Prevalence and trends of common mental disorders from 2007-2009 to 2019-2022: results from the Netherlands Mental Health Survey and Incidence Studies (NEMESIS), including comparison of prevalence rates before vs. during the COVID-19 pandemic

Margreet ten Have[1], Marlous Tuithof[1], Saskia van Dorsselaer[1], Frederiek Schouten[1], Annemarie I. Luik[1,2], Ron de Graaf[1]

[1]Netherlands Institute of Mental Health and Addiction (Trimbos Institute), Utrecht, The Netherlands; [2]Department of Epidemiology, Erasmus MC University Medical Center, Rotterdam, The Netherlands

Up-to-date information on the prevalence and trends of common mental disorders is relevant to health care policy and planning, owing to the high burden associated with these disorders. In the first wave of the third Netherlands Mental Health Survey and Incidence Study (NEMESIS-3), a nationally representative sample was interviewed face-to-face from November 2019 to March 2022 (6,194 subjects; 1,576 interviewed before and 4,618 during the COVID-19 pandemic; age range: 18-75 years). A slightly modified version of the Composite International Diagnostic Interview 3.0 was used to assess DSM-IV and DSM-5 diagnoses. Trends in 12-month prevalence rates of DSM-IV mental disorders were examined by comparing these rates between NEMESIS-3 and NEMESIS-2 (6,646 subjects; age range: 18-64 years; interviewed from November 2007 to July 2009). Lifetime DSM-5 prevalence estimates in NEMESIS-3 were 28.6% for anxiety disorders, 27.6% for mood disorders, 16.7% for substance use disorders, and 3.6% for attention-deficit/hyperactivity disorder. Over the last 12 months, prevalence rates were 15.2%, 9.8%, 7.1%, and 3.2%, respectively. No differences in 12-month prevalence rates before vs. during the COVID-19 pandemic were found (26.7% pre-pandemic vs. 25.7% during the pandemic), even after controlling for differences in socio-demographic characteristics of the respondents interviewed in these two periods. This was the case for all four disorder categories. From 2007-2009 to 2019-2022, the 12-month prevalence rate of any DSM-IV disorder significantly increased from 17.4% to 26.1%. A stronger increase in prevalence was found for students, younger adults (18-34 years) and city dwellers. These data suggest that the prevalence of mental disorders has increased in the past decade, but this is not explained by the COVID-19 pandemic. The already high mental disorder risk of young adults has particularly further increased in recent years.

Key words: Common mental disorders, prevalence, trends, young adults, NEMESIS studies, COVID-19 pandemic, anxiety disorders, mood disorders, substance use disorders, attention-deficit/hyperactivity disorder

In recent decades, it has been suggested that an increasing proportion of the population is developing poorer mental health[1,2]. If there is indeed an increase in the prevalence of mental disorders, this is relevant to health care policy and planning, owing to the high burden associated with these disorders[3].

Mood, anxiety and substance use disorders are common across the world, but studies examining trends in their prevalence in representative samples of the adult population have provided mixed findings. Some studies have found an increase in the prevalence rates of mental disorders or mental health problems over time[4-13], while others have reported stable prevalence rates[14-23]. No study has found evidence for a decrease in prevalence.

The existing trend studies have many limitations. Most of them focused solely on major depressive episodes, while trends in anxiety and substance use disorders were explored far less (in one and four of the 20 studies above, respectively). Only a few studies used fully structured diagnostic interviews to assess mental disorders, while most relied on abbreviated versions of such interviews or self-report symptom questionnaires. Hardly any study investigated socio-demographic differences in time trends. Almost no study examined trends over the past decade.

However, precisely in these more recent years, the prevalence of mental disorders in the general population of Western countries may have changed, due to factors such as the economic crisis that started in 2008[24], the increased income inequality[25], the further individualization of society[26], and the recent COVID-19 pandemic. The reported rise in mental health care use[27,28] might indicate that the prevalence of mental disorders has increased, but this may also be explained by improved accessibility, efficiency and capacity of care.

Since the outbreak of the COVID-19 pandemic, the number of studies examining the mental health status of the general population and of specific groups has increased enormously. Most of these studies were online surveys, based on convenience samples with one-time data collection, suggesting dramatic increases in clinically significant anxiety and depression early in the pandemic[29]. However, a systematic review of general population studies comparing prevalence rates before vs. during the pandemic reported a much more modest increase in the prevalence of depressive and anxiety disorders during the first year of the pandemic[30].

That review was largely based on studies with short-reference symptom scales. It included only three studies that used diagnostic interviews allowing statements about trends in mental disorders. Two of these studies indicated stable levels of depression[31] and mental disorders[32] during the pandemic compared to pre-pandemic levels, while another suggested a large increase in the prevalence of mental disorders[33]. However, all three studies used a different method to collect data before vs. during the pandemic, for example moving from face-to-face or paper-and-pencil to telephone or web interviews.

Our study attempts to avoid these drawbacks of COVID-era

studies by using a strong data source: a standardized diagnostic instrument and the same (face-to-face) interview method were used before and during the first two years of the pandemic, assessing not only major depressive episodes but also anxiety and substance use disorders.

We report prevalence rates of DSM-5 mood disorders, anxiety disorders, substance use disorders, and attention-deficit/hyperactivity disorder (ADHD), and their socio-demographic correlates, based on data from the third Netherlands Mental Health Survey and Incidence Study (NEMESIS-3)[34]. This is a psychiatric epidemiological study of the Dutch general population aged 18-75 years, designed to provide up-to-date information on the prevalence of mental disorders. As the fieldwork for the first wave of NEMESIS-3 was conducted before and during the COVID-19 pandemic, we could investigate the extent to which the pandemic has had an effect on population mental health.

Furthermore, we could assess time trends in the 12-month prevalence rates of DSM-IV mood disorders, anxiety disorders, substance use disorders and ADHD at the baseline wave of NEMESIS-3 vs. NEMESIS-2 (i.e., in 2019-2022 vs. 2007-2009). We could also examine to what extent these trends were similar for different socio-demographic groups, and whether the trends in disorder prevalence paralleled those of service use for mental health problems.

METHODS

Study design

We used a multistage, stratified random sampling procedure. First, a random sample of municipalities was drawn. Second, in NEMESIS-3[34], a random sample of individuals aged 18-75 years was drawn from the Dutch population register (Basisregistratie Personen, BRP). This compares to NEMESIS-2[35], in which a random sample of addresses of private households from postal registers was drawn – each address with the same selection probability. A random individual aged 18-64 years was selected to be asked to participate, based on the most recent birthday at first contact within the household. In both studies, individuals with insufficient command of the Dutch language, as well as institutionalized individuals (i.e., those living in hostels, hospices or prisons), were excluded. Individuals temporarily living in institutions were contacted to be interviewed after returning home.

