



Age of onset and cumulative risk of mental disorders

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Age-of-onset and cumulative risk of mental disorders: A cross-national analysis of population surveys data based on 156,331 respondents from 29 countries

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Abstract

Background: Information on frequency and timing of mental disorder onsets across the lifespan is of fundamental importance for public health planning. Broad-based cross-national estimates of this sort from coordinated general population surveys were last updated 15 years ago.

Methods: Data were analyzed for 156,331 adults (18 years and older) in the World Mental Health surveys, a coordinated series of cross-sectional face-to-face community epidemiological surveys in 29 countries administered between 2001 and 2022. A fully structured lay-administered psychiatric diagnostic interview was used to assess age-of-onset, lifetime prevalence, and morbid risk of 13 mental disorders through age 75 across surveys by sex. Ethnicity was not assessed.

Outcomes: Lifetime prevalence (percent [95% CI]) of any mental disorder was 28·6% (27·9-29·2%) males and 29·8% (29·2-30·3%) females. Morbid risk by age 75 was substantially higher – 46·4% (44·9-47·8%) for males and 53·1% (51·9-54·3%) for females. Conditional probabilities of first onset peaked at age 15, with median age-of-onset of 19 for males and 20 for females. The two most prevalent disorders were alcohol abuse and major depression for males and major depression and specific phobia disorder for females.

Interpretation: By age 75, approximately half the population can expect to develop one or more of the mental disorders considered here. These disorders typically first emerge in childhood, adolescence, or young adulthood. Given these findings, services need to have the capacity to detect and treat common mental disorders promptly and to optimize services that suit patients in these critical parts of the life course.

Funding: See below.

Research in context

Evidence before this study

Age-of-onset (AOO), lifetime prevalence, and lifetime morbid risk of mental disorders are key estimates required for service planning on frequency of disorders when in the life course disorders first emerge. Previous studies of these estimates often relied on suboptimal samples (eg, case-only samples, treated patients via registers). Few studies presented both AOO and lifetime prevalence for diverse mental disorders based on population-based data from multiple countries. We searched PubMed with the search terms: (["age of onset"[TIAB] OR "lifetime prevalence"[TIAB] OR "morbid risk"[TIAB] OR "cumulative incidence" [TIAB]) AND (mental[TIAB] OR psychiatri*[TIAB]) for articles in any language published between January 1, 1966 and June 30, 2022. We identified 4050 articles (including 93 systematic reviews). Most studies focused on one type of mental disorder in one country. A systematic review of AOO summarized data from 192 studies but did not examine lifetime prevalence. With respect to cross-national studies, one 2007 study reported country-specific AOO, lifetime prevalence, and morbid risk for 17 countries, but cross-national and sex-specific estimates were not presented.

Added value of this study

We present data from 32 coordinated community epidemiological surveys in 29 countries (12 low- and middle-income countries; 17 high-income countries) including 156,331 adult (ages 18+) survey respondents on thirteen types of DSM-IV/DSM-5 mental disorders. These included 16 of the 17 surveys in the 2007 report noted above (the exceptions being a survey no longer available from mainland China) with a combined sample of 81,342 respondents plus 74,989

respondents from 16 more recent surveys from some of the same and 13 additional countries. We present sex-specific cross-national estimates of AOO distributions, including median AOO, lifetime prevalence, and morbid risk up through age 75 for 13 types of mental disorders. Lifetime prevalence for any mental disorder was 28·6% for males and 29·8% for females. Morbid risk by age 75 was 46·4% for males and 53·1% for females. Conditional probabilities of first onset peaked at age 15, with median age-of-onset of 19 for males and 20 for females. The results are displayed graphically in an interactive data visualization website.

Implications of all the available evidence

Mental disorders are common: by age 75. Many disorders have first onsets in childhood through young adulthood. Given these findings, health planners need to ensure sufficient services to reach out and treat mental disorders among young people.

