

## **We are delighted to announce six new exciting PhD projects at the Centre for Urban Mental Health**

Each of them is a 4-year project starting in January 2020. The projects are equally distributed across three Faculties (two projects per Faculty): Faculty of Sciences, Social & Behavioral Sciences, and Medicine. If you would like to learn more about the vacancies, please find them under '**PhD Opportunities**' on our website. <http://uva.nl/urban-mental-health>.

### **Project 1.**



*Understanding affective and addictive disorders in adolescents with an urban background using a life-course complex systems approach*

Main applicants: assistant professor Susanne de Rooij (Amsterdam UMC-Bioinformatics), assistant professor Helle Larsen (FMG-Developmental Psychology), and dr. Tanja Vrijkotte (Amsterdam UMC-Public Health)

Symptoms of affective and addictive disorders are common during adolescence and change over time. In resilient adolescents symptoms may disappear, in others they persist or even transition to a disorder. We aim to understand the complexity between the development of affective disorders such as anxiety, mood and stress and addictive disorders such as alcohol, drug abuse, excessive gaming or social media use in adolescents living in urban areas. For this purpose the Amsterdam Born Children and their Development cohort will be used. We take an interdisciplinary approach investigating dynamic interactions between multi-level factors including individual, social and environmental health determinants.

## Project 2.



*Understanding and targeting microbial patterns among adolescents with depression: using a complex systems approach in an urban environment*

Main applicants: dr. Anja Lok (Amsterdam UMC-Psychiatry) and professor Stanley Brul (FNWI-SILS)

Adolescent depression is prevalent in urban settings and associated with recurrence, comorbidity and suicide. Many, if not all of the challenges, faced by the developing adolescent in an urban environment have an impact on the intestinal commensal microbiota. This may be particularly valuable in adolescents with depression because response to current treatment is less effective than in adults. Therefore, targeting the intestinal bacteria, and consequently the microbiota-gut-brain axis, to reduce depressive symptomatology is an innovative concept. The malleability of the nervous system at adolescence can be harnessed and may provide a critical window of opportunity to safely mitigate depression. In order to target the microbiome, we need an increased understanding of the microbial patterns in urban settings and how this is altered in depression. This goal asks for a complexity approach, in which multiple factors at distinct levels interact and biological systems are a potential endpoint to target.



### Project3.



*Computational modelling of psychological and social dynamics in urban mental health conditions: the case of addictive substance use*

Main applicants: assistant professor Sacha Epskamp (FMG-Psychological Methods) and assistant professor Michael Lees (FNWI-Informatics)

In this project we will develop novel computational models to study the dynamics of addictive substance (ab)use. Our central hypothesis is that the dynamics of addiction and mental health issues are driven by psychological and social dynamics and we aim to build complex system models to understand this. By forming a computational modeling framework that integrates psychological and social levels of explanation. This modeling framework will be applied to study the interplay of substance use and mental health and will provide a toolbox applicable to study other common mental health conditions throughout the Centre for Urban Mental Health (UMH).

## Project 4.



*Urban Networks of Addiction and Depression*

Main applicants: associate professor Ruth van Holst (Amsterdam UMC-Psychiatry) and assistant professor Maarten Marsman (FMG-Psychological Methods)

Addiction and depression are common and debilitating mental health disorders with an increased occurrence in an urban context. Both disorders have been related to similar risk factors and mitigation factors. Yet, most studies have focused on just one or a few factors and have neglected the role of ethnicity. We will leverage a complex systems approach to handle these highly correlated factors and their interactions, to understand how they contribute to depression and addiction in a multi-ethnic urban context. This will provide a model which can lead to more targeted interventions for addiction, depression and their comorbidity.



## Project 5.



### *Working Out Urban Stress*

Main applicants: assistant professor Joram Mul (FNWI-SILS) and assistant professor Anouk Schranter (Amsterdam UMC-Radiology)

Understanding how exercise training protects against stress and prevents depression and anxiety in high-risk urban adolescents. Adolescents living in an urban, demanding and social-media-dominated environment commonly report high levels of stress. Consequently, the incidence of stress-related psychopathologies, such as depression, is rising in this population. Furthermore, adolescents are nowadays often physically in-active and overweight, which further increases their sensitivity to stress. Exercise training helps to deal with stress. How it exactly does this, remains poorly understood. The goal of this project is to understand how exercise training decreases sensitivity to stress and whether exercise training plays a central role in preventing depression and anxiety in high-risk adolescents, by studying it at the neurobiological and behavioral level.

## Project 6.



*Active and Healthy Aging: Promoting Preventive Interventions based on Resilience Network Analysis*

Main applicants: professor Richard Ridderinkhof (FMG-Developmental Psychology) and associate professor Harm Krugers (FNWI-SILS)

Mental and physical well-being of vulnerable seniors, especially in large cities, present massive and urgent concerns to aging individuals (>100.000 in Amsterdam), caretakers, and our society at large. Our resilience network perspective proposes that seniors' mental and physical fitness is represented as meta-stable states in a system of networks (from functional and structural brain networks to networks of symptoms, behaviors, environmental factors, and social networks). This will help signal imminent transitions and uncover patterns of network factors that promote or reduce resilience. This approach will enable preventive interventions to promote resilience among the most vulnerable citizens.