

The future German Center for Mental Health (Deutsches Zentrum für Psychische Gesundheit): a model for the co-creation of a national translational research structure

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Moving the needle in mental health research requires doing justice to the social, psychological, biological and developmental complexities that affect people in their living environments. We developed a comprehensive national research program to achieve scale and depth through translational project bundles focused on early recognition and prevention, urban mental health, and enhanced psychotherapy, underpinned by a range of shared infrastructures. The program was consistently co-created with and will involve people with lived experience at all stages of research.

To combat common major disorders with considerable impact on population health, the German Federal Ministry of Education and Research and German State Ministries launched the German Centers for Health Research in 2009. These are alliances of university departments, hospitals and non-university research institutions that receive long-term funding for translational research and its rapid implementation in practice. As mental disorders are common and serious, with only 50–70% of patients recovering fully and considerable societal and personal burden¹, the creation of a German Center for Mental Health (Deutsches Zentrum für Psychische Gesundheit (DZPG)) was initiated. First, six sites (with spokespersons in Berlin, Bochum, Jena, Mannheim, Munich and Tübingen) were competitively selected through international peer review in 2021. In a second stage, these received funding of €500,000 to design a coherent large-scale translational research network able to reduce the mental health burden long term. Here we report the outcome of this co-creative process and our vision.

We posit that to move the needle in population mental health, translational research needs to develop more valid diagnostic and prognostic models, taxonomies and methods, together with personalized preventive and therapeutic strategies for individual patients and their communities². The future DZPG has the ambitious goal of accelerating translation substantially through socially embedded research. To reach

the necessary scale and expertise with which to conceive, conduct and validate decisive translational studies, we will implement a participatory approach³ in interdisciplinary networks of clinicians and basic scientists, service users and their relatives, community and healthcare workers, regulators and policymakers.

The main research areas are organized in a translational cycle (Fig. 1) with the following three interconnected research domains: I, risk and resilience in mental health and somatic comorbidities over the lifespan; II, innovative individualized interventions; and III, prevention, recovery and participation in living environments. Each domain combines several research clusters that set the thematic agenda for local and joint projects.

Domain I aims to expand understanding of the causes and trajectories of mental disorders⁴ and comorbid physical illnesses. It studies not only risk mechanisms but also neuroimmunological⁵, interpersonal and other salutogenic processes that mediate recovery from mental disease. This domain is composed of the following three clusters: 1, early adversity and trauma; 2, transgenerational mental health⁶; and 3, bio-psycho-social trajectories of mental and physical health across the lifespan. As 75% of mental disorders start before adulthood, a focus on early development (from the prenatal period to adolescence) is vital for understanding the processes that shape individual mental health pathways. Key to this approach are computational models that can be used by vulnerable people to improve their salutogenic capacity, enable early detection and interception of mental disorders and adverse physical sequelae, and combat excess mortality.

Domain II focuses on preventing and improving the course and outcome of mental disorders through the development of novel, individualized interventions based on a rich understanding of neurobiological, psychological and environmental mechanisms. We aim to improve treatment options in real-world practice. Although traditionally, pharmacological and psychotherapeutic treatments have been seen as additive, a true paradigm shift recognizes learning, memory and neuronal plasticity as underpinning all treatments. This leads to new strategies that specifically target such mechanisms as enhancers. This domain comprises the following three clusters: 1, innovative, individualized digital and neuromodulatory interventions and prevention; 2, personalized pharmacological and psychotherapy; and 3, stepped care that integrates psychotherapy, biological therapies (pharmacotherapy, stimulation therapies or neurofeedback) and psychosocial interventions. Through model-based integration of multimodal data, we aim at ‘best-fit outcome’ concepts using innovative interventions. These include neuromodulation⁷, digital real-time interventions,