For NEMESIS-3, the Medical Research Ethics Committee (METC Utrecht) stated that the Dutch Medical Research Involving Human Subjects Act (WMO) did not apply (reference number: WAG/mb/19/017126; May 15, 2019). Therefore, no official approval was required under the WMO. The field procedures, information for respondents and informed consent forms were assessed positively by the local ethical review committee. NEMESIS-2 was approved by a medical ethics committee (the Medical Ethics Review Committee for Institutions on Mental Health Care, METiGG; reference number: CCMO/NL18210.097.07), since it included saliva collection. In both studies, respondents provided written informed consent, after full written and verbal information about the study was given before and at the start of the interview.

Fieldwork and interview characteristics

In NEMESIS-3, the baseline wave was performed from November 2019 to March 2022, and included three fieldwork-free periods owing to the COVID-19 pandemic. In NEMESIS-2, the first wave was performed from November 2007 to July 2009. In both studies, the recruitment methods were intensive, and a relatively long fieldwork period was chosen to have sufficient time to re-contact potential respondents.

In both studies, the face-to-face interviews were laptop computer-assisted, and almost all were held at the respondent's home. In NEMESIS-3, 1,576 participants (25.4%) were interviewed before and 4,618 (74.6%) during the COVID-19 pandemic. A total of 500 interviews (8.1%) were completed via video call. The average interview duration was 91 min in NEMESIS-3 and 95 min in NEMESIS-2.

Response and generalization to the population at large

Thanks to the fieldwork methods, it was possible to achieve relatively high response rates[36-38]: 54.6% (N=6,194) in NEMESIS-3[34], and 65.1% (N=6,646) in NEMESIS-2[35]. In both studies, the following groups were somewhat under-represented: younger people, higher secondary educated people, those not living with a partner, people living in bigger towns, and people of non-Western origin[34,35]. To allow generalization of the data to the Dutch population, based on post-stratification, a weighting factor was constructed for each study. After weighting, the distribution of the socio-demographic characteristics of both study samples was very similar to that of the Dutch population in the particular study period[34,35].

Diagnostic assessment

In both studies, DSM-IV diagnoses of common mental disorders were ascertained using the Composite International Diagnostic Interview (CIDI) 3.0. This is a fully structured diagnostic interview, developed for use in the World Mental Health Survey Initiative[39]. In NEMESIS-3, a slightly modified version of CIDI 3.0 was used to enable both DSM-IV and DSM-5 diagnoses[34].

We assessed the following conditions: mood disorders (major depressive disorder, persistent depressive disorder/dysthymia, bipolar disorder); anxiety disorders (panic disorder, agoraphobia, social anxiety disorder or social phobia, specific phobia, generalized anxiety disorder); substance use disorders (alcohol and drug use disorders); and ADHD. These disorders are assessed with good validity using the CIDI 3.0[40,41].

Most DSM-5 definitions of mental disorders are based on information already available in the CIDI 3.0, and were applied by

making small changes in the algorithms[34]. However, to enable the assessment of ADHD according to DSM-5 criteria, the childhood symptom questions referred to their presence prior to age 12, instead of age 7 as in the DSM-IV. Due to this change, we do not report the trend of ADHD prevalence rates between the studies.

Other variables

Information on sex, age, education, living situation, employment status, household income, country of origin, urbanicity, and service use was collected during the interview.

Household income was calculated based on the income of the respondent and, if applicable, the partner, for various living situations (e.g., living with partner and children, living with partner without children, single parent, living alone), and was then divided into the lowest 25%, the middle 50% and the highest 25% income category per living situation. Country of origin was categorized as Dutch (respondent and both parents born in the Netherlands) or non-Dutch. Service use was defined as at least one contact made in general medical or mental health care for emotional or alcohol or drug problems in the previous 12 months.

In NEMESIS-3, the same questions and measurement methods as in NEMESIS-2 were used, to enable comparisons[34,35].

Statistical analyses

The characteristics of the NEMESIS-3 sample were described using frequency tables. Lifetime and 12-month prevalence rates of DSM-5 disorders (mood disorders, anxiety disorders, substance use disorders, ADHD) were calculated for the total sample and stratified by sex. Additionally, the association of socio-demographic characteristics with the 12-month DSM-5 disorder prevalence rates was explored using logistic regression analysis adjusted for sex and age.

To assess differences before vs. during the COVID-19 pandemic, we calculated the 12-month prevalence rates of DSM-5 disorders separately for individuals interviewed before and during the pandemic. We tested the differences between these rates using logistic regression analysis adjusted for socio-demographic characteristics (sex, age, education, living situation, employment status, urbanicity).

To study trends over time, 12-month DSM-IV disorders (mood disorders, anxiety disorders, substance use disorders) among the same age range of respondents (18-64 years) in NEMESIS-3 and NEMESIS-2 were combined in one dataset, with *study* as independent variable and *socio-demographic variables* as confounders. Trends for these disorders were calculated using descriptive statistics and were analyzed using logistic regression adjusted for differences in socio-demographic characteristics between the samples (sex, age, education, living situation, employment status, urbanicity), because the population structure and therefore the sample composition of the studies had changed over time. To analyze whether the trend was the same for all socio-

demographic groups, we estimated additive interaction effects between study and each socio-demographic feature using generalized linear models with a binomial distribution and an identity link function adjusted for socio-demographic characteristics[42,43].

Trends in mental health care use were also examined, to determine to what extent these were comparable to those for mental disorders.

RESULTS

Description of the NEMESIS-3 sample

Table 1 provides a description of the sample. The mean age was 46.2 years (standard error, SE: 0.35). The sample included 50.0% women; 42.2% with higher secondary education; 63.0% living with a partner; 64.0% with paid employment; 56.3% living in a city (i.e., high and very high degree of urbanization) and 81.2% of Dutch origin.

Prevalence of DSM-5 disorders

Table 2 shows the lifetime prevalence rates of DSM-5 disorders in NEMESIS-3. Any lifetime disorder was found in almost half of the respondents (48.4%). Mood and anxiety disorders were the most prevalent disorder categories (27.6% and 28.6%, respectively), followed by substance use disorders (16.7%) and ADHD (3.6%). The most prevalent specific disorders were major depressive disorder (24.9%), social phobia (13.1%), specific phobia (11.8%) and alcohol use disorder (12.8%). Of all respondents, 21.8% had one disorder during their lifetime, 11.8% had two and 14.8% had three or more.

One in four respondents (25.9%) met the criteria for any disorder in the 12 months before the interview. Of those with any lifetime disorder, more than half (53.5%) also had a disorder in the past year. The most prevalent disorder category was anxiety disorders (15.2%), followed by mood disorders (9.8%), substance use disorders (7.1%) and ADHD (3.2%). ADHD was still present in adulthood among the vast majority of cases with that disorder in childhood (88.9%). Of those with a mental disorder in the past 12 months, 42.5% had two or more disorders.

Socio-demographic correlates of DSM-5 disorders in the past 12 months

Women were more likely to have any mental disorder in the past 12 months than men (Table 3). While the prevalence of mood and anxiety disorders was higher in women, that of substance use disorders and ADHD was higher in men. Lower age was associated with higher prevalence of all disorder categories.

