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## Research report

# First-incident of DSM-IV mood, anxiety and substance use disorders and its determinants: Results from the Netherlands Mental Health Survey and Incidence Study-2

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## ABSTRACT

**Background:** Prospective studies measuring first-incident of DSM-IV mood, anxiety and substance use disorders in the general population are rare. We assessed these incidence rates in the Dutch population; and identified baseline sociodemographic, physical and psychopathological variables, and negative changes in sociodemographics and physical health between baseline and follow-up, as determinants of first-onset main categories of disorders.

**Method:** Data are from NEMESIS-2, a representative face-to-face survey including 5303 subjects aged 18–64 interviewed twice (2007–2009; 2010–2012) with the CIDI 3.0.

**Results:** In three years, 8.86% of adults without prior psychopathology experienced any mental disorder, corresponding with 3.09 cases per 100 person-years. Incidence was highest for anxiety (1.69 per 100 person-years) and mood disorder (1.65), and lowest for substance use disorder (0.97). For the separate disorders, incidence was highest for major depression (1.58), specific phobia (0.79) and alcohol abuse (0.73). For mood and anxiety disorder, incidence rate was higher among women and for substance use disorder it was higher among men. Age was inversely related to all disorder categories. Changes in sociodemographics, like no longer living with a partner and decrease in income, were stronger determinants than the corresponding sociodemographics. Incident mood disorder was predicted by baseline anxiety and substance use disorder, incident anxiety disorder by mood and substance use disorder, and incident substance use disorder by adult ADHD.

**Limitations:** Validity of lifetime diagnoses can be questioned because of difficulty of accurate recall. Only determinants of categories of disorders were studied, due to low numbers of incident cases of most separate disorders.

**Conclusion:** First-onset of mental disorders in a 3-year period is not an uncommon phenomenon. Results about determinants of incident disorders are important for prevention and early intervention initiatives aimed at reducing burden of mental disorders.

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## 1. Introduction

In the last decade, worldwide the number of cross-sectional psychiatric epidemiological studies increased substantially. Especially because of the World Mental Health Survey (WMHS) initiative, in many countries prevalence rates and correlates of mental disorders were studied (Kessler and Üstün, 2008). However, the number of prospective studies measuring incidence of mental disorders is low. Reasons for this are that they are more

complex than cross-sectional studies, require samples of sufficient size due to generally low incidence rates, and are more resource intensive (Grant et al., 2009; Lehtinen et al., 2005). Incidence studies are of importance to identify risk factors of mental disorders (Anthony and Petronis, 1991), which are essential for targeting prevention and intervention initiatives (Grant et al., 2009). Prevalence data are less suitable for studying these risk factors, because they include both new and chronic disorders (Chou et al., 2011).

Landmark incidence studies are the Lundby Study in Sweden (Rorsman et al., 1990) and the Stirling County Study in Canada (Murphy et al., 1988). These studies had long follow-up periods, but were conducted long time ago and based on pre/early DSM-classifications. More recent are the epidemiologic catchment area (ECA) study in the USA (Eaton et al., 1989), the Outcomes of Depression International Network (ODIN) study in Finland

*Abbreviations:* ADHD, Attention-deficit/hyperactivity disorder; ASP, Antisocial personality disorder; CI, confidence interval; CIDI, Composite International Diagnostic Interview; IRR, Incidence rate ratio; NEMESIS-2, Netherlands Mental Health Survey and Incidence Study-2

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(Lehtinen et al., 2005), the first Netherlands Mental Health Survey and Incidence Study (NEMESIS-1) (Bijl et al., 2002), the follow-up of the National Comorbidity Survey (NCS-2) (Swendsen et al., 2010) and the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (Grant et al., 2009), both carried out in the USA. These studies had follow-up periods from 1 to 3 years, except for NCS-2 (11 years).

Incidence of major depression varied in the more recent studies from 1.51 to 2.72 cases per 100 person-years (Bijl et al., 2002; Eaton et al., 1989; Grant et al., 2009; Lehtinen et al., 2005). The older studies showed substantially lower rates (Murphy et al., 1988; Rorsman et al., 1990), indicating an increase in major depression in the last decades or being the result of methodological differences between older and more recent studies. Incidence of anxiety disorders has mainly been studied in the more recent studies. For panic disorder, incidence rates varied between 0.56 and 0.78 (Bijl et al., 2002; Eaton et al., 1989; Grant et al., 2009); for social phobia between 0.32 and 0.94 (Bijl et al., 2002; Grant et al., 2009; Wells et al., 1994). Also incident substance use disorders were more often examined in the more recent studies. For example, alcohol abuse rates varied between 1.03 and 2.38 (Bijl et al., 2002; Grant et al., 2009).

