatment studies
 - Equivalence trials
 - Side-effects of treatments
 - · Alternative and/or non-randomised designs
 - · Improved reliability and validity of outcome measures
- 5. To increase the involvement of healthcare staff (among others) in order to stop non-effective treatments.

Goal 4: To perform proof-of-concept clinical trials for innovative treatments

- 6. To establish (European) research networks to coordinate and facilitate clinical research.
- 7. To identify or develop standard definitions and guidelines to increase the understanding of the term 'proof-of-concept'.

Goal 5: To gain insight into the role of comorbidity between mental disorders and somatic conditions for diagnosis, treatment decisions, and treatment and patient-related outcomes

- 8. To develop research in order to better understand mechanisms of comorbidity and how to investigate and treat comorbidity (including diagnostic strategies).
- 9. To increase research on intervention studies that target comorbidity.

Goal 6: To improve diagnostic strategies and the stratification of disorders

- 10. To define and validate stages for different disorders.
- 11. To develop and validate new diagnostic approaches and to foster standardisation of diagnostic tools.

Goal 7: To improve interventions in terms of return-to-work, presenteeism, and absenteeism

- 12. To conduct more research on interventions that target work disability and return-to-work as the main outcomes.
- 13. To identify or develop standard measures for return-to-work and related outcomes.

Goal 8: To determine the cost-effectiveness of interventions to increase rates of return to work, presenteeism, decreased rates of absenteeism

14. To foster the standard inclusion of cost-effectiveness assessments in studies on return-to-work interventions.



Goal 9: To overcome methodological gaps regarding the inclusion of patient preferences by study designs (specific gaps are for instance the lack of time for the explanation of the trials to patients, no consistency in the measurement of preferences, insufficient coverage of patient preferences, etc.)

- 15. To develop or identify standard measures of preferences (thus: to achieve more consistency in the measures of preference used).
- 16. To develop designs for preference studies.

Goal 10: To overcome methodological gaps regarding psychotherapeutic interventions studies (a specific gap is for instance that placebo studies are missing)

- 17. To explore what the most likely accepted placebo is in psychotherapeutic studies.
- 18. To increase research on the process and outcomes of different psychotherapies, especially by conducting more RCTs in this field.

Goal 11: To overcome methodological gaps regarding psychopharmacological intervention studies (one of the specific gaps mentioned is that most pharmacological studies are funded by the pharmaceutical industry)

19. To work more closely with industry in a precompetitive environment to ensure high quality trial design, on an independent basis.

Overall advance

20. To increase funding/financial investment in order to conduct more research (this advance is needed to reach each of the goals).







Justification Criteria

Identified priorities for the most pressing and promising advances in mental health research in the near future were justified according to four common dimensions of criteria. This was done individually by each ROAMER work package. The full list of justifications for all priorities generated by individual ROAMER work packages are reproduced in the ROAMER document **D11.2** (Haro, Obradors-Tarragó, van Os, Kuepper, Leboyer, Brunn, Chevreul, et al., 2013).

As the current roadmap assimilated the priorities for mental health and well-being research from individual work packages into a set of 20 common priorities, the justifications below have similarly been grouped into corresponding themes. Each priority is justified according to four dimensions, which are as follows:

- **Efficacy/effectiveness:** Likelihood that the advance results in an effective intervention to diminish the appearance of a disorder or its consequences, or to solve a concrete problem.
- Impact / deliverability / economic benefits in Europe: Likelihood that the advance could be
 provided to Europeans and impact on society (i.e. to decrease disease burden, to improve well-being,
 or to produce economic benefits).
- Answerability/feasibility in Europe: Likelihood that the advance can be achieved in Europe (lead to new knowledge, enabling development or planning of an intervention).
- **European research strength:** Relative competitiveness of Europe to other regions to achieve and implement the advance.

A) Supporting Mental Health for All

A.1. Research is required into the quality of mental health services across Europe. This requires quantitative and qualitative interdisciplinary research across countries with different health systems and cultures, to investigate how these systems affect service users and population-level mental health outcomes.

Efficacy/effectiveness:

Mental health services are extremely important but high-quality intervention research on governance, funding mechanisms, organisation and delivery of mental health care is scarce. This encompasses all levels of services, including inpatient and outpatient care, community care and peer support. Randomised controlled trials are crucial for such research, but other research designs should also be used to evaluate and develop service provision. Research is needed on mental health programmes that have potential for major public health impact, such as deinstitutionalisation programmes, universal promotion and prevention programmes, primary care capacity-building programmes and programmes that improve access to mental health services. There is also a need for more research on community based services for people with mental health problems, examining what is already being implemented and what community based services have produced the best outcomes for people with mental health problems.

Impact / deliverability / economic benefits in Europe:

Clinicians and healthcare professionals greatly influence mental health services. Communication skills, attitudes, and motivation of health workers may improve outcomes, and as a result there deserves to be more research into this. It will be necessary at the policy level to explore innovations in the organisation and delivery of healthcare. Such research is also vital if Europe is to meet the demographic and economic challenges that it will face in future. Re-organisations of healthcare may be forced on Europe by external events (e.g. ageing populations), but policymakers will need models to consider, and evidence upon which to base their suggested health system innovations.

Answerability/feasibility in Europe:

A typology of healthcare delivery systems across Europe and elsewhere will be a helpful research contribu-



tion. This could be coupled with, targeted investigations into the relative benefits of community care versus inpatient care. What is needed, in particular, are instruments that can reliably measure not only satisfaction with the health care system, but the impact of healthcare encounters on the subjective well-being of people with mental health needs. These same instruments would also be useful in determining the relationship between social investments in mental health services and the general well-being of the population, in order to support additional policy innovations. With an appropriate sampling design – including cohorts from different age groups and responding to economic, social and cultural differences – it would be possible to form the basis for a multi-centre study to address this central question across Europe.

European research strength:

There are a number of European groups already looking at mental health in Europe at the systems level (e.g. the Mental Health: European Economic Network, MHEEN; the Anti-Stigma Programme European Network, ASPEN; the European Network for Mental Health Service Evaluation, ENMESH), highlighting the aptitude of Europe for this kind of research. The infrastructure of healthcare systems in Europe allows for the collection of systems-level data at the national level in a way that is not possible with more privatised systems of healthcare. Furthermore the ability to compare these national systems-level data across international research groupings is perhaps unique to the European research community. Europe additionally has pioneering research initiatives led by service users, which stand to provide extremely important input to the design and considerations of metrics for the quality of mental health services.

A.2 Research is required into patient treatment and intervention preferences, as well as how to support and empower people with mental health problems, their families and other carers to improve well-being. The evidence base, particularly for younger carers, needs to be strengthened and the disproportionate burden of care that falls upon women should be investigated. Research on continuation of non-effective treatments should harness the involvement of healthcare staff and service users.

Efficacy/effectiveness:

Research is needed to overcome methodological gaps regarding the inclusion of service user preferences in study designs. Specific gaps include the lack of time for the explanation of trials to service users, a lack of consistency in the measurement of preferences, and insufficient coverage of research into service user preferences. There needs to be a concerted effort to build this kind of information and explanation into trials, rather than treating service users as passive subjects of interventions. There needs to be a more dynamic incorporation of insights and input from individuals with mental health problems (as well as their families and carers) with regards to treatment. For instance, research needs to take account of how best to address the specific impairments experienced by individuals, going beyond generic interventions for a given diagnosis.

In order to do this, research needs to develop or identify standard measures of preferences. More generally, given that considerations of service user preferences are still (unfortunately) rather novel, there need to be efforts to develop standardised designs for preference studies. Once these standardised measures of preference are developed, research can progress to examining the impact of service user and provider preferences on the effectiveness of different interventions.

Impact / deliverability / economic benefits in Europe:

One of the most prominent issues addressed by service users' groups and recent international statements of the human rights of persons with disabilities and health problems is the central importance of preserving and promoting autonomy, both within and outside of the health sector. The impact of service user preference research would be felt not merely in increasing participation in mental health interventions, but also in the development of mental health policies designed to further service user autonomy.

Evidence of demographic and economic changes across Europe make it clear that more and more reliance will be put on <u>informal care</u>, typically by female family members. The available research suggests that caregiving involves a considerable loss in happiness; however, not all caregivers show such a decrease. There is as yet little indication on the reasons for these differences. More comprehensive research methods will



produce results addressing issues like these, with greater relevance to community contexts. This will support more rational decisions by public health policymakers.

Answerability/feasibility in Europe:

Comprehensive healthcare systems in Europe provide access to wide and representative samples of patients, with close contact between service users and service-providers at various levels. Europe is also home to a number of patient rights and advocate groups actively encouraging opportunities for service users to have greater autonomy, and to have their preferences given stronger and more active consideration. This existing infrastructure allows for the implementation of plans to introduce or expand service user preference research. It provides numerous, multifaceted bases from which research into service user preferences may be developed and maintained.

Extensive European research on caregiver socioeconomic burden has typically ignored the issue of positive mental health and well-being. In future, however, European social services will be required to promote subjective well-being and prevent mental health problems in this important population of <u>informal caregivers</u>, and it will be essential to base these policy initiatives on sound evidence. In order to do this, social workers need to be involved. Unfortunately, this has not been the case up to now.

European research strength:

European values and EU fundamental rights provide a basis for an inclusive approach to public mental health research. Europe is a leader in the area of mental health human rights. Research building on this expertise in the psychological determinants of empowerment and related notions such as locus of control and autonomy – and in particular the linkages between these factors and subjective well-being – is a key European priority.

A.3 Research is needed that focuses on improving access to mental health resources, in reducing inequality in service provision, and in encouraging health systems to make better use of community assets. Implementation research is a useful but under-utilised tool in ensuring access and adherence to service users' preferred, tolerable treatments and interventions. In addition to disorder prevention, services should aim to promote mental health and well-being.

Efficacy/effectiveness:

Prudent use of <u>mixed-methods approaches</u> in public mental health research will support the attainment of research results which are generalisable, and feasible in public health practice. This is especially true for a better understanding of aspects of treatment such as its salience, acceptability and appropriateness. A practical example of this approach would be in the context of <u>implementation studies</u> on process of delivery. Additionally, barriers to access for adequate mental health services currently disproportionately affect disadvantaged groups, including older or social isolated people, and marginalised cultural groups (e.g. groups with low socioeconomic status, or those discriminated against on the ground of gender, sexuality, ethnicity or immigrant status).

Population-level mental health interventions need to build on individual and community assets. Research is needed which examines the effectiveness of community based interventions, as well as mapping how these vary across Europe. Research on how to best mobilise these assets by public engagement and active participation of target groups is the important next step in the evaluation and implementation research of public mental health interventions. This applies regardless of whether the field is mental health promotion, prevention of mental health problems, delivery of mental health care, or policy actions.

Impact / deliverability / economic benefits in Europe:

Research on policies to ensure equal opportunities for well-being has high policy relevance, especially when considering that across Europe there are huge inequalities in mental health between population groups. It is not enough to develop effective treatments or interventions – these must be effectively implemented and made accessible to all who require them. Appropriate research will greatly facilitate such a process.

Effective mental health services result in lower mortality rates, higher longevity, less medical expense and fewer physical health problems. Improving the efficiency of mental health systems will increase system affordability and accessibility. Establishing universal access to mental health services is a key objective in



doing this. Effective mental health services, together with interventions that improve mental health and reduce mental health-related morbidity, will have major impacts on the health of Europeans.

Answerability/feasibility in Europe:

European mental health systems face common challenges in needing to improve access to services. The mental health systems in Europe are highly developed but fragmented, and thus there is both a need and a potential for research on integrated service provision models. The European community mental health tradition forms a basis for <u>implementation research</u> focusing on mobilisation of community assets and avoiding unnecessary and possibly harmful medicalisation of mental health challenges.

European research strength:

Europe is strong in research on socioeconomic determinants of health and access to services, and there is a growing awareness of the need for action to reduce health inequalities. There is a European commitment to public health systems and reduction of social inequalities in health. There are European research groups within this field (e.g. the European Network for Mental Health Service Evaluation, ENMESH) and their work can be built upon and further developed.

A.4 There should be more research into preventative measures, resilience factors, and buffer interventions for positive mental health and well-being, as part of a wider focus on positive mental health and well-being. This requires investigating both societal (e.g. economic crises) and personal factors (e.g. lifestyle and behaviour change). Novel interventions research (e.g. eHealth and self-management of disorders) will elucidate these factors and their relationship to each other – for instance relationships between psychopathology and subjective well-being.

Efficacy/effectiveness:

Following considerable speculation on this issue, there is some empirical evidence for the causal role of subjective well-being in recovery from mental health problems. Early evidence also suggests subjective well-being may be effective in protecting against future mental and physical illness and increasing longevity, healthy life years, and productivity.

In order to implement these findings effectively, we need knowledge of which subgroups these effects are most pronounced in. It is also important to integrate the perspectives of mental health resources and protective or <u>resilience</u> factors in public mental health research in order to gain full understanding of population mental health. Interventions to promote public mental health and well-being reach wide audiences from being implemented in workplaces, schools, and other information centres that can reach individuals of all (working and non-working) ages.

Shifting viewing research and interventions away from simply 'treating symptoms' will improve outcomes as part of a wider paradigm shift to personalised and holistic treatment of individuals as situated in wider somatic, social and environmental contexts. Promoting research into the utility of a <u>Collaborative/Integrated Care</u> approach to managing mental health problems (away from the tradition of institutional care) would also fit well with this agenda.

Impact / deliverability / economic benefits in Europe:

An emphasis on positive mental health reduces stigma and makes mental health a matter for everybody. Mental well-being is closely connected to healthy life years and productivity. Some policies and programmes to improve mental well-being are already being implemented in European countries, showing positive outcomes and economic benefit. There is a great need for more research, development and evaluation to enhance impact and deliverability of these programmes. This includes defining society's mental capital and other community determinants of mental well-being.

It is essential to increase Europe's evidence base regarding the impact – and cost-effectiveness – of public health interventions designed to improve subjective well-being. The evidence base also needs to take account of the impact of improving subjective well-being on mental health outcomes. This research provides the important link between recent European endeavours to use subjective well-being as a general population indicator of policy effectiveness, and the urgent work that is required to investigate effective public



health promotion measures targeting mental health. The impact of this research would be profound, both clinically and from a public health perspective. It would not only increase scientific knowledge of the effect of subjective well-being on mental health, but would also assist in the development of suitable interventions, whether these are generic public health interventions, or targeted clinical interventions. This important research provides a crucial input into policy decisions. <u>Translational</u> and <u>implementation research</u> are critical research areas in relation to both mental health promotion and prevention interventions.

Answerability/feasibility in Europe:

The need to reform medically oriented public mental health is widely accepted in Europe, and the user-defined <u>recovery concept</u> has gained widespread acceptance. Many of the leading centres in positive mental health and well-being research worldwide are located in the EU. Europe is thus well equipped for the development of concepts and answering questions about the role of positive mental health in preventing mental disorders and promoting well-being. These are among the most important unresolved issues in public mental health research. Existing national mental well-being surveys (e.g. in England, Iceland and Scotland) form a starting point for pan-European measurement of mental well-being.

Retrospective research on past public health interventions would be the most feasible start, but this research needs to be complemented by more prospective investigations. Using existing experience, it would be possible to design and perform randomised controlled trials on subjective well-being interventions, in order to empirically substantiate the impact of these interventions on the well-being of service users. In addition, meta-analyses of such interventions could be carried out, provided that first all available data are presented in a comparable way in a findings archive. Cost-effectiveness analyses can then be performed, suited to the nature of the intervention.

European research strength:

There is certainly European expertise in this area that can be channelled to research targeting subjective well-being interventions. The positive mental health perspective has largely been conceptualised in Europe, and many of the leading centres in positive mental health and well-being research are located here. Several existing national or regional cohort studies in the field of mental health provide unique research skills and databases for long-term cohort research, which will best inform the impact of early detection and preventative strategies. In northern Europe, well-developed health registers and the ability to track service users through care pathways provide unique and cost-effective opportunities for register-based long-term cohort studies, both within and across countries.

A.5 There should be a focus on developing novel, safe, and effective interventions using new scientific and technological advances (e.g. Technology-enabled interventions). Interventions and diagnoses will be based on developments in mental health research. Studies are required of applications for routine health care settings, investigating increasing adherence and evaluating new interventions as they are implemented. This research needs a participatory approach including target groups together with research on translation into policy and wider dissemination.

Efficacy/effectiveness:

Research should address questions about real world service implementation, conducting explicit effectiveness and transfer trials to ensure the validity of research findings when they are implemented in practice. Techniques of <u>knowledge translation</u> and evidence-based policy development are essential tools for moving research into the domain of practice, both at micro (clinical) and macro (policy) levels. Furthermore, translation is not a unidirectional process, and there needs to be a constant dialogue between research, practice and implementation, including back translation.

Research about these techniques is greatly needed, especially as it relates to accumulating research about subjective well-being and putting this into practice across the mental health sector. Organisation of <u>eHealth</u> services can improve access to and compliance with mental health care. However, evaluation research, dissemination research and research on the public mental health implications of these new technologies is still lacking. It is important to study the uptake and implementation of new interventions developed by research-



ers and also why some interventions disseminate widely but many other effective ones do not.

Outcome measurement can be improved by implementing new forms of technology-assisted clinical tools (e.g. virtual reality applications or minimal contact therapies such as <u>telepsychiatry</u>) and by supplementing traditional treatment modalities with psychometric feedback tools. The multi-modal data collection possibilities offered by mobile phones (e.g. accelerometer, GPS, audio, contact with other phones) along with input from the user (e.g. Where are you? What are you doing? How is your mood? How did you sleep?), allow for assessment of mental health problems in real time, during day-to-day life.

Impact / deliverability / economic benefits in Europe:

There is a need for improved models of dissemination and transfer to routine care that take into account the needs of clinicians, individuals with mental health problems and their families. Appropriate translation of state-of-the-art research into interventions will improve outcomes and ensure the most effective treatment possible. For example, the implementation of existing tools that predict personalised risk could serve to greatly increase the effectiveness of interventions.

Rigorous evaluation of the implementation of novel interventions stands to improve understanding of how variations in usual care practices affect outcomes for service users. It further allows for the integration of constructs of organisational culture and climate into services and intervention research. Together these developments will aid in designing culturally and socially adapted interventions. There is a need for innovative implementation, including holistic approaches, empowerment-based strategies and use of virtual social network implementation support. The development of new treatments and interventions also stands to positively impact on European growth and job creation, especially in the ICT sector in the case of eHealth interventions.

<u>eMental health</u> has the potential for a major impact on the mental health of Europeans. It may be possible to substitute cost-effective <u>eMental health</u> applications for more expensive face-to-face interventions. Such interventions have the potential to become successful commercial products. <u>eHealth</u> platforms may also be useful in improving healthcare professionals' adherence to evidence-based guidelines, given adequate research into such approaches. If successfully implemented, this would improve both the effectiveness and cost-effectiveness of care.

Answerability/feasibility in Europe:

European researchers are well-versed in both the need for <u>knowledge translation</u> and its methodologies, although most of this research has been directed to biomedical results. There is an urgent need, however, to extend Europe's expertise in the area of subjective well-being and mental health into practice in health and social care. This requires <u>translational studies</u> on a much larger scale than performed up to now. Public mental health interventions are contextual, and it is essential that research on intervention components is performed within the established welfare models of Europe. Strong public policies and well-organised public services in Europe form an excellent ground for universal promotion and prevention actions, as well as for identifying those in need of selective or indicated interventions.

Europe is a well-developed information society, with a high level of computer literacy and an abundance of innovative enterprises in the <u>eHealth</u> field. The potential for the Internet as a cost-effective tool to enable both social contacts and accessibility of various services and interventions is broad. Simultaneously, there is an evident risk of social exclusion and other inequalities if for example older people are not given the support they need in order to be introduced to these e-resources. This is a challenge that should be given attention and priority.

