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RUNNING HEAD: PSYCHOSIS, BIPOLAR AND SES

**Employment, income and social income transfers before and after an onset of a severe mental disorder: a case-control study**

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**ABSTRACT**

**Objective:** Individuals with severe mental disorders have an impaired ability to work and are likely to receive income transfer payments as their main source of income. However, the magnitude of this phenomenon remains unclear. Using longitudinal population cohort register data we conducted a case-control study to examine the levels of employment and income before and after first hospitalization for a serious mental disorder.

**Methods:** All individuals (n=50,551) who had been hospitalized for schizophrenia, other non-affective psychosis, and bipolar disorder in Finland between 1988 and 2015 were identified and matched with five randomly selected participants who had the same birth year and month, and sex. Employment status and earnings, social income transfers, and total income in euros were measured annually from 1988 to 2015.

**Results:** Individuals with serious mental disorders have notably low levels of employment already before, and especially after, the diagnosis of severe mental disorder. Their total income mostly constituted of social income transfers, especially in schizophrenia, and over half of all individuals with serious mental disorders did not have any earnings after they received the diagnosis.

**Conclusions:** Present study shows how large proportion of individuals with serious mental are dependent solely on social income transfers after an onset of mental disorder.

**KEY WORDS:**

Serious mental disorder; Earnings; Transfer payments; Labor market

**Highlights**

- High-quality register data from Finland where information of all hospitalizations for serious mental disorders with accurate employment and income data was combined.
- Serious mental disorder is associated with low levels of employment before and after the diagnosis.
- Most individuals with serious mental disorders are dependent on social income transfers after the onset of mental disorder.

It is well established that individuals with severe mental disorders have an impaired ability to work. Consequently, many of them are unemployed or completely out of the labor force. Individuals with schizophrenia or other nonaffective psychotic disorders are often unemployed already years before their first actual hospitalization(1,2). This pattern most likely explains the low reported employment rates, i.e., the estimates ranging from 10% to 30%(3–6). Although slightly higher rates of employment, from 40% to 60%, have been documented for individuals with bipolar disorder(7), a recent study using national hospitalization registry from Israel found that only approximately 25% of all patients with bipolar disorder earned more than the prevailing national minimum wage(2).

However, in most welfare states with a comprehensive social safety net, individuals with severe mental disorders are highly likely to receive fixed-term or even permanent disability pension after they have been diagnosed. These disability pensions constitute of social income payments. As the functional recovery rate from serious mental disorders is remarkably low(8,9) – in schizophrenia only around 15%(10) – individuals with severe mental disorders are likely to have transfer payments as their main source of income after the onset of mental disorder. However, the exact magnitude of this phenomenon is currently unclear as there is a lack of large-scale studies on the topic.

In the present study, we examined in detail employment, income and social income transfer levels before and after a hospitalization for a serious mental disorder (i.e., schizophrenia, other nonaffective psychosis and bipolar disorder). To accomplish this, we used Finnish longitudinal population cohort register data, which included all admissions to Finnish hospitals, to undertake a comprehensive and nationwide case-control analysis.

## **Methods**

### **Study population**

Using unique personal identifiers, which have been allocated to all Finnish residents starting from 1969, we linked Hospital Discharge Register (HDR) of National Institute for Health and Welfare, full Finnish population register (FOLK) and Finnish Longitudinal Employer–Employee Data (FLEED) registers of Statistics Finland to construct the current study population. HDR was used to identify all individuals who had been hospitalized for schizophrenia, other nonaffective psychosis and bipolar disorder. FOLK is constructed from administrative registers and it contains demographics of the whole Finnish population and is updated annually. FLEED is a comprehensive annual panel data that records the entire Finnish working-age population. It is constructed from administrative registers including information on individuals' labor market status, salaries and other sources of income extracted from tax and other administrative registers, such as from mandatory government-run pension programs. FLEED is available from 1988 onwards and for the current study we used the data over the period 1988–2015.