INTRODUCTION

Age-of-onset (AOO), lifetime prevalence (ie, the proportion of survey respondents with a history of disorder at the time of assessment), and lifetime morbid risk (ie, the projected lifetime prevalence in the sample as of a fixed age) are essential features of epidemiology. In recent decades, psychiatric epidemiology has demonstrated that many mental disorders have an onset in the first and second decades of life.^{1,2} This is in contrast to most other non-communicable disorders, (eg, respiratory and cardiovascular disorders, cancer), which typically have onsets in late adulthood. Understanding these AOO patterns is important for several reasons. First, we need to ensure that the correct mix of services is available to provide prompt treatments to the right groups (eg, early intervention for teenagers with mental disorders). Second, we need to focus research efforts on understanding risk factors for different types of mental disorders during critical parts of the lifespan. Third, register-based family pedigree studies,³ and genome-wide association studies based on case-control or case-cohort studies⁴ increasingly use AOO distributions to weight non-cases at the time of sample ascertainment according to their estimated future morbid risk of the disorder of interest, making it important to have accurate information about AOO distributions, although other factors are also important in controlling for bias in these types of studies. Fourth, disease-specific AOO distributions are important inputs for models used to estimate the non-fatal burden of disease.⁵

The most comprehensive data on AOO, lifetime prevalence, and morbid risk of common mental disorders to date were reported 15 years ago by the WMH Survey collaborators based on data obtained in coordinated community epidemiologic surveys from 17 countries.¹ Key features (eg, median and other quantiles) were reported, providing compelling evidence that

many mental disorders first emerge between childhood and early adulthood. More recently, Solmi and colleagues presented a systematic review and meta-analysis of published literature on AOO (n = 192 studies).² The authors noted that included studies were heterogeneous, making it difficult to pool data, but tables nonetheless displayed key properties of AOO distributions (eg, peak AOO, proportion with onset by age 25) by disorder type and sex.

Most commonly, epidemiologic studies show sex-specific incidence rates by age; that is, rate of first onset at specific ages defined as a ratio of the number of disorder onsets divided by the number of people who never had the disorder up to that age and lived through that age.

Figures based on these estimates allow calculation of cumulative lifetime risk by sex.

Whereas incidence rates can either increase or decrease with increasing age, cumulative risk curves are always non-decreasing. Univariate statistics can be derived from these cumulative risk curves (eg, median, 25th and 75th percentiles of the AOO distributions) to estimate lifetime morbid risk (ie, the projected proportion of the population who will have a lifetime disorder as of a given age). However, morbid risk does not tell us how many people experienced the disorder as of their current age, which is known as lifetime prevalence. By comparing the ratio of morbid risk as of some age (in our case, age 75) to lifetime prevalence (henceforth MR/LP ratio), we can appreciate how age-related incidence interacts with background population age structure. Disorders with peak incidence in early life will have a lower MR/LP ratio than disorders with peak hazard rates later in life.

Existing data on AOO and morbid risk are prone to under-reporting,⁶ as survey data rely on memory. Recall bias may result in a systematic bias against recalling events in the distant past or telescoping the recalled AOO. While the structured interview used in WMH is designed to reduce recall bias,⁷ accuracy can also be improved by focusing on respondents

who reported more recent onsets (eg, in the last 10 years).⁸ This method is used here to update WMH AOO and morbid risk estimates. In the years since the 2007 publication of the WMH AOO study, WMH surveys have been completed with 74,989 respondents, including some in 13 additional countries. We combine these new data with data from the earlier WMH surveys to provide updated and improved estimates of AOO distributions, lifetime prevalence, and morbid risk and to provide look-up tables for use in a range of epidemiologic and genetic studies.

METHODS

Samples

Data were obtained from 32 WMH surveys carried out in 29 countries (12 low- and middle-income countries; 17 high-income countries). All surveys were based on rigorous multi-stage geographically clustered area probability household sampling designs. An overview of samples can be found in Table 1. A detailed description of sample designs is presented in an earlier report.⁹ The weighted average response rate across surveys was 63·6%. A discussion of possible reasons for variation in WMH response rates is presented elsewhere.¹⁰