Respondents with primary or lower secondary education, and those with a low household income, more often had mood disorders, anxiety disorders and ADHD, but not substance use disor-

Table 1 Description of the NEMESIS-3 sample (2019-2022) of people aged 18-75 years (N=6,194), in unweighted numbers and weighted percentages

	N	%
Sex		
Men	3,071	50.0
Women	3,123	50.0
Age at interview (years)		
18-24	665	12.1
25-34	938	17.5
35-44	1,004	16.2
45-54	1,096	19.4
55-64	1,266	18.6
65-75	1,225	16.3
Education		
Primary or lower secondary	1,367	23.2
Higher secondary	2,259	42.2
Higher vocational or university	2,568	34.6
Living situation		
With partner and children	2,138	33.8
With partner without children	2,025	29.1
Without partner with children (single parent)	260	5.0
Alone	987	17.3
With other(s)	784	14.7
Employment status		
Paid job	3,876	64.0
Homemaker	318	5.1
Student	454	8.1
Unemployed/disabled	479	8.6
Retired	1,067	14.2
Income		
Low	1,584	27.8
Medium	2,892	48.6
High	1,462	23.6
Urbanicity		
Very low	570	7.6
Low	1,414	20.9
Medium	994	15.1
High	1,819	30.4
Very high	1,397	25.9
Country of origin		
Dutch	5,125	81.2
Non-Dutch	1,069	18.8

Data were weighted based on post-stratification to facilitate generalization to Dutch population. Urbanicity: very low, <500 addresses per km^2; low, 500-1,000 addresses per km^2; medium, 1,000-1,500 addresses per km^2; high, 1,500-2,500 addresses per km^2; very high, ≥2,500 addresses per km^2.

ders. Respondents living alone were more likely to have all disorder categories than those living with a partner and children. For all disorder categories, unemployed or disabled subjects were worse off than those in paid employment. While the degree of urbanization of the place of residence was clearly associated with the prevalence of 12-month disorders, country of origin was not.

Prevalence rates before and during the COVID-19 pandemic

Table 4 shows that the prevalence rate of any DSM-5 disorder in the past 12 months assessed before vs. during the COVID-19 pandemic did not differ significantly (26.7% pre-pandemic vs. 25.7% during the pandemic), even after controlling for differences in socio-demographic characteristics of the respondents interviewed in these two periods. This was the case for all four disorder categories.

In a sensitivity analysis, we also assessed differences in 6-month prevalence rates to ensure that the rates of the respondents interviewed after the first lockdown (from September 2020 onwards) were only related to a period during the COVID-19 pandemic. These analyses showed that the prevalence rates of any 6-month DSM-5 disorder before vs. during the COVID-19 pandemic did not differ significantly (21.8% pre-pandemic vs. 19.7% during pandemic). However, after controlling for differences in socio-demographic characteristics, the 6-month prevalence rate of any DSM-5 disorder was significantly lower during the pandemic than pre-pandemic (19.5% vs. 22.5%, respectively; adjusted odds ratio, aOR=0.82, 95% CI: 0.70-0.96). A lower prevalence during the pandemic was also evident in the 6-month prevalence of substance use disorders (aOR=0.70, 95% CI: 0.54-0.91), but not of mood disorders (aOR=0.82, 95% CI: 0.67-1.00) and anxiety disorders (aOR=0.91, 95% CI: 0.75-1.10).

Trends in 12-month prevalence of disorders

Table 5 shows that the 12-month prevalence rate of any DSM-IV mood, anxiety or substance use disorder among 18-64 year olds significantly and substantially increased from 17.4% in NEMESIS-2 to 26.1% in NEMESIS-3, and that this change remained significant after controlling for differences in socio-demographic characteristics between the studies. A similar trend was seen for any mood disorder (from 6.0% to 10.8%) and any anxiety disorder (from 10.1% to 15.6%). The prevalence of any substance use disorder also increased (from 5.5% to 7.1%), but the change was not significant after controlling for differences in socio-demographic characteristics between the two studies. All specific mood, anxiety and substance use disorders assessed in both studies significantly increased in the period between NEMESIS-2 and NEMESIS-3 after controlling for differences in socio-demographic characteristics between the studies, except for alcohol use disorder.

Among those with any 12-month mood, anxiety or substance use disorder, the ratio of those with a mild, moderate or severe dis-

Table 2 Prevalence rates of lifetime and 12-month DSM-5 disorders among people aged 18-75 years, based on NEMESIS-3 (2019-2022; N= 6,194), in weighted percentages with standard error (SE)

	Lifetime prevalence						12-month prevalence					
	Men		Women		Total		Men		Women		Total	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Any mood disorder	22.1	0.9	33.0	1.2	27.6	0.8	8.1	0.7	11.5	0.7	9.8	0.5
Major depressive disorder	19.2	0.8	30.5	1.2	24.9	0.8	6.7	0.6	10.4	0.7	8.5	0.5
Persistent depressive disorder	6.7	0.5	11.4	0.8	9.1	0.5	2.6	0.4	4.4	0.6	3.5	0.3
Bipolar disorder	2.5	0.3	1.8	0.3	2.1	0.2	1.3	0.2	1.1	0.2	1.2	0.2
Any anxiety disorder	21.8	0.9	35.5	1.3	28.6	1.0	11.0	0.7	19.4	1.0	15.2	0.7
Panic disorder	3.7	0.4	7.5	0.6	5.6	0.4	1.5	0.2	2.9	0.5	2.2	0.3
Agoraphobia	2.4	0.3	5.5	0.4	4.0	0.3	1.1	0.2	2.7	0.4	1.9	0.2
Social phobia	10.8	0.7	15.3	0.8	13.1	0.6	4.6	0.5	6.7	0.6	5.6	0.4
Specific phobia	7.5	0.6	16.1	0.8	11.8	0.6	4.6	0.4	11.0	0.7	7.8	0.4
Generalized anxiety disorder	6.5	0.5	12.6	0.6	9.5	0.5	2.8	0.3	4.8	0.5	3.8	0.3
Any substance use disorder	22.5	1.4	11.0	1.2	16.7	1.2	9.5	1.1	4.8	0.6	7.1	0.7
Alcohol use disorder	17.8	1.2	7.9	0.9	12.8	0.9	7.5	0.8	3.3	0.4	5.4	0.6
Drug use disorder	8.5	1.0	4.7	0.7	6.6	0.7	2.8	0.6	1.7	0.3	2.3	0.4
Cannabis use disorder	5.9	0.7	1.9	0.3	3.9	0.4	1.9	0.3	0.6	0.1	1.3	0.2
ADHD	4.3	0.4	3.0	0.3	3.6	0.3	3.7	0.3	2.7	0.3	3.2	0.3
One mental disorder	22.1	0.8	21.5	0.8	21.8	0.6	14.9	1.0	15.0	0.8	15.0	0.7
Two mental disorders	11.2	0.7	12.5	0.6	11.8	0.5	5.2	0.5	6.0	0.6	5.6	0.4
Three or more mental disorders	11.8	0.8	17.8	1.1	14.8	0.8	4.0	0.5	6.8	0.7	5.4	0.5
Any mental disorder	44.9	1.3	51.8	1.5	48.4	1.2	24.0	1.3	27.8	1.2	25.9	1.1

Data were weighted based on post-stratification to facilitate generalization to Dutch population. ADHD – attention-deficit/hyperactivity disorder.

order remained the same between the two studies (34.8%, 31.4% and 33.9% in NEMESIS-2 vs. 34.6%, 31.3% and 34.1% in NEMESIS-3, respectively). The percentage of those with two or more mental disorders significantly increased (from 32.6% in NEMESIS-2 to 41.3% in NEMESIS-3), and the increase remained significant after controlling for differences in socio-demographic characteristics between the two studies (OR=1.50, 95% CI: 1.21-1.86).