European research strength:

Existing European research creates the necessary empirical base for studies trying to determine the effects of components of interventions. There is a growing body of evidence on the effectiveness of mental health promotion and mental disorder preventative measures that have potential to be further developed and implemented in Europe. There is an existing pool of expertise in translation methodologies and clinical implementation research in European institutions. Some of the leading centres in eMental health research are located in Europe, and by joining forces a critical mass could be achieved.



B) Responding to Societal Values and Issues

B.1 Research is needed that uses economic approaches to measure benefits in interventions for the promotion and protection of mental health and well-being across Europe. This should range from low-level behavioural economics (e.g. behaviour change, motivation/incentives), to determining the cost-effectiveness of different ways of funding, regulating and organising mental health services. These analyses are especially needed to investigate the costs of comorbidity.

Efficacy/effectiveness:

There is general scope for improving the quality of country-specific economic evaluations of interventions to protect and promote mental health, and of treatments and support for people living with mental health problems. This includes gathering more and better information on the unit cost of resources for mental health. Evidence on service delivery has traditionally focused on clinical decision-making and research designed to support evidence-based policymaking in the public mental health field. Focusing on organisational and managerial aspects of mental health services as well as financial mechanisms for funding service provision is now also warranted.

Impact / deliverability / economic benefits in Europe:

Ineffective mental health systems, management models and financing mechanisms burden individuals in need of mental health care and wider society. The use of economic approaches allows for considerations not only of the costs of mental health burdens, but of the avoidable costs given appropriate prevention and mental health promotion strategies. One pertinent example would be comparisons of the relative costs and efficacy of different forms of treatment in the long-term as well as immediately. For example, some psychological treatments may offset burden-of-disease in the long term, but this would not be accounted for by cost-benefit analyses conducted immediately following interventions. Longitudinal studies are needed in order to show whether interventions to improve well-being have an impact on the health (both physical and mental) of the population, and whether these lead to reductions in healthcare expenditure, improvements in the labour market and economic benefits for society. Costs of ineffective healthcare systems can be reduced by developing effective, evidence-based models to be applied at both clinical and policy levels for organisation and management of mental health care.

Answerability/feasibility in Europe:

Europe is already developing and implementing interventions to improve the well-being of the population, but the costs and benefits of these interventions need to be evaluated. The use of economic techniques can help inform policymakers of the benefits of improving subjective well-being. Using existing experience, it would be possible to design and perform randomised controlled trials on subjective well-being interventions, or carry out meta-analyses of such interventions, in order to calculate their impact upon individuals with mental health problems. Cost-effectiveness analyses can then be performed, appropriate to the nature of the intervention. Meta-analyses examining the cost-effectiveness of different interventions and their implementation across Europe would first require that available data are presented in a comparable way in a findings archive – as outlined elsewhere in these recommendations.

European research strength:

There are well-established European research networks in this area and their work can be built upon and further developed. Europe is also home to research and policy groups dedicated to informing the cost-effectiveness of interventions increasing positive mental health and well-being at the population level. In recent years, networks focused on economic issues in relation to mental illness and well-being have formed to facilitate research in these areas across Europe, including the Mental Health: European Economic Network (MHEEN); Mental Health Economics European Network, and REFINEMENT (Research on Financing and Quality of Mental Health Care in Europe).

B.2 Research outcomes should be expanded to include useful new indices of wider social and economic outcomes (e.g. employment, housing, education, social life, happiness), and interventions need to be developed that directly target these. Policy implementations (including



those addressing e.g. education, parenting and schooling) and any changes to the delivery of care must be robustly evaluated, for instance by systematic natural-experiment methodology. There especially need to be closer links between policymakers and researchers with regards to evidence-based policy in mental health and well-being.

Efficacy/effectiveness:

An important dimension of the efficacy of public policy is its utility in yielding relevant outcomes for public mental health, and this needs to be reflected in research. For example, shifts in policy regarding families, schools, workplaces or communities could all be viewed as natural experiments. At present, rigorous evaluation of natural experiments is scarce, which means that policy decisions are frequently based on uncertain assumptions. Better evaluation of policy actions and other natural experiments as well as effective knowledge translation is essential for building evidence-based policy.

There is a lack of dialogue between researchers, practitioners and policymakers. It seems that European societies and decision-makers are not fully aware of the importance of mental health and well-being research. More direct links from empirical evidence to policy are vital to ensure the correct and timely implementation of significant research developments.

Impact / deliverability / economic benefits in Europe:

Formulation of robust and standardised measures of interventions and services will be a major step forward for public mental health research. Valid and effective measures are necessary in order to monitor the impact of policies and programmes and allow comparison across countries in Europe. As one example, educational outcome measures are necessary in efforts to compensate for missed educational opportunities resulting from experiences of mental health problems while in school or training.

Longitudinal outcomes of interventions are also extremely important in ensuring the safety and efficacy of prospective interventions. They offer the additional ability to identify long-term effects that would not be seen in one-off or cross-sectional studies. High quality evaluation research will guide health decision-makers to improve policies, including the effective allocation of scarce public health resources. This will make public mental health policy more transparent and accountable, as well as more representative of societal needs.

Answerability/Feasibility in Europe:

European countries are experiencing shifts in public policies, which provide unique research opportunities. The diversity of European public policies provides a rich soil for comparative policy evaluation research. Attention to socioeconomic outcomes in European society (especially against the backdrop of economic crises in Europe) will facilitate the collection of these same kinds of outcome measures in relation to mental health interventions. Comparing the social and economic outcomes of mental health to these same outcomes resulting from physical health problems would also serve to contextualise findings.

Further research in the field of public mental health will lead us to European harmonisation of measurements, which will form a common base for European public mental health research that takes full account of the burden of mental health problems upon society.

European research strength:

Considerations of social impacts are currently well-placed in Europe. These cohere with numerous research networks established in recent years that specifically consider wider social issues and outcomes surrounding mental health research (e.g. the Anti-Stigma Programme European Network, ASPEN; the European Network for Mental Health Service Evaluation, ENMESH). Several theoretically well-founded measurement tools have been developed in Europe and field tested across European countries.

European and national governments have made moves towards science-based and evidence-based policy, showing that there is recognition of the need to evaluate policies as they are implemented. Furthermore, assessments of existing and already-implemented policies and interventions could build on current required evaluative measures, but enhance them with more rigorous scientific methodology. Inter-country variation in Europe creates unique opportunities for comparative and transferable policy evaluations.



B.3 There is a need to address the international, social and cultural context which results in mental health disparities, with especial reference to under-researched groups such as at-risk, disadvantaged, or marginalised populations. These contexts include economic inequality, lifestyles, population well-being, effects of public and economic policy, ethnicity, religion, and nationality.

Efficacy/effectiveness:

Health research – including mental health research – should use multiple perspectives to understand the complexity of health. Public mental health research needs to involve all potential aspects (cultural, economic, spiritual, relational etc.) and <u>stakeholders</u>, in order to adopt a more holistic view. This may be reflected in a wider conception of 'interventions' in research, including for example social or community interventions such as exercise, psycho-education, peer-to-peer contact, and self-therapy.

The validity and relevance of mental health research will be strengthened by better considerations of the intercontinental as well as intra-European cultural aspects (e.g. ethnicity, nationality, religion and other value systems) of mental health. This is relevant in order to assess transferability of the evidence base for mental health policies and practice between countries.

Disadvantaged groups (e.g. minority groups, people living in poverty, institutionalised individuals) have low levels of mental well-being and high levels of mental health problems, but are often excluded from or do not participate in research. A solid research basis is needed to reduce social inequalities in mental health and to promote inclusion of lesser-heard groups in research. Representative sampling will improve external validity of research, and highlight the needs and outcomes most relevant to disadvantaged groups, as well as potential solutions to such issues.

Impact / deliverability / economic benefits in Europe:

Existing research, although fragmentary, points strongly to the fact that socioeconomic factors show differential impact upon subjective well-being for individuals with and without mental health problems. Public health is to a large degree influenced by how we organise our society and our economy. A broadened scientific scope will contribute to better public mental health actions and improve the mental health of Europeans. New models, interpretations and conceptions of mental health can underpin new approaches to promotion, prevention, care and rehabilitation.

The burden and costs of mental health problems in Europe are distributed unequally. Emerging evidence indicates that interventions which promote social inclusion and mental health literacy can lead to improvements in mental health. Poverty reduction, family and parenting support, and universal access to mental health promotion in schools have all been linked with reducing mental health inequalities.

Understanding cultural factors – such as people's beliefs, attitudes and values – is crucial for transferability, adaption and reinvention of public mental health policies and interventions. It is increasingly important for individual countries to be culturally sensitive and understand the impact of diverse cultures on mental health promotion and prevention initiatives.

Answerability/feasibility in Europe:

European social policy aims at social cohesion and inclusion. Being at the heart of European values, there is both a need and a willingness to pursue this track of research. Existing fundamental rights and anti-discrimination research provides a supportive base for improving the mental health of disadvantaged groups. The cultural diversity of Europe and its migrant population creates a rich starting point for conceptual and empirical studies of the role of culture in mental health. Strong European values of equity provide support to this research area, as well as cross-sector strategies of mental health promotion supported by the European Union.

Cross-disciplinary public health and mental health research programmes exist in many European countries. This forms the basis for considerations of societal for and cultural impacts on mental health that include multiple perspectives. Further, it is not enough to show that public health initiatives work; the contexts in which they work and the balance between costs and benefits need to be established. Retrospective research on past public health interventions would be the most feasible start, but this research needs to be supplemented with more prospective investigations.



European research strength:

There is a long European tradition of diverse research approaches (British empiricism, German hermeneutics and French post-structuralism) and today Europe is home to strong research from diverse fields of qualitative and quantitative research. The relevant expertise for all these methodologies is well-represented, and further research targeting well-being and mental health determinants can greatly strengthen the European global position in this area.

A number of European countries have good population and health registers. From a practical standpoint, these registers enable the linkage of health and socioeconomic data at the individual level, which would then allow for detailed studies of different (mental) health services. Some research of culturally sensitive mental health services, including trans-cultural psychiatry, is already based in the EU, and several Pan-European research projects have been implemented in this area. Research can also build on existing European research networks, such as the COST network for migrant health research.

B.4 There needs to be more research into protection of the rights of people with mental health problems, including a consideration of the effects of stigma and discrimination. In particular the potential reciprocal relationship between stigmatisation (including self stigma) and mental ill health can be addressed in evidence-based interventions, especially randomised trials. This should lead to research and interventions aimed at increased social inclusion, as well as secondary stigma effects on carers.

Efficacy/effectiveness:

Universal fundamental rights of Europeans must include people with mental health problems on equal grounds, as well as the special rights laid out in the UN Convention on Rights of People with Disabilities. Involuntary psychiatric treatment and physical restraint and seclusion need special consideration. There is a need to revisit models of psychopathology and associated concepts and to consider to what extent some symptoms may be secondary to stigmatisations, possibly leading to reclassification of some symptoms.

Impact / deliverability / economic benefits in Europe:

Research on discrimination of people affected by mental health problems and their families is needed in order to avoid discrimination and protect fundamental rights. Such research (and its dissemination) will contribute to the removal of stigma surrounding mental health problems, and will advance public awareness of – and participation in – mental health promotion and prevention strategies. Mental health legislation plays a crucial role in addressing stigma and protecting the rights of individuals with mental health problems, but such legislation varies across Europe. Promoting the rights of people with mental health problems will support social inclusion and respect for fundamental rights of all Europeans⁵⁴.

Answerability/feasibility in Europe:

The respect for fundamental rights is a core value in the EU, and this is reflected at numerous levels of organisation. Advocate groups for the rights and wider representation of people with mental health problems are active in Europe. Such groups and campaigns would facilitate projects to reduce stigma and self-stigma, especially given the willingness of such organisations to work with both policymakers and research centres.

European research strength:

Cross-European research networks on mental health legislation exist. As previously mentioned, service user empowerment and support is a key priority in Europe. European countries are world-leading in addressing the rights of people with mental health problems, as well as in conducting service user led research that informs critical issues relating to stigma. Furthermore, given current reconsiderations of symptom and disorder classifications, the timing is apt to incorporate stigma into models of mental health problems and potentially re-classify symptoms. Europe is especially well-placed to do this, perhaps uniquely, in light of the fact that it is not unilaterally adherent to any of the recently revised classification systems (i.e. DSM-5, ICD-11, RDoC).



C) Life Course Perspective of Mental Health Problems

C.1 There needs to be a greater focus on the aetiology, development and progression of symptoms, syndromes and well-being across the lifespan. This requires research on conceptualising developmental risk and resilience factors and outcomes on various levels, including proxy and intermediate outcome measures (e.g. transcription, gene-environment relationships, epigenetics, stress exposure, cognitive control). Potential causal associations between mental health and cognition should be considered in terms of ageing, especially how this might inform interventions.

Efficacy/effectiveness:

There is a strong need for improved models of and approaches to normal and abnormal functioning within a developmental perspective. In order to promote mental health and to prevent mental health problems, more knowledge is needed about risk and protective factors and processes, as well as developmental trajectories. Development does not end at adolescence, and needs to take into account older adults as part of truly comprehensive life-course research. As treatments improve and decrease mortality rates (e.g. for severe psychotic disorders), there are commensurate increases in morbidity which then need to be addressed. It is crucial to disentangle the effects of environment and genes on population mental health and resilience. Intermediate outcomes, appropriately assessed, are vitally important to good quality evaluation research. Studies into the identification of intermediate outcomes should be designed so as to be able to assess and

Studies into the identification of intermediate outcomes should be designed so as to be able to assess and decompose relevant functional components of mediating processes for mental health problems, such as decision-making and cognitive control. These relationships (particularly the latter) are especially important to research in older adults. Epidemiology is also integral to life-course research. Models of these findings should incorporate measures of behavioural, cognitive, and neural phenotypes. This requires prospective-longitudinal designs, validating developmentally sensitive behavioural tasks.

The exposome encompasses environmental exposures of great importance for morbidity and mortality across both mental and physical health problems. Exposures to various chemical compounds have different effects during pregnancy (e.g. foetal alcohol syndrome spectrum; low-birth weight among smokers). In addition, lasting effects on brain development have been reported that are still poorly understood in humans, despite good documentation in rodent models. In general little is known about the effects of several chemical/medications/drugs over the life-course. It is therefore necessary to investigate the effect of these toxins on the exposome and its implications for transgenerational transmission, and its possible modulation by genetic and epigenetic factors.

In order to supplement existing knowledge, research should include age groups which are underrepresented so far, such as the elderly. For example, research in older adults is currently confined mainly to dementia and Alzheimer's, though there is a need to additionally focus on the increased risks for depression, suicide and other issues in this population.

Impact / deliverability / economic benefits in Europe:

Use of intermediate outcomes increases the feasibility of lifespan research and facilitates achieving research results within a shorter time frame. Significantly, using valid intermediate outcome measures will improve the cost-effectiveness of intervention studies. Identification of possible intermediate outcomes is especially important when final outcomes are rare, like suicide.

Understanding the environmental prerequisites for mental health and well-being (including intra-uterine environments, family environments, and parenting) in all age-groups is important in order to find ways of improving mental health and reducing the burden of mental health problems, beyond treating manifest disorders. Risk factors implicated by exposome research carry a large and diverse set of public health and economic burdens. Understanding the mechanisms of such exposures will allow treatments that reduce their associated burdens and disabilities.

There is a need to investigate the contribution of gene-environment interactions to age-related <u>resilience</u> (or vulnerability) to mental disorder and well-being. Such investigations need to be conducted in different environments and populations across Europe. This will help us better understand individual vulnerability and



<u>resilience</u> in adverse conditions as well as the consequences of a nurturing environment on mental health. Better understanding of these risk and protective factors will allow for earlier treatment and more effective prevention, thereby reducing disability and unemployment across the lifespan. Such treatments will reap economic benefits by treating disorders earlier, when the burden of disease has not yet fully developed.

Answerability/feasibility in Europe:

Some existing European infrastructures may be recruited for lifespan research – in particular, family doctors and GPs could greatly facilitate research into families and parenting. More widely though, further collaborative networks will be required for research across the life-course. Multicentre studies measuring genotype and environment have been feasible in Europe and there have not been ethical impediments to such research. The identification of more associated genes, the use of genetic risk scores and genome-wide scores will in any case allow smaller, more feasible studies. However, such studies will require massive datasets if current crude environmental measures are used, due to the modest effect sizes associated with single genes – so the development of better environmental measures is sorely needed. On the other hand, as more and more genes are identified to be associated, use of genetic risk scores and genome-wide scores will bring much more power to such studies, permitting analyses in reasonably sized samples (i.e. from a single study rather than combined over multiple studies). Multicentre studies measuring aspects of the exposome along with genetic and epigenetic characterisation have been feasible and ethically approved in Europe.

European research strength:

Due to the high level of healthcare provision in Europe it is relatively easy to recruit large cohorts of individuals and examine epigenetics, genetics and neuroplasticity across the lifespan. Additionally, there are already Europe-wide biobanking initiatives that could be harnessed to gather the required data. Europe encompasses diverse socioeconomic conditions and other environmental factors. It also encompasses populations with diverse patterns of chemical and other exposures, all of which are ideal for examining environmental and exposome effects. Several existing long-term studies in Europe with data on genes, early environment and mental health outcomes create a promising starting point. Finally, Europe is also well-placed in terms of its high scientific capacities in measure development.

C.2 Analyses of existing datasets should be carried out, as well as new longitudinal and clinical cohort studies (with nested RCTs), including children and older adults. This would be especially valuable in pan-European collaborations, so that larger cohorts would be formed. In addition a focus on significant or stressful events, transitions (e.g. return to work, adolescence, transition to older age, suicidal behaviour) and chronic issues across the life-span (e.g. absenteeism/presenteeism, employability of individuals with long-term illness or disability) with regards to mental health and subjective well-being would be useful.

Efficacy/effectiveness:

Mental health is built in life-long processes. Long-term observational studies, as well as long-term outcomes of experimental studies, provide invaluable information about the distribution of mental health as well as determinants of mental health and its stability over time. Longitudinal and clinical cohort data are needed in order to establish the causal links between well-being and mental health. Since the effects will differ across subgroups, large panels are also needed. As well as efforts to increase mental health promotion, routine data collection and long-term datasets will strengthen the knowledge base for the current (and lifelong) status of mental health and well-being in Europe.

Impact / deliverability / economic benefits in Europe:

Mental disorders are leading causes of burden of disease and productivity loss in Europe. Mental well-being improves productivity and reduces healthcare costs. Long-term studies are needed to understand long term courses of mental well-being and mental illness. Linking research with European <u>biobank</u> data derived from genomics, proteomics and metabolomics provides unique possibilities to study biological as well as environmental determinants of mental health. The development and validation of an evaluation tool for suicidal risks based on an interdisciplinary biological, psychological and social approach is an important task, and a clear example application of the approaches recommended here.



Longitudinal research may help to inform questions about chronic issues that cross-sectional studies may be insensitive to (e.g. <u>absenteeism</u>, long-term employability of individuals with chronic problems). These will also inform models of key life transitions associated with onsets or upturns in the rate or extent of mental health problems (notably adolescence and the transition to older age). These life transitions are proportionately under-researched at present in terms of the burden they represent to mental health and well-being, as well as in terms of educational and economic outcomes.

Answerability/feasibility in Europe:

The high level of health informatics in Europe, as well as strengths in cohort and parenting studies, will facilitate longitudinal studies across the lifespan. Several large-scale panel studies are already available in Europe and most of these involve measures of subjective well-being and mental health. A first step is to locate and harvest this existing information. A next step is to add measures in future waves of ongoing panel studies. This approach is not only feasible but is a cost-effective and highly efficient use of existing research funding. Existing longitudinal studies, health registers and biobanks based in Europe provide cost-effective sources of data. Universal public health and welfare structures in EU countries make long-term cross-country studies quite feasible in Europe as opposed to, for example, the US. Existing longitudinal administrative healthcare registers provide rich opportunities for collecting additional data in many EU countries.