Interviews were in two parts. Part I was administered to one, or in a few surveys two, randomly selected adults in each sampled household. Part I contained assessments of core mental disorders (depression, mania, panic disorder, social phobia, specific phobia, agoraphobia, generalized anxiety disorder, substance use disorder). A Part I weight adjusted for differential probabilities of selection within households (based on number of eligible adults in the household) and between households (based on discrepancies between Census estimates of number of households in a sample segment and the number of households found when the interviewers visited the segments). Part II, which included questions about other

mental disorders and correlates, was then administered to 100% of Part I respondents who met lifetime criteria for any Part I disorder in addition to a probability subsample of other Part I respondents. A Part II weight equal to the inverse of the probability of selection into Part II was used to restore the representativeness of the Part II sample, resulting in prevalence estimates of Part I disorders in the doubly weighted Part II sample having the same expected values weighted prevalence estimates in the Part I sample. A third weight was then applied to the doubly weighted Part II sample to calibrate discrepancies between sample and population distributions on the cross-classification of Census socio-demographic and geographic variables.

Choice of primary measures

The WHO Composite International Diagnostic Interview (CIDI)¹¹ was used to assess DSM-IV disorders in the WMH surveys (other than DSM-5 disorders in the most recent survey, which was carried out in Qatar). The CIDI is a fully structured diagnostic interview administered by trained lay interviewers who read questions word for word and record answers in prespecified categories. Consistent interviewer training and quality control monitoring procedures were used across surveys.¹² Based on DSM-IV/DSM-5 criteria, thirteen specific diagnoses were identified: panic disorder and/or agoraphobia, generalized anxiety disorder, post-traumatic stress disorder, social phobia, specific phobia, major depressive disorder, bipolar disorder, alcohol abuse disorder, alcohol dependence disorder, drug abuse disorder, drug dependence disorder, attention deficit/hyperactivity disorder, and intermittent explosive disorder. In addition, diagnoses were pooled for any anxiety disorder, any mood disorder, any substance use disorder, any externalizing disorder. and any disorder. Clinical reappraisal studies indicated that lifetime diagnoses based on the CIDI have good

concordance with diagnoses based on masked semi-structured (ie, allowing open-ended clinical probing) clinical research diagnostic interviews.¹³

Respondents who met lifetime criteria for a given disorder were asked about their AOO using a question series designed to review core symptoms and encourage accurate dating. For example, the question about onset of a major depressive episode was administered after the completion of a question series that focused on symptoms of the respondents' worst lifetime establishing that lifetime criteria were met. The next question after completing that question series was: "*Think of the very first time in your life when you had an episode lasting two weeks or longer when most of the day nearly every day you felt (sad/or/discouraged/or/uninterested) and also had some of the other problems we just reviewed. Can you remember your exact age (Emphasis in original)?*" Respondents who could not remember their exact ages were then probed for the earliest age they could clearly remember having the syndrome with the goal of obtaining upper bound AOO estimates. It is noteworthy, though, that symptom-level assessments were only obtained for worst lifetime episodes, not for first onsets, introducing the possibility that AOO estimates were for subthreshold episodes. A more detailed description of the CIDI is presented elsewhere.¹¹

Statistical analyses

Results were pooled across surveys with sums of weights equal to numbers of respondents rather than equal to country populations. Lifetime prevalence was estimated in the final doubly weighted and calibrated Part II sample as the proportion of respondents who ever had a given disorder as of interview. For each disorder, conditional probability of first onset at each year of life t (ie, incidence by year of life) was then estimated in the subsample of respondents who were at least t years of age and reported not having had the disorder as of

age $t-1$. In calculating these conditional probabilities, we used information only from respondents in the age range t to $t + 10$ to minimize recall bias. We then calculated cumulative lifetime disorder risk up to age 75 (ie, morbid risk) from these incidence data using the standard exponential formula.¹⁴ Smoothing was used with a five-year bandwidth to reduce instability in estimates. Standard errors of both incidence rates and cumulative incidence curves were calculated using the jackknife repeated replications (JRR) simulation method taking into consideration both the weighting and geographic clustering of the WMH data.¹⁵ In using JRR, surveys were treated as sets of independent strata and strata within surveys were defined as primary sampling units (equivalent to counties or municipalities in the USA). The sampling error calculation units (subsamples within strata) used to generate the JRR estimates were second-stage sampling units equivalent to neighborhoods.