Post-hoc, we assessed differences in 3-year prevalence rates of DSM-IV mood, anxiety and substance use disorders during the three follow-up waves of NEMESIS-2, to guide our interpretation of time trends. Prevalence rates of all categories increased over time after controlling for differences in socio-demographic characteristics. The increases were most evident between the first and the last follow-up waves (i.e., between 2010-2012 and 2016-2018) (see Table 6).

Trends in socio-demographic correlates of 12-month disorders

To study whether the trend was the same for all socio-demographic groups, we estimated additive interaction effects between study and each socio-demographic characteristic adjusted for all other socio-demographic variables. A stronger increase in the 12-month prevalence of any DSM-IV disorder in the period between the two studies was found for younger adults (18-34 years) compared to those aged 35 and older (p<0.001), for students compared to those with a paid job (p<0.001), and for those living in a city compared to non-urban residents (p=0.002). In contrast, retirees showed a less marked increase compared to people with a paid job (p=0.030). No interaction effects were found for sex, education and living situation.

Trends in service use for mental health problems

Parallel to these increasing trends in the prevalence of common mental disorders, general medical and specialized mental health care significantly and substantially increased between the two studies: from 9.0% and 6.2% in NEMESIS-2 to 15.0% and 10.0% in NEMESIS-3, respectively (see Table 7). The same was true for psychotropic medication use, which rose from 5.7% to 6.9%. On the other hand, unmet need for care also increased: from 1.8% to 4.0%. All these trends in service use remained significant after controlling for differences in socio-demographic characteristics between the studies.

Table 3 Association between socio-demographic characteristics and 12-month DSM-5 disorders among people aged 18-75 years, based on NEMESIS-3 (2019-2022; N=6,194), in weighted percentages, adjusted odds ratios (aORs) and 95% confidence intervals (CIs), controlled for sex and age

	Mood disorders		Anxiety disorders		Substance use disorders		ADHD		Any mental disorder	
	%	aOR (95% CI)	%	aOR (95% CI)	%	aOR (95% CI)	%	aOR (95% CI)	%	aOR (95% CI)
Sex										
Men	8.1	1	11.0	1	9.5	1	3.7	1	24.0	1
Women	11.5	1.50 (1.21-1.86)	19.4	1.97 (1.66-2.34)	4.8	0.48 (0.38-0.60)	2.7	0.73 (0.55-0.96)	27.8	1.24 (1.07-1.44)
Age at interview (years)										
18-24	13.3	3.04 (1.91-4.83)	19.9	2.68 (2.00-3.57)	15.8	7.17 (4.45-11.57)	3.7	3.67 (1.78-7.59)	39.6	4.09 (3.16-5.28)
25-34	13.1	2.97 (2.01-4.37)	19.8	2.62 (2.05-3.36)	12.6	5.56 (3.65-8.48)	3.9	3.86 (1.92-7.76)	35.2	3.37 (2.76-4.11)
35-44	11.1	2.41 (1.46-3.96)	17.5	2.20 (1.72-2.83)	7.4	3.13 (1.75-5.59)	5.5	5.66 (2.68-11.95)	27.7	2.35 (1.76-3.14)
45-54	9.5	2.05 (1.48-2.85)	13.3	1.61 (1.24-2.09)	4.1	1.65 (1.05-2.58)	2.9	2.90 (1.31-6.41)	21.8	1.72 (1.39-2.14)
55-64	7.9	1.67 (1.05-2.66)	13.8	1.68 (1.31-2.16)	3.3	1.30 (0.78-2.15)	2.5	2.44 (1.14-5.20)	21.4	1.68 (1.34-2.12)
65-75	4.9	1	8.7	1	2.6	1	1.0	1	13.9	1
p for linearity		<0.001		<0.001		<0.001		<0.001		<0.001
Education										
Primary or lower secondary	12.0	2.21 (1.70-2.87)	17.0	1.79 (1.46-2.20)	6.4	1.16 (0.82-1.64)	5.0	3.25 (1.99-5.32)	27.9	1.77 (1.43-2.20)
Higher secondary	10.2	1.37 (1.08-1.74)	15.9	1.28 (1.06-1.53)	6.3	0.72 (0.57-0.89)	3.0	1.44 (0.93-2.24)	26.0	1.13 (0.98-1.31)
Higher vocational or university	7.9	1	13.3	1	8.6	1	2.2	1	24.4	1
Living situation										
With partner and children	7.7	1	12.9	1	4.0	1	2.8	1	20.5	1
With partner without children	7.5	1.20 (0.92-1.57)	11.8	1.09 (0.85-1.40)	5.3	1.85 (1.33-2.57)	2.5	1.09 (0.67-1.76)	20.6	1.32 (1.10-1.58)
Single parent	12.2	1.53 (0.96-2.44)	23.0	1.75 (1.15-2.66)	5.0	1.63 (1.00-2.68)	5.2	2.14 (1.26-3.64)	31.1	1.71 (1.18-2.47)
Alone	14.0	2.23 (1.68-2.97)	19.4	1.86 (1.47-2.36)	9.9	2.83 (1.95-4.11)	3.8	1.43 (1.00-2.05)	32.7	2.23 (1.80-2.75)
With other(s)	13.6	1.24 (0.89-1.74)	19.9	1.20 (0.90-1.60)	15.4	1.67 (1.16-2.41)	4.2	0.87 (0.57-1.33)	39.0	1.40 (1.11-1.77)
Employment status										
Paid job	8.1	1	13.2	1	6.7	1	2.7	1	23.3	1
Homemaker	11.2	1.47 (0.97-2.22)	18.9	1.39 (1.00-1.93)	3.9	1.15 (0.60-2.21)	3.3	1.84 (0.99-3.41)	26.8	1.41 (1.05-1.88)
Student	13.5	1.06 (0.76-1.47)	20.3	1.03 (0.78-1.37)	17.4	1.27 (0.99-1.64)	3.1	0.74 (0.38-1.47)	41.1	1.21 (0.96-1.52)
Unemployed/disabled	27.6	4.70 (3.58-6.16)	35.6	3.90 (3.08-4.94)	11.2	2.30 (1.53-3.46)	11.3	5.34 (3.89-7.33)	52.0	4.17 (3.27-5.30)
Retired/other	4.2	0.95 (0.55-1.63)	7.9	1.01 (0.76-1.35)	2.2	1.26 (0.71-2.26)	0.8	0.56 (0.23-1.35)	12.9	1.13 (0.81-1.56)
Income										
Low	13.1	1.77 (1.34-2.32)	19.2	1.45 (1.13-1.86)	8.0	1.05 (0.75-1.48)	4.4	1.88 (1.19-2.99)	30.5	1.41 (1.13-1.74)
Medium	9.2	1.32 (1.01-1.73)	14.5	1.16 (0.93-1.44)	7.1	1.11 (0.85-1.44)	2.9	1.32 (0.82-2.11)	25.4	1.23 (1.04-1.44)
High	6.9	1	12.3	1	6.2	1	2.3	1	21.3	1

