

The Life Course Epidemiology of Psychotic Symptoms in Schizophrenia and Other Psychoses: from environment to psychosis

John Grace QC PhD Scholarship 2015 - University College London, Division of Psychiatry,

Supervisor: Dr James B Kirkbride

Summary:

Schizophrenia risk is strongly linked to urban living and ethnic minority status. We don't know, however, whether these factors act on specific psychotic symptoms which underpin schizophrenia (i.e. hallucinations, delusions, paranoia, changes in mood, impaired thinking or social withdrawal). In this PhD research project we will use statistical data from two population-based studies to (a) investigate which psychotic symptoms are most strongly linked to detailed social & environmental factors in childhood and adolescence, (b) establish the ages when such associations are strongest, and (c) examine the pathways through which these factors increase risk of symptoms.

Research Student: Jennifer Dykshoorn

I am a PhD student, working with Dr. James Kirkbride and Dr. Glyn Lewis in the Division of Psychiatry at UCL. My current research focuses on social and spatial determinants of psychotic disorders, including schizophrenia. For part of my research, I am collaborating closely with researchers at the Karolinska Institutet.



My research investigates the timing of exposure to adverse social environments in order to explore how these experiences influence the risk of developing psychotic disorders. I will be using longitudinal data available through record linkages in Sweden as well as the ALSPAC birth cohort from Bristol in order to investigate these questions.

My research is made possible through the generous support of Mental Health Research UK and UCL Overseas Research Scholarship.

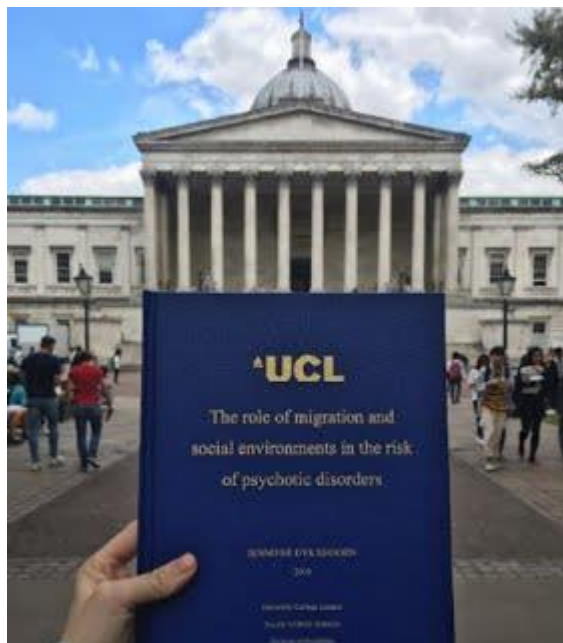
Start Date: September 2015

Scientific goal:

The scientific goal of this proposed PhD project is to (a) test which types of psychotic symptoms are most strongly linked to socio-environmental risk factors, (b) establish when such associations are strongest over the life course, and (c) examine the direct and mediated pathways through which such risk factors contribute to psychosis aetiology.

Jen Dykxhoorn's research update for MHRUK's Annual Report August 2019

It has been a very exciting final year of my PhD at UCL. It has been a very busy year from a research perspective. I conducted a study on how neighbourhood migrant density affected psychosis risk in Sweden. I found evidence that as own-group migrant density increased, risk of non-affective psychosis (including schizophrenia) decreased. I presented this research at the *International Federation for Psychiatric Epidemiology* conference in Sao Paulo, Brazil, which generated much discussion and interest.



2018/2019 was also an exciting year to see outputs of my earlier PhD studies published in *Psychological Medicine* and *Schizophrenia Research*. I also co-wrote a chapter for the *Oxford Textbook of Public Mental Health* and an editorial for *Epidemiology and Psychiatric Sciences*.

The exciting output of this past year was the completion of my thesis! I successfully defended on May 20, 2019 and am thrilled to announce that I have completed my PhD.

I am extremely grateful to Mental Health Research UK and their supporters for providing the funding for my PhD studentship, without which I would not have

had the opportunity to study at UCL and further my development as a mental health researcher. Upon finishing my degree, I started a *Senior Research Fellow* post at UCL where I am working a NIHR-funded public mental health programme. I know the training I received during my PhD will serve me well in this and future roles in mental health research.

2019 Report

I am just writing to let you know that Jen Dykxhoorn, who we were able to fund from the John Grace QC Scholarship which you generously awarded to Glyn and I, has successfully defended her PhD.

We have been constantly and extremely impressed by Jen's dedication to her PhD and aptitude in the field. It has been a pleasure to supervise her. During her PhD she has published two peer-reviewed papers (attached here for your reference), with a third to follow in due course. She has also co-authored an editorial with me (attached, also) and two book chapters. She should have a long and successful career ahead of her. I am delighted to say that the MHRUK funded scholarship has already led to a positive outcome/exit for her from her PhD, and she has started a Senior Research Associate post in the Division of Psychiatry with our colleague, Prof David Osborn on a public mental health project. In demonstration of her success, experience and ability Jen was successfully able to

apply for a job at the grade above that typically offered to people who have just completed their PhD.