European research strength:

Several existing national or regional cohort studies in the field of mental health provide unique research skills and databases for long-term cohort research. In northern Europe, well-developed health registers and unique identification codes provide near-perfect opportunities for register-based long-term cohort studies, both within and across countries. Several centres across Europe are well positioned to take the lead in the development of suitably powerful longitudinal datasets, and developing this existing research capacity (especially in countries with lower research outputs at present) will have a direct impact on the clinical and public health usefulness of these data.

C.3 Research and interventions for children and adolescents (including parenting) are crucial to understand how early experience and wider social influences affect health over the life-course, including identifying risk factors. This research will require age-appropriate measures and should guide the development of new, early and preventative interventions to help improve outcomes in these populations.

Efficacy/effectiveness:

It is important to understand how to optimise child and adolescent mental health, not least because it strongly predicts adult and life-long development of mental health. It is also important to understand how health and social services can best contribute to these efforts, alongside population and community social and economic actions. Public policies supporting parenthood and parenting and ensuring safe and non-abusive family life are proven to be effective, and urgently need to be implemented. Day care and schools can additionally promote mental health and prevent mental health problems, given an adequate research base and infrastructural support.

Research into the understanding of mental health trajectories needs to cover the whole lifespan but in particular child and adolescence as the period when many mental disorders first become apparent. There is a need to specify how vulnerabilities and stress influence critical developmental trajectories for poor health and specific mental disorders. There is also a need to understand why a substantial proportion of children and adolescents do not respond to evidence-based treatments, or are otherwise difficult to treat (e.g. young people with learning difficulties, children and adolescents with autism spectrum disorders). This should be approached together with finding methods of potentiating the effects of (or adherence to) interventions in children and adolescents.

There is a need to implement knowledge and expertise derived from developmental neuroscience in order to establish links between childhood psychopathology and aberrant processes in the developing brain. This can then progress to explorations of whether and to what extent such processes can be corrected or modified by means of psychotherapy. Understanding the mechanisms of adverse early life experience and subsequent



trajectories will permit more effective treatments, on the basis that treatments will be more targeted to those at most risk and delivered earlier in the course of a disorder. There is a need to expand target groups to children and young people without parental care, suffering abuse/neglect, in poor socioeconomic circumstances, or with physical disabilities.

Impact / deliverability / economic benefits in Europe:

The proposed advances are central to treating mental disorders earlier and ultimately preventing them and their economic and public health burden. Such a focus is also necessary to address the missed educational opportunities as a result of experiencing mental health problems in childhood or adolescence.

Targeted child and adolescent research will improve the efficacy of already effective psychotherapeutic interventions. It will also help develop psychological interventions targeting newly discovered vulnerability and protective factors for childhood psychopathology, and contribute to more developmentally sensitive and appropriate treatment programmes. Effective implementation of relevant promotion and prevention interventions by public services will support the mental health of children and adolescents. Interventions targeting the early years and parents have potential to foster long term effects and are thus also cost-effective.

Answerability/feasibility in Europe:

During pregnancy and early years of life parents and children utilise health services more frequently than in other life stages. This provides a good platform for implementing effective mental health promotion and preventive interventions for mental disorders. There is universal coverage of such services in many European countries, which further facilitates their use in public health research. Long-term birth cohort studies have been shown to be feasible in Europe.

European research strength:

Europe's healthcare infrastructure coupled with <u>centres of excellence</u> in genetics and epigenetics and diverse populations create an excellent environment to study the effects of early life experience over the lifespan. Europe has a strong tradition of child and adolescent psychiatry and a diversified social care system. There is a similar strong research tradition on parenting. These factors suggest the existence of relevant knowledge bases and expertise for the expansion of competitive child and adolescent research.

D) Research Towards Personalised Care

D.1 Research is required into the aetiology and mechanisms of mental disorders, mental health and related behaviours through use of '-omics' and bio-markers (adapted from validated biological/animal models) and other basic (psychological and social) science. This research should be directed towards developing novel interventions and understanding their therapeutic mechanisms.

Efficacy/effectiveness:

Modelling how different (single or small chains of) molecules and cells act in concert will provide novel therapeutic targets, prompting the development of more effective treatments. Models of mental disorders that implicate a single molecular perturbation (e.g. the 'dopamine hypothesis' of schizophrenia) were useful in the development of prototypical psychiatric drugs, but they are insufficient as a basis for developing new treatments. Stratified treatment of mental disorders will require reliable biomarkers. Better insight into mechanisms of vulnerability and resilience may help to identify genes and epigenetic modifications influencing critical pathways, serving to stratify service users by risk.

There needs to be a stronger emphasis on and integration of research into basic psychological functions (e.g. attention), processes (e.g. learning) and higher-order cognitive factors (e.g. decision-making, impulsivity-control, motivation) relevant for healthy functioning and mental health, including their neurobiological underpinnings. There is a strong need to identify whether impairments in decision-making and cognitive control are consequences of mental disorders, or if they are antecedent vulnerabilities – or even causal factors. A closer integration of computational models and psychopathology would provide an avenue towards explaining how phenotypical expressions of mental disorders emerge from nonlinear interactions among underlying neurocognitive mechanisms, dysfunctional meta-control parameter settings, and aberrant systems.



Pharmaceutical companies have been pulling out of psychiatric drug development. In great part this is due to attrition: for every compound that reaches market approximately ten others fail. Forward translation (into humans) of valid animal models will allow earlier 'go/no-go' decisions to be made about candidate compounds, reducing the attrition cited as a reason for withdrawal of pharmaceutical companies from neuroscience research. Moreover such models will facilitate the development of truly novel drug mechanisms, as opposed to simply improving the tolerability and toxicity of prototypical psychiatric drugs.

Impact / deliverability / economic benefits in Europe:

Identifying the active components (or combinations of components) of treatments will enable the development of more precise and economical public mental health interventions. Similarly, understanding the mechanisms underlying individual variation in mental disorders will allow for more effective targeting of treatments and interventions – including combinations of treatments or complex interventions. There are clear, unmet needs in terms of treatment-resistant disorders and inadequately addressed aspects of disorders (e.g. negative symptoms in schizophrenia). These carry heavy economic burdens (e.g. 80% unemployment in individuals with schizophrenia). Stratification of service users using biomarkers will bring about more intelligently focused use of healthcare resources.

Answerability/feasibility in Europe:

<u>Biomarkers</u> may be based on knowledge of the biological mechanisms of mental disorders and forward translation from animal models. There are already multicentre <u>translational studies</u> taking place in Europe involving translation between humans and animal models. Further collaborative networks will be required, but there are no ethical barriers to doing such studies. Large-scale studies examining putative <u>biomarkers</u> have been shown to be feasible in Europe, typically employing multi-centre consortia. Research concerning cognitive markers is similarly feasible, again provided that adequate collaborative networks are in place.

Social processes have been well charted over development, together with some evidence of their use as behavioural makers of mental disorders. What remains is to describe their neurobiological underpinnings. This will require a combination of developmental and environmental studies with integrative approaches. In turn this will provide the new knowledge with which to formulate research and clinical questions. Developments in social media and analyses of the networks that these give rise to may also serve to enhance and facilitate research into behavioural and social markers. An interesting empirical challenge for basic social science is whether the positive impact of social support and networks in traditional relations on mental health will be displaced by social media and what the balance sheet will be of positive and negative outcomes.

European research strength:

Europe has research strengths and appropriate <u>centres of excellence</u> spanning various academic disciplines, from molecular biology to epidemiology and public health, encompassing all the required components for developing research towards <u>personalised and individual-focused medicine and care</u>. Europe combines diverse and accessible populations with <u>translational</u> expertise in <u>-omics</u>, neuroimaging and neuropsychology, all of which have the potential to yield pertinent <u>biomarkers</u>.

Moreover, the existence of this expertise forms the basis of research that can realistically be competitive on a world stage. Europe's advantages include excellent public data registries and isolated populations for study. Eastern and Central Europe in particular are resources that must be further developed.

Considerations of <u>basic social science</u> are currently well-placed in Europe. Research focused on identifying cognitive neural markers for aberrant social processing would be well-informed by Europe's wealth of research centres specialising in both <u>biomarkers</u> and social psychology, as well as its competitive research background in social neuroscience.

D.2 There needs to be more research into diagnostic strategies and the stratification of mental disorders, discovering valid subtypes and individual variations with differential treatment outcomes. These should be based on neurobehavioural or cognitive markers and other validated empirical findings – rather than commercial or professional interests – including



findings at the (epi-) genetic level, through endophenotypes, neuroimaging, experimental psychobiology, and identified progressive stages of disorders.

Efficacy/effectiveness:

Disorder classification and stratification must be based on verified empirical data. More effective treatment will require not only medications developed on the basis of biological and psychological mechanisms, but relating such mechanisms to practical diagnostic systems. Diagnostic classifications are still largely based on clinical observation and symptom reports by service users, rather than evidence from basic (biological, psychological or social) science. Consequently, treatment is aimed at merely reducing and managing observable symptoms. This inability to target the causes of disorder results in suboptimal response rates and adverse effects of medication.

Using multiple levels of assessment will improve response prediction for different individuals. Such different levels of assessment might include (epi-) genetics, neuroimaging; experimental psychobiology; objective behavioural measures (virtual reality EMA, actography, mobility); bio-, psychological and social-behavioural markers (e.g. emotional regulation, self-efficacy, executive function). This will allow research to identify individual service user constellations associated with non- or partial response to treatment. Further, identifying the role of concomitant and prior appropriate or inappropriate treatment experiences will help refine personally-relevant treatment outcomes for different service users - i.e. determining what type and pattern of medication has an impact.

At a <u>basic science</u> level, failures in brain systems associated with social processes are fundamental to a large number of mental disorders, though because they contribute only modestly to differentiation between ICD categories they often go undiagnosed. While the behavioural phenomena of such failures have been described, there is a need for developmental studies that chart these, as well as integration of information from different approaches into unitary paradigms. Treatments targeting failures in systems for social processes have the potential for broad efficacy due to the pervasive nature of such failures across mental disorders.

Impact / deliverability / economic benefits in Europe:

Three important aspects form the basis for successful mental health research: 1) theoretical contention and clarity about competing arguments about generative mechanisms (explaining causal processes); 2) meanings attached to psychological difference in society (interpreting professional and lay knowledge); and 3) solid empirical data. It is in the interest of all Europeans that mental health concepts and diagnostic strategies are based on sound pre-empirical and empirical research, instead of being dictated by commercial or professional conflicts of interest.

Testing putative <u>endophenotypes</u> and respective neurobiological, psychological and behavioural mechanisms could more reliably guide clinicians' treatment choices and improve the prediction of treatment outcomes. Further, an archive of such findings would be an invaluable resource to identify gaps in understanding of the association between levels of subjective well-being and different levels of psychopathology. Identifying the needs of neglected, or particularly vulnerable service user sub-groups would aid in incorporating matching treatment components. This is especially pertinent in regards to treatment-resistant and chronic disorders, which show some of the largest health burdens in Europe. Moving to a <u>personalised care</u> focus on individuals in overcoming these issues stands to overcome issues in treatment resistance. This in turn will greatly impact wider social and economic outcomes, owing to the nature of the disorders and impairments most closely associated with treatment resistance.

Failures in social processes carry a heavy burden for the individual as well as society. Yet these are not well covered by the current diagnostic system, in spite of several obvious clinical phenomena – e.g. shyness vs. unsocial personality traits; callous/unemotional vs. reactive/impulsive aggressive behaviour. Thus there is great scope for delivering benefits in terms of reduced morbidity, mortality and economic burden.

Answerability/feasibility in Europe:

From the starting point of a findings archive, more focused research questions – relying on different expertise across European mental health research centres – could target specific disorders and stages of disorder in order to more effectively increase our clinical knowledge. Reductions of exclusion rules in randomised



controlled trials to include typical patterns of <u>comorbidity</u> beyond current diagnostic categories could help provide guidance as to what targets and procedures should be chosen in individuals who do not show prototypical manifestations of disorders. Such research would build up more representative and useful profiles of service users at the individual level.

Further research in this field will lead to a better European convergence of concepts and harmonisation of measurements, which will form a common basis for European public mental health research. Europe provides a diverse population with near universal healthcare, allowing field trials in large cohorts of relationships between neurobiological mechanisms and observed symptoms.

European research strength:

Europe has a strong tradition of theoretical research regarding concepts and meanings of mental health in many disciplines, such as sociology, anthropology, psychiatry and psychology. There are <u>centres of excellence</u> in the different disciplines required to study the mechanisms that underlie and differentiate disorders. Europe has other advantages, for example isolated populations for study such as on the islands of Sweden that are extremely useful for <u>biomarker</u> research. Making use of universal healthcare systems to facilitate large cohort studies across the lifespan will allow the development of dynamic diagnostic criteria that reflect how disorders change across the life-course, rather than representing static and monolithic lists of symptoms.

Europe is not yet fully committed to the US-based DSM mental disorder classification system (nor the new US RDoC system), which provides opportunities for exploring alternative conceptual systems. In terms of relating neurobiological mechanisms to clinical diagnoses, Europe carries the advantages of the open development process of ICD-11 and expertise in translational research.

D.3 Research is needed concerning the comorbidity of mental disorders with one another, and with somatic disorders. Improvements in understanding can only be achieved through adhering to agreed common standards (e.g. outcome measures, methods of measurement), and addressing comorbidity in terms of progression, underlying physiological and cognitive mechanisms, and risk factors. Clinical research is required for a thorough consideration of the treatment implications for comorbidity.

Efficacy/effectiveness:

There is a high level of <u>comorbidity</u> between physical illness and mental disorders, including substance use problems. Physical and mental <u>comorbidity</u> is linked to worse outcomes, lower access to care, and high mortality rates. This is especially pronounced for long-term health problems. Effective models for organising the care of people with complex needs will improve outcomes for people with comorbid health problems. There is a need to extend <u>aetiopathogenic</u> research on single disorders to typical <u>comorbid</u> constellations. There is also a need to examine the clinical implications of <u>comorbidity</u> with regard to treatment effects, side-effects, clinicians' judgement and service user preferences, and moderators (including developmental and socio-cultural factors) within appropriate clinical trial designs.

Findings like these will inform and improve models of mental disorders. Complementary computational models can help generate novel hypotheses about common mediating mechanisms across disorders. Future treatment strategies that target <u>allostatic load</u> (the chronic cost of stress on the body) have the potential for effectiveness across different mental and <u>somatic disorders</u>. Such treatment strategies would do well to target <u>allostatic load</u> at a number of levels, including its epigenetic, inflammatory and neuroendocrine aspects, across population, circuit/physiology, and molecular levels.

Such investigations will prompt more effective treatments of somatic and mental disorders, and moreover a holistic, personalised approach to treating an individual based on somatic, mental and environmental factors. However, the lack of consensus about methodological standards in <u>comorbidity</u> research hampers progress and requires agreement on methodological standards at various levels of analysis.

Impact / deliverability / economic benefits in Europe:

The establishment of integrated health programmes, sensitive to the context and needs of people with <u>comorbid</u> conditions, will improve health outcomes and productivity of Europeans. This may be enhanced



by the integration of physical and mental health promotion. Understanding the interactions between mental disorders and physical health will have a positive impact on the leading causes of mortality in Europe (e.g. cardiovascular disease) as well as chronic, disabling mental disorders. Treatments that modulate <u>allostatic load</u> have the potential to address the most burdensome mental and <u>somatic disorders</u> in Europe (chronic mental disorders, cardiovascular disease, cancer).

Answerability/feasibility in Europe:

In spite of a generally acknowledged need for integration, Europe is still dominated by isolated service systems, creating a need for research that will support <u>integrated care</u>. A great deal is already known about hormonal and autonomic mechanisms that have been implicated in issues of <u>comorbidity</u>; what remains is a precise integration of the diverse mechanisms that mediate mental and somatic health. The identification of specific mechanisms will make developing new treatments targeting specific impairments associated with <u>comorbidity</u> feasible and ethical. Beyond this, there is a need for the development of clinical and research methods for the assessment and evaluation of <u>comorbidity</u> within mental disorders, as well as with regard to relationships to <u>somatic disorders</u> and social functioning/disability. Such methods may include for example the use of innovative approaches like <u>clinimetrics</u>, for which there is currently promising research being conducted in Europe.

European research strength:

Europe has research strengths encompassing public health and epidemiology, neuroimaging and physiology, molecular biology and genetics. In Europe, epidemiological research on occurrence of mental and physical disorders is of high quality, as well as mental health service research. This creates a fertile ground for addressing research issues that link epidemiology with mental health services. Europe has centres of excellence that span mental and physical health (including expertise in studying hormonal, autonomic and other systems) and which deliver healthcare to the entirety of their catchment population, allowing the recruitment of appropriate cohorts.

D.4 Research on standardising methodologies for mental health treatment research (including economic analysis) is essential to ensure better design of randomised trials of pharmacological, psychological and combined and complex interventions. Where appropriate, this would involve close working with industry in a pre-competitive framework. Better understanding is needed of the mechanisms of treatment response (e.g. to CBT), and of whether alternatives to randomised designs may be possible for such research.

Efficacy/effectiveness:

Improved principles and heuristics in evaluation need to be adopted in evidence-based psychological interventions. There also need to be thorough replications of the efficacy of existing interventions, both in absolute terms, and in ensuring the generalisability and transferability of interventions. In such evaluations it must be borne in mind that randomised controlled trials will not always be the most useful approaches, and appropriate alternatives need to be formulated in such instances, as noted by the European Evaluation Society.

Basic experimental research can be used to characterise commonalities and differences across disorders in terms of responses to psychotherapies, such as cognitive behavioural therapy (CBT). This will additionally help optimise core active components of such treatments. At present, in spite of high effectiveness and some progress in clinical psychological research, little is known about the mechanisms of action of established methods of CBT and related psychotherapies. Research should look to establish the neural and neurobiological changes associated with changes induced by psychotherapies. This can then progress to questions of which factors and mechanisms are diagnosis-specific and which are shared or common factors that apply to a wider scope of clinical problems and diagnoses. Most importantly this will help identify what the core moderators and mediators of change are for service users who show positive effects of treatment. There are analogous methodological gaps in pharmacological trial designs that must be overcome in order to guarantee a robust evidence base for effective treatment and practice.

There is a general lack of understanding about the basic mechanisms of behaviour, as well the moderators



or mediators of interventions. There is a limited understanding of the mechanisms of behaviour initiation, maintenance and change and their critical trajectories and determinants. We do not know whether mechanisms governing these aspects of <u>behaviour change</u> are the same or different, and whether, for example, individual variation (genetic, or in capacities such as 'self-regulation') plays a role. These issues must be addressed in order to enhance models of effective treatments, and so improve their implementation.

Impact / deliverability / economic benefits in Europe:

Despite some coordinated efforts, there is a profound lack of knowledge about the degree to which psychological treatments are applied in EU countries, where and what kind of research and service delivery programmes are in place, and how they are integrated into wider mental health care infrastructure. As a result, Europe lacks basic prerequisites for an evidence-based mental health research policy. Ensuring that implemented interventions are validated and based on sound evidence stands to greatly enhance both their efficacy and cost-effectiveness. Additionally, standardisation of trial procedure will facilitate systematic reviews and meta-analyses, which will maximise the usability and value of research findings.

Answerability/feasibility in Europe:

Consensus is currently missing about the way to define treatments (psychological and psychosocial treatments in particular), and to translate this into a standardised, European typology of interventions and service delivery modes in the current and future mental health system. Building towards such a consensus would first entail collecting existing data on psychological and psychosocial treatments in Europe, the formats in which they are delivered, and taking into account the perspectives of different countries and geographical regions. This would require developing a map of existing research centres and programmes involved in psychotherapy and other psychological and psychosocial interventions, including basic research issues in all countries.

Such a coordinated research focus would also need to develop a methodology to identify gaps between evidence-based psychological methods and their application and delivery in routine care. A methodology aiming to successfully identify gaps between <u>basic science</u> and practice must be able to make distinctions by country, diagnostic domain, age group and so on. Finally, knowledge and insight gathered in the preceding steps needs to be unified, updated and processed in an integrated database – from which consultation processes and consensus can be developed.

