



The FP7 and Horizon2020 funding strategy for mental disorders

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E4. Non-Communicable Diseases and
the challenge of Healthy Ageing,
European Commission

HORIZON 2020

The global context



- **Demographic change**
- **Increased burden of non - communicable diseases**
- **Raising health costs, increasing pressure on healthcare systems**
- **Increased costs for medicines and vaccines development**
- **Differences in outcomes, insufficient evidence on comparative benefits and overall value of current practices and approaches**

EU R&I response to non-communicable diseases



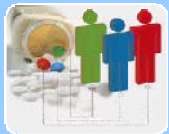
Research policy & Research for Policies



Anticipate demographic changes and the increase of NCDs: risk factors, exposures, socio-economic context



Develop new approaches to manage diseases



Translate and validate personalised medicine



Build the European dimension in MS research activities



Collaborate with global funders

Challenges posed by mental disorders



The burden of mental disorders

- **Depression:** an estimated **300 million** people are affected by depression worldwide (WHO, April 2017)
 - **Bipolar affective disorder:** **60 million** people effected worldwide (WHO, April 2017)
 - **Schizophrenia** and other psychoses: **21 million** people worldwide (WHO, April 2017)
 - **Dementia:** **47.5 million** people have dementia worldwide (WHO, April 2017)
 - **Autism spectrum disorders:** **1 in 160 children** (WHO, April 2017)
- **Complex disorders associated with stigma and high costs**
 - **Rapid solutions for short-term implementation to relieve patients and help caregivers**
 - **But also long-term research to decipher complex interplay between genetic, environment and life style factors**

FP7-Health: strong focus on translation



FP7, 2007-2013

*Translational
research, Systems
biology*

TRANSLATING RESEARCH FOR HUMAN HEALTH

- 2007: Childhood and adolescent mental disorders
 - 2009: Synaptopathies: genesis, mechanisms and therapy
 - Identifying genetic and environmental interactions in schizophrenia
 - Optimising current therapeutic approaches to schizophrenia
 - Large-scale functional genomics effort in multi-cellular organisms to elucidate the function of human genes products
 - 2013: Development of effective imaging tools for diagnosis, monitoring and management of mental disorders

BIOTECHNOLOGY, GENERIC TOOLS AND MEDICAL TECHNOLOGIES FOR HUMAN HEALTH

- 2011: Genome-based biomarkers for patient stratification and pharmacogenomic strategies

OPTIMISING THE DELIVERY OF HEALTHCARE TO EUROPEAN CITIZENS

- 2007: Disease networks of centres of reference

Research and
Innovation

Towards better patients stratification



- **Need:** Stratification of patients in more homogeneous groups for schizophrenia
- **Challenge:** rare mutations difficult to use to stratify patients in clinical subgroups
difficult to detect rare alleles increasing the risk of common diseases
- **Strategy:** set of genes with higher likelihood of role in schizophrenia → 2 546 genes (10% of the exome)

Swedish Hospital Discharge Register

Exome sequencing of 5 079 individuals
2 536 cases
2 543 controls

Could demonstrate a **polygenic burden of rare mutations** that increases the risk of schizophrenia (Purcell et al, 2014, Nature) with higher rate of rare disruptive mutations in :
ARC complex genes /**PSD-95** complex genes/**voltage-gated ion channel** genes

- Replicated in a Wellcome Trust study ("Rare loss-of-function variants in SETD1A are associated with schizophrenia and developmental disorders", Singh et al., 2016 Nature)
- Next step: Larger cohorts