I'd like to thank you, the Trustees and the MHRUK for your support, and look forward to working with you more in the future.

With best wishes

James B. Kirkbride Ph.D. Reader in Epidemiology Division of Psychiatry UCL

[DYKXHOORN ET AL. - 2018 - PSYCHOLOGICAL MEDICINE.PDF](#)

[DYKXHOORN ET AL. - 2019 - SCHIZOPHRENIA RESEARCH\(2\).PDF](#)

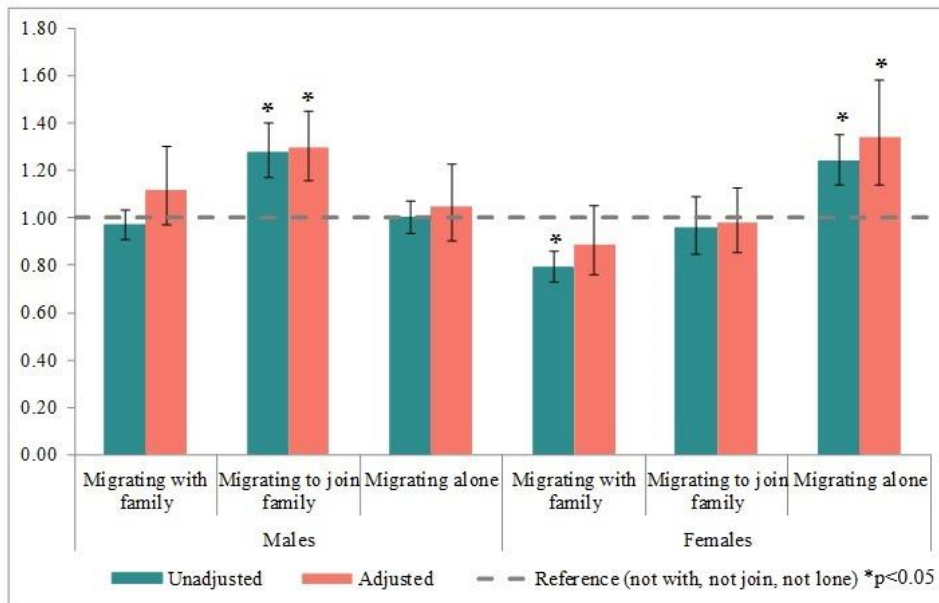
[DYKXHOORN, KIRKBRIDE - 2019 - EPIDEMIOLOGY AND PSYCHIATRIC SCIENCES.PDF](#)

2018 Report

This past year has been a notable one, with successes presenting my research internationally, progress made on exciting new projects, and learning new skills. I have been furthering my research on psychotic disorders including schizophrenia and bipolar disorder with psychotic symptoms, with a particular focus on the social environmental factors that have been linked to the development of these disorders.

My first PhD paper focused on age-at-migration and region of origin and the development of psychotic and non-psychotic disorders utilizing data from the Swedish population, which is currently under review at Psychological Medicine. My second piece of research focused on how family capital during migration affected the risk of non-affective psychosis. Over the past year, I have finalized the results from this investigation (see Figure) and have had the opportunity to present these findings at the International Federation for Psychiatric Epidemiology. This paper is under review at Schizophrenia Research.

FIGURE 2: UNADJUSTED AND ADJUSTED HAZARD RATIOS OF FAMILY CAPITAL AND RISK OF NON-AFFECTIVE PSYCHOSIS, BY SEX



For my third piece of research, I have done extensive work on the Swedish registers in order to generate measures of neighbourhood ethnic density and have been working on investigating if neighbourhood ethnic density explains some of the heterogeneous risk between migrant groups.

I have also had the opportunity to co-author two book chapters as well as an editorial for *Epidemiology and Psychiatric Sciences* and I have been working to gain additional skills with teaching and supervision, working closely with mentors at UCL. I have also had the opportunity to attend several workshops and conferences to increase my epidemiological skills as well as build my network to other researchers in mental health and epidemiology. I continue to closely collaborate with researchers at Karolinska Institutet, and have again had a productive research visit in Sweden, which has accelerated my research and strengthened this relationship.

I am excited for the coming year, which will see me finish my PhD studies and submit my dissertation.

2017 Report

It's been another exciting, research-intensive year at UCL. I am continuing my research on psychotic disorders including schizophrenia and bipolar disorder with psychotic symptoms, with a particular focus on the social environmental factors that have been linked to the development of these disorders.

In my first year, I initiated a project investigating the role that age-at-migration and region of origin have on the development of psychotic and non-psychotic disorders utilizing data

from the Swedish population. Over the past year, I have finalized the results from this investigation (see Figure 1) and have had the opportunity to present these findings at the Epidemiology & Social Psychiatry section meeting of the European Psychiatry Association as well as at the International Congress on Schizophrenia Research. I am in the process of submitting a manuscript based on this research for publication.