European research strength:

Europe has extensive public data registries (for example the ability to identify almost all individuals with schizophrenia), together with information about the forms of treatment that individuals receive. This perfectly places Europe to investigate the mechanisms of efficacy of interventions. Coordinating such work across Europe would enhance the power of any such research initiatives, not least because of the large sample sizes this affords. Drawing on existing registries and information across Eastern, Central and Western Europe will give a preliminary indication of the relative efficacy of various extant treatments, and inform subsequent targeted and collaborative research.

E) Building Research Capacities

E.1 Shared databases (biobanks, specialist cohorts, mental health registries, status surveys, normative data of subjective well-being etc.), should be strongly encouraged across Europe. These should be open access, and as visible as possible. Research outcomes, databases and terminology (e.g. 'well-being', 'mental health', 'personalised care') should be standardised to facilitate data-sharing and collaboration.

Efficacy/effectiveness:

Even though Europe has an increasing network of research infrastructures, there is still a need to better communicate their presence so as to facilitate access by as many users as possible. In order to improve the accessibility and the (e-)sharing of European clinical and research data generated by public funding, it seems necessary to create a database of all available mental health databases in Europe – including clinical, routine, survey and research data. This newly-available data would ultimately need to be structured



and presented in an accessible format (e.g. a unique internet platform, the database of databases), within a dedicated infrastructure. The activity of an infrastructure in charge of mapping mental health databases could be linked to the promotion of mental health registries and comparable indicators in order to increase the comparability of data across Europe.

It is important to conduct research that clarifies and validates the concepts underpinning public mental health research. Conceptual clarity is a cornerstone of successful research because today much public mental health research is partly inconclusive and non-comparable with other research in the field. At present this is due to simplistic or unclear concepts, which are neither linked to empirical data nor to theoretical considerations. The concepts of mental health, psychological well-being and mental disorder and their relation to functions and capacities need to be defined in a cross-disciplinary approach.

Valid research relies on valid measurements. A suite of reliable measures of positive mental health and well-being, as well as indicators of key protective factors, need to be developed and validated. Likewise, valid typologies for mental health interventions and services are needed for cross-national comparative studies. An agreed-upon classification of concepts and related measures will open the door to the establishment of a 'findings archive' in which research findings are sorted by subject matter and become available for synthetic analysis. A firm conceptual foundation, moreover, will increase the effectiveness of subjective well-being as a clinical outcome for mental health interventions.

Impact / deliverability / economic benefits in Europe:

Standardising results and information across databases would facilitate meta-analyses across Europe – taking account of differences across nations, healthcare systems, cultures and research backgrounds. Secondary analyses of data collected for specific trials would allow for more questions to be answered using the same set of findings. This would allow for Europe-wide systematic reviews and meta-analyses that would maximise the usefulness of extant data. Due to exponential increases in the amount of available data, meta-analyses have become more involved and time-consuming, and as such now require dedicated funding.

It is paradoxical that public money finances projects for which access to the published results requires payment of additional public money. Funding entities and/or commissioners should establish open-access publications as an obligation for publicly-funded research to ensure that results are available to other research units and the wider public. More complete and informative data will prompt greater understanding of disorder mechanisms and more effective treatments. Providing visible and harmonised information about existing databases (including owner, objectives, types of variables, method and language), available in English, would facilitate the dissemination and usage of publicly funded knowledge in a way that matches its potential.

Answerability/feasibility in Europe:

<u>Open access</u> publication has increasingly become standard practice for publicly-funded research in Canada, the US, and the UK. Thus, the recommendation should be feasible for publicly-funded research in Europe. Penalties and random controls could be considered in order to enforce this rule. The <u>open data</u> philosophy is making inroads to the scientific community, and it would be possible to condition public funding on <u>open access to data</u> unless these data are particularly sensitive or non-anonymised.

The US and UK governments have implemented websites⁵⁵ where national databases are available to their citizens. Likewise, a number of journals and websites offer the possibility of publishing anonymised datasets. Based on these examples, it seems feasible for the EU and national governments to condition funding upon public access to data. The European network of Research Infrastructures (a leading example being the ESFRI roadmap⁵⁶) is sufficiently developed that an online database of health databases and normative population data with free access for the research community could be established. Owing to the demands associated with expanding data pools, there is a need for infrastructural support in terms of updating and managing databases, as well as statistical analyses of shared data. Translation into English of the databases would further be needed in order to encourage use and analysis of the data across countries. Specific funding would need to be dedicated to the creation, maintenance and translations required for such a database.

^{55.} http://data-archive.ac.uk/ http://data.gov.uk/; http://www.data.gov/

^{56.} http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri-roadmap



European research strength:

European e-networks are capable of ensuring the storage, sustainability and protection of <u>open access databases</u>, developing the use of common research languages, procedures and standards throughout Europe, limiting biases and increasing the reproducibility of studies.

The Euroreach project and existing working groups (e.g. at OECD and Eurostat) could provide models for creating mental health registries. There are also several European research centres with expertise in the required survey methodologies for creating a database of normative well-being data, and this research would further extend the European research experience and worldwide reputation in this area.

The Cochrane Collaboration and Campbell Collaboration in the UK and other European grants have high-lighted the benefits of supporting meta-analyses and reviews of existing data in extracting the maximum value from research findings. Future initiatives could be expanded though Europe, following these models and examples. In other fields, such as children's services, the EC has funded a "what works" platform of practices supported by empirical evidence. These platforms are ideally suited to translating effective research into evidence based policy more widely.

E.2 International and interdisciplinary research networks should be developed and maintained for knowledge exchange and rigorously standardised and coordinated research training and practice. Networks should make use of common research infrastructures, including genetic and neuroimaging resources. Specifically collaborative research and large European initiatives should have access to adequate funding.

Efficacy/effectiveness:

European e-networks and investigative and scientific networks have been identified as key infrastructures to develop interdisciplinary and international research. Networks can bring together scientists (as well as health professionals and service users) of different disciplines and nations in a common research field and allow them to discuss and elaborate projects together. Collaborative networks are required both to provide a <u>translational approach</u> involving different disciplines, to study large diverse cohorts, to elucidate the mechanisms of mental disorders and to provide more effective treatments. Such networks will help share complementary resources and strengths. Networks should be inclusive in order to allow researchers from all geographic origins to close existing gaps. Virtual or physical spaces as well as some events dedicated to mental health topics are needed so that researchers may meet, have discussions and share contacts, ideas and concepts.

Comparable research training among European researchers would facilitate exchanges like those above, and would likely improve overall research quality. To this end, specific mental health research masters and PhDs could be created at the European level and organised by several universities. This could also address the specific training needs of clinicians by giving them the clinical and research skills necessary for mental health research.

Impact / deliverability / economic benefits in Europe:

The lack of coordination across Europe with regard to mental health research opens an opportunity to pool complementary resources into <u>networks of excellence</u>, stimulating <u>translational medicine</u> for mental disorders. A systematic knowledge exchange for mental health research in Europe would be a step towards reaching the 'critical mass' necessary to attain a leading position in mental health research worldwide. This common tool would facilitate collaboration and the launch of single- and multi-national projects for the European research community. Moreover, by doing so, mental health would become more attractive for young researchers who are often interested in fields with solid research materials.

Increasing the sharing of available training resources in research and encouraging students' mobility (physically and virtually) would ensure access to research training in regions without their own capacities. This latter point is especially important in order to reduce the East-West gap in research training. Potential benefits of public-private collaboration stem both from more effective treatments reducing the burden of disease and from establishing Europe as a more attractive location for pharmaceutical research and development.



Answerability/feasibility in Europe:

Important research projects in mental health require a minimum of financial and human resources in order to be competitive with the rest of the world. The critical mass can easily be reached at the European level. Multicentre consortia have been shown to be feasible across Europe, without insurmountable ethical issues. The European Innovative Medicines Initiative (IMI) has already shown the feasibility of public-private collaboration.

Small events where researchers can meet and develop ideas together could be initiated by public authorities. However, they would likely be more efficient if initiated by the researchers themselves - who would need funding to do so. Therefore, a specific budget for 'knowledge exchange activities' could be included in all funding as a routine part of researchers activities. Furthermore, the most effective knowledge translation would require the involvement of individuals with mental health problems, healthcare workers and other key stakeholders in such activities. These activities could be virtual or physical and do not have to be formal. Additionally, investigative networks can be initiated by public bodies in order to provide services to national and European research units. These networks are Research Infrastructures, as defined in the ESFRI roadmap⁵⁷ and may be linked to it. Numerous important generic Research Infrastructures exist in Europe and are mapped by the current MERIL⁵⁸ project. The recent European Research Infrastructure Consortium (ERIC) provides another example of tools promoting Research Infrastructures: ERIC confers a specific legal status to infrastructures of European interest, thereby facilitating their extension to additional countries.

The EU and individual countries can provide incentives for the creation of European mental health masters and inter-university PhDs, guidance for the harmonisation of research training in medical schools, and additional support for student mobility. Efforts should be directed to increasing the possibility of e-learning and other distance training, based on existing pilots and experiences in other fields. For example, CIBER-SAM in Spain is currently launching a specific mental health research masters⁵⁹, which could be an example for other initiatives.

European research strength:

The number of Research Infrastructures in Europe is high, and via the ESFRI Roadmap the EU has expanded and streamlined them over the past ten years. Thus, Europe is in a favourable position due to the relative density of its scientific community, so that no research should be hindered by the distance between a research unit and the relevant Research Infrastructure(s). Considering the quality and quantity of data collection and linkage in some countries (not to mention the number and diversity of research groups in Europe), Europeans are in a position to be leaders in mental health research if the resources are mutualised. Current EU funding also provides unprecedented opportunity for large-scale collaboration among European research teams.

The coordination of European <u>centres of excellence</u> with complementary areas of expertise will facilitate large cohort studies and unravel the heterogeneity of mental disorder. Europe has extensive experience in the mobility of students with numerous European masters in a variety of domains. There are also immense research strengths in both public and private sectors, which can again be maximised by complementing each other's resources and expertise.

E.3 There needs to be a greater focus on a strong and interdisciplinary empirical research base in mental health, and consideration of mental health issues in training courses such as public health and epidemiology. Career opportunities should be created for academics with research training, with funding infrastructure that can quickly respond to emergent issues, as well as sufficient long-term funding dedicated to mental health research.

Efficacy/effectiveness:

The majority of mental health research training is currently taking place in courses related to psychiatry, psychology and neurosciences. However, mental health research encompasses a much wider range of disciplines. Due to the absence of clear career paths and the prevalence of short-term employment contracts,

 $^{57.\} http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri-roadmap$

^{58.} http://portal.meril.eu

 $^{59. \} http://www.ub.edu/web/ub/en/estudis/oferta_formativa/master_universitari/fitxa/R/M2806/index.html$



young trainees (in medical school or research training) may be discouraged from entering into an academic career in mental health research. In particular, there is a gap between academic and industrial careers in some parts of Europe, compared to regions where researchers can easily pass from a private company to a public research unit with few difficulties (and vice versa). This needs to be addressed with more versatile training. In order to make the case for mental health research careers, efforts should be made to increase future researchers' awareness of implications for mental health research and to transmit the specific skills needed. To that end, mental health content should be incorporated into public health, epidemiology, health statistics and other related courses, given the disease burden represented by mental disorders.

There is a lack of resources dedicated to mental health research in Europe, and it appears that the proportion of investment in human and financial resources does not match the burden of mental disorders. Dedicated mental health research funds would allow implementation of several of the recommendations made above, particularly the database of databases for mental health research. Some dynamic fields of mental health research necessitate rapid investigation under specific circumstances; sufficiently reactive funding mechanisms should be developed in order to facilitate competitive research on these topics.

Impact / deliverability / economic benefits in Europe:

Due to the dominance of project-based funding in European research, researchers are often faced with professional insecurity, which is a disincentive for pursuing research careers (especially compared to clinical practice). In order to increase the competitiveness of European research, incentives should be created to increase the number of merit-based appointments, i.e. focusing on the publications and/or the research training and skills of the candidate. Calls for proposals represent an administrative burden, such as the requirement of detailed budget predictions that may seem arbitrary. The necessary funding controls could be made more a posteriori and linked to a lighter administrative burden. These measures are likely to increase the attractiveness of academic mental health research for early career scientists. A shift towards longer projects and an increase in core funding would also help to ameliorate this problem.

Introducing renewable funding for existing projects will yield more complete datasets and less wastage of resources from incomplete analysis. The costs of high-risk/high-impact pilot studies, exchange and stimulation packages need not be great, but would bring about considerable benefits in terms of discovery and cross-pollination of expertise. This would increase the exchange between private and public research as well as employability and research career opportunities, which would clearly improve the attractiveness of mental health research. Moreover, the quality of research itself would likely be improved because cross-fertilisation could occur between ideas and concepts in private and public research. Finally, several skills developed in the private sector could be useful in the public sector (e.g. project management, human resources management, public relations, etc.).

Answerability/feasibility in Europe:

The recommendation for incorporating mental health research into wider health training tracks is relevant both to institutions offering courses and to EU/national authorities. While the former may readily incorporate such a change in practice into their course designs, the latter may provide the appropriate guidance and harmonisation. There is already exchange of expertise between EU countries and it is entirely feasible to develop this into a more organised programme. Europe currently leads initiatives that bridge academia and the private sector in the wider field of biomedicine. These experiences can provide concrete lessons that may be readily applied in the mental health field.

Initiatives from researchers are difficult to fund at the European level, and thus the calls system may be balanced with more investigator-driven projects, such as those offered under the FP7 programme 'Ideas'. Further, with Horizon 2020, a window of opportunity is open for modifying funding procedures. Competitively renewable funding is feasible and ethical in extracting the maximum value from funded projects. The awarded projects often require a significant investment in the establishment of methods and infrastructure. Often the most informative data are acquired towards the end of a project or after funding for the project has expired. In order to avoid incomplete data analysis and maximal benefit from methods and infrastructure development a competitive renewal of projects after the initial funding period is highly desirable. It seems worth considering the possibility of having an institution dedicated to funding and structuring



European mental health research, similar to the NIMH⁶⁰ in the US. Agile funding schemes for high-risk and high-impact pilot studies already exist in the US; the funding they supply is modest, enough for <u>proof-of-concept</u>. Such schemes would be feasible in Europe.

European research strength:

Europe has a well-trained research workforce as well as the training capacities needed to provide appropriate incentives for the next generation of mental health researchers. European research resources are numerous but need to be secured in order to ensure sustainability and quality. EU funding has the potential to provide the sustained, renewable funding necessary to extract maximum benefit from projects. Europe has investigators with diverse backgrounds and expertise. This strength would be maximised by the programmes described here.

E.4 Stakeholders need to be involved in research, and this includes individuals with mental health problems. This could be achieved by greater transparency and horizontal organisation in mental health research strategy and agenda-setting, with service users identifying problems and proposing research outcomes. Basic research training should be provided to all healthcare professionals.

Efficacy/effectiveness:

Providing training in research basics to every health professional (so that they understand the use of evidence in medicine and are equipped to implement research outcomes) would be of great use in bridging the gap between research and clinical practice. By the same token, efforts should be made to educate researchers about the organisation and delivery of mental health services. Individuals with mental health problems and their families are at the centre of any decisions made in mental health, and this needs to be reflected in a greater input from these individuals into research directions and outcomes. Researchers also need to be informed by clinicians about current interrogations and observations that could lead to research questions.

Additionally there is a lack of dialogue between researchers and policymakers. European societies and decision-makers may not be fully aware of the importance of mental health and well-being research. It appears that sometimes calls for proposals in mental health research do not respond to research needs and that their phrasing is ambiguous. This may be due to the absence of or weak visibility of existing bottom-up and consultative mechanisms for the development of calls.

When set up, research should include a consortium involving practitioners and service users when necessary, allowing such individuals to be involved in research from the design stage and throughout. At the end of projects, research should be communicated in language that is widely understood by the end users.

Impact / deliverability / economic benefits in Europe:

Researchers are the most informed about the state of research in their own domains, and they should be more involved in the selection of EU research topics, which would orient calls for proposals to the most innovative fields. At the same time, exchanges among researchers and policymakers may be extremely fruitful as policymakers are in a position to prioritise areas with particular importance for society. In any case, the transparency of the development of calls for proposals must be improved, and the possibility to participate in this process should be actively communicated. Such changes would give rise to more targeted and efficient funding calls and research programmes, with more directly applicable findings.

Answerability/feasibility in Europe:

Consultative entities should be created and expanded in order to transfer to inform decision-makers about contemporary knowledge of the mental health and well-being of the European population and the evidence on how to improve it. Likewise, researchers need to be better informed about the questions that are of particular interest to individuals with mental health problems and their families, policymakers, and healthcare professionals.

Clarifying the consultative processes that allow researchers to voice their research priorities appears to be feasible at a limited cost, if any. In this context, the EU and many individual countries may draw upon a

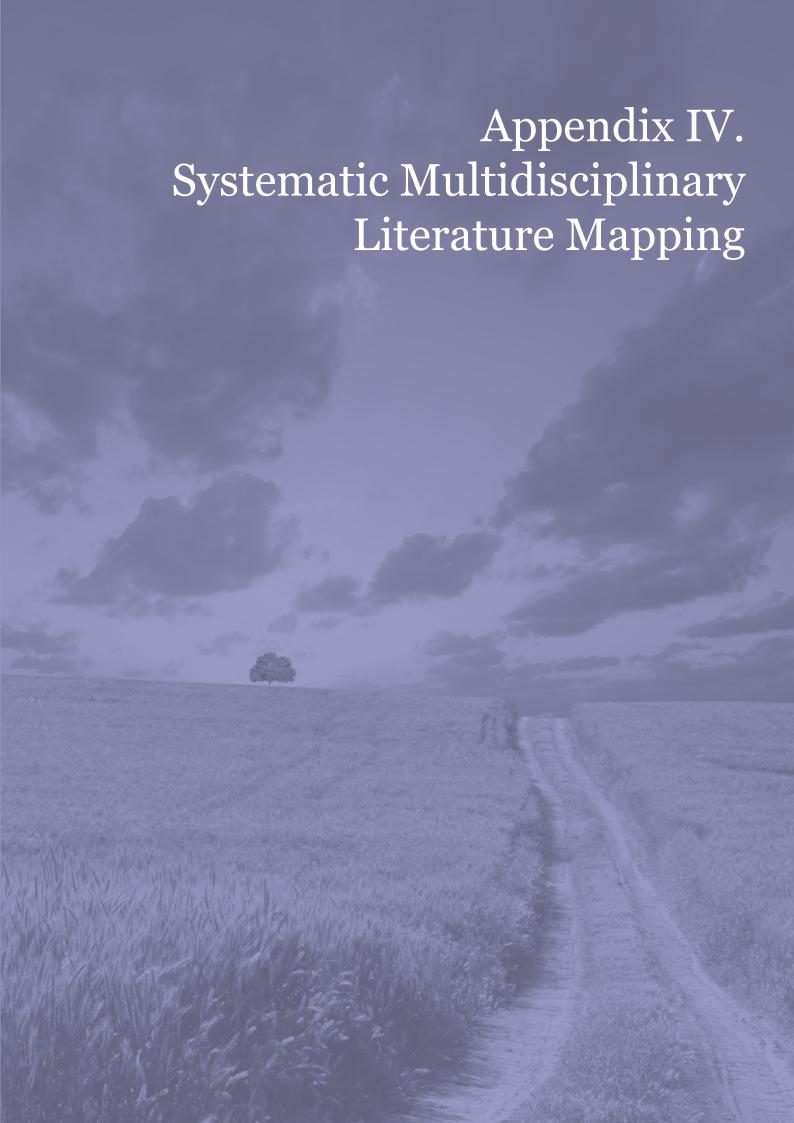


number of existing networks that can collectively and efficiently solicit participation in the setting of themes for calls for proposals. Guidance could be provided at EU and national levels. Better transparency regarding the criteria and processes of academic appointments would require little in terms of financial resources. The recommendation of basic research training for every health professional is of particular concern for professional associations and medical schools; the role of the EU and individual countries would be to provide leadership and recommendations in order to close the knowledge gap between clinical practice and research in mental health.