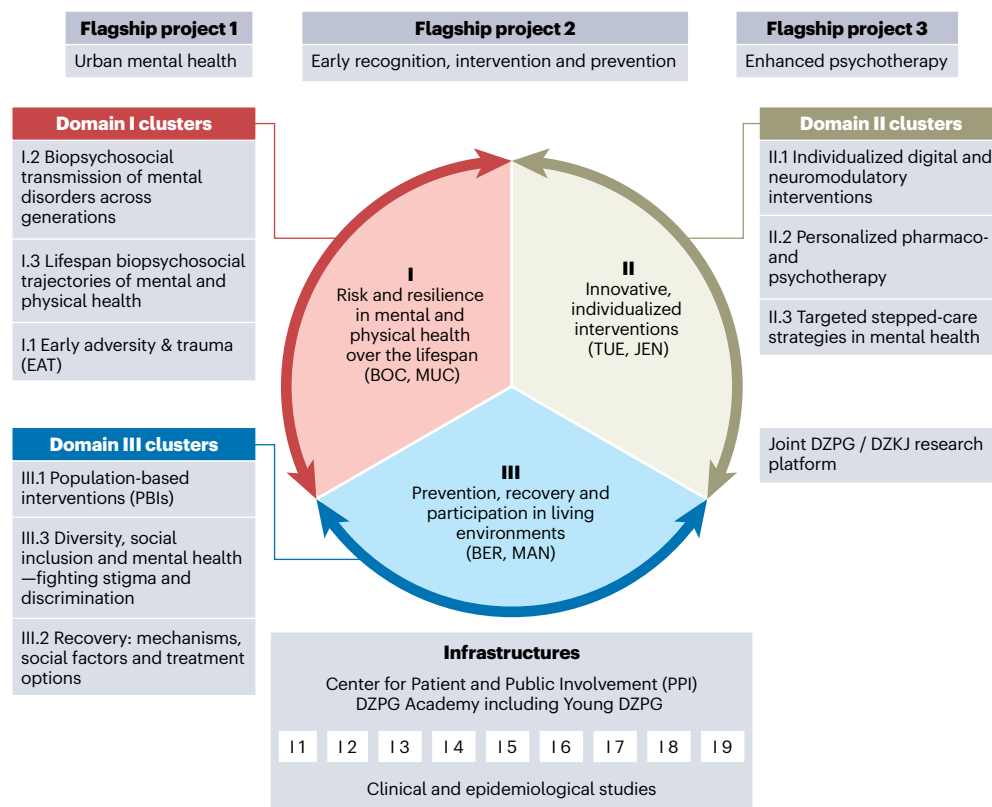


Fig. 1 | Research concept for DZPG. The concept is centered on bidirectional interactions in a translational cycle with three research domains and (interconnecting) thematic clusters. These are supported by systematically selected infrastructure, including PPI, clinical studies, and the promotion of

young researchers. BOC, Bochum; MUC, Munich; TUE, Tübingen; JEN, Jena; BER, Berlin; MAN, Mannheim; DZKJ, Deutsches Zentrum für Kinder- und Jugendgesundheit (German Center for Child and Adolescent Health).

pharmacotherapy (e.g., new and repurposed substances), psychotherapy (e.g., transdiagnostic, transgenerational, short-term and mechanism-based approaches), informed combinations, and real-world delivery. People with lived experience provide input on, for example, patient-reported outcomes and organizing stepped-care models to ensure good coverage of people with serious mental illness.

Domain III studies interventions in living environments, opening a dialog between science and society. It assesses multidimensional information from individual, social, large-scale physical, and economic environments⁸. The overall goal is to move out of the laboratory and into the diverse environments in which people with lived experience and professionals interact. Domain III comprises the following three clusters: 1, population-based interventions; 2, recovery mechanisms, social factors and treatment options; and 3, diversity, social inclusion and mental health, fighting stigma and discrimination. The complexity of living environments in physical, biological, social and societal domains will be addressed through multimodal deep phenotyping in harmonized cohort studies and living laboratories. This forms the basis for population-based interventions that promote prevention, recovery and participatory research into salutogenesis. Stigma and social exclusion are serious problems in which much progress can be made. Domain III completes the translational cycle from bench to bedside to practice to insight and enables back-translation from living environments to basic science.