Determinants of first-onset disorders have not often been studied extensively, and were often limited to sociodemographic variables (Grant et al., 2009). Risk of incident mood and anxiety disorder was found to be greater among women and risk of substance use disorder was greater among men (Eaton et al., 1989; Graaf et al., 2002; Grant et al., 2009). Younger age cohorts were more at risk for incident mood and anxiety disorder (Grant et al., 2009), and much more at risk for substance use disorder (Graaf et al., 2002; Grant et al., 2009). A clear relationship between low educational level and incident disorders was not found (Graaf et al., 2002; Grant et al., 2009). Also changes in sociodemographics – like no longer living with a partner, decrease in income – were not often studied in a systematic way. These changes might be strong determinants, because they reflect important negative life events which often precede mental disorders; for example, a study showed that getting divorced is related to subsequent incidence of alcohol abuse, dysthymia and social phobia (Overbeek et al., 2006). Furthermore, it is important to study the association between prior disorders and subsequent onset of comorbid disorders as well, because incident disorders are often secondary. For example, in NESARC many significant associations were found between prior anxiety disorders and incident mood disorders, although hardly any between prior substance use disorders and incident mood disorders (Grant et al., 2009).

This paper reports incidence rates of DSM-IV mood, anxiety and substance use disorders, based on the first two waves of the second NEMESIS study (NEMESIS-2), which is a new cohort with subjects aged 18–64 years. The second aim was to study baseline sociodemographic, physical and psychopathological variables, and negative changes between both waves in sociodemographics and physical health, as determinants of first-onset categories of disorders.

## 2. Methods

### 2.1. Sample

In a multistage, stratified random sampling procedure, a random sample of 184 of the 443 existing municipalities was drawn. In these municipalities, a random sample of addresses of private households from postal registers was drawn. Based on the most recent birthday at first contact within the household, an

individual aged 18–64 years with sufficient fluency in the Dutch language was randomly selected for face-to-face interview (mean duration: 95 min).

The study was approved by a medical ethics committee and respondents provided written informed consent. The first wave was conducted in 2007–2009. The response rate was 65.1%. The sample was nationally representative, although younger subjects were somewhat underrepresented. The study design has been described in detail elsewhere (Graaf et al., 2010a).

All 6646 participants were approached for follow-up, three years after baseline (2010–2012), of which 5303 could be reinterviewed (80.4% response, with those deceased excluded; mean interview duration: 84 min). Although other studies found a weak to moderate association between baseline psychopathology and attrition at follow-up after controlling for sociodemographics (Eaton et al., 1992; Graaf et al., 2000; Lamers et al., 2012), no such significant associations were found for the separate and categories of 12-month disorders (Graaf et al., 2012a).

The mean period between both interviews was 3 years and 7 days (1.102 days;  $sd=64$ ).

### 2.2. Mental disorders

DSM-IV disorders were assessed using the Composite International Diagnostic Interview (CIDI) 3.0, which was developed in the WMHS (Alonso et al., 2004; Graaf et al., 2008; Kessler and Üstün, 2008). The following disorders measured in both waves were used to ascertain incidence: mood (major depression, dysthymia, bipolar disorder), anxiety (panic disorder, agoraphobia (without panic disorder), social phobia, specific phobia, generalized anxiety disorder (GAD)), and substance use disorders (alcohol/drug abuse and dependence). Adult attention-deficit/hyperactivity disorder (ADHD) and antisocial personality disorder (ASP) were assessed at baseline; both were included as determinants of incidence. In administering the CIDI, ADHD was limited to respondents aged 18 to 44 because of concerns about recall bias in older respondents on questions about ADHD in childhood (Kessler et al., 2007).

Clinical calibration studies conducted in various countries have found that CIDI 3.0 (Haro et al., 2006) and earlier versions (Andrews and Peters, 1998; Wittchen, 1994) assess anxiety, mood and substance use disorders with generally good validity compared to blinded clinical reappraisal interviews.

At baseline ( $T_0$ ) a lifetime CIDI version was used; at follow-up ( $T_1$ ) a CIDI version with as timeframe the period between  $T_0$  and  $T_1$ .

First-incident cases of a mental disorder were defined as persons who developed a disorder between  $T_0$  and  $T_1$ , among those who never in their life had experienced that disorder at  $T_0$  (population at risk). First-incident cases of a category of disorders were defined as persons who developed a disorder in a category (mood, anxiety or substance use disorder) between  $T_0$  and  $T_1$ , among those who never in their life had experienced any separate disorder in that category at  $T_0$ . Incidence was calculated with the DSM-IV hierarchical rules not applied.

Both 3-year incidence rate expressed as percentage, and incidence per 100 person-years at risk, were calculated. It can be assumed that the average point at which new cases emerge lies halfway through the period between both interviews (Eaton et al., 1989; Grant et al., 2009). Therefore the number of person-years at risk in an incident case was calculated as one half of the time elapsed between both interviews.

### 2.3. Determinants of first-onset disorders

*Sociodemographic characteristics.* These were recorded at  $T_0$ : gender, age (3 categories), educational level (4 categories), degree of urbanization (rural, urban), cohabitation status (living with a

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