European Research Strength:

Europe has sufficiently developed research networks and administrative bodies that would allow the creation of effective consultative initiatives. Additionally, Europe has specific professional associations (e.g. the European Federation of Psychologists' Associations, European Psychiatric Association etc.) that promote mental health training within a scientist-practitioner model. Such bodies offer useful bases for expanding research at all levels of the mental health system. Some new formats may need to be created in order to allow this exchange of knowledge between researchers and policymakers with the goal of supporting evidence-based policy. Moreover, indicators to evaluate potential benefits of mental health research, especially in terms of socioeconomic impact, should be developed in order to 'make the case'. For instance, little is currently known about the return on investment in mental health research but early evidence has indicated a high rate of return⁶¹. Innovative service user-led research in Europe is also apt to inform worthwhile outcome measures for future mental health research.

^{61.} Health Economics Research Group, Office of Health Economics, RAND Europe. Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK. London: UK Evaluation Forum; 2008.





Part 1: Method

In generating their overviews of State-of-the-Art European research in mental health and well-being (**Section 5** of the main roadmap), individual work packages had to map the main publications in peer-reviewed journals for each area of knowledge within mental health research (i.e. biomedicine, psychological processes and treatments, public health, social and economic aspects, and well-being, respectively) during the last five years in Europe. Accordingly, ROAMER defined a common approach across all work packages for the systematic multidisciplinary literature remappings. This approach was based on the protocol described in Curran et al., (2007) and adapted to the research field of interest (see **Figure IV.1**).

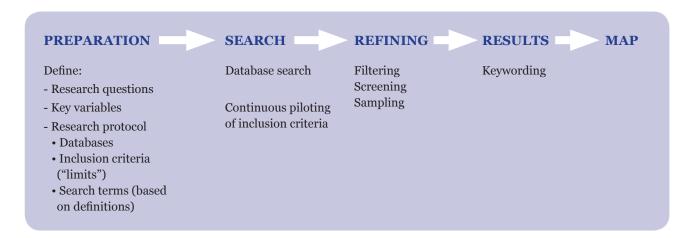


Figure IV.1. Schematic of the methodology for the Systematic reviewing to map the literature

All the steps of the approach are elaborated below, broken down in the processes of Preparation, Search, Refining, Results and Map – as outlined by Curran et al.

PREPARATION

1) Define the review questions

Primary question:

What research exists in Europe in the area of Mental Health and Well-being?

Secondary questions:

What is the nature of this evidence? Is it qualitative or quantitative?

Which are the countries where this research is done?

What are the main topics?

2) Define the key variables

It is necessary to have broad, functional and unambiguous definitions in order to avoid inadvertently missing relevant evidence, to generate a search strategy, to ensure consistency of concepts and replicability. The objective of the literature mappings was to have as comprehensive coverage as possible, therefore overlap in search terms was preferred to leaving gaps between definitions.

Mental health search terms (common across work packages) were defined as below based on Curran et al., 2007 (with further input from Prof. Marion Leboyer):

- Mental and behavioural disorders due to psychoactive substance use
- Mental and behavioural disorders due to use of alcohol
- · Mental and behavioural disorders due to use of opioids
- Mental and behavioural disorders due to use of cannabinoids
- · Mental and behavioural disorders due to use of sedatives or hypnotics



- · Mental and behavioural disorders due to use of cocaine
- · Mental and behavioural disorders due to use of other stimulants, including caffeine
- Mental and behavioural disorders due to use of hallucinogens
- · Mental and behavioural disorders due to use of tobacco
- · Mental and behavioural disorders due to use of volatile solvents
- Mental and behavioural disorders due to multiple drug use and use of other psychoactive substances

Schizophrenia, schizotypal and delusional disorders

- Schizophrenia
- Schizotypal disorder
- Persistent delusional disorders
- Acute and transient psychotic disorders
- · Induced delusional disorder
- Schizoaffective disorders
- · Other nonorganic psychotic disorders
- Unspecified nonorganic psychosis

Mood [affective] disorders

- Manic episode
- Bipolar affective disorder
- Depressive episode
- · Recurrent depressive disorder
- · Persistent mood [affective] disorders
- · Other mood [affective] disorders

Neurotic, stress-related and somatoform disorders

- · Phobic anxiety disorders
- · Other anxiety disorders
- · Obsessive-compulsive disorder
- · Reaction to severe stress, and adjustment disorders
- · Dissociative [conversion] disorders
- Somatoform disorders
- Conversion disorder
- Hypochondriasis
- Body dysmorphic disorder
- Pain disorder
- Other neurotic disorders

Behavioural syndromes associated with physiological disturbances and physical factors

- Eating disorders
- Nonorganic sleep disorders
- · Sexual dysfunction, not caused by organic disorder or disease
- · Mental and behavioural disorders associated with the puerperium, not elsewhere classified
- · Psychological and behavioural factors associated with disorders or diseases classified elsewhere
- Abuse of non-dependence-producing substances
- Unspecified behavioural syndromes associated with physiological disturbances and physical factors

Disorders of adult personality and behaviour



- · Specific personality disorders
- · Mixed and other personality disorders
- · Enduring personality changes, not attributable to brain damage and disease
- · Habit and impulse disorders
- · Gender identity disorders
- · Disorders of sexual preference
- · Psychological and behavioural disorders associated with sexual development and orientation
- Other disorders of adult personality and behaviour
- · Unspecified disorder of adult personality and behaviour

Disorders of psychological development

• Pervasive developmental disorders

Behavioural and emotional disorders with onset usually occurring in childhood and adolescence

- Hyperkinetic disorders
- Conduct disorders
- · Mixed disorders of conduct and emotions
- Emotional disorders with onset specific to childhood
- Disorders of social functioning with onset specific to childhood and adolescence
- Tic disorders
- · Other behavioural and emotional disorders with onset usually occurring in childhood and adolescence

Unspecified mental disorder

Symptoms and signs involving emotional state

Anorexia

General terms

- Mental confusion
- Mental disability
- · Mental capacity
- Psychiatry
- Psychology
- Mental health
- Psychiatric medical comorbidity

Other key variables (e.g. 'Well-being', especially in the case of Work Package 8) were defined by individual work packages, and refined through an iterative feedback process with other members of the ROAMER project. See Part 3 of the current Appendix ('Key Term Syntax for each ROAMER Work Package') for these specific key variable terms in full.

3) Specify inclusion criteria

Inclusion criteria for the ROAMER systematic literature reviews were as follows (note that literature mappings were conducted in 2011 prior to the accession of Croatia to the EU, hence the use of "EU-27"):

- Academic peer-reviewed papers (except in cases where work package leader considered that other type of publications should also be included because of their relevant information)
- Published during the last 5 years (2007-2011)
- English language (except in cases where work package leaders considered that national publications should also be included because of their relevant information)
- Based in any European country (EU-27 countries, EU Candidate countries and/or other European countries)
- · Publications must have had an abstract



SEARCH

4) Specify search terms

Search terms were based on the definitions of the key variables above. The main challenge of the literature review process was to include as many terms as possible so as not to miss any relevant findings, while not formulating an impossibly large search. The specific search strategy differed slightly when using different databases (e.g. PubMed or PsycINFO). However, the general procedure is specified below:

- 1. Limit the search at least for the inclusion criteria mentioned above (each database has specific tools to do it).
- 2. Introduce the search terms in the advanced search tool as described below:

(Search terms for "Mental health") [only within the title/abstract] *

AND

(Search terms for the second key variable) [only within title/abstract] **

AND

(Search terms for included countries or nationalities of the subjects of the study) [only within title/abstract] **OR** (Search terms for included countries of authors) [only within the affiliation] *

*These terms were identical across all work packages (see Part 2 of the current Appendix)

Examples are given below (i.e. in Parts 2 and 3 of this appendix) of both i) the general search terms for mental health across all work packages plus the search terms for all countries/nationalities (Part 2 of the Appendix), and ii) the search terms specific to each work package (Part 3 of the appendix). For the sake of conciseness, only search terms for the PubMed database are included in the current appendix. Details of the (very similar) search terms used for the PsychINFO database are available upon request.

The rationale of the selection of these search terms is explained below for each key concept:

- Search terms for "Mental Health"
 - Based on the list of keywords taken from Curran et al., 2007 and input from Prof. Marion Leboyer and other ROAMER participants.
- Search terms for the second key concept
 - Each WP should define a similar list of search terms for the second key variable (i.e. "Well-being", "Biomedicine", "Psychology and treatments", "Social-economy", or "Public Health").
- Search terms for included countries
 - All approaches for a systematic reviewing of ROAMER used 1) a common list of countries that should appear within the affiliation of the authors, or 2) a common list of countries and nationalities that should appear within the title or the abstract of articles reflecting the origin of the subjects of study. This one element of difference varied between search terms for the PubMed and PsycINFO databases.

5) Specify search strategy

The search strategy was defined to be comprehensive enough to identify all relevant literature but precise enough to minimize the number of spurious references retrieved. All work packages searched at least the PubMed and PsychINFO databases. The "advanced search" tool and the "limits" option were used whenever possible to correspond with the inclusion/exclusion criteria detailed above. Where other databases were searched, this is additionally noted below for each work package individually. In such cases, the same search terms were used as for the PubMED search, but the syntax may have differed very slightly in form depending on the commands required to perform analogous searches of different databases.

REFINING

6) Filtering

Publications were only selected for the literature review if they included an abstract, as the reviewing and systematic mapping processes were based on the information contained in the abstract, title and keywords.

^{**}These terms were specific to each work packages (see Part 3 of the current Appendix)



7) Review

In cases where searches returned more than 3000 selected references, random sampling was performed to reduce the number of references reviewed. All decisions were based on abstract, keywords and titles only.

Each work package added their own inclusion/exclusion criteria to the above list in order to adapt the refinement strategy to each area of research (see Part 3 of the current appendix). The mapping process was also designed to be flexible enough to maximise usability. As such, the pairs of ROAMER researchers who conducted reviews in each work package were at relative liberty to revise inclusion/exclusion criteria and adopt conventions based on their experiences of piloting the overall inclusion/exclusion criteria.

CODING PROCESS:

Researchers were required to code each reference as either included or excluded, with a secondary code reporting the reason for rejection. Included papers were coded using a simple coding system and then entered into a statistical package (SPSS) in order to run simple correlations. All codes were piloted to ensure their usefulness to researchers and the final output.

The aim of the mapping was to characterise the references, not to look at the evidence itself. Codes were assigned to characterise each reference, covering several dimensions:

- · Reviewer (the person who is doing the systematic reviewing)
- · Reference Manager ID
- PsycINFO ID
- Medline ID
- · First author
- · Country of the corresponding author
- City of the corresponding author
- Centre: Hospital, University, Research Centre, other (mark all that apply)
- Specify the centre
- · Title of the article
- Keywords
- Year
- Journal
- Excluded
- · Reason why excluded
- Country of the subjects of the sample of study (only if applies)
- Age of individuals of the study: children, adolescents, children and adolescents, adults, elderly (mark all that apply), more than one, etc.
- Gender: male, female, both (mark all that apply)
- Type and sub-type of study (based on the Health Research Classification System of the UK Clinical Research Collaboration 2009):
 - o Underpinning Research
 - Normal biological development and functioning
 - Psychological and socioeconomic processes
 - Chemical and physical sciences
 - Methodologies and measurements
 - Resources and infrastructure (underpinning)
 - Aetiology
 - · Biological and endogenous factors
 - Factors relating to physical environment
 - · Psychological, social and economic factors
 - Surveillance and distribution



- Research design and methodologies (aetiology)
- · Resources and infrastructure (aetiology)
- o Prevention of Disease and Conditions, and Promotion of Well-being
 - · Primary prevention interventions to modify behaviours or promote well-being
 - Interventions to alter physical and biological environmental risks
 - Nutrition and chemoprevention
 - Vaccines
 - Resources and infrastructure (prevention)
- o Detection, Screening and Diagnosis
 - Discovery and preclinical testing of markers and technologies
 - Evaluation of markers and technologies
 - Influences and impact
 - Population screening
 - Resources and infrastructure (detection)
- o Development of Treatments and Therapeutic Interventions
 - · Pharmaceuticals
 - Cellular and gene therapies
 - Medical devices
 - Surgery
 - Radiotherapy
 - · Psychological and behavioural
 - Physical
 - Complementary
 - Resources and infrastructure (development of treatments)
- o Evaluation of Treatments and Therapeutic Interventions
 - · Pharmaceuticals
 - Cellular and gene therapies
 - · Medical devices
 - Surgery
 - Radiotherapy
 - · Psychological and behavioural
 - Physical
 - Complementary
 - Resources and infrastructure (evaluation of treatments)
- o Management of Diseases and Conditions
 - Individual care needs
 - End of life care
 - Management and decision making
 - Resources and infrastructure (disease management)
- o Health and Social Care Services Research
 - Organisation and delivery of services
 - · Health and welfare economics
 - Policy, ethics and research governance
 - Research design and methodologies
 - Resources and infrastructure (health services)
- "Mental health" content (Research concern)
- Content related to the second key variable (Research area)

RESULTS - MAPPING

8) Mapping

The map describes each included paper by assigning a range of keywords that characterize content, setting, date of publication and methodological approach. By storing information in this fashion it becomes possible to undertake



additional analysis, for instance allowing a researcher to identify both those topics that are well researched and others that are not (Gough and Elbourne, 2002). Maps were produced as tables of correlations (i.e. "year of the study" versus "mental health disorder"; "country of the study" versus "type of study", etc.).

Part 2: General Search Terms in PUBMED

Limits:

- Publication date: 01/01/2007 31/12/2011
- · With abstract
- In English language

Syntaxes:

1. Mental health --- Limited in the title/abstract

(("drug abuse" OR "drug addict" OR "drug addicts" OR "drug addiction" OR "drug addicted" OR "drug dependent*" OR "drug dependence*" OR "drug withdrawal" OR "drug abuse") OR

("addictive disease*" OR "addictive disorder*") OR

("alcoholic patient*" OR "alcoholic subject*" OR alcoholism OR "alcohol dependent*" OR "alcohol dependence*" OR "fetal alcohol*" OR "prenatal alcohol*" OR "chronic ethanol*" OR "chronic* alcohol*" OR "alcohol withdrawal" OR "ethanol withdrawal") OR

("caffeine dependent*" OR "caffeine dependence" OR "caffeine addiction" OR (caffeine AND addict*) OR "caffeine withdrawal") OR

(((cocaine OR heroin OR cannabis OR mdma OR ecstasy OR morphine*) AND (abuse OR depend* OR dependent* OR dependence* OR addict* OR addicts OR addicted OR addiction* OR withdrawal)) OR methadone) OR

(addiction OR addictive OR "substance abuse" OR "withdrawal syndrome" OR psychoactive*) OR ((schizophrenia OR schizophrenic) OR Schizotyp* OR ((Delusional OR paranoid) AND disorder*) OR hallucination* OR Psychotic OR Schizoaffective OR psychosis) OR

(((manic OR bipolar OR mood) AND disorder*) OR (depressive AND (disorder* OR episode*)) OR "depressive symptom*" OR hypomania OR mania* OR ((major OR psychotic OR disorder*) AND depression) OR "suicide attempt*" OR suicidal* OR cyclothymia OR Dysthymia) OR

(((anxiety OR panic OR "Obsessive-compulsive" OR adjustment OR conversion OR dissociative OR Somatoform OR Somatization OR neurotic) AND disorder*) OR ("hypochondriasis*" OR "body dysmorphic disorder*" OR "pain disorder*") OR agoraphobia OR "social phobia*" OR "Post-traumatic stress" OR "stress disorder*") OR

("Eating disorder*" OR "Anorexia nervosa" OR "Bulimia nervosa" OR "sleep disturbance" OR (sexual AND (disorder* OR dysfunction)) OR ((postnatal OR postpartum) AND depression) OR ((antidepressant* OR laxative* OR analgesic* OR psychotropic* OR vitamin* OR steroids OR hormone*) AND abuse)) OR

(((insomnia OR sleepiness OR "sleep disturbance") NOT (apnea OR "side effect*" OR parkinson* OR alzheimer OR neurodegenerat* OR cancer OR obesity OR obese*)) OR (hypersomnia NOT narcolepsy) OR ((sleep OR night) AND terror*) OR nightmare*) OR

((disorder* AND (personality OR identity OR impulse* OR impulsiv*)) OR asocial OR antisocial OR psychopathic OR anxious OR narcissi* OR "Pathological gambling" OR pyromania* OR Trichotillomania OR Psychosexual OR ("Munchhausen syndrome")) OR

("Pervasive developmental disorder*" OR autism OR autist* OR "Rett* syndrome" OR "Asperger* syndrome") OR

(((Hyperkinetic OR Conduct OR Emotional OR tic) AND disorder*) OR (anxiety AND (separation OR phobic OR social)) OR (hyperactivity AND (disorder* OR syndrome)) OR "Tourette syndrome" OR "Tourette's syndrome") OR

((Mental AND (disorder* OR illness OR health)) OR "psychological distress" OR "psychiatric disorder ") OR



(Nervousness OR "nervous tension" OR Irritability) OR anorexia OR

(neurosis OR neuroses OR psychoses) OR (("mental confusion*") OR ("mental disability*") OR ("mental capacity*") OR ((psychiatric OR mental) AND (comorbidity OR comorbid)) OR psychiatry OR psychology))

AND

2. 2nd key term syntaxes (specific for area of knowledge) ---- Limited in title/abstract

Each WP defined this syntax in line with their remit and specific per area of knowledge (see next section for a full list of these for each individual work package.

AND

((

3. Geographic limitation (countries and nationalities) --- Limited in the title/abstract

("European Union" OR Europe* OR "EU-27" OR "European country" OR "European countries") OR (Austria OR Belgium OR Bulgaria OR Cyprus OR "Czech Republic" OR Denmark OR Estonia OR Finland OR France OR Germany OR Greece OR Hungary OR Ireland OR Italy OR Latvia OR Lithuania OR Luxembourg OR Malta OR Netherlands OR Holland OR Poland OR Portugal OR Romania OR Slovak* OR Slovenia OR Spain OR Sweden OR "United Kingdom" OR England OR Wales OR Scotland OR "Great Britain") OR (Croatia OR "Former Yugoslav Republic of Macedonia" OR Macedonia OR Iceland OR Montenegro OR Turkey) OR Albania OR Andorra OR Armenia OR Azerbaijan OR Belarus OR "Bosnia and Herzegovina" OR Bosnia OR Georgia OR Liechtenstein OR Moldova OR Monaco OR Norway OR Russia OR "San Marino" OR Serbia OR Switzerland OR Ukraine OR (Vatican AND (City OR State)) OR

(European* OR Austrian* OR Belgian* OR Bulgarian* OR Cypriot* OR Czech* OR Danish* OR Estonian* OR Finish* OR French* OR German* OR Greek* OR Hungarian* OR Irish* OR Italian* OR Latvian* OR Lithuanian* OR Luxembourg* OR Maltese* OR Dutch* OR Hollander* OR Netherlander* OR Polish* OR Portuguese* OR Romanian* OR Slovak* OR Slovenian* OR Spanish* OR Swedish* OR English* OR Scottish* OR Britannic* OR British* OR Welsh* OR Croatian* OR Macedonian* OR Icelandic* OR Turkish* OR Albanese* OR Andorran* OR Armenian* OR Azerbaijani* OR Belarusian* OR Bosnian* OR Georgian* OR Liechtenstein OR Moldavian* OR Monaco OR Nordic* OR Russian* OR Serbian* OR Swiss* OR Ukrainian* OR Vatican*)

) OR

(

4. Geographic limitation (countries) --- Limited in the affiliation

("European Union" OR Europe* OR "European Commission") OR (Austria OR Belgium OR Bulgaria OR Cyprus OR "Czech Republic" OR Denmark OR Estonia OR Finland OR France OR Germany OR Greece OR Hungary OR Ireland OR Italy OR Latvia OR Lithuania OR Luxembourg OR Malta OR Netherlands OR Holland OR Poland OR Portugal OR Romania OR Slovak* OR Slovenia OR Spain OR Sweden OR "United Kingdom" OR England OR Wales OR Scotland OR "Great Britain") OR (Croatia OR "Former Yugoslav Republic of Macedonia" OR Macedonia OR Iceland OR Montenegro OR Turkey) OR Albania OR Andorra OR Armenia OR Azerbaijan OR Belarus OR "Bosnia and Herzegovina" OR Bosnia OR Georgia OR Liechtenstein OR Moldova OR Monaco OR Norway OR Russia OR "San Marino" OR Serbia OR Switzerland OR Ukraine OR (Vatican AND (City OR State))

))



Part 3: Key Term Syntax for each ROAMER Work Package

Search terms for Work Package 2: Geographic, multidisciplinary and lifespan viewpoints

These search terms indicate PUBMED search parameters used to define areas for the comparative literature section tracking exercise in ROAMER. The example search terms given below are for the UK, but searches were conducted for all European countries.