### **Participants in the case and control groups**

Cases were defined by identifying all individuals who had been hospitalized for schizophrenia (ICD-10: F20), other nonaffective psychosis (ICD-10: F22-29), and bipolar disorder (ICD-10: F30-31) between 1988 and 2015 in Finland. Individuals who were diagnosed with schizophrenia, other nonaffective psychosis and bipolar disorder before the age of 15 or after the age of 60 were excluded. Only data from the first such hospitalization and primary diagnoses were used, and thus an individual was categorized only into one diagnostic group (e.g., schizophrenia). Using data from the FOLK register, we randomly selected five participants as control group for each case who did not have a diagnosis of severe mental disorder. As matching criteria, we used sex and birth year and month. The control had to be alive and live in Finland at the year when the case was diagnosed. Thus, the differences observed between participants in the case and control groups represent differences between

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individuals with severe mental disorder and a random population-based sample. Participants in the case and control group were followed over the same observation period.

### **Ethical permission**

This study was approved by the ethics committees of the National Institute of Health and Welfare (THL/730/6.02.01/2018). Data were linked with the permission of the National Institute of Health and Welfare and Statistics Finland (TK-53-1696-16).

### **Socioeconomic measures**

Annual employment status was measured as the employment status during the last week of each calendar year. Individuals who were working or self-employed were defined as employed. All others were classified as not being employed. Personal income was measured annually and the following three different measures of income were used: taxable income, earnings, and social income payments. Taxable income is a broad income measure. It includes annual wage and salary earnings, self-employment income, capital income (dividends and capital gains), social security benefits (e.g., parental leave and unemployment benefits), and income transfers (e.g., child allowance). Earnings were measured as the average of annual wage and salary earnings and self-employed income for each year. Social income payments consist of social security benefits and income transfers, including permanent and temporary pensions. To allow for the comparability of income measures over the observation period, all measures were adjusted to the base year 2015 using the official consumer price index maintained by Statistics Finland.

### **Statistical analyses**

Data was constructed such that the time point zero represented the year when the first hospitalization for schizophrenia, other non-affective psychosis or bipolar disorder occurred

for each case. If an individual did not have data for a certain year, the corresponding case or control was not included in the statistical analyses. Descriptive statistics of the proportions of individuals who were employed and the mean and median (rounded to the nearest tenth) earnings, social income transfers and total income levels were reported for three diagnostics groups (schizophrenia, other non-affective psychosis and bipolar disorder) and for three corresponding control groups. Differences between group means in total income were examined using nonparametric bootstrap analysis(11), because statistical assumptions for parametric tests (i.e., normal distribution and homogeneity of variance) were violated. Stata 15.1 (Stata Corp, College Station, TX) was used in all statistical analyses.

## Results

Altogether, 50,551 cases with severe mental disorders were identified during the study period. The first inpatient diagnosis for 6,939 individuals was schizophrenia, for 34,565 individuals other nonaffective psychosis, and for 9,047 individuals a bipolar disorder. The number of participants in three diagnosis categories and control groups per measurement year are shown in **Table 1**.

**Figure 1** reports the average employment status for case and control groups. In all years, the average employment status was clearly lowest among individuals with schizophrenia and highest among individuals with bipolar disorder when compared to the control groups. At the end of the year when the first inpatient diagnosis was given, on average, 14% of individuals with schizophrenia, 33% of individuals with other nonaffective psychosis, and 43% of individuals with bipolar disorder were employed. In comparison, between 65% and 69% of the participants in the control group were employed. There was a clear decreasing trend in the average employment status during the years before the first inpatient diagnosis was given, and after that the average employment status remained relatively stable.