It is noteworthy that the approach used here to estimate conditional probability of first disorder onset within specific years of life took into consideration right censoring (ie, the fact that not all respondents reached the age of t as of the time of survey) by excluding (censoring) respondents who are not yet t years of age from the denominator. The restriction of estimates to respondents no older than $t + 10$ years of age also reduced the effects of bias due to premature mortality. However, premature mortality bias could still occur if mortality depended on history of mental disorders and systematic nonresponse based on factors related to the age-specific disorder risks. This possibility of residual bias is inevitable in community surveys, although it can be addressed in population registry data.¹⁶ The direction of this potential bias cannot be assessed rigorously in the absence of information about disorder risk and censoring. However, given that people with mental disorders have reduced life spans¹⁷ and that people with known histories of psychiatric hospitalization have been found to have

comparatively low response rates in epidemiologic surveys,¹⁸ it is reasonable to assume that bias is in the direction of under-estimating risk.

We compared lifetime prevalence estimates by sex with Wald chi-square tests and two-sided p values. We show these estimates along with 95% confidence intervals. As the WMH data are both geographically clustered and weighted, the design-based Taylor series linearization method implemented in version 9.4 of SAS software¹⁹ was used to estimate standard errors.

An interactive data-visualization website is available here

[<https://csievert.shinyapps.io/mental-aoo/>]. The age- and sex- specific data underlying the figures are available in the Supplementary Data and can be downloaded from the data visualization website.

Consent

Informed consent was obtained from respondents before beginning the interview. Procedures for obtaining informed consent and data protection (ethical approvals) were somewhat different across countries but were always obtained from the institutional review boards of the collaborating organizations in each country before beginning the survey. Data use agreements allowed only de-identified data to be deposited in the centralized WMH server and required all analyses to be carried out on that server only by trained and approved WMH analysts.

Role of the funding source

None of the funders had any role in the design, analysis, interpretation of results, or preparation of this paper. The views and opinions expressed in this report are those of the

authors and should not be construed to represent the views of the sponsoring organizations, agencies, or governments.

RESULTS

Lifetime prevalence of any mental disorder was 28·6% (95% CI = 27·9-29·2%) for males and 29·8% (95% CI = 29·2-30·3%) for females (see Table 2). Lifetime prevalence of any anxiety disorder was 11·3% (95% CI = 10·9-11·7%) for males and 18·8% (95% CI = 18·3-19·2%) for females and of any mood disorder 9·5% (95% CI = 9·2-9·7%) for males and 15·4% (95% CI = 15·1-15·7%) for females. The three specific mental disorders with highest lifetime prevalence for males were alcohol abuse disorder (13·7%, 95% CI = 13·3-14·1%), major depressive disorder (7·5%, 95% CI = 7·2-7·7%) and specific phobia (5·0%, 95% CI = 4·8-5·3%) and for females were major depressive disorder (13·6%, 95% CI = 13·3-13·9%), specific phobia (10·0%, 95% CI = 9·7-10·2%) and post-traumatic stress disorder (5·4%, 95% CI = 5·2-5·7%).

As expected, projected lifetime morbid risk by age 75 for each mental disorder was considerably higher than observed lifetime prevalence at interview. Lifetime morbid risk of any disorder as of age 75 was 46·4% (95% CI = 44·9-47·8%) for males and 53·1% (95% CI = 51·9-54·3%) for females. The three disorders with highest lifetime morbid risk for men were alcohol abuse disorder (21·6%, 95% CI = 20·6-22·7%), major depressive disorder (20·1%, 95% CI = 19·2-20·9%), and drug abuse disorder (7·9%, 95% CI = 7·2-8·7%) (Table 3) and for females were major depressive disorder (34·0%, 95% CI = 33·2-34·9%), post-traumatic stress disorder (12·6%, 95% CI = 11·7-13·5%) and generalized anxiety disorder (12·5%, 95% CI = 11·8-13·2%).

The minimum, maximum, median, and interquartile range (25th and 75th percentiles of the AOO distribution) of cumulative lifetime risk as of age 75 are reported in Supplementary Table 1. Figure 1 shows smoothed (five-year bandwidth) incidence of first onset (number of cases per 10,000 people) of any disorder separately for males and females. Peak incidence was approximately at age 15, where males had higher incidence than females. However, across the rest of the lifespan, incidence was for the most part slightly higher among females than males. Cumulative risk curves (per 1,000 people) were higher across the lifespan for females than males. For any disorder, median AOO of first disorder was 19 for males and 20 females.