Table 3 Association between socio-demographic characteristics and 12-month DSM-5 disorders among people aged 18-75 years, based on NEMESIS-3 (2019-2022; N=6,194), in weighted percentages, adjusted odds ratios (aORs) and 95% confidence intervals (CIs), controlled for sex and age *(continued)*

	Mood disorders		Anxiety disorders		Substance use disorders		ADHD		Any mental disorder	
	%	aOR (95% CI)	%	aOR (95% CI)	%	aOR (95% CI)	%	aOR (95% CI)	%	aOR (95% CI)
Urbanicity										
Very low	6.4	1	10.3	1	3.4	1	1.9	1	16.5	1
Low	7.7	1.20 (0.70-2.06)	10.9	1.04 (0.70-1.55)	5.2	1.54 (0.77-3.09)	2.5	1.27 (0.62-2.58)	20.4	1.27 (0.92-1.74)
Medium	7.5	1.14 (0.62-2.07)	14.4	1.42 (0.91-2.19)	6.5	1.92 (0.95-3.88)	3.3	1.71 (0.85-3.44)	23.2	**1.47 (1.04-2.07)**
High	10.8	**1.73 (1.02-2.93)**	17.3	**1.77 (1.20-2.60)**	6.0	1.81 (0.92-3.54)	3.3	1.69 (0.86-3.30)	27.3	**1.85 (1.38-2.49)**
Very high	12.7	**1.94 (1.17-3.23)**	18.2	**1.78 (1.19-2.66)**	11.6	**3.22 (1.57-6.60)**	4.0	1.95 (0.99-3.84)	33.0	**2.24 (1.63-3.07)**
p for linearity		**<0.001**		**<0.001**		**<0.01**		**<0.05**		**<0.001**
Country of origin										
Dutch	9.3	1	14.5	1	7.0	1	3.1	1	24.9	1
Non-Dutch	12.3	1.23 (0.92-1.65)	18.7	1.21 (0.98-1.50)	7.8	0.99 (0.78-1.25)	3.9	1.19 (0.75-1.90)	30.2	1.15 (0.96-1.38)

Data were weighted based on post-stratification to facilitate generalization to Dutch population. Significant values of aOR or p for linearity (<0.05) are highlighted in bold prints. Urbanicity: very low, <500 addresses per km²; low, 500-1,000 addresses per km²; medium, 1,000-1,500 addresses per km²; high, 1,500-2,500 addresses per km²; very high, ≥2,500 addresses per km². ADHD – attention-deficit/hyperactivity disorder.

Table 4 Prevalence rates of 12-month DSM-5 disorders before vs. during the COVID pandemic in NEMESIS-3 (2019-2022; N=6,194), in weighted percentages, odds ratios (ORs) or adjusted odd ratios (aORs), and 95% confidence intervals (CIs)

	Pre-pandemic (N=1,576)		During pandemic (N=4,618)		Unadjusted model	Adjusted model
	%	95% CI	%	95% CI	OR (95% CI)	aOR (95% CI)
Mood disorders	10.2	8.5-11.9	9.7	8.6-10.9	0.95 (0.79-1.14)	0.91 (0.75-1.11)
Anxiety disorders	15.7	13.4-18.1	15.1	13.6-16.6	0.95 (0.80-1.14)	0.92 (0.77-1.09)
Substance use disorders	7.8	5.8-9.8	7.0	5.5-8.4	0.89 (0.71-1.11)	0.80 (0.63-1.00)
ADHD	3.4	2.5-4.4	3.2	2.6-3.8	0.94 (0.66-1.33)	0.91 (0.65-1.27)
Any mental disorder	26.7	23.5-29.9	25.7	23.5-27.8	0.95 (0.82-1.09)	0.89 (0.77-1.02)

Data were weighted based on post-stratification to facilitate generalization to Dutch population. Unadjusted model: OR and p not controlled for socio-demographic differences between respondents interviewed before and during the pandemic. Adjusted model: aOR and p controlled for socio-demographic differences (sex, age, education, living situation, employment status, urbanicity) between respondents interviewed before and during the pandemic. ADHD – attention-deficit/hyperactivity disorder.

DISCUSSION

This study presents prevalence rates of DSM-5 disorders in a sample representative of the general population; examines the effect of the COVID-19 pandemic on population mental health using a structured face-to-face diagnostic interview before and during the pandemic; and explores trends in DSM-IV disorders over more than a decade between two highly comparable samples randomly drawn from the general population.

Nearly half of the NEMESIS-3 respondents (48.4%) had a DSM-5 mood disorder, anxiety disorder, substance use disorder or ADHD during their lifetime, and one in four (25.9%) in the 12 months prior to the interview. There were no significant differences in the 12-month prevalence of mental disorders before vs. during the COVID-19 pandemic. The 12-month prevalence of any DSM-IV mood, anxiety or substance use disorder substantially increased over time (from 17.4% in 2007-2009 to 26.1% in 2019-2022), and this was paralleled by a marked increase in the use of specialized mental health care (from 6.2% to 10.0%). At the same time, unmet need for care rose from 1.8% to 4.0%.

The prevalence rates of any mental disorder in the lifetime and in the past 12 months in this sample from the Netherlands are similar to those reported in the US, but higher than those found in other European countries, based on studies dating back to the turn of the century[45]. The most recent population study performed in the US showed similar rates of DSM-5 mood and anxiety disorders, but higher rates of substance use disorders[46]. These findings show that mental disorders are quite common in the general population. It is important to recognize, though, that not all mental disorders are severe[47]. Mild and moderate cases are nonetheless meaningful, because even mild disorders can be impairing and often evolve into severe mental disorders over time[48].

The socio-demographic correlates of having 12-month DSM-5 disorders in NEMESIS-3 are broadly consistent with previous surveys that mostly used DSM-IV criteria: lower age[49,50]; sex (being female for any anxiety and mood disorder, and being male for substance use disorder and ADHD[40,49]); living alone[16,51]; being unemployed[16,49,51]; a low education level or having a low income[16,40,51]; and a higher degree of urbanization[49,51].