Randomised Controlled Treatment Trials

((RCT OR "randomised controlled trial" OR "randomized controlled trial") AND (psychiatry[ti/ab] OR "mental disorder" OR "mental illness" OR psychiatric[ti/ab] OR psychology[ti/ab] OR "depressive disorder" OR "depressive illness" OR "bipolar disorder" OR psychosis OR psychotic OR schizophr* OR anxiety OR anorexia OR Post-traumatic stress)) AND UK[ad]

Stigma Research

((stigma OR stigmatization) AND (psychiatry[ti/ab] OR "mental disorder" OR "mental illness" OR psychiatric[ti/ab] OR psychology[ti/ab] OR "depressive disorder" OR "depressive illness" OR "bipolar disorder" OR psychosis OR psychotic OR schizophr* OR anxiety OR anorexia OR Post-traumatic stress)) AND UK[ad]

Epidemiology Research

(("risk factor" OR "cohort study" OR epidemiology OR incidence OR prevalence) AND (psychiatry[ti/ab] OR "mental disorder" OR "mental illness" OR psychiatric[ti/ab] OR psychology[ti/ab] OR "depressive disorder" OR "depressive illness" OR "bipolar disorder" OR psychosis OR psychotic OR schizophr* OR anxiety OR anorexia OR Post-traumatic stress)) AND UK[ad]

Psychotherapy Research

((psychoanalysis[ti/ab] OR psychotherapy[ti/ab] OR CBT[ti/ab] OR mindfulness[ti/ab] OR IPT[ti/ab] OR "interpersonal therapy" OR "cognitive-behavior therapy" OR "cognitive behavioural therapy") AND (psychiatry[ti/ab] OR "mental disorder" OR "mental illness" OR psychiatric[ti/ab] OR psychology[ti/ab] OR "depressive disorder" OR "depressive illness" OR "bipolar disorder" OR psychosis OR psychotic OR schizophr* OR anxiety OR anorexia OR Post-traumatic stress)) AND UK[ad]

Genetics/Neuroimaging Research

((genetics OR (MRI OR fMRI OR sMRI OR PET OR neuroimaging[ti/ab] OR fMRS OR "resonance spectroscopy" OR SPET)) AND (psychiatry[ti/ab] OR "mental disorder" OR "mental illness" OR psychiatric[ti/ab] OR psychology[ti/ab] OR "depressive disorder" OR "depressive illness" OR "bipolar disorder" OR psychosis OR psychotic OR schizophr* OR anxiety OR anorexia OR Post-traumatic stress)) AND UK[ad]

Somatic Non-Psychiatric Research

((cancer[MeSH Major Topic] OR cardiovascular[MeSH Major Topic] OR diabetes[MeSH Major Topic] OR hypertension[MeSH Major Topic] OR kidney[MeSH Major Topic] OR liver[MeSH Major Topic] or stomach[MeSH Major Topic] OR heart[MeSH Major Topic] OR pancreas[MeSH Major Topic] OR thyroid[MeSH Major Topic] OR spleen[MeSH Major Topic] OR pregnancy[MeSH Major Topic] OR bladder[MeSH Major Topic] OR arthritis[MeSH Major Topic] OR joint[MeSH Major Topic]) NOT (psychiatry OR "mental disorder" OR "mental illness" OR psychosis OR psychology OR "depressive disorder" OR "depressive illness" OR "bipolar disorder" OR psychosis OR psychotic OR schizophr* OR anxiety OR anorexia OR Post-traumatic stress)) AND UK[ad]

Search terms for Work Package 3: Research funding, infrastructure and capacity building

After an initial screening yielding a very low number of articles (<100), a systematic mapping as used for a very high number of publications and carried out by ROAMER's scientific work packages did not seem meaningful. It was therefore decided to carry out a traditional, systematic literature review.

The research covered the three areas of knowledge and used the PubMed database. We included articles published between January 1st 2002 and September 31th 2012. After a pilot search yielding very few articles for Europe, we decided not to restrict the geographic area.

After retrieval, the relevance of the articles was evaluated according to title and abstracts in order to retain only



the papers focusing on mental health research. All articles related to a particular disorder, service, population or treatment were eliminated unless they included some element about mental health research in general. Articles focusing on research in low and middle income countries were also eliminated as well as those focusing on health research in general rather than mental health in particular.

The search terms and strategy for the literature review were as follows:

- ("mental health" research OR "psychiatric research") AND "infrastructure" (all fields): 155 articles retrieved, 9 retained as relevant.
- ("mental health research" OR "psychiatric research") AND "financing" (all fields): 18 articles retrieved, 4 articles retained as relevant.
- ("mental health research" OR "psychiatric research") AND "funding" (all fields): 49 articles retrieved, 17 articles retained as relevant.
- ("mental health research" OR "psychiatric research") AND "capacity building" (all fields): 3 articles retrieved, none of them was relevant.
- ("mental health research" OR "psychiatric research") AND "training" (all fields): 168 results retrieved, 6 articles retained as relevant.

Search terms for Work Package 4: Biomedicine – neurobiological, pharmacological and clinical research

(("emotions"[MeSH Terms] OR "motivation"[MeSH Terms] OR "helplessness, learned"[MeSH Terms] OR "reinforcement (psychology)"[MeSH Terms] OR "satiation"[MeSH Terms] OR "punishment"[MeSH Terms] OR "motivation"[MeSH Terms] OR "anhedonia"[MeSH Terms] OR "cognition"[MeSH Terms] OR "attention"[MeSH Terms] OR "perception"[MeSH Terms] OR "memory"[MeSH Terms] OR "language"[MeSH Terms] OR "executive function"[MeSH Terms] OR "social behaviour"[MeSH Terms] OR "theory of mind"[MeSH Terms] OR "empathy"[MeSH Terms] OR "facial expression"[MeSH Terms] OR "self concept"[MeSH Terms] OR "stress, psychological"[MeSH Terms] OR "stress, physiological"[MeSH Terms] OR "arousal"[MeSH Terms] OR "homeostasis"[MeSH Terms] OR "sleep"[MeSH Terms]))

AND

("medicine" [MeSH Terms] OR "biomedical research" [MeSH Terms] OR "neurosciences" [MeSH Terms] OR "genetics" [MeSH Terms] OR "molecular biology" [MeSH Terms] OR "Macromolecular Substances" [MeSH Terms] OR "Hormones, Hormone Substitutes, and Hormone Antagonists" [MeSH Terms] OR "Enzymes and Coenzymes" [MeSH Terms] OR "Carbohydrates" [MeSH Terms] OR "Lipids" [MeSH Terms] OR "Amino Acids, Peptides, and Proteins" [MeSH Terms] OR "Nucleic Acids, Nucleotides, and Nucleosides" [MeSH Terms] OR "Biological Factors" [MeSH Terms] OR "Biomedical and Dental Materials" [MeSH Terms] OR "Pharmaceutical Preparations" [MeSH Terms] OR "neurons" [MeSH Terms] OR "neuroglia" [MeSH Terms] OR "neuroimaging" [MeSH Terms] OR "physiology" [MeSH Terms] OR "Physiological Phenomena" [MeSH Terms] OR "behaviour" [MeSH Terms])