Earnings, social income payments, and the total taxable income for participants in the case and control groups are shown in **Figure 2**. The average total taxable income was approximately 2 times higher for individuals with bipolar disorder and around 1.5 times higher for individuals with other non-affective psychoses compared to the individuals with schizophrenia. The differences in the average total income between individuals with schizophrenia, other non-affective psychoses and bipolar disorder with their matched control groups were all statistically significant ( $p < .001$ ). The dynamics between earnings and income transfers was rather similar in the three case groups. First, the average earnings decreased rapidly between one to three years before the diagnosis, and then the earnings remained rather stable. By contrast, the average income transfers increased at the year when the first inpatient diagnosis was given, and this increasing trend continued during the following years. On average, during the year when the first inpatient diagnosis was given, individuals with schizophrenia earned 40%, individuals with other non-affective psychoses 61%, and individuals with bipolar disorder 76% of the total income compared to the control groups. Five years later, the same proportions were 39%, 54%, and 67%, respectively, and ten years later they were 37%, 51%, and 66%, respectively.

Median earnings, median social income payments, and the median total taxable income for participants in the case and control groups are shown in **Figure 3**. Already years before the first inpatient diagnosis, the median earnings are zero among individuals with schizophrenia. Higher median earnings are found for individuals with other non-affective psychosis (around 3,000 euros three years before diagnosis) and with bipolar disorder (around 9,000 euros three years before diagnosis). However, in these two groups, the median earnings drop to zero after the year when the diagnosis have been given. The median income transfers are rather equal across the three groups.

## **Discussion**

The present study using comprehensive register data of individuals hospitalized with severe mental disorders in Finland, reveals that individuals with serious mental disorders have a notably low level of participation in the labor market already before and especially after the first inpatient diagnosis of severe mental disorder. There was a clear gradient by the alleged severity of mental disorders; individuals with schizophrenia had 40%, individuals with other non-affective psychoses 61%, and individuals with bipolar disorder 76% of the total income when compared to the control group with no diagnosis. Among individuals with schizophrenia, most of the total income consisted of social income transfers, and in the two other groups income transfers also consistently increased.

These findings are in accordance with previous studies where low employment rates have been reported especially among individuals with schizophrenia(2–4) and other non-affective psychoses(2), but also with bipolar disorder(7), and other severe mental disorders (12). Most of the earlier studies have, however, not examined average income over several years, or have used incomplete and coarse income measures such as the recent Israeli study where at the time of the first diagnosis, 8% of schizophrenia patients, 12% of the other non-affective psychotic patients, and 21% of the bipolar patients earned more than the prevailing national minimum wage(2). Moreover, to best of our knowledge, this is one of the first studies to examine the interplay between wage or salary income with a comprehensive measures of social income transfers. Our results show that whereas salary income decreases significantly already years before diagnosis, the income transfers increase rapidly at the year and straight after the first diagnosis. For individuals with schizophrenia, on average, the income transfers constituted approximately 76% of the total taxable income, and even for individuals with bipolar disorder the share was around 40%. The reported median income transfers increased steadily after the diagnosis of a mental disorder. However, whereas over half of individuals with other nonaffective psychoses and bipolar disorders had some earnings before the diagnosis, the median earnings were zero among individuals with other nonaffective

psychosis straight after the diagnosis, and they also approached to zero among individuals with bipolar disorders. These findings indicate that after an onset of severe mental disorder, income transfers are the main source of income for individuals with severe mental disorders, and their long-run economic well-being is largely dependent on social income transfers and entitlement programs.

Although not examined in the present study, there are several plausible mechanisms, which likely explain why individuals with serious mental disorders have difficulties in getting and maintaining jobs. From the psychosocial factors, for example, poor neurocognitive functioning, problems with intrapersonal and/or social functioning, current or residual symptoms such as paranoia or anhedonia, untypical behavior, and poor motivation are likely important(8,13,14). In addition to these factors, poor educational attainment, absenteeism due to time spent in hospital care, and stigmatization further limits possibilities of finding and maintaining stable employment(15,16).