We found that the prevalence rates of mental disorders before vs. during the COVID-19 pandemic did not differ significantly. This finding is in line with two studies that used diagnostic interviews before and during the pandemic[31,32], but in contrast with a study that found an increase in the prevalence of mental disorders[33]. However, this latter study used market research quota sampling, a design that likely overestimates the increase in disorder prevalence[30]. In contrast, a fourth study found a decrease in the prevalence of major depressive and generalized anxiety disorder relative to pre-pandemic levels[52]. Other studies that used short-reference symptom scales instead of diagnostic interviews

Table 5 Trends in prevalence rates of 12-month DSM-IV disorders in people aged 18-64 years (N=11,615), based on NEMESIS-2 (2007-2009) and NEMESIS-3 (2019-2022), in weighted percentages, odds ratios (ORs) or adjusted odds ratios (aORs), and 95% confidence intervals (CIs)

	NEMESIS-2		NEMESIS-3		Unadjusted model	Adjusted model
	%	95% CI	%	95% CI	OR (95% CI)	aOR (95% CI)
Mood disorders	6.0	5.3-6.8	10.8	9.7-11.9	**1.89 (1.59-2.24)**	**2.04 (1.71-2.42)**
Anxiety disorders	10.1	9.2-11.0	15.6	14.3-16.9	**1.64 (1.44-1.87)**	**1.76 (1.56-1.99)**
Substance use disorders	5.5	4.5-6.5	7.1	6.1-8.2	**1.32 (1.04-1.68)**	1.27 (0.99-1.63)
Any mental disorder	17.4	16.0-18.7	26.1	24.2-28.0	**1.68 (1.48-1.90)**	**1.78 (1.59-2.00)**

Data were weighted to be representative of the adult population in the particular study period. Unadjusted model: OR and p not controlled for socio-demographic differences between the studies. Adjusted model: aOR and p controlled for socio-demographic differences (sex, age, education, living situation, employment status, urbanicity) between the studies. Significant values of OR or aOR (<0.05) are highlighted in bold prints.

Table 6 Prevalence rates of 3-year DSM-IV disorders during the follow-up waves of NEMESIS-2 (2010-2018; N=12,021), in weighted percentages, adjusted odds ratios (aORs) and 95% confidence intervals (CIs)

	Wave 2 (2010-2012)		Wave 3 (2013-2015)		Wave 4 (2016-2018)		Adjusted model (reference: wave 2)	
							Wave 3	Wave 4
	%	95% CI	%	95% CI	%	95% CI	aOR (95% CI)	aOR (95% CI)
Mood disorders	7.4	6.4-8.5	7.5	6.3-8.8	10.7	9.0-12.3	1.01 (0.81-1.27)	**1.51 (1.22-1.86)**
Anxiety disorders	6.8	5.7-8.0	8.1	6.8-9.5	9.6	7.7-11.5	1.21 (1.00-1.47)	**1.47 (1.15-1.88)**
Substance use disorders	4.8	3.8-5.8	6.1	4.5-7.6	6.5	4.8-8.1	**1.31 (1.02-1.68)**	**1.42 (1.09-1.85)**
Any mental disorder	15.3	13.5-17.1	17.3	15.1-19.4	20.2	17.7-22.7	**1.17 (1.02-1.33)**	**1.44 (1.23-1.68)**

The trend is shown on the follow-up waves, because at baseline no 3-year prevalence rates were assessed. Data were weighted based on post-stratification to facilitate generalization to Dutch population. The analyses are based on the respondents who participated at all follow-up waves. Similar results were found when we included all respondents in the analyses. Adjusted model: % with 95% CI, aOR and p controlled for socio-demographic differences (sex, age, education, living situation, employment status) between respondents interviewed at the different follow-up waves. Significant values of aOR (<0.05) are highlighted in bold prints.

generally showed an increase in the prevalence of depression and anxiety during the pandemic compared to pre-pandemic levels[30]. These differences in findings of COVID studies indicate that symptom ratings do not equate to the presence of mental disorders[53].

We found a substantial increase in the prevalence of all main categories of common mental disorders between 2007-2009 and 2019-2022. *Post-hoc* analyses of NEMESIS-2 data showed that the increase in prevalence started before the initiation of NEMESIS-3. Previous trend studies reported mixed findings (i.e., suggesting an increase or stabilization, but not a decrease), but those studies did not examine trends in the past decade.

Although our study was not designed to provide explanations for the trends between 2007-2009 and 2019-2022, we cautiously suggest possible reasons. We found that students and those aged 18-34 years showed a stronger increase in the prevalence of any 12-month disorder compared to people with a paid job and those aged 35 and older, respectively. In recent decades, young adults may have been more adversely affected by the further individualization of society[26], the rise of social media[54,55], and the increasing pressure to succeed[56]. They may also be more adversely affected by current social problems (e.g., shortage of affordable housing, climate change concerns), or have more difficulty coping with setbacks, such as not immediately having a successful job or owner-occupied home.

A stronger increase in the prevalence of any 12-month disorder was also seen among those living in a city, which was not explained by differences in socio-demographic characteristics between the two studies. Living in a city may come with more disadvantages today than before.

Among retired people, a smaller increase in disorder prevalence was found, perhaps because they have been less affected by the long-term consequences of the economic crisis that started in 2008[24], or are less adversely affected by current social problems than the employed.

While we can only speculate about the reasons for the trends, we can rule out some explanations. The significant increase in the prevalence rates of mental disorders over time cannot be attributed to the small difference in clinical assessment instrument between NEMESIS-3 and NEMESIS-2, as in both studies the DSM-IV diagnoses were based on the same questions using the same algorithms. The increase is also not caused by the fact that 500 interviews (8.1%) were conducted via video calling in NEMESIS-3, as those interviewed via video calling did not differ in 12-month and lifetime prevalence rates from those interviewed face-to-face, after adjustment for socio-demographic differences between the two groups[34]. Change in the population structure, such as relatively more highly educated people and more people with a paid job, also does not explain the sharp increase in prevalence of mood and anxiety disorders, but it may have played a limited role in explaining the increase in substance use disorders.