Search terms for Work Package 5: Psychological research and treatments

```
(psychol* AND
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treatment OR (management OR case-management) OR intervention OR therapy OR prevention OR training OR education OR rehabilitation OR counseling OR remediation OR

"empirically supported treatment*" OR EST OR "evidence-based*" OR "clinical trial" OR "randomized trial" OR "randomized controlled*" OR RCT OR "wait-list" OR experimental OR

("cognitive-behavioral*" OR CBT OR "behavioral therap*) OR "psychodynamic therap*" OR "psychoanalysis" OR (schema OR "schema therapy" OR CBASP) OR ("acceptance and commitment therapy" OR "acceptance commitment" OR ACT OR "Mindfulness based*") OR interpersonal OR systemic OR psychoeducation OR ("rational-emotive therap* OR "rational emotive behavior therap*") OR DBT OR "virtual reality therapy")) OR



("health care research" OR "service research" OR "service utilization" OR "service implementation" OR allocation OR "treatment seeking" OR "e-health" OR "m-health" OR "help-seeking" OR "patient-focused research") OR

(relapse OR remission OR recovery OR efficacy OR effectiveness OR "cost-effectiveness" OR placebo OR *adherence OR compliance OR "treatment outcome") OR

("mechanisms of action" OR "mechanisms of change" OR "therapeutic change" OR "behavior change" OR "outcomes management" OR "therapist effects"))

OR

(pharmacogenetics OR pharmacology OR pharmacotherapy OR ("drug therap*" OR "drug treatment*" OR "drug trial*" OR "drug discovery" OR "drug design"))

psychol*

treatment OR (management OR case-management) OR intervention OR therapy OR prevention OR training OR education OR rehabilitation OR counseling OR remediation OR "empirically supported treatment*" OR EST OR "evidence-based*" OR "clinical trial" OR "randomized trial" OR "randomized controlled*" OR RCT OR "wait-list" OR experimental

("cognitive-behavioral*" OR "CBT" OR "behavioral therap*) OR "psychodynamic therap*" OR "psychoanalysis" OR schema OR "schema therapy" OR "CBASP" OR "acceptance and commitment therapy" OR "acceptance commitment" OR "ACT" OR "Mindfulness based*" OR interpersonal OR systemic OR psychoeducation OR ("rational-emotive therap*" OR "rational emotive behavior therap*") OR "DBT" OR "virtual reality therapy"

("health care research" OR "service research" OR "service utilization" OR "service implementation" OR allocation OR "treatment seeking" OR "e-health" OR "m-health" OR "help-seeking" OR "patient-focused research")

(relapse OR remission OR recovery OR efficacy OR effectiveness OR "cost-effectiveness" OR placebo OR *adherence OR compliance OR "treatment outcome")

("mechanisms of action" OR "mechanisms of change" OR "therapeutic change" OR "behavior change" OR "outcomes management" OR "therapist effects")

((pharmacogenetics OR pharmacology OR pharmacotherapy) OR ("drug therap*" OR "drug treatment*" OR "drug trial*" OR "drug discovery" OR "drug design"))

Search terms for Work Package 6: Social and economic issues

Social exclusion search terms (title or abstract)

(Social exclusion OR socially excluded OR social isolation OR socially isolated OR social rejection OR socially rejected OR (social adj3 disadvantage) OR (social adj3 disadvantages) OR (social adj3 disadvantaged) OR social alienation OR (socially inactive) OR (social adj3 inactivity) OR (social adj3 inactive) OR (social adj3 inactivo) OR (social adj3 inactivo) OR (social adj3 inactivo) OR social outcast OR underclass OR social distance OR social hierarchy OR anomie OR vulnerable populations OR underprivileged OR Social inclusion OR socially included OR social capital OR social cohesion OR social engagement OR socially engaged OR social involvement OR socially involved OR Social participation OR social cohesion OR social capital OR Social environment OR social insurance OR social protection OR social security OR social support OR social welfare OR social wellbeing OR social well-being OR support networks OR welfare benefit OR welfare rights OR minimum income OR minimum wage Social adjustment OR social interaction OR social interactions OR social justice OR social networks OR social adaptation OR Interpersonal relations OR social interaction OR social responsibility OR Social responsibilities OR right to treatment OR Inequity OR disparity OR disparities OR unfair treatment OR differential treatment OR social discrimination OR prejudice OR Social characteristics OR shame OR stigmato OR stigmatizing OR stigmatization OR stigmatization OR social perception OR stereotype OR stereotyping OR

Barriers or barrier OR social class OR right to treatment OR social segregation OR Community participation OR community support OR community networks OR community mental health services OR (Neighbourhood AND support) OR (neighborhood support) OR



(Friends AND support) OR friendship OR Family life OR family relations OR family relationships OR family relationship OR partner OR communication OR family support OR Marriage OR divorce OR marital status OR Civil rights OR human rights OR basic rights OR

Rights AND (freedom OR move OR movement) OR food OR starvation OR starving OR

Hunger OR Political rights OR vote OR voting OR voice OR voicing OR politically active OR politically inactive OR politically engaged OR political engagement OR autonomy OR

Patient rights OR (rights AND health) OR (rights AND physical health) OR (rights AND somatic health) OR (rights AND healthcare) OR standard of care OR living will OR poor healthcare OR professional patient relationship OR right to treatment OR

Data protection OR access to information OR informed consent OR community networks

OR confidentiality OR (Patient adj3 access adj3 medical records) OR

Consent to treatment OR forced treatment OR cruel treatment OR inhuman treatment OR inhuman treatment OR inhumane treatment OR degrading treatment OR Involuntary admission OR involuntary interventions OR involuntary treatment OR (involuntary AND medication) OR coercion OR coerce OR threat OR threaten OR refuse to treatment OR treatment refusal OR

Maltreatment OR maltreat OR persecution OR persecute OR punishment OR punish Rights AND (child bearing OR pregnant OR pregnancy OR parenting OR abortion) OR

unwanted pregnancy OR Access AND (social services OR public services OR mental health services OR public facilities) OR Socioeconomic factors OR economically inactive OR (gap adj3 income) OR (socioeconomic adj3 inequalities) OR (socioeconomic adj3 inequality) OR (social adj3 inequalities) OR (social adj3 inequality) OR Low income OR (income adj3 inequality) OR (income adj3 inequalities) OR (poor adj3 community) OR (poor adj3 family) OR (poor adj3 families) OR (poor adj3 household) OR (poor adj3 neighbourhood) OR (poor adj3 neighborhood) OR poor adj3 community OR (poor adj3 income) OR (poor adj3 money) OR deprivation OR deprive OR low earning OR poverty OR low wage OR low wages OR (Practice adj3 monitor) OR (quality adj3 care) OR (quality adj3 services) OR (complain and services) OR treatment guidelines OR admission principles OR

Poor housing OR residence characteristics OR (poor AND accommodation AND standard)

OR (rights adj3 ownership) OR (rights adj3 assets) OR (poor housing) OR (poor

adj3 shelter) OR housing conditions OR living conditions OR rights adj3 treatment OR

Homeless or homelessness OR (Access AND education) OR job and training OR (rights adj3 education) OR basic skill OR basic skills OR continuing education OR education OR poor education OR qualification OR illiteracy OR adult education OR educational status OR educational achievement OR special education OR Labour market OR labor market OR employment OR labour force OR labor force OR workforce OR employment OR employed

Unemployed OR unemployment OR Occupations OR (Job AND flexibility) OR (flexible AND job) OR (work AND voluntary) OR paid job OR paid work OR working conditions OR lonel*)

Mental illness and mental health and well-being search terms (title or abstract)

(("drug abuse" OR "drug addict" OR "drug addicts" OR "drug addiction" OR "drug addicted" OR "drug dependent*" OR "drug dependence*" OR "drug withdrawal" OR "drug abuse") OR ("addictive disease*" OR "addictive disorder*") OR ("alcoholic patient*" OR "alcoholic subject*" OR alcoholism OR "alcohol dependent*" OR "alcohol dependence*" OR "fetal alcohol*" OR "prenatal alcohol*" OR "chronic ethanol*" OR "chronic* alcohol*" OR "alcohol withdrawal" OR "ethanol withdrawal") OR ("caffeine dependent*" OR "caffeine dependence" OR "caffeine addiction" OR (caffeine AND addict*) OR "caffeine withdrawal") OR (((cocaine OR heroin OR cannabis OR mdma OR ecstasy OR morphine*) AND (abuse OR depend* OR dependent* OR dependence* OR addict* OR addicts OR addicted OR addiction* OR withdrawal)) OR methadone) OR (addiction OR addictive OR "substance abuse" OR "withdrawal syndrome" OR psychoactive*) OR ((schizophrenia OR schizophrenic) OR Schizotyp* OR ((Delusional OR paranoid) AND disorder*) OR hallucination* OR Psychotic OR Schizoaffective OR psychosis) OR (((manic OR bipolar OR mood) AND disorder*) OR (depressive AND (disorder* OR episode*)) OR "depressive symptom*" OR hypomania OR mania* OR ((major OR psychotic OR disorder*) AND



depression) OR "suicide attempt*" OR suicidal* OR cyclothymia OR Dysthymia) OR (((anxiety OR panic OR "Obsessive-compulsive" OR adjustment OR conversion OR dissociative OR Somatoform OR Somatization OR neurotic) AND disorder*) OR ("hypochondriasis*" OR "body dysmorphic disorder*" OR "pain disorder*") OR agoraphobia OR "social phobia*" OR "Post-traumatic stress" OR "stress disorder*") OR ("Eating disorder*" OR "Anorexia nervosa" OR "Bulimia nervosa" OR "sleep disturbance" OR (sexual AND (disorder* OR dysfunction)) OR ((postnatal OR postpartum) AND depression) OR ((antidepressant* OR laxative* OR analgesic* OR psychotropic* OR vitamin* OR steroids OR hormone*) AND abuse)) OR (((insomnia OR sleepiness OR "sleep disturbance") NOT (apnea OR "side effect*" OR parkinson* OR alzheimer OR neurodegenerat* OR cancer OR obesity OR obese*)) OR (hypersomnia NOT narcolepsy) OR ((sleep OR night) AND terror*) OR nightmare*) OR ((disorder* AND (personality OR identity OR impulse* OR impulsive* OR impulsivity)) OR asocial OR antisocial OR psychopathic OR anxious OR narcissi* OR "Pathological gambling" OR pyromania* OR Trichotillomania OR Psychosexual OR ("Munchhausen syndrome")) OR ("Pervasive developmental disorder*" OR autism OR autistic* OR "Rett* syndrome" OR "Asperger* syndrome") OR (((Hyperkinetic OR Conduct OR Emotional OR tic) AND disorder*) OR (anxiety AND (separation OR phobic OR social)) OR (hyperactivity AND (disorder* OR syndrome)) OR "Tourette syndrome" OR "Tourette's syndrome") OR ((Mental AND (disorder* OR illness OR health)) OR "psychological distress" OR "psychiatric disorder ") OR (Nervousness OR "nervous tension" OR Irritability) OR anorexia OR (neurosis OR neuroses OR psychoses) OR (("mental confusion*") OR ("mental disability*") OR ("mental capacity*") OR ((psychiatric OR mental) AND (comorbidity OR comorbid)) OR psychiatry OR psychology))

NB. Work Package 6 did not use the geographic / country search term syntax – i.e. syntax 3 above (see Part 2). Work package participants manually screened out studies manually that were not from participating EU countries. However the same criteria as noted in the syntax were still used for geographic inclusion / exclusion – i.e. the research must have been performed in a European Union (EU) country (including EU-28 countries and EU Candidate countries, i.e., Iceland, Montenegro, Serbia, The former Yugoslav Republic of Macedonia and Turkey) or the first author or corresponding author must have been based at a research institution in an EU country.

Search terms for Work Package 7: Public health

TI, KW AND AB (epidemiol* or prevalence* or incidence or comorbid* or co-morbid* or occurrence or aetiolog* or population-based or "population study" or "population survey" or "population representative" or "general population")

TI, KW AND AB ("public policy" or "health polic*" or "public health" or "welfare polic" or "government program*" or "government policy" or "policy program*" or "policy guideline*" or "health advocac*" or "community development" or "national health program*")

TI, KW AND AB ("health promotion" or "mental health promotion" or promotion or "health impact" or "early intervention")

TI, KW AND AB (prevention or preventive or "disorder prevention" or "preventive health care" or "primary prevent*" or "secondary prevent*" or "tertiary prevent*")

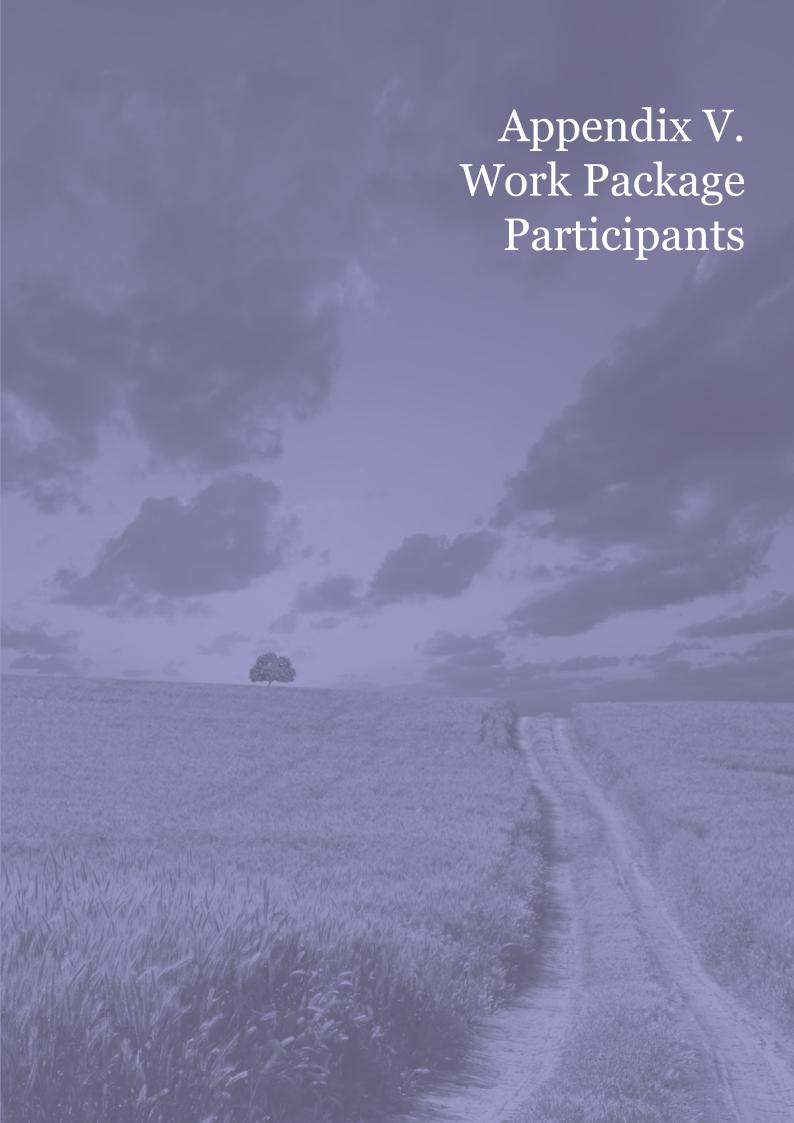
TI, KW AND AB ("health service*" or "health services delivery" or "health care delivery" or "health services need*" or "health services demand*" or "health services access" or "health service organi*" or "health education" or "patient satisfaction")

NB. The search terms given here were used for the PsychINFO database. Searches were also conducted of Pro-Quest, Cinahl and Medline databases.

Search terms for Work Package 8: Well-being

Well-being ---- Limited in title/abstract

(("well-being" OR "wellbeing") OR ("happiness" OR "happy") OR ("SALY") OR ("flourish*") OR ("positive affect" OR "negative affect") OR ("satisfaction with life" OR "life satisfaction"))





Countries represented across all work package workshops:

Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Romania, Scotland, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom

Work Package 1

Coordination and Project Management

Coordinator		
Josep Maria Haro	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Project manager		
Carla Obradors Tarragó	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Consultancy		
Carla Finocchiaro	CF consulting SRL	Italy
Grazia Pagano	CF consulting SRL	Italy

Work Package 2

Geographic, multidisciplinary and lifespan viewpoints

Coordinator		
Jim van Os	Maastricht University	Netherlands
Post-Doc		
Rebecca Kuepper	Maastricht University	Netherlands
Workshop Participants		
Celso Arango	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
David Baldwin	University of Southampton	United Kingdom
Max Birchwood	University of Birmingham	United Kingdom
István Bitter	Semmelweis University	Hungary
Jan Buitelaar	Radboud University Nijmegen	Netherlands
Stephan Claes	Louvain University	Belgium
Louise Gallagher	Trinity College Dublin	Ireland
Peter Jones	Cambridge University	United Kingdom
Marianne Joëls	Utrecht University Medical Center	Netherlands
Nanda Lambregts	Radboud University Nijmegen	Netherlands
Brian Lawlor	Mercer's Institute, Dublin	Ireland
Phil McGuire	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Andreas Meyer-Lindenberg	Central Institute of Mental Health	Germany
Steffen Moritz	University Hospital Hamburg	Germany
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John O'Brien	Newcastle University	United Kingdom
Carmine Pariante	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Jürgen Rehm	Technische Universität Dresden	Germany
Trevor Robbins	Cambridge University	United Kingdom
Diana Rose	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Raimo Salokangas	Turku University Hospital	Finland
Tuula Tamminen	University of Tampere	Finland
Eduard Vieta	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Jan Walburg	Trimbos Institut	Netherlands
Siegfried Weyerer	Central Institute of Mental Health	Germany
Til Wykes	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom

Work Package 3

Research funding, infrastructures and capacity building

Coordinators:

Marion Leboyer	Fondamental	France
Jacques Demotes	European Clinical Research Infrastructure Network (ECRIN)	France
Karine Chevreul	Fondamental	France
Post-docs		
Matthias Brunn	Fondamental	France
Jean-Baptiste Hazo	Fondamental	France
Workshop Participants		
Francesco Amaddeo	University of Verona	Italy
Josipa Basic	University of Zagreb	Croatia
Michael Borowitz	OECD health division	OECD
Patrice Boyer	Universities of Paris and Ottawa	France
Razvan M. Chereches	University Cluj-Napoca	Romania
Georges Dagher	Biobanking and Biomolecular Resources Research In- frastructure (BBMRI)	France/EU
Sarah Evans-Lacko	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Mika Gissler	Nordic School of Public Health	Finland
Josep Maria Haro	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Rebecca Kuepper	Maastricht University	Netherlands
Taavi Lai	University of Tartu	Estonia
Dusica Lecic-Tosevski	Belgrade University	Serbia
Don Linszen	Universities Maastricht and Amsterdam	Netherlands
Mario Luciano	University Naples	Italy
David McDaid	London School of Economics	United Kingdom



Marta Miret	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Carla Obradors Tarragó	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Szilvia Papp	Semmelweis University	Hungary
Angel Pazos	University of Cantabria	Spain
Stefan Priebe	Queen Mary University London	United Kingdom
Heleen Riper	Universities of Lüneburg and Amsterdam	Netherlands
Julio Sanjuán	University of Valencia	Spain
Patrik Sobocki	Karolinska Institutet, Stockholm	Sweden
Kristian Wahlbeck	National Institute for Health and Welfare	Finland

Countries Represented

Croatia, Estonia, Finland, France, Italy, Netherlands, Romania, Serbia, Spain, Sweden, United Kingdom

Work Packages 4 & 5

NB: Work Packages 4 and 5 were coordinated and managed separately, by the work package leads and post-docs listed below. However, the two work packages held combined scientific workshops, so the participants of these listed below are common to WPs 4 and 5.

Work Package 4

Biological: Neurobiological, pharmacological and clinical research

Coordinator		
Gunter Schumann	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Post-docs		
Tom Walker-Tilley	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom

Work Package 5

Psychological research and treatments

Coordinator		
Hans-Ulrich Wittchen	Technische Universität Dresden	Germany
Post-Doc		
Susanne Knappe	Technische Universität Dresden	Germany
Additional Participants a	at Combined Work Package 4 & 5 Workshops / Experts	
	University of Nottingham /	
Clive Adams	Cochrane Schizophrenia Review Group	United Kingdom
	Research School Experimental Psychopathology - EPP	
Arnoud Arntz	(UM)	Belgium
	Department of Clinical Psychological Science (UM)	
István Bitter	Semmelweis University	Hungary
Francesc Colom	Institute of Neurosciences, Barcelona	Spain



	Contro do Investigación Riomódica en Dod de Calud	
Benedicto Crespo	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Pim Cuijpers	University Amsterdam	Netherlands
Ron de Kloet	University of Leiden	Netherlands
Sara Evans-Lacko	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Giovanni Andrea Fava	University of Bologna	Italy
Sarah Forberger	Technische Universität Dresden	Germany
Lars Fréden	Nordic School of Public Health	Finland
Josep Maria Haro	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Andreas Heinz	Berlin School of Brain and Mind, Charité Universitäts- medizin, Berlin	Germany
Neven Henigsberg	University of Zagreb	Croatia
Arne Holte	University of Oslo	Norway
Jürgen Hoyer	Technische Universität Dresden	Germany
Clemens Kirschbaum	Technische Universität Dresden	Germany
Uwe Koch	Universitätsklinikum Hamburg-Eppendorf	Germany
Ilse Kryspin-Exner	Institut für Klinische, Biologische und Differentielle Psychologie, Wien	Austria
Rebecca Kuepper	Maastricht University	Netherlands
Klaus-Peter Lesch	University of Würzburg	Germany
Hella Lichtenberg	Stakeholder, ERANET	Germany
Mario Luciano	University of Naples	Italy
Wolfgang Lutz	Universität Trier	Germany
Wolfgang Maier	Universität Bonn	Germany
Jean-Luc Martinot	INSERM	France
Marta Miret	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Carla Obradors Tarragó	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Ketil Ødegaard	University of Bergen	Norway
Robert Richter	Technische Universität Dresden	Germany
Nic van der Wee	University of Leiden	Netherlands
Robert Richter	Technische Universität Dresden	Germany

Countries Represented

Austria, Belgium, Croatia, France, Germany, Hungary, Italy, Netherlands, Norway, Spain, United Kingdom

Work Package 6

Social and economic issues

Coordinators

David McDaid	London School of Economics	United Kingdom
Graham Thornicroft	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom



Post-doc and Research Officer

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Sara Evans-Lacko	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
External Experts and Wor	kshop Participants	
A-La Park	London School of Economics	United Kingdom
Chantal Van Audenhove	KU Lueven	Belgium
Antonio Lasalvia	Università di Verona	Italy
Jaap van Weeghel	Trimbos Institut	Netherlands
Andrzej Cechnicki	Jagiellonian University	Poland
Vesna Svab	University of Ljubljana	Slovenia
Norman Sartorius	Association for the Improvement of Mental Health Programmes	Switzerland
Nicolas Rusch	University of Ulm	Germany
Paul McCrone	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Alina Zlati	Open Minds: Center for Mental Health Research	Romania
Chris O'Sullivan	Mental Health Foundation	Scotland
Filip Smit	Trimbos Institut	Netherlands
Sarah Byford	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Pim Cuijpers	VU University Amsterdam	Netherlands
Reinhold Kilian	University of Ulm	Germany
Brenden Kennelly	National University of Ireland, Galway	Ireland
Silvia Evers	Maastricht University	Netherlands
Francesco Amaddeo	Università di Verona	Italy
Ingrid Zechmeister	Ludwig Boltzmann Institut	Austria
Taavi Lai	University of Tartu	Estonia
Laszlo Gulacsi	Corvinus University of Budapest	Hungary
Maciej Pilecki	Jagiellonian University	Poland