Employment is often regarded as a recovery goal in severe mental disorders. Supported employment, and especially Individual Placement and Support (IPS) model, have been shown to be at least two times more effective at placing individuals with severe mental disorders to non-supported employment than alternative services(17,18). Recent randomized controlled trials from Sweden(19) and Norway(20), show that even in a comprehensive welfare system with strong job security, IPS model accomplishes better results than normal care. In addition, there is some evidence that after gaining employment, individuals with severe mental disorders have lower probability of experiencing psychiatric hospitalization (21). As the rate of clinical and functional recovery in severe mental disorders is not very high(8), and in schizophrenia remarkably low(10), it is important to prioritize employment models such as IPS that could enhance the opportunities for individuals with severe mental disorders to gain stable employment.

In addition to highlighting the importance of proper intervention mechanisms, present findings emphasize the importance of the early prediction of individuals who could possibly develop serious mental disorders later in life. Targeting employment services for young adults with early stage mental health problems could also increase the likelihood of getting them employed after an onset of serious mental disorder(23). This would be especially important as serious mental disorders with an onset in the early adulthood have been associated low levels of employment and educational achievement over the work-life course(22). It could also prevent young adults from falling into the “disability trap”, which is a major policy concern in many OECD countries (24). From the public policy perspective, maximizing the labor force participation of individuals with serious mental disorders would be crucial.

Main strengths of the present study are the use of high-quality register data that enabled us to combine information of all hospitalizations with accurate employment and income data before and after an individual was diagnosed with severe mental disorders. The main limitations are also related to the use of register data, which was originally not designed for research purposes. First, although the diagnostic validity of schizophrenia(25) and type I bipolar disorder(26) diagnoses are reported to be good, diagnostic validity of other non-affective psychoses and type II bipolar disorder has not been evaluated. However, the diagnoses are often based on clinical observations made during a several weeks long hospital period, and in typical cases, several diagnostic procedures have been used by a number of physicians, which likely increase the reliability of the diagnoses. Second, the present study included only individuals who were treated in a hospital because of their mental disorder, and individuals who received treatment in primary care or in outpatient clinics, or who did not seek treatment at all, were not included. Thus, the present findings may not be applicable to less severe or well-managed serious mental disorders. Lastly, the present findings related to the dynamics between earnings and income transfers are likely generalizable only to

institutional settings where similar welfare systems and social income transfers exist.

Although similar disability policy reforms from passive income maintenance to active employment encouragement have been conducted in most OECD countries during recent years (27), the diversity in disability policies between countries remains substantial (28).

## **Conclusion**

The present findings, which are based on all individuals hospitalized for severe mental disorders in Finland between the years 1988 and 2015, show that individuals with serious mental disorders lowered total income already years before the first hospitalization, and that a large part of the total income constitutes of social income transfers after an onset of mental disorder. These finding imply that more emphasis should be placed to the employment situation of individuals with serious mental disorders. From the mental health policy perspective, it would be important to estimate whether current employment policies are effective in helping individuals with serious mental disorders to gain employment.