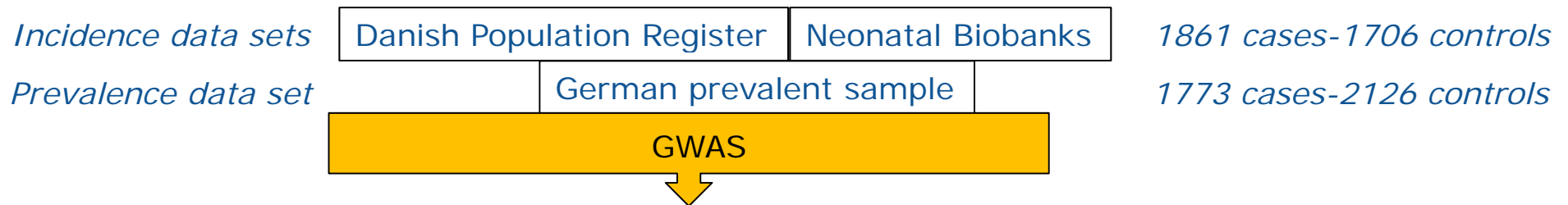
Towards better patients stratification



- **Need:** Increase prediction accuracy of chronicity and treatment resistance
- **Challenge:** Proportion of variance of liability explained by genomic risk profile scores (GRPSs) varies between prevalent and incident samples.

→ Potential sources of variability: stratification and recruitment strategy, with over-representation of increased survival, long duration of illness and frequent admissions in prevalence samples.

- **Strategy:** incidence samples instead of prevalence samples



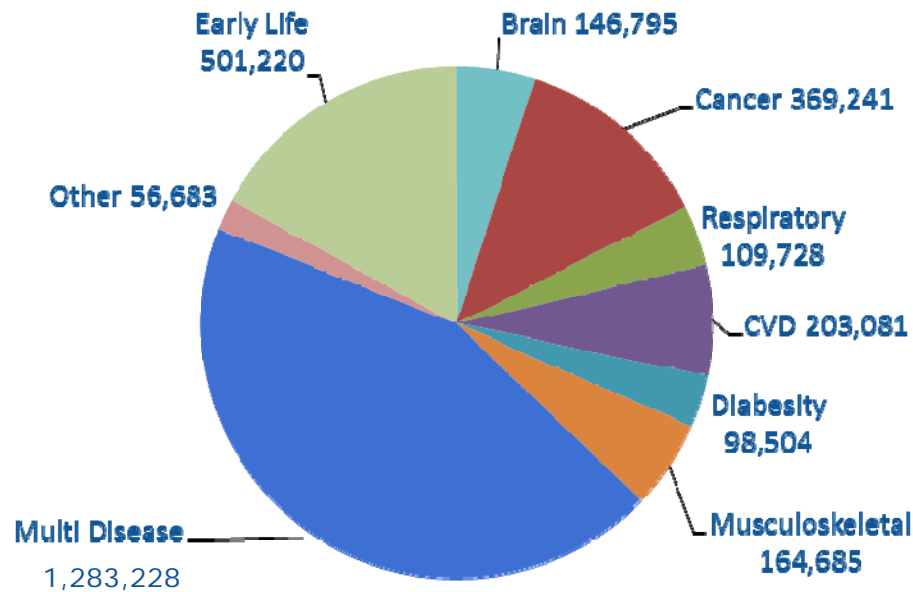
Could demonstrate that **the GRPS is correlated with admission frequency and chronicity** in schizophrenia (Meier et al, 2016, Molecular Psychiatry)