Rebecca Kuepper	Maastricht University	Netherlands
Marta Miret	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Kristian Wahlbeck	National Institute for Health and Welfare	Finland
Matthias Brunn	Fondamental	France
Josep Maria Haro	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Carla Obradors	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Susanne Knappe	Technische Universität Dresden	Germany
Tom Walker-Tilley	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom

Countries Represented

Austria, Belgium, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Poland, Romania, Scotland, Slovenia, Spain, Switzerland, United Kingdom



Work Package 7

Public health

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Co	ord	lın	ator	

Kristian Wahlbeck	National Institute for Health and Welfare	Finland
Post-Doc		
Anna Forsman	Nordic School for Public Health (NHV)	Sweden
Workshop Participants		
Margaret Barry	National University of Ireland Galway	Ireland
Mima Cattan	Northumbria University	United Kingdom
Sarah Stewart-Brown	Warwick Medical School	United Kingdom
Kristinn Tomasson	Administration of Occupational Safety and Health	Iceland
Jukka Vuori	Finnish Institute for Occupational Health	Finland
Leif Edward Aarø	Norwegian Institute of Public Health	Norway
Daniel Ventus	THL National Institute for Health and Welfare	Finland
Josep Maria Haro	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Carla Obradors Tarragó	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Matthias Brunn	URC Eco	France
Rebecca Kuepper	Maastricht University	Netherlands
Mario Luciano	University of Naples	Italy
Marta Miret	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Merte Nordentoft	Copenhagen University	Denmark
Jordi Alonso	World Mental Health Survey Initiative	Spain
Graça Cardoso	Hospital Fernando Fonseca	Portugal
Raimo Salokangas	University of Turku	Finland
Tuula Tamminen	University of Tampere	Finland
Airi Värnik	Estonian-Swedish Suicidology Institute	Estonia
Matt Muijen	World Health Organization	Denmark
José Miguel Caldas de Almeida	New University of Lisbon Medical School	Portugal
Maris Taube	Centre of Health Economics	Latvia
Arne Holte	Norwegian Institute for Public Health	Norway
Lars Hansson	University of Lund	Sweden
Lars Fredén	Nordic School of Public Health NHV	Sweden
Crispin Day	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Heinz Katschnig	Ludwig Boltzmann Society	Austria
Jasna Russo	Mental Disability Advocacy Center	Germany
Torleif Ruud	Akershus University Hospital	Norway
Hans Joachim Salize	Central Institute of Mental Health	Germany
Michael Sharpe	University of Oxford	United Kingdom



Marita Välimäki	University of Turku	Finland
Ulrich Hegerl	University of Leipzig	Germany
Vladimir Carli	Karolinska Institute	Sweden
Malin Eberhard Gran	Norwegian Institute of Public Health	Norway
Giovanni de Girolamo	IRCCS St John of God Clinical Research Centre	Italy
David Pilgrim	University of Liverpool	United Kingdom
Christina van der Feltz-Cornelis	Trimbos Institut / Tilberg University	Netherlands
Jean Baptiste Hazo	URC Eco	France
Andrea Fiorillo	University of Naples	Italy
Sara Evans-Lacko	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Susanna Knappe	Technische Universität Dresden	Germany

Countries Represented:

Austria, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Italy, Latvia, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom

Work Package 8

Well-being

Coordinator		
José Luis Ayuso Mateos	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Post-Doc		
Marta Miret	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Workshop Participants		
Ad Vingerhoets	Tilburg University	Netherlands
Alarcos Cieza	Ludwig-Maximilians-University	Germany
Carmelo Vázquez	Complutense University of Madrid	Spain
Chiara Ruini	University of Bologna	Italy
Christopher Dowrick	University of Liverpool	United Kingdom
Daniel Chisholm	World Health Organization	Switzerland
Dieter Naber	University of Hamburg	Germany
Felicia Huppert	Well-being Institute, University of Cambridge	United Kingdom
Ferran Casas	University of Girona	Spain
Gerben Westerhof	University of Twente	Netherlands
Heli Koivumaa-Honkanen	Kuopio University Hospital	Finland
Jerome Bickenbach	Swiss Paraplegic Research	Switzerland
Joar Vittersø	University of Tromsø	Norway
Julio Bobes	Oviedo University	Spain
Luis Salvador-Carulla	University of Cadiz	Spain
Székely András	Semmelweis University	Hungary



Mona Eklund	Lund University	Sweden
Róbert Manchin	Gallup Europe	Belgium
Ruut Veenhoven	Erasmus University Rotterdam	Netherlands
Somnath Chatterji	World Health Organization	Switzerland
Ulrike Ravens-Sieberer	University of Hamburg	Germany
Sara Evans-Lacko	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Susanna Knappe	Technische Universität Dresden	Germany
Jean Baptiste Hazo	URC Eco	France
Carla Obradors Tarragó	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Don Linszen	Universities Maastricht and Amsterdam	Netherlands
David McDaid	London School of Economics	United Kingdom
Anna Forsman	Nordic School for Public Health (NHV)	Sweden
Josep Maria Haro	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain
Mario Luciano	University of Naples	Italy
Kristian Wahlbeck	National Institute for Health and Welfare	Finland
Tom Walker-Tilley	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Rebecca Kuepper	Maastricht University	Netherlands
Andrea Fiorillo	University of Naples	Italy
Celso Arango	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain

Countries Represented

Belgium, Finland, Germany, Hungary, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom

Clinical Research Task Force

Coordinator

Christina van der Feltz-Cornelis	Trimbos Institut / Tilberg University	Netherlands		
Post-docs				
Iman Elfeddali	Maastricht University	Netherlands		
ROAMER Participants				
Jim van Os	Maastricht University	Netherlands		
Susanne Knappe	Technische Universität Dresden	Germany		
Gunter Schumann	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom		
Eduard Vieta	University of Barcelona	Spain		
Hans-Ulrich Wittchen	Technische Universität Dresden	Germany		
Shôn Lewis	University of Manchester	United Kingdom		
Kristian Wahlbeck	National Institute for Health and Welfare	Finland		
Rebecca Kuepper	Maastricht University	Netherlands		
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Carla Obradors-Tarragó	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain	
Josep Maria Haro	Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM)	Spain	
Don Linszen*	Maastricht University	Netherlands	

^{*}Participated as an observer in his function as chair of the Scientific Advisory Board.

Countries represented by Delphi survey exercise:

Austria, Belgium, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, United Kingdom

Work Package 9

Coordination of stakeholders' involvement

Coordinator

Mario Maj	University of Naples SUN	Italy
Post-Docs		
Andrea Fiorillo	University of Naples SUN	Italy
Mario Luciano	University of Naples SUN	Italy
Valeria Del Vecchio	University of Naples SUN	Italy
Gaia Sampogna	University of Naples SUN	Italy

Work Package 10

Promotion and dissemination of results

Coordinator

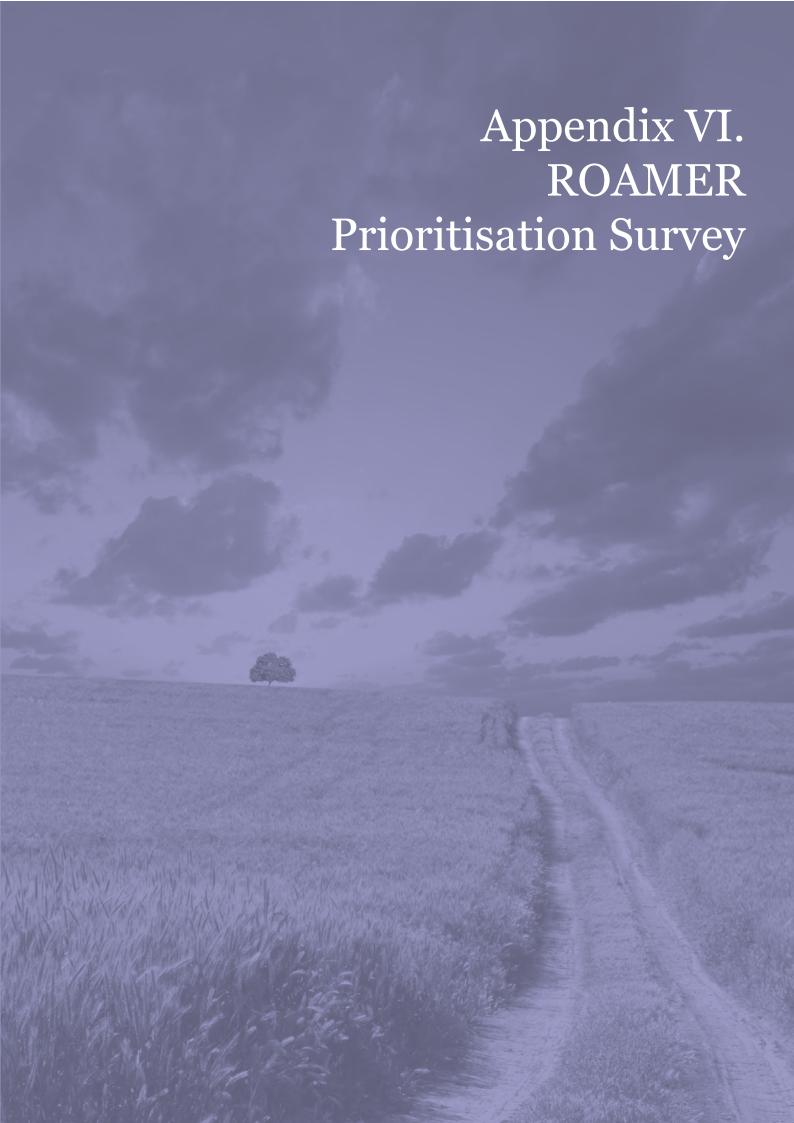
István Bitter	Semmelweis University	Hungary
Post-Doc		
Szilvia Papp	Semmelweis University	Hungary

Work Package 11

Translation of results into final roadmap

Coordinators

Til Wykes	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom
Shôn Lewis	University of Manchester; Manchester Academic Health Science Centre	United Kingdom
Post-Doc		
Stefano Belli	Institute of Psychiatry, Psychology & Neuroscience	United Kingdom





Part 1: Selection of respondents

Researchers

The selection of researchers invited to participate in the ROAMER Prioritisation Survey was transparent and comprehensive.

The number of researchers invited from each European country depended on the total number of publications produced by that country in the field of mental health field during the period 2008-2013 (see Table VI.1). The number of publications was determined by the number of hits for mental health articles in Web of Knowledge.

No. publications in a country	No. of researchers invited from the country
< 100 articles	5 participants
100 - 1000 articles	10 participants
1000 - 2500 articles	25 participants
2500 - 5000 articles	50 participants
> 5000 articles	100 participants
> 20000 articles	200 participants

Table VI.1 Number of participants invited to participate in the ROAMER prioritisation per country, as determined by number of mental health publications over 5 years

The top researchers from each country listed in Web of Knowledge were invited to participate, with the number of researchers invited being determined by the key in Table VI.1. In addition to these researchers, all participants within ROAMER's work packages and Scientific Advisory Board were also invited to participate in the prioritisation survey.

The search terms used to find mental health publications in Web of Knowledge were as follows:

(("drug abuse" OR "drug addict" OR "drug addicts" OR "drug addiction" OR "drug addicted" OR "drug dependent*" OR "drug dependence*" OR "drug withdrawal" OR "drug abuse") OR

("addictive disease*" OR "addictive disorder*") OR

("alcoholic patient*" OR "alcoholic subject*" OR alcoholism OR "alcohol dependent*" OR "alcohol dependence*" OR "fetal alcohol*" OR "prenatal alcohol*" OR "chronic ethanol*" OR "chronic* alcohol*" OR "alcohol withdrawal" OR "ethanol withdrawal") OR

("caffeine dependent*" OR "caffeine dependence" OR "caffeine addiction" OR (caffeine AND addict*) OR "caffeine withdrawal") OR

(((cocaine OR heroin OR cannabis OR mdma OR ecstasy OR morphine*) AND (abuse OR depend* OR dependent* OR dependence* OR addict* OR addicts OR addicted OR addiction* OR withdrawal)) OR methadone) OR

(addiction OR addictive OR "substance abuse" OR "withdrawal syndrome" OR psychoactive*) OR ((schizophrenia OR schizophrenic) OR Schizotyp* OR ((Delusional OR paranoid) AND disorder*) OR hallucination* OR Psychotic OR Schizoaffective OR psychosis) OR

(((manic OR bipolar OR mood) AND disorder*) OR (depressive AND (disorder* OR episode*)) OR "depressive symptom*" OR hypomania OR mania* OR ((major OR psychotic OR disorder*) AND depression) OR "suicide attempt*" OR suicidal* OR cyclothymia OR Dysthymia) OR

(((anxiety OR panic OR "Obsessive-compulsive" OR adjustment OR conversion OR dissociative OR Somatoform OR Somatization OR neurotic) AND disorder*) OR ("hypochondriasis*" OR "body dysmorphic disorder*" OR "pain disorder*") OR agoraphobia OR "social phobia*" OR "Post-traumatic stress" OR "stress disorder*") OR



("Eating disorder*" OR "Anorexia nervosa" OR "Bulimia nervosa" OR "sleep disturbance" OR (sexual AND (disorder* OR dysfunction)) OR ((postnatal OR postpartum) AND depression) OR ((antidepressant* OR laxative* OR analgesic* OR psychotropic* OR vitamin* OR steroids OR hormone*) AND abuse)) OR

(((insomnia OR sleepiness OR "sleep disturbance") NOT (apnea OR "side effect*" OR parkinson* OR alzheimer OR neurodegenerat* OR cancer OR obesity OR obese*)) OR (hypersomnia NOT narcolepsy) OR ((sleep OR night) AND terror*) OR nightmare*) OR

((disorder* AND (personality OR identity OR impulse* OR impulsiv*)) OR asocial OR antisocial OR psychopathic OR anxious OR narcissi* OR "Pathological gambling" OR pyromania* OR Trichotillomania OR Psychosexual OR ("Munchhausen syndrome")) OR

("Pervasive developmental disorder*" OR autism OR autist* OR "Rett* syndrome" OR "Asperger* syndrome") OR

(((Hyperkinetic OR Conduct OR Emotional OR tic) AND disorder*) OR (anxiety AND (separation OR phobic OR social)) OR (hyperactivity AND (disorder* OR syndrome)) OR "Tourette syndrome" OR "Tourette's syndrome") OR

((Mental AND (disorder* OR illness OR health)) OR "psychological distress" OR "psychiatric disorder ") OR

(Nervousness OR "nervous tension" OR Irritability) OR

anorexia OR

(neurosis OR neuroses OR psychoses) OR (("mental confusion*") OR ("mental disability*") OR ("mental capacity*") OR ((psychiatric OR mental) AND (comorbidity OR comorbid)) OR psychiatry OR psychology))

- · Limited by period of time: 2008-2013
- Total publications on mental health in worldwide 652,465 hits (date: 22/03/13)
- Refined for a specific European country (i.e., the search tool considers only those articles that contain at least one author affiliated to that country)
- Listing of the top 100 authors within the hits obtained in that search (i.e., authors with more publications). Please note that in some cases authors are not affiliated to a specific country, and that one author can appear in the lists of many different countries.

The table below shows the hits obtained in each country and the corresponding number of researchers selected to participate in the survey:

Country	No. hits	No. authors invited to the study
Austria	2317	25
Belgium	3867	50
Bulgaria	209	10
Cyprus	103	10
Czech Republic	1081	25
Denmark	3237	50
Estonia	285	10
Finland	2745	50
France	9515	100
Germany	19451	100
Greece	1825	25



Hungary	1053	25
Ireland	2091	25
Italy	10998	100
Latvia	65	5
Lithuania	244	10
Luxembourg	115	10
Malta	31	5
Netherlands	11633	100
Poland	2592	50
Portugal	1474	25
Romania	868	10
Slovakia	275	10
Slovenia	488	10
Spain	9441	100
Sweden	5724	100
United Kingdom*	30876	200
Croatia	971	10
Former Yugoslav Republic of Macedonia	66	5
Iceland	259	10
Turkey	4458	50
Armenia	62	5
Bosnia and Herzegovina	200	10
Norway	3550	50
Russia	1751	25
Serbia	690	10
Switzerland	5411	100
Ukraine	189	10

Table VI.2 Number of mental health publications per country from 2008-2013, and number of researchers invited to participate in the survey as a result.

NB. No publications in the mental health field during the period 2008-2013 were found for the following countries: Albania, Andorra, Azerbaijan, Belarus, Georgia, Liechtenstein, Moldova, Monaco, Montenegro, San Marino, Vatican City/State.

Stakeholder associations

European associations of **stakeholders** were also invited to participate in the survey. They represented different groups of interest: individuals with mental health problems, families, carers, psychologists, psychiatrists, other healthcare professionals, academics, the education sector and industry.

To be invited to participate in the survey, the associations had to fulfil the following criteria: i) European scope, ii) not focused on specific disorders, and iii) not consisting of research or university networks. The list of European associations included all members of the Stakeholder Advisory Board, together with numerous other organisations.

^{*}Search conducted on 26/03/13



European associations were requested to provide their collective view. However, they were asked to invite each of their national components to participate in the survey individually, if they wished. Having said this, the survey was only delivered in English and could not be translated into all European languages. Unfortunately this may have made it more difficult for some national associations to participate.

Additionally, 108 national **stakeholder** associations that participated in the first survey among national **stakeholders**' associations conducted by the ROAMER project (Fiorillo et al., 2013) were also invited to answer the ROAMER Prioritisation Survey. Though in this case, a lower participation rate was expected due to the fact that the survey was not translated into different languages. The geographic distribution of survey respondents is shown in Figure IV.1.

Part 2: Results

In the ROAMER Prioritisation Survey, researcher and other **stakeholder** participants rated each of the 20 ROAMER priorities (**Section 2**) on a 10-point scale for their i) Relevance and ii) Feasibility in Europe (see **Section 4** of the main roadmap for fuller details about the method). Table VI.3 below gives results from the ROAMER prioritisation survey for 731 respondents, collapsing across researchers and other stakeholders. The final column of Table VI.3 shows if strong consensus was achieved on these ratings – specifically if the interquartile range (IQR; .25 - .75) of ratings for a given priority was ≤ 2 (for a 10-point scale rating; according to Scheibe, Skutsch & Shofer, 1975). Table VI.4 also shows the 5 highest-rated ROAMER priorities broken down by different stakeholder groups.

Priority (From 20 ROAMER Priorities)	Mean Rat- ing	High Level Priority	Interquar- tile Range	Consen- sus
C3 – Childhood and adolescence	8,16	1	2,50	
E2 – Interdisciplinary research networks	7,98	3	2,00	Yes
C1 – Aetiology and development	7,98	2	2,00	Yes
C2 – Longitudinal and cohort studies	7,96	2	2,00	Yes
A ₅ – Developing new interventions	7,95	4	2,00	Yes
D1 – Basic science into disorder mechanisms	7,82	2	2,00	Yes
E3 – Research base and training	7,70	3	2,00	Yes
D3 – Comorbidity	7,61	2	2,00	Yes
E1 – Shared databases and terminology	7,59	3	2,50	
A2 – Empowering users and carers	7,53	5	2,50	
D4 – Standardising research practice	7,45	3	2,50	
A1 – Mental health systems research	7,425	6	2,00	Yes
D2 – Improving diagnoses	7,40	4	2,50	
A4 – Prevention and health promotion	7,40	1	2,50	
A3 – Improving access to services	7,30	6	2,00	Yes
B4 – Rights, stigma and discrimination	7,20	5	2,50	
E4 – Stakeholder involvement	7,17	5	2,50	
B3 – Socio-cultural contexts	6,86	6	2,50	
B2 – Wider research outcomes	6,78	6	2,50	
B1 – Economic approaches	6,69	6	2,50	

Table VI.3 Mean Ratings (combining relevance and feasibility ratings) from the ROAMER survey for all 20 ROAMER priorities, across all 731 researchers and stakeholder associations.



Priority Ranking	Resear (n=4	chers 86)	Service familie caregi (n=	s and vers	Health service fessio (n=4	pro- nals	Acade (n=1	mics 14)	Nationa cymak fund (n=1	ers & ers	Indus (n=	stry 9)	Educa sect (n=1	or
		Mean rating		Mean rating		Mean rating								
1	C3 – Risk factors and preventions in childhood and adolescence	8,19	B4 – Reducing mental health stigma	9.06	E2 – Maintaining interdisciplinary research networks	7.90	C3 – Risk factors and preventions in childhood and adolescence	8.02	C3 – Risk factors and preventions in childhood and adolescence	8.29*	D1 – Mechanisms of psychological disorders	8.56	A5 – Applying safe, innovative and effective interventions	8.03
2	C1 – The development of symptoms across the lifespan	8,11	E4 – Involving stakeholders in research	8.87	C3 – Risk factors and preventions in childhood and adolescence	7.81	E2 – Maintaining interdisciplinary research networks	7.89	C2 – Longitudinal and cohort datasets and studies	8.10	A5 – Applying safe, innovative and effective interventions	8.22	C3 – Risk factors and preventions in childhood and adolescence	7.89
3	C2 – Longitudinal and cohort datasets and studies	8,10	C3 – Risk factors and preventions in childhood and adolescence	8.50	D3 – What are the mechanisms and outcomes of comorbidity?	7.72	A5 – Applying safe, innovative and effective interventions	7.84	E2 – Maintaining interdisciplinary research networks	8.00	D2 – Improving diagnostic strategies	8.17	C1 – The development of symptoms across the lifespan	7.84
4	A5 – Applying safe, innovative and effective interventions	8,08	A2 – How service users and carers can be empowered	8.44	A2 – How service users and carers can be empowered	7.55	C1 – The development of symptoms across the lifespan	7.82	E3 – Building a strong empirical research base	7.79	A2 – How service users and carers can be empowered	8.11	E2 – Maintaining interdisciplinary research networks	7.82
5	E2 – Maintaining interdisciplinary research networks	7,99	C1 – The development of symptoms across the lifespan	8.44	A1 – Measuring quality across health systems and services	7.54	C2 – Longitudinal and cohort datasets and studies	7.81	C1 – The development of symptoms across the lifespan	7.71*	A3 – Finding how access to services can be improved	8.06	E3 – Building a strong empirical research base	7.82

Table VI.4 The top 5 most highly rated of the 20 ROAMER priorities (combining ratings for relevance and feasibility) from the prioritisation survey, broken down by stakeholder group. Priorities that have reached consensus within the stakeholder group (IQR \leq 2 for a 10-point scale rating; according to Scheibe et al., 1975) are shown in bold. All other priorities achieved a great intragroup agreement, with an IQR between 2 and 3 (with the only exception of two priorities indicated in with an asterisk *).



Though Table IV.4. above shows some degree of difference in the ordering of the top 5 priorities between different groups of stakeholders (as would be expected), it also shows that across the stakeholders the ROAMER priorities were considered both highly relevant and feasible in Europe (with no mean ratings below 6.6 on a 10-point scale), with a great deal of consensus. The orderings of the overall ratings for relevance and feasibility of the priorities were used to integrate and order the final list of 6 high-level ROAMER priorities (Section 3).

Continuing beyond the completion of the ROAMER project and submission of this roadmap, members of the ROAMER consortium intend to pursue these lines of enquiry into differences of priority between different stakeholder groups, and analyse this output more systematically.

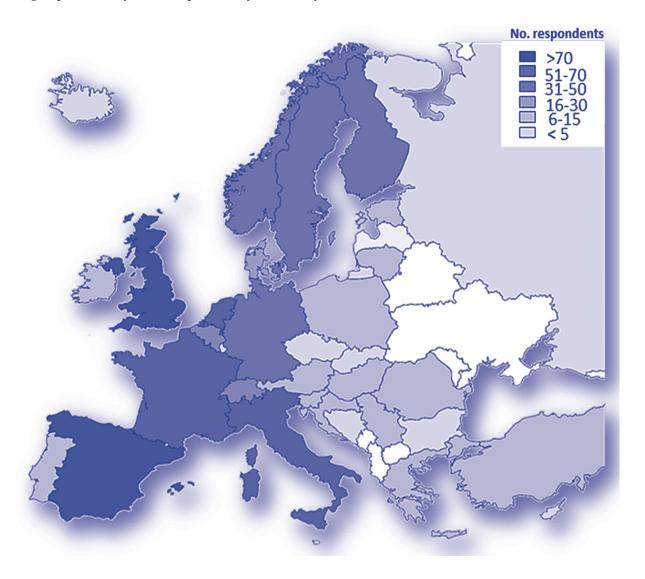
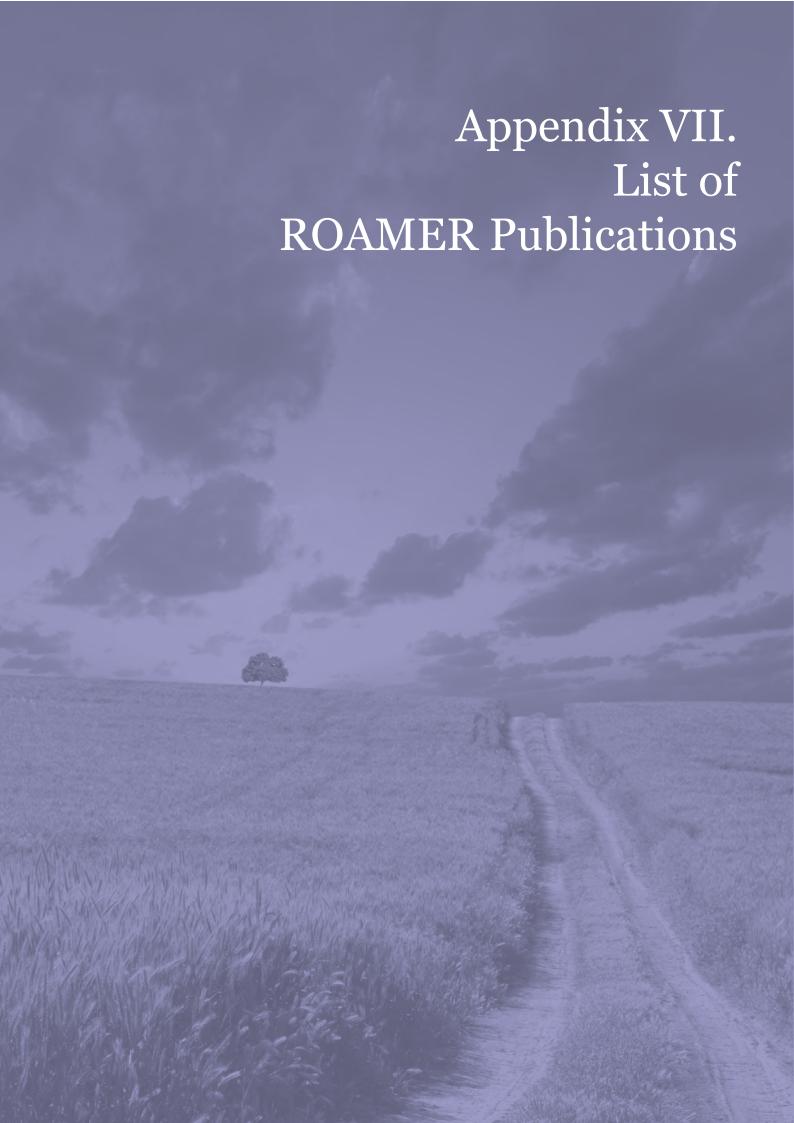


Figure VI.1 Geographic distribution of the participants in the ROAMER Prioritisation survey (N=707). Notice that 24 respondents represented Europe as a whole or were from abroad (USA, Australia or Canada).





Below is a full list of scientific publications arising from the ROAMER project, at the time of the publication of the roadmap:

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