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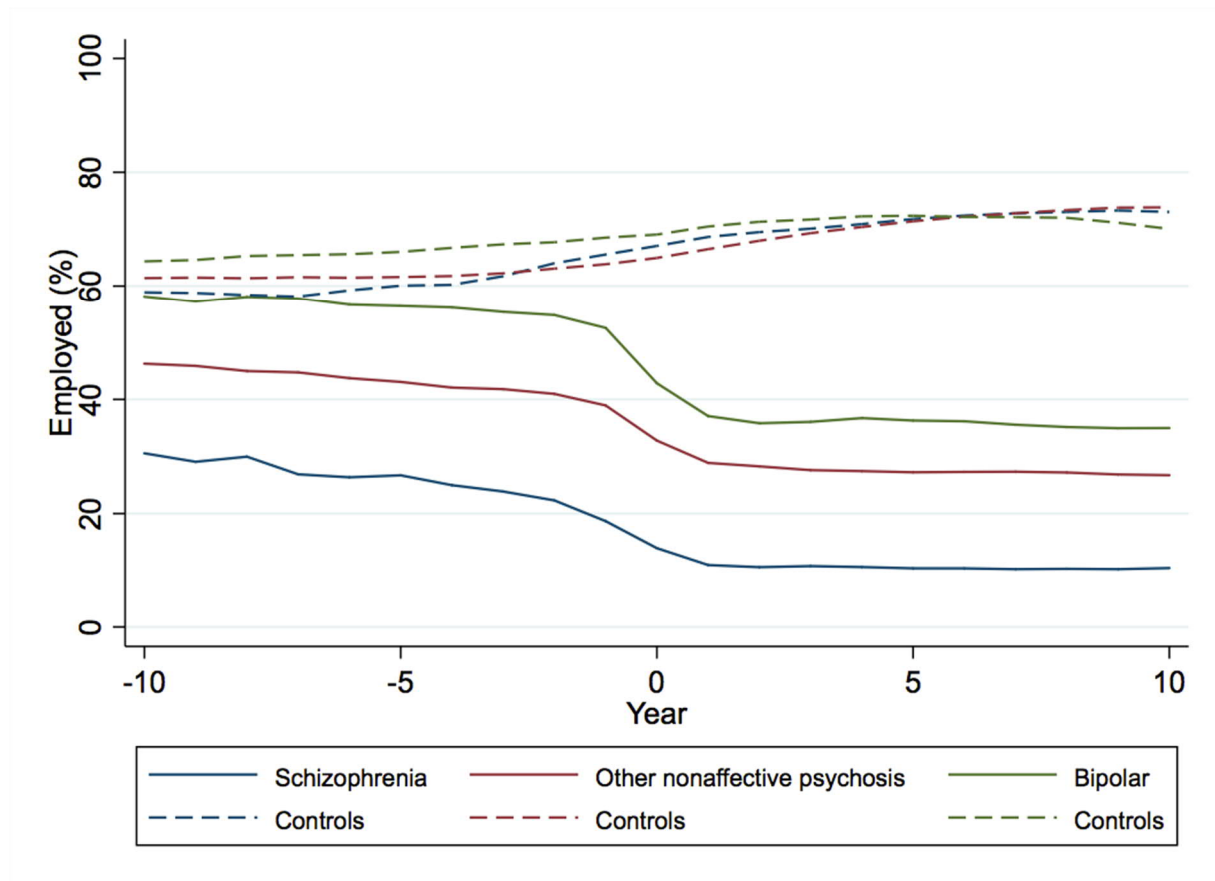
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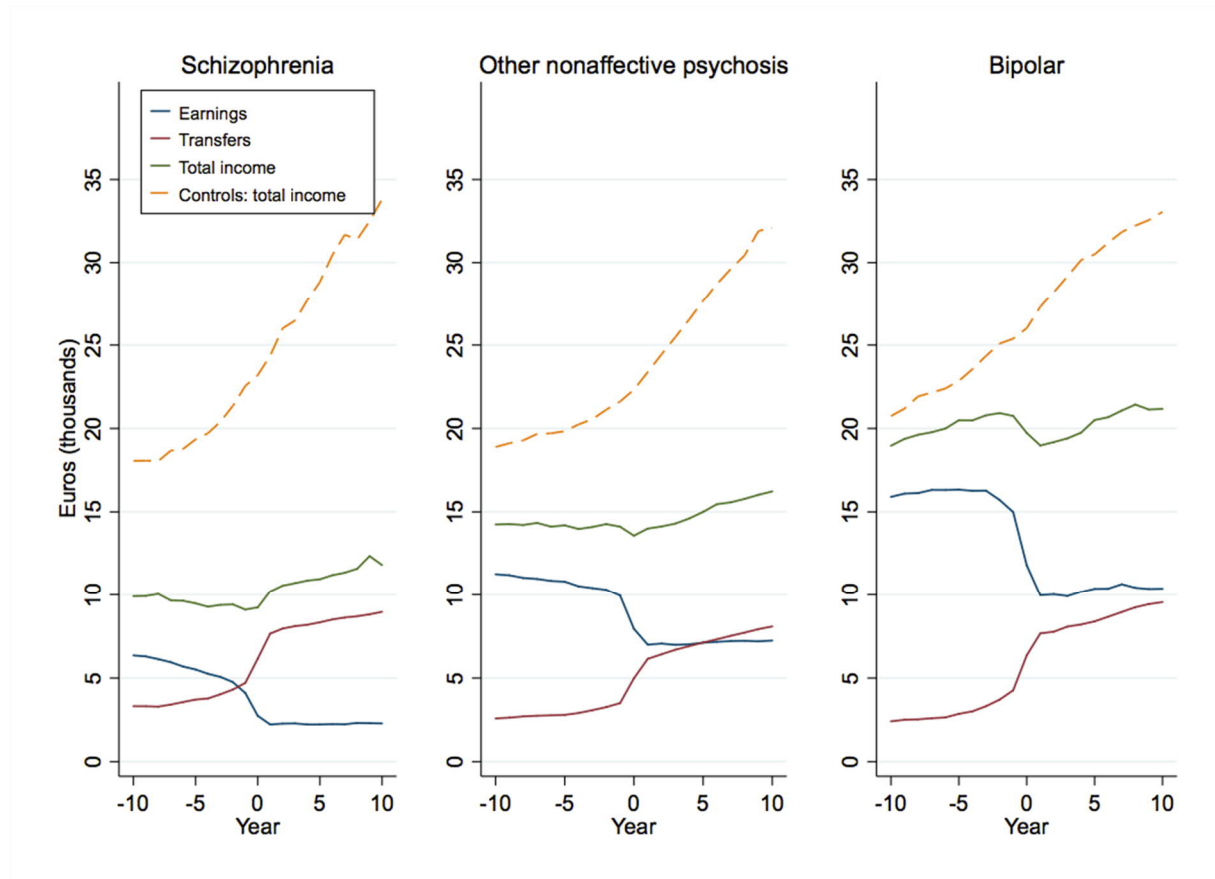
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**Figure 1.** Mean employment levels for participants in the case (individuals with schizophrenia, other non-affective psychoses and bipolar disorder) and control groups <sup>a</sup>