We plan to give priority to three DZPG-wide projects – Urban Mental Health, Early Intervention and Prevention, and Enhanced Psychotherapy – due to their considerable potential for tangible benefits in German mental health, as follows:

- The Urban Mental Health project aims to provide causal evidence about risk and resilience processes in cities, where the majority of Germans and an even greater share of minorities live. Extending existing studies longitudinally, it aims to elucidate urban and societal change and respond rapidly with evidence-based information to emergent stressors such as the current COVID-19 pandemic. Sites will implement and evaluate local population-based interventions to improve mental health measurably. Findings will be shared with international cooperation partners through joint projects, particularly in the Global South⁹.
- The Early Intervention and Prevention project aims at obtaining deeper understanding of the ‘risk and resilience space’ in children and adolescents to select, implement and evaluate best-practice interventions. For this, deeper biopsychosocial understanding must meet personalized therapeutic research. This requires computational tools that quantify individual trajectories of risk and inform the selection of optimal multimodal interventions at critical windows of vulnerability. These diagnostic, prognostic and therapeutic modules aim at a stepped-care approach.

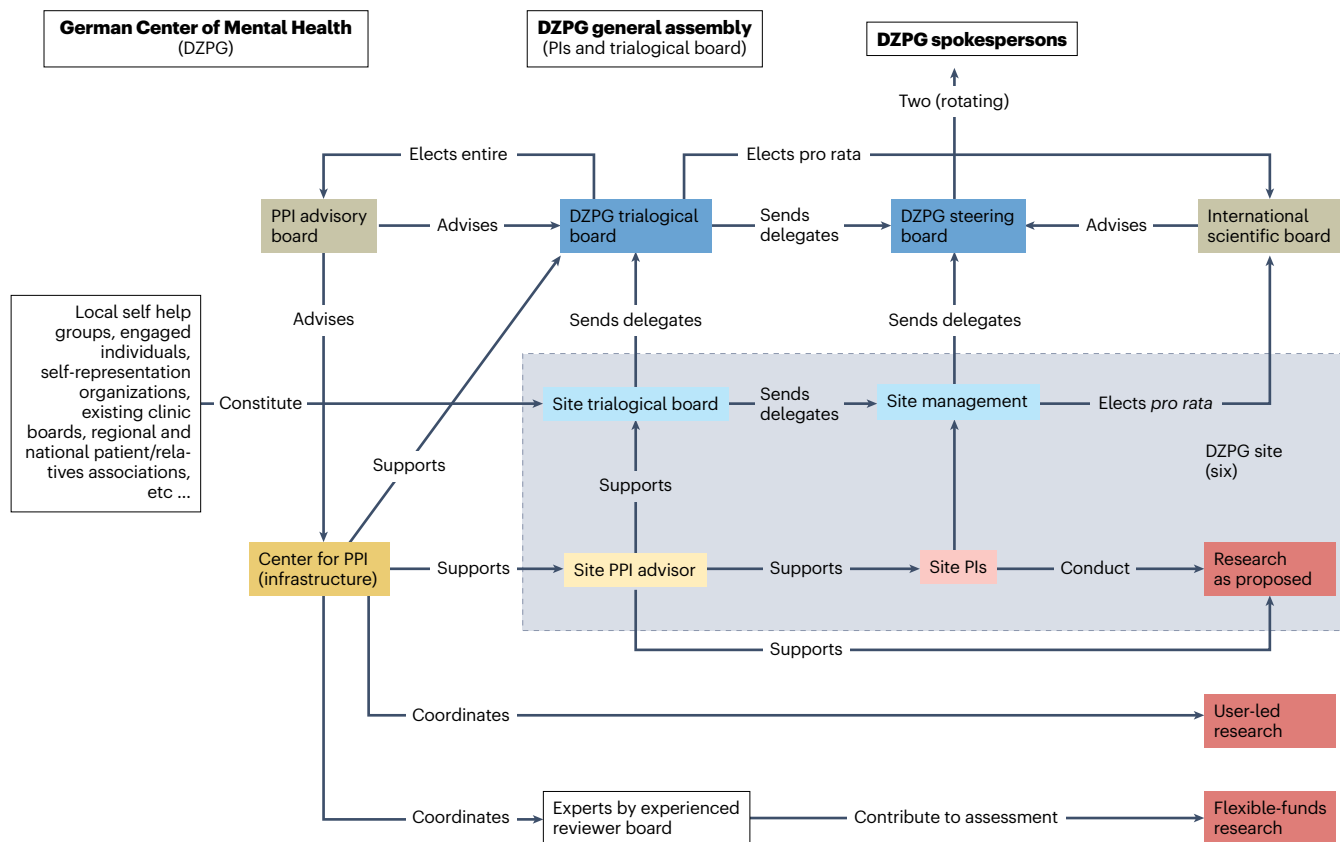


Fig. 2 | Participatory concept of DZPG. In this concept, people with lived experience are embedded into the research planning, execution and assessment. A 'trialogical' board includes clinicians, patients and relatives. A 'pro rata' election indicates a share relative to the other sites. PI, principal investigator.

- The Enhanced Psychotherapy project aims to improve effectiveness on the basis of addressing underlying processes through innovative components. These include neuromodulation, cognitive training, tailored sleep interventions, digital technologies (such as serious games and virtual reality), and pharmacological interventions aimed at components such as social interactions or neuroplasticity. These will be combined into novel formats for individualized treatment – i.e., precision psychotherapy. This relies on a sound mechanistic understanding and, in a theory-driven manner, aims at processes that should have lasting effects.

All future DZPG research activities envisaged leverage the combined power of consortium-wide research infrastructures. These will be implemented in the initial 2 years and include biobanking, ‘-omics’ and bioinformatics, a digital mental health platform, an imaging platform (coordinated with Jena), data infrastructure, a psychotherapy research platform, youth mental health, model systems, a neuromodulation platform and federated cohort management.