NCD cohorts to improve disease understanding



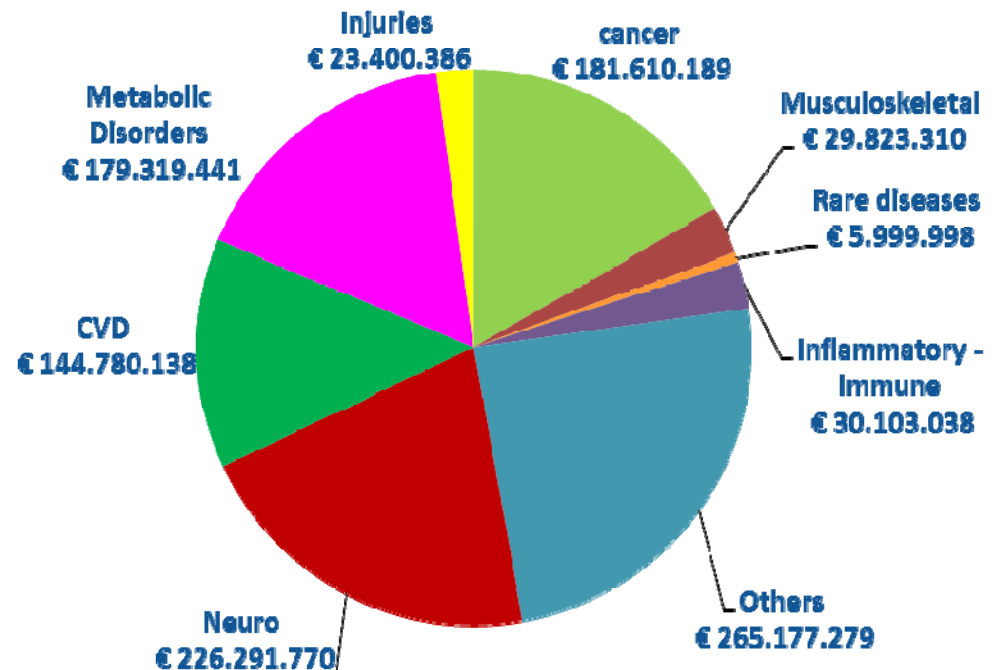
NCD clinical trials to develop treatments