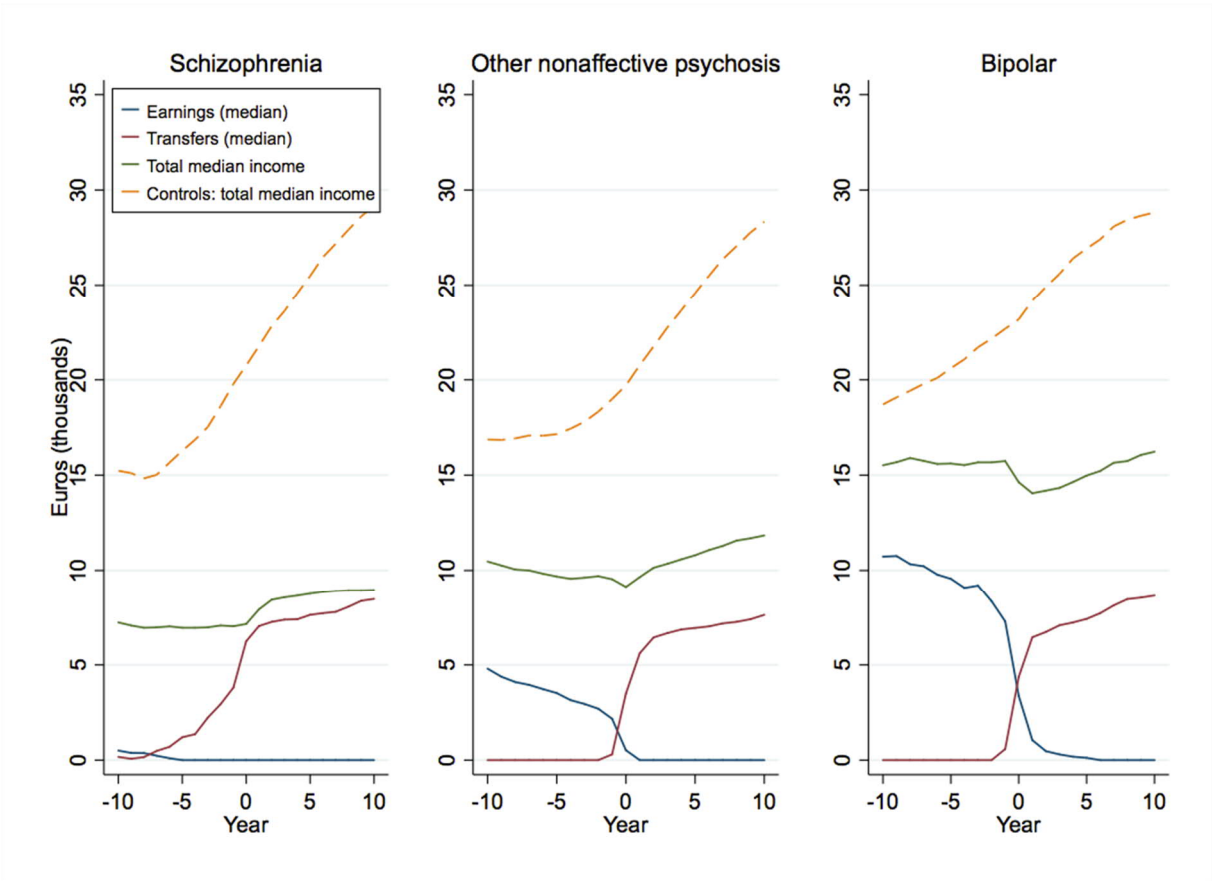
<sup>a</sup> The time point zero denotes the year when the first hospitalization for participants in the case group occurred.