An additional infrastructure supports clinical trials and evidence-based mental health. It will provide facilities (an Early Clinical Trials Unit at Mannheim, and research units for later-stage trials (phases 2–4) at every center), support for recruitment (e.g., a youth mental health platform in Bochum and Marburg), and communication with industry, funding agencies and regulators. It incorporates a unit for systematic reviews (including Cochrane) and guideline development in Munich.

The education of the next generation of translational and clinician-scientists, essential for the long-term success, will take place in and be funded by an academy coordinated from Tübingen that will closely interact with an early-career-researchers' platform (Young DZPG).

In a patient and public involvement (PPI) infrastructure, we aim to ensure that service users, including children, adolescents and adults, and their relatives will be involved in decision competency at all levels of the future DZPG and in all steps of the research process (Fig. 2). In stage model¹⁰, true participation is enabled through decision-making competence and shared power, going beyond inviting the opinions of service users and relatives. The focus of our strategy is enabling and funding participatory research at each of the six sites. This is supported by a PPI infrastructure attached to the central office; a dedicated service user and relative advisory board, established at the beginning of the process; and a PPI expert advisory board drawn from national and international experts in participation. People with lived experience will be involved as grant reviewers, and funding has been allocated to employ, in research projects, experts by (lived) experience. A curriculum to enable both professionals and experts by experience to work together is being developed. Finally, PPI will also be a research topic at the future DZPG, with a planned professorship in Berlin. During development, all sites (that had different initial experiences with PPI) committed themselves to ensure that people with lived experience were adequately supported through compensation for travel costs and time, especially as the majority of these were volunteers.

After a positive international review of the second-stage concept described here in 2022, a phased-in start, initially focusing on the topic of early recognition, intervention and prevention, is now planned for the middle of 2023. This will mark the beginning of the first co-created translational research structure of national scope. We had to address unmet needs in translational research that are especially pressing in Germany (such as the lack of national infrastructure) and in mental health (such as stigmatization). However, the design process and structure of the future DZPG may serve as a model for other similar research-development processes in other regions of the world, especially for societally important segments of research.

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Competing interests

The authors declare no competing interests.