266 projects, > € 1 billion
 55 collaborative projects ~
 3 million subjects



FP7: Health Programme
 Number of subjects in 55 projects

> 340,000 patients recruited
 165 Projects, 286 CTs, € 1.1 billion



CTs per Medical Areas

FP7 efforts on brain imaging



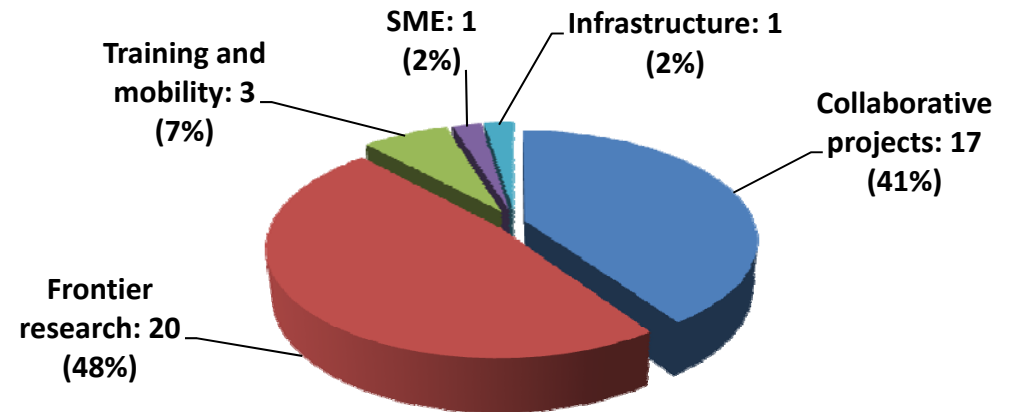
FP7 Medical imaging - Neuroscience

Projects supported in different FP7 calls

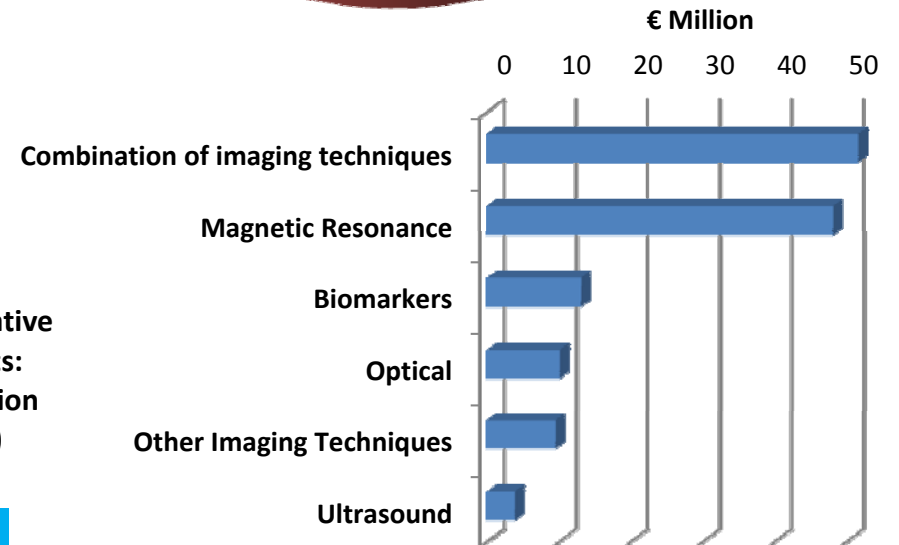
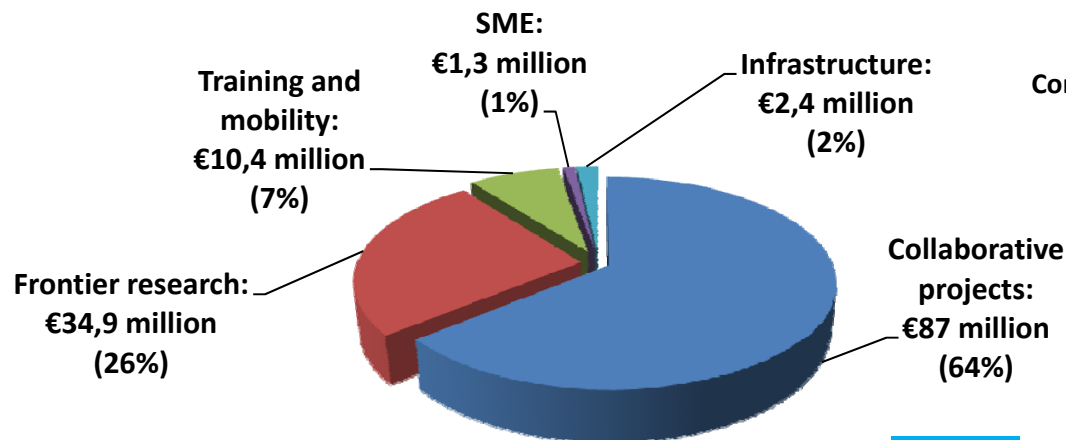
Key figures

€136 million invested

42 projects >€0,5 million



Financial support in different FP7 calls



Horizon 2020: further knowledge-base and its integration for personalised medicine



- **Understanding health, ageing and disease**
- **2014: Understanding health, ageing and disease: determinants, risk factors and pathways**
 - **2015: Understanding diseases: systems medicine**
 - **2015: Understanding common mechanisms of diseases and their relevance in co-morbidities**
 - **2016: Networking and optimising the use of population and patient cohorts at EU level**
- **Preventing disease**
 - **2017: Promoting mental health and well-being in the young**
- **Treating and managing diseases**
 - **2016: New therapies for chronic diseases**



Horizon 2020 efforts on brain imaging



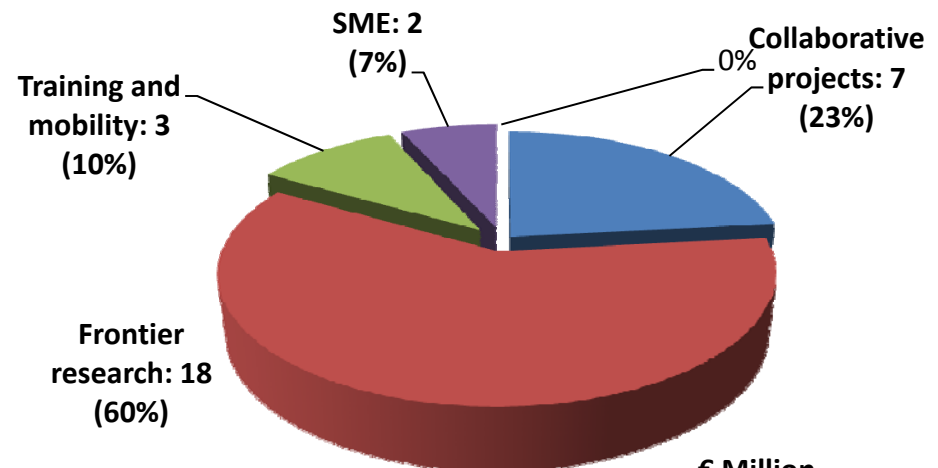
H2020 Medical imaging – Neuroscience (2014-16)