The MR/LP ratio also reflects the relatively high proportion of mental disorders that first occur in childhood, adolescence, or young adulthood (Table 3). Disorders with earlier onsets have MR/LP ratios closer to one, while disorders with a wider AOO distribution have MR/LP ratios greater than one. For males, the lowest MR/LP ratios were for attention-deficit/hyperactivity disorder, social phobia, and specific phobia (1.2-1.3), while the highest was for major depressive disorder (2.7). For females, the lowest MR/LP ratios were for attention-deficit/hyperactivity disorder, social phobia, and specific phobia (1.2-1.3), while the highest was for bipolar disorder (2.8).

The distributions show distinct features when disaggregated by broad general categories (Figure 2) or specific disorder types (Figure 3). For example, any externalizing disorder shows an early peak incidence in the first decade of life, while incidence of substance use disorders peaks around age 15. Both types of disorder are more common among males than females. The two most common groups of disorders (mood and anxiety disorders) are more common among females than males across the lifespan, but the peak incidence of any anxiety

disorder is at age 5 compared to age 15 for any mood disorder. Table 2 shows the Wald chi-square test comparing the lifetime prevalence for each specific disorder and broad general category. As expected, men and women differ significantly for each disorder, with mood and anxiety disorders significantly more common among females and substance and externalizing disorders more common among males.

As noted at the onset, the WMH surveys were carried out over a wide range of years. To see if results differed depending on time of survey, we replicated all analyses for broad classes of disorders and any disorder separately for the 81,342 respondents in the 2007 paper and the 74,989 additional respondents in more recent surveys. Results reported in Supplementary Table 2 shows broad consistency in relative prevalence across disorders and in comparing males versus females. Supplementary Table 3 shows broad consistency in MR/LP ratios between the earlier and more recent surveys. Supplementary Figures 1-2 show broad consistency in AOO distributions between the earlier and more recent surveys.

DISCUSSION

Based on surveys with 156,331 respondents from 29 countries, we reported estimates of AOO distributions, lifetime prevalence, and morbid risk for 13 mental disorders. We estimated that by age 75, about one in two individuals will develop at least one of the mental disorders considered here. We found the same female excess of anxiety and mood disorders and male excess of substance use and externalizing disorders as in other epidemiological surveys. Importantly, though, our findings, based as they are on more accurate estimates of AOO distributions than previous studies, confirm that many mental disorders have their first onsets during childhood, adolescence, or young adulthood and that some disorders have notably earlier ages of onset than others. The current report extended the WMH findings

reported in 2007 to close to twice as large a sample and included surveys from 29 countries compared to 17 in the earlier report.

Given that most major studies of AOO distributions in recent years have been based on register-based studies of treated mental disorders,²⁰ it is noteworthy that both commonalities and differences can be seen between those studies and the population-based results reported here. First, as expected, the lifetime morbid risk of any treated mental disorders based on registers is lower than the estimates found in population-based surveys. This is because epidemiological studies show that many people with mental disorders never receive treatment.²¹ Second, because of the well-documented delays in seeking treatment after the first onset of mental disorders,²² the AOO distributions for register-based studies tend to be right-shifted (ie, delayed) compared to population-based studies. This bias is sex-dependent, as females are more likely than males to seek treatment and to do so more quickly.²³

A key finding is the substantial proportion of mental disorders that have early first onsets. Strikingly, we found that half of those who develop a mental disorder before age 75 have their first onset by ages 19-20 (males and females). In addition to the traditional childhood onset disorders (eg, attention-deficit/hyperactivity disorder, social and specific phobia), common mental disorder such as major depressive disorder, generalized anxiety disorder, panic disorder and drug use disorders were found often to have their first onsets in childhood through early adulthood. This observation lends weight to the need to invest in mental health services that have a particular focus on young people.²⁴ While the median AOO for many disorders in males and females were comparable, our findings confirm significant sex differences in lifetime prevalence for each of the mental disorders examined, with anxiety disorders and major depressive disorder more common among females compared to impulse

control and substance use disorders more common among males. These differences are consistent with previous studies.²⁵