Figure 1: Hazard ratios by age-at-migration (to be added later)

Building from this research, which demonstrated increased risk of psychotic disorders in migrant groups, I have started to investigate other factors in the social environment that could explain the increased risk of schizophrenia and other psychotic disorders in migrants. In my current work, I have developed a novel measure of family-based social networks to investigate if migrating with family or joining family who already reside in Sweden mitigates schizophrenia risk.

I am using the Swedish population registers, with 3.3 million individuals born between 1968 and 1997. I have conducted survival analysis to determine if family status alters the risk of psychosis. In order to conduct this analysis, I collaborated closely with researchers at the Karolinska Institutet and have greatly benefited from two extended research visits to Sweden. This has allowed me to work closely with experts in the registers and has greatly enhanced my understanding of these data. I look forward to strengthening this research relationship over the coming years of research.

I am excited for the next phase of research, where I will finalize these results and initiate research in factors affecting psychosis risk among children of migrants. In addition to making progress on my research questions, I successfully defended my research in the “upgrade” process at UCL in October, contributed to a book chapter on the epidemiology of public mental health, and continued to enhance my teaching skills through lecturing and assisting the MSc courses in statistics and epidemiology. I have also had the opportunity to attend several workshops and conferences to increase my epidemiological skills as well as build my network to other researchers in mental health and epidemiology.

2016 Report

Psychotic disorders, including schizophrenia and bipolar disorder with psychotic symptoms, are serious mental illnesses that have a debilitating impact on individuals and society. While both genetic and environmental markers have been linked to the development of psychotic disorders, it is unclear whether there are sensitive windows during which exposure to adverse social environments, including migration and social exclusion, increases risk. My research investigates the timing of exposure to such factors in relation to the development of psychotic disorders, with the hope that by better understanding the timing of exposures can provide important information to what underlying mechanisms are affected.

I am finishing the first analysis for this, where I was able to use Swedish registry data to investigate how timing of migration affects the risk of developing affective and non-

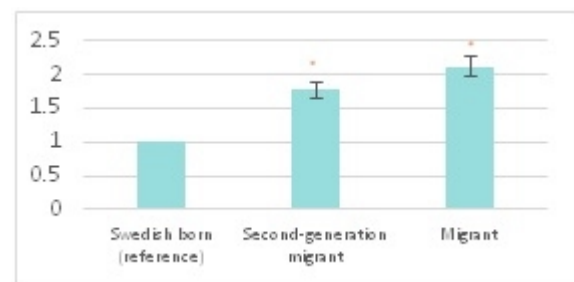
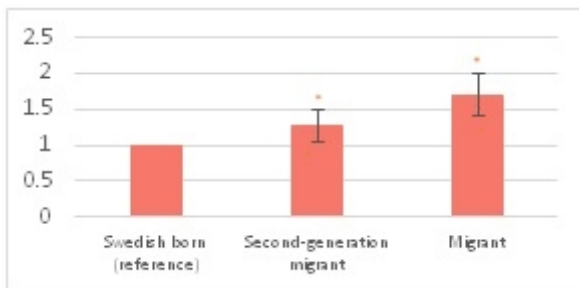
affective psychosis. My analysis looked at over 2 million people, and I conducted a survival analysis which revealed an increased risk of psychosis for both first and second-generation migrants. Figures 1 and 2 show the age- and sex- adjusted hazard ratios ((which compare the rate at which diagnoses of psychotic disorders happen in each group (e.g. migrants, second-generation migrants) to the reference group (e.g. Swedish born)) for non-affective and affective psychosis by migrant status. These figures show a significantly increased risk for both diagnostic categories in both first and second-generation migrants, when compared to the Swedish-born (with Swedish-born parents) population.

Figure 1: Age- and sex-adjusted hazard ratios adjusted hazard

for non-affective psychosis by migrant status
psychosis by migrant status

Figure 2: Age- and sex-

ratios for affective



* denote significantly increased hazard ratio in that group compared to the reference category, in this case Swedish born individuals.

I also demonstrated the increased risk of psychosis appears to vary age at which migration occurred. I have been accepted to present these results as part of a symposium at the European Psychiatric Association's Epidemiology and Social Psychiatry in November. In the next phase of research, where I will be using these data to investigate how timing of maternal migration affects risk among second- generation migrants. I will also examine if the increased risk of psychotic disorders varies according to country of origin. I hypothesize that the adverse stressors may be exaggerated among those who have moved from countries that are very culturally different from Sweden, which in turn may have an increased impact on mental health, including psychotic disorders.

In addition to making progress on my research questions, I have had the opportunity to co-author a book chapter, participate in teaching and lecturing the MSc students, and attending training courses and conferences to increase my knowledge and skills. I was also awarded the UCL Overseas Research Scholarship, which covers the difference between

domestic and international fees. This award, in combination with the support from MHRUK, allows me to continue this fascinating research.