Projects supported in different H2020 calls

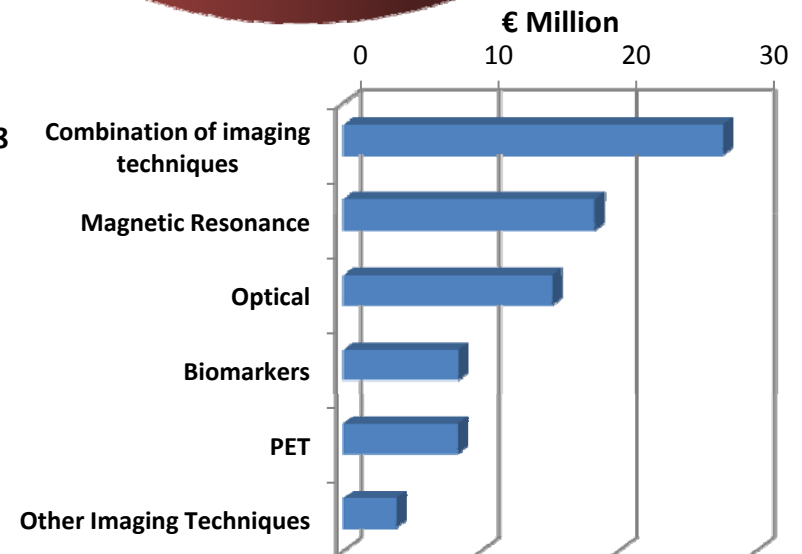
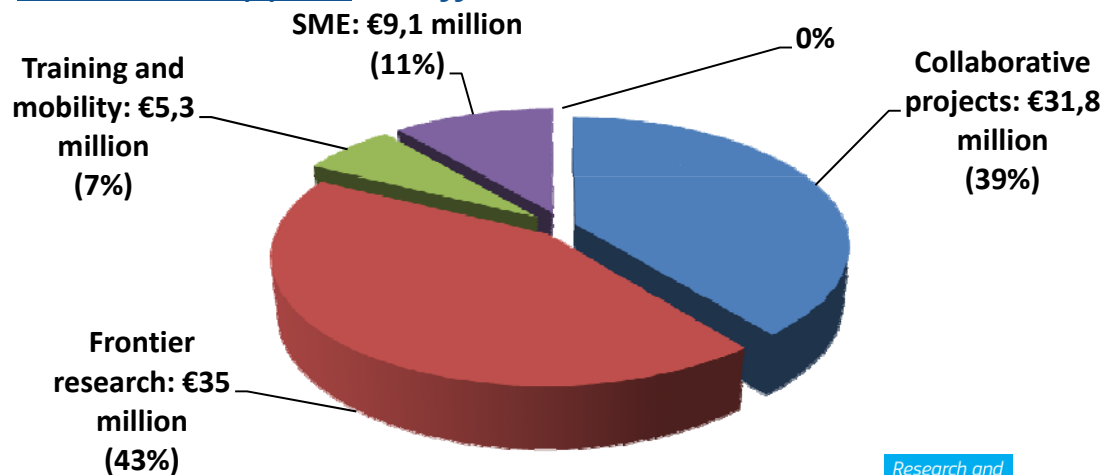
Key figures

€81 million invested

30 projects >€0,5 million



Financial support in different H2020 calls



A flavour of coming trends (2018-20)



- Comorbidities
- Systems approaches
- Microbiome
- New therapies (Advanced therapies, Regenerative Medicine)
- Maternal & child health
- Cohorts
- E-health
- Boosting the translation of health research results
- Innovative procurements for health care
- HTA research