Limitations

While the current study has several major strengths (eg, cross-national, harmonized protocols, use of bounded recall and restricted recall period to reduce recall bias), it also has important limitations. First, surveys were carried out over a range of more than two decades, although there was good consistency of results. Second, all data were based on retrospective reports. Recall bias increases with length of recall, and can lead to under-identification of more temporally distant events,⁷ as illustrated in birth cohort studies.⁶ We based our estimates on onsets within ten years of interview to minimize this bias. Third, our definition of disorder onset was based on single questions rather than detailed diagnostic assessments for first recalled occurrence, leading to possible downwardly biased AOO estimates. Fourth, the surveys could have been biased due to differential response. Fifth, although the sample was large enough to generate relatively precise pooled disorder-specific estimates, it was not large enough to investigate between-country differences. Sixth, not all mental disorders were included in the CIDI. Seventh, we did not consider comorbidity. There is a growing appreciation that comorbidity is common within different types of mental disorders—individuals with one type of mental disorder are at increased risk of subsequently developing other types of mental disorders²⁶⁻²⁸—and that burden of illness is strongly influenced by comorbidity. While the current study provided lifetime estimates for any mental disorder and for specific types of disorder, we did not consider patterns of comorbidity and how that change over the life course.²⁷ We hope to explore this issue in future studies.

In summary, our study reconfirmed the fact that mental disorders are common across the lifespan. We provided updated estimates of AOO distributions, lifetime prevalence, and morbid risk for a range of mental disorders using improved methods to reduce the effects of recall bias. These estimates will be of value to service planners as well as researchers interested in the burden of disease^{5,29} and genetic epidemiology.^{3,4}

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A complete list of all within-country and cross-national WMH publications can be found at <http://www.hcp.med.harvard.edu/wmh/>.

Contributors

Conceptualization of study and study design – JJM, RCK

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Data sharing statement

Access to the cross-national World Mental Health (WMH) data is governed by the organizations funding and responsible for survey data collection in each country. These organizations made data available to the WMH survey consortium through restricted data sharing agreements that do not allow data to be released to third parties. The exception is that the U.S. data are available for secondary analysis via the Inter-University Consortium for Political and Social Research (ICPSR),

<http://www.icpsr.umich.edu/icpsrweb/ICPSR/series/00527>.

Declaration of interests

LD reports untied educational grants from Indivior and Seqirus for the study of new opioid medications in Australia.

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In the past 3 years, RCK was a consultant for Cambridge Health Alliance, Canandaigua VA Medical Center, Holmusk, Partners Healthcare, Inc., RallyPoint Networks, Inc., and Sage Therapeutics. He has stock options in Cerebral Inc., Mirah, PYM, Roga Sciences and Verisense Health.

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All other authors declare no competing interests.

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Table 1. WMH sample characteristics by World Bank income categories^a