**Figure 2.** Mean levels of earnings, social income transfers and total income for individuals with schizophrenia, other non-affective psychoses and bipolar disorder and their matched participants in the control group <sup>a, b</sup>

<sup>a</sup> The time point zero denotes the year when the first hospitalization for participants in the case group occurred.

<sup>b</sup> Differences in the mean total income between individuals with schizophrenia, other non-affective psychoses and bipolar disorder with their matched participants in the control group were statistically significant (all p-values <.001)



**Figure 3.** Median earnings, social income transfers and total income for participants in the case and control groups<sup>a</sup>

<sup>a</sup> The time point zero denotes the year when the first hospitalization participants in the case group occurred.

**Table 1.** Number of participants in case (schizophrenia, other non-affective psychosis, and bipolar disorder) and their matched control groups

Year	Schizophrenia	Control group	Non-Affective psychosis	Control group	Bipolar Disorder	Control group
-10	2,287	11,435	11,406	57,030	4,615	23,075
-9	2,648	13,240	12,940	64,700	5,005	25,025
-8	3,073	15,365	14,685	73,425	5,434	27,170
-7	3,497	17,485	16,614	83,070	5,853	29,265
-6	3,937	19,685	18,794	93,970	6,315	31,575
-5	4,362	21,810	21,108	105,540	6,751	33,755
-4	4,875	24,375	23,567	117,835	7,155	35,775
-3	5,335	26,675	26,133	130,665	7,591	37,955
-2	5,789	28,945	28,703	143,515	8,022	40,110
-1	6,332	31,660	31,487	157,435	8,510	42,550
0	6,939	34,695	34,565	172,825	9,047	45,235
1	6,546	32,730	32,213	161,065	8,327	41,635
2	6,208	31,040	30,131	150,655	7,664	38,320
3	5,858	29,290	28,291	141,455	7,109	35,545
4	5,588	27,940	26,492	132,460	6,521	32,605
5	5,297	26,485	24,891	124,455	5,934	29,670
6	5,020	25,100	23,292	116,460	5,358	26,790
7	4,680	23,400	21,787	108,935	4,785	23,925
8	4,412	22,060	20,226	101,130	4,223	21,115
9	4,117	20,585	18,778	93,890	3,693	18,465
10	3,801	19,005	17,413	87,065	3,224	16,120

*Note.* 0=the year diagnosis was given