The increase in mood and anxiety disorders could be due to people being more likely to recognize and admit mental health prob-

Table 7 Trends in 12-month service use for mental health problems in people aged 18-64 years (N=11,615), based on NEMESIS-2 (2007-2009) and NEMESIS-3 (2019-2022), in weighted percentages, odds ratios (ORs) or adjusted odds ratios (aORs), and 95% confidence intervals (CIs)

	NEMESIS-2		NEMESIS-3		Unadjusted model	Adjusted model
	%	95% CI	%	95% CI	OR (95% CI)	aOR (95% CI)
General medical care	9.0	8.3-9.7	15.0	13.8-16.1	**1.77 (1.57-2.00)**	**1.85 (1.64-2.08)**
Mental health care	6.2	5.4-6.9	10.0	8.7-11.3	**1.69 (1.42-2.02)**	**1.71 (1.44-2.04)**
Psychotropic medication use	5.7	5.2-6.3	6.9	6.1-7.7	**1.22 (1.04-1.44)**	**1.27 (1.07-1.50)**
Unmet care need	1.8	1.5-2.2	4.0	3.3-4.7	**2.22 (1.70-2.91)**	**2.14 (1.60-2.84)**

Data were weighted to be representative of the adult population in the particular study period. Unadjusted model: OR and p not controlled for socio-demographic differences between the studies. Adjusted model: aOR and p controlled for socio-demographic differences (sex, age, education, living situation, employment status, urbanicity) between the studies. Significant ORs and aORs are highlighted in bold prints.

lems today than in the past. However, we believe that these factors explain the substantial increase in disorder prevalence only to a limited extent, as we have used a clinical assessment instrument that asks about symptoms of a disorder and not about the disorder itself, which is less subject to feelings of shame and taboo.

Finally, the increase cannot be attributed to the COVID-19 pandemic, as we found that the pandemic was not associated with a higher prevalence of mental disorders in the general population. The only clinically relevant effect of the COVID-19 pandemic on population mental health was a significant decrease in the 6-month prevalence of substance use disorder, which mainly includes mild alcohol use disorder, during the pandemic. One explanation for this could be that the social restrictions during the pandemic reduced the possibility of drinking alcohol with others or in bars and restaurants, thus reducing alcohol consumption and its consequences.

Some limitations of the study should be mentioned. First, while the CIDI 3.0 assesses DSM-IV mood, anxiety and substance use disorders with generally good validity[41], the validity and reliability of our slightly modified CIDI 3.0 to assess DSM-5 diagnoses have not been formally investigated. Second, our prevalence rates are based on retrospective recall: diagnosing disorders in the lifetime, rather than within the past 12 months, often results in underreporting[44]. Third, survey non-response could lead to bias in prevalence estimates: in line with an international trend towards declining response rates in all types of surveys[37], the non-response in NEMESIS-3 was larger than in NEMESIS-2; however, similar to NEMESIS-2, we found that hard-to-reach respondents – who might most resemble non-responders – did not differ in the prevalence of mood, anxiety and substance use disorders compared to easier-to-recruit respondents[34]. Fourth, although the sample was representative of the Dutch population on most parameters, those with insufficient mastery of Dutch, those with no permanent residential address, and those who were long-term institutionalized were excluded from participation.

To conclude, the present study shows that the mental state of a population is subject to gradual changes, probably related to long-term sociocultural developments, and that youngsters and city dwellers seem to be more sensitive to these developments. The study also shows that adversities of shorter duration (such as the COVID-19 pandemic) have little or no effect on that mental state. This could suggest effective resilience and adaptation, although time-lag effects of the pandemic may yet be felt[53]. These findings reaffirm the role of social determinants as risk factors for common mental disorders, and the need to develop and implement effective mental health promotion programmes, and to ensure timely access to mental health care, especially for young people[57].

REFERENCES

1. Fink G. Stress: the health epidemic of the 21st century. Neuroscience, April 26, 2016.
2. Fynes-Clinton J. Stress will take its toll. Courier Mail, May 10, 2012.
3. Whiteford HA, Degenhardt L, Rehm J et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet 2013;382:1575-86.
4. Andersen I, Thielen K, Bech P et al. Increasing prevalence of depression from 2000 to 2006. Scand J Publ Health 2011;39:857-63.
5. Compton WM, Conway KP, Stinson FS et al. Changes in the prevalence of major depression and comorbid substance use disorders in the United States between 1991-1992 and 2001-2002. Am J Psychiatry 2006;163:2141-7.
6. Fu TS , Lee C-S, Gunnell D et al. Changing trends in the prevalence of common mental disorders in Taiwan: a 20-year repeated cross-sectional survey. Lancet 2013;381:235-41.
7. Goldney RD, Eckert KA, Hawthorne G et al. Changes in the prevalence of major depression in an Australian community sample between 1998 and 2008. Aust N Z J Psychiatry 2010;44:901-10.
8. Grant BF, Chou SP, Saha TD et al. Prevalence of 12-month alcohol use, high-risk drinking, and DSM-IV alcohol use disorder in the United States, 2001-2002 to 2012-2013. Results from the National Epidemiologic Survey on Alcohol and Related Conditions. JAMA Psychiatry 2017;74:911-23.
9. Hasin DS, Saha TD, Kerridge BT et al. Prevalence of marijuana use disorders in the United States between 2001-2002 and 2012-2013. JAMA Psychiatry 2015; 72:1235-42.
10. Park JE, Lee J-Y, Sohn JH et al. Ten-year trends in the prevalence and correlates of major depressive disorder in Korean near-elderly adults: a comparison of repeated nationwide cross-sectional studies from 2001 and 2011. Soc Psychiatry Psychiatr Epidemiol 2015;50:1399-406.
11. Park SH, Kim CH, Kim DJ et al. Secular trends in prevalence of alcohol use disorder and its correlates in Korean adults: results from Korea National Health and Nutrition Examination Survey 2005 and 2009. Subst Abus 2012;33: 327-35.
12. Twenge JM, Cooper AB, Joiner TE et al. Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005-2017. J Abnorm Psychol 2019;128:185-99.
13. Yu B, Zhang X, Wang C et al. Trends in depression among adults in the United States, NHANES 2005-2016. J Affect Disord 2020;263:609-20.
14. Baumeister SE, Schomerus G, Schmidt C-O et al. Change in depressive symptoms and mental health-related quality of life in northeast Germany between 1997-2001 and 2008-2012. Int J Publ Health 2015;60:33-9.
15. Cebrino J, Portero de la Cruz S. Environmental, health and sociodemographic determinants related to common mental disorders in adults: a Spanish country-wide population-based study (2006-2017). J Clin Med 2020;9:2199.
16. De Graaf R, ten Have M, Van Gool C et al. Prevalence of mental disorders, and trends from 1996 to 2009. Results from the Netherlands Mental Health Survey and Incidence Study-2. Soc Psychiatry Psychiatr Epidemiol 2012;47:203-13.
17. Dobson KG, Vigod SN, Mustard C et al. Trends in the prevalence of depression and anxiety disorders among working-age Canadian adults between 2000 and 2016. Health Rep 2020;31:12-23.
18. Eaton WW, Kalaydjian A, Scharfstein DO et al. Prevalence and incidence of depressive disorder: the Baltimore ECA follow-up, 1981-2004. Acta Psychiatr Scand 2007;116:182-8.
19. Kessler RC, Demler O, Frank RG et al. Prevalence and treatment of mental disorders, 1990 to 2003. N Engl J Med 2005;352:2515-23.
20. Markkula N, Zitko P, Peña S et al. Prevalence, trends, correlates and treatment of depression in Chile in 2003 to 2010. Soc Psychiatry Psychiatr Epidemiol 2017; 52:399-409.
21. Mojtabai R, Jorm AF. Trends in psychological distress, depressive episodes and mental health treatment-seeking in the United States: 2001-2012. J Affect Disord 2015;174:556-61.
22. Patten SB, Williams JVA , Lavorato DH et al. The prevalence of major depression is not changing. Can J Psychiatry 2015;60:31-4.
23. Spiers N, Qassem T, Bebbington P et al. Prevalence and treatment of common mental disorders in the English national population, 1993-2007. Br J Psychiatry 2016;209:150-6.
24. Mehta K, Kramer H, Durazo-Arvizu R et al. Depression in the US population during the time periods surrounding the great recession. J Clin Psychiatry 2015; 76:e499-504.
25. Patel V, Burns JK, Dhingra M et al. Income inequality and depression: a systematic review and meta-analysis of the association and a scoping review of mechanisms. World Psychiatry 2018;17:76-89.

26. Santos HC, Varnum MEW, Grossmann I. Global increases in individualism. Psychol Sci 2017;28:1228-39.
27. Ruths S, Haukenes I, Hetlevik Ø et al. Trends in treatment for patients with depression in general practice in Norway, 2009-2015: nationwide registry-based cohort study (The Norwegian GP-DEP Study). BMC Health Serv Res 2021; 21:697.
28. Steffen A, Thom J, Jacobi F et al. Trends in prevalence of depression in Germany between 2009 and 2017 based on nationwide ambulatory claims data. J Affect Disord 2020;271:239-47.
29. Kessler RC, Ruhm CJ, Puac-Polanco V et al. Estimated prevalence of and factors associated with clinically significant anxiety and depression among US adults during the first year of the COVID-19 pandemic. JAMA Netw Open 2022;5:e2217223.
30. The COVID-19 Mental Disorders Collaborators. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. Lancet 2021;398:1700-12.
31. Ayuso-Mateos JL, Morillo D, Haro JM et al. Changes in depression and suicidal ideation under severe lockdown restrictions during the first wave of the COVID-19 pandemic in Spain: a longitudinal study in the general population. Epidemiol Psychiatr Sci 2021;30:e49.
32. Knudsen AKS, Stene-Larsen K, Gustavson K et al. Prevalence of mental disorders, suicidal ideation and suicides in the general population before and during the COVID-19 pandemic in Norway: a population-based repeated cross-sectional analysis. Lancet Reg Health Eur 2021;4:100071.
33. Winkler P, Mohrova Z, Mlada K et al. Prevalence of current mental disorders before and during the second wave of COVID-19 pandemic: an analysis of repeated nationwide cross-sectional surveys. J Psychiatr Res 2021;139:167-71.
34. ten Have M, Tuithof M, Van Dorsselaer S et al. The Netherlands Mental Health Survey and Incidence Study-3 (NEMESIS-3): objectives, methods and baseline characteristics of the sample. Int J Methods Psychiatr Res 2022; doi:10.1002/mpr.1942.
35. De Graaf R, ten Have M, van Dorsselaer S. The Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2): design and methods. Int J Methods Psychiatr Res 2010;193:125-41.
36. Beullens K, Loosveldt G, Vandenplas C et al. Response rates in the European Social Survey: increasing, decreasing, or a matter of fieldwork efforts? Survey Methods: Insights from the Field, 2018. https://surveyinsights.org/?p=9673.
37. De Leeuw E, Hox J, Luiten A. International nonresponse trends across countries and years: an analysis of 36 years of labour force survey data. Survey Methods: Insights from the Field, 2018. https://surveyinsights.org/?p=10452.
38. Toledano MB, Smith RB, Brook JP et al. How to establish and follow up a large prospective cohort study in the 21st century – lessons from UK COSMOS. PLoS One 2015;10:e0131521.
39. Kessler RC, Üstün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res 2004;13:93-121.
40. Fayyad J, De Graaf R, Kessler R et al. Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder. Br J Psychiatry 2007;190:402-9.
41. Haro JM, Arbabzadeh-Bouchez S, Brugha TS et al. Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standard-ized clinical assessments in the WHO World Mental Health Surveys. Int J Methods Psychiatr Res 2006;15:167-80.
42. ten Have M, Oldehinkel A, Vollebergh W et al. Does educational background explain inequalities in care service use for mental health problems in the Dutch general population? Acta Psychiatr Scand 2003;107:178-87.
43. Wall MM. Are you looking for the right interactions? Additive versus multiplicative interactions with dichotomous outcome variables. Presented at the Meeting of the Eastern North American Region International Biometric Society, Orlando, March 2013.
44. Moffitt TE, Caspi A, Taylor A et al. How common are common mental disorders? Evidence that lifetime prevalence rates are doubled by prospective versus retrospective ascertainment. Psychol Med 2010;40:899-909.
45. Kessler RC, Üstün TB (eds). The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders. New York: Cambridge University Press, 2008.
46. Olfson M, Blanco C, Wall MM et al. Treatment of common mental disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions-III. J Clin Psychiatry 2019;80:18m12532.
47. ten Have M, Nuyen J, Beekman A et al. Common mental disorder severity and its association with treatment contact and treatment intensity for mental health problems. Psychol Med 2013;43:2203-13.
48. Kessler RC, Merikangas KR, Berglund P et al. Mild disorders should not be eliminated from the DSM-V. Arch Gen Psychiatry 2003;60:1117-22.
49. Alonso J, Angermeyer MC, Bernert S et al. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. Acta Psychiatr Scand 2004;109(Suppl. 420):21-7.
50. Reynolds K, Pietrzak RH, El-Gabalawy R et al. Prevalence of psychiatric disorders in U.S. older adults: findings from a nationally representative survey. World Psychiatry 2015;14:74-81.
51. Bijl RV, Ravelli A, van Zessen G. Prevalence of psychiatric disorder in the general population: results of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). Soc Psychiatry Psychiatr Epidemiol 1998;33:587-95.
52. Vloo A, Alessie RJM, Mierau JO et al. Gender differences in the mental health impact of the COVID-19 lockdown: longitudinal evidence from the Netherlands. SSM Popul Health 2021;15:100878.
53. Penninx BWJH, Benros ME, Klein RS et al. How COVID-19 shaped mental health: from infection to pandemic effects. Nat Med 2022;28:2027-37.
54. Sharma MK, John N, Sahu M. Influence of social media on mental health: a systematic review. Curr Opin Psychiatry 2020;33:467-75.
55. Torous J, Bucci S, Bell IH et al. The growing field of digital psychiatry: current evidence and the future of apps, social media, chatbots, and virtual reality. World Psychiatry 2021;20:318-35.
56. Cosma A, Stevens G, Martin G et al. Cross-national time trends in adolescent mental well-being from 2002 to 2018 and the explanatory role of schoolwork pressure. J Adolesc Health 2020;66:S50-8.
57. McGorry PD, Mei C, Chanen A et al. Designing and scaling up integrated youth mental health care. World Psychiatry 2022;21:61-76.