Country by income category	Survey ^b	Sample characteristics ^c	Sample size					Response rate ^e
			Field dates	Age range	Part I	Part II	Part II and age ≤ 44 ^d	
I. Low and middle income countries								
Brazil - São Paulo	São Paulo Megacity	São Paulo metropolitan area.	2005-8	18-93	5,037	2,942	NA	81·3
Bulgaria	NSHS	Nationally representative.	2002-6	18-98	5,318	2,233	741	72·0
Bulgaria 2	NSHS - 2	Nationally representative.	2016-17	18-91	1,508	578	NA	61·0
Colombia ^g	NSMH	All urban areas of the country (approximately 73% of the total national population).	2003	18-65	4,426	2,381	1,731	87·7
Colombia – Medellin	MMHHS	Medellin metropolitan area	2011-12	19-65	3,261	1,673	NA	97·2
Iraq	IMHS	Nationally representative.	2006-7	18-96	4,332	4,332	NA	95·2
Lebanon ^g	LEBANON	Nationally representative.	2002-3	18-94	2,857	1,031	595	70·0
Mexico ^g	M-NCS	All urban areas of the country (approximately 75% of the total national population).	2001-2	18-65	5,782	2,362	1,736	76·6
Nigeria ^g	NSMHW	21 of the 36 states in the country, representing 57% of the national population. The surveys were conducted in Yoruba, Igbo, Hausa and Efik languages.	2002-4	18-100	6,752	2,143	1,203	79·3
Peru	EMSMP	Five urban areas of the country (approximately 38% of the total national population).	2004-5	18-65	3,930	1,801	1,287	90·2
PRC ^f - Shenzhen ^h	Shenzhen	Shenzhen metropolitan area. Included temporary residents as well as household residents.	2005-7	18-88	7,132	2,475	NA	80·0
Romania	RMHS	Nationally representative.	2005-6	18-96	2,357	2,357	NA	70·9
South Africa ^{g,h}	SASH	Nationally representative.	2002-4	18-92	4,315	4,315	NA	87·1
Ukraine ^g	CMDPSD	Nationally representative.	2002	18-91	4,725	1,720	541	78·3
TOTAL					(61,732)	(32,343)	(7,834)	80·4
II. High-income countries								
Argentina	AMHES	Eight largest urban areas of the country (approximately 50% of the total national population).	2015	18-98	3,927	2,116	NA	77·3
Australia ^h	NSMHWB	Nationally representative.	2007	18-85	8,463	8,463	NA	60·0
Belgium ^g	ESEMeD	Nationally representative. The sample was selected from a national register of Belgium residents.	2001-2	18-95	2,419	1,043	486	50·6
France ^g	ESEMeD	Nationally representative. The sample was selected from a national list of households with listed telephone numbers.	2001-2	18-97	2,894	1,436	727	45·9
Germany ^g	ESEMeD	Nationally representative.	2002-3	19-95	3,555	1,323	621	57·8
Israel ^g	NHS	Nationally representative.	2003-4	21-98	4,859	4,859	NA	72·6
Italy ^g	ESEMeD	Nationally representative. The sample was selected from municipality resident registries.	2001-2	18-100	4,712	1,779	853	71·3

Japan ^g	WMHJ 2002-2006	Eleven metropolitan areas.	2002-6	20-98	4,129	1,682	NA	55-1
Netherlands ^g	ESEMeD	Nationally representative. The sample was selected from municipal postal registries.	2002-3	18-95	2,372	1,094	516	56-4
New Zealand ^{g,h}	NZMHS	Nationally representative.	2004-5	18-98	12,790	7,312	NA	73-3
N. Ireland	NISHS	Nationally representative.	2005-8	18-97	4,340	1,986	NA	68-4
Poland	EZOP	Nationally representative	2010-11	18-65	10,081	4,000	2,276	50-4
Portugal	NMHS	Nationally representative.	2008-9	18-81	3,849	2,060	1,070	57-3
Qatar	WMHQ	Nationally representative. The sample was selected from a national list of cellular telephone numbers and restricted to Qatari nationals and Arab expatriates.	2019-22	18-90	5,195	2,583	NA	19-2 ⁱ
Saudi Arabia ^h	SNMHS	Nationally representative	2013-2016	18-65	3,638	1,793	NA	61-0
Spain ^g	ESEMeD	Nationally representative.	2001-2	18-98	5,473	2,121	960	78-6
Spain-Murcia	PEGASUS-Murcia	Murcia region. Regionally representative.	2010-12	18-96	2,621	1,459	NA	67-4
United States ^g	NCS-R	Nationally representative.	2001-3	18-99	9,282	5,692	3,197	70-9
TOTAL							(94,599) (52,801) (10,706)	56-0
III. TOTAL							(156,331) (85,144) (18,540)	63-6

Abbreviations: NA, Not Applicable.

^a The World Bank (2012) Data. Accessed May 12, 2012 at: <http://data.worldbank.org/country>. Some of the WMH countries have moved into new income categories since the surveys were conducted. The income groupings above reflect the status of each country at the time of data collection. The current income category of each country is available at the preceding URL.

^b NSHS (Bulgaria National Survey of Health and Stress); NSMH (The Colombian National Study of Mental Health); MMHHS (Medellín Mental Health Household Study); IMHS (Iraq Mental Health Survey); LEBANON (Lebanese Evaluation of the Burden of Ailments and Needs of the Nation); M-NCS (The Mexico National Comorbidity Survey); NSMHW (The Nigerian Survey of Mental Health and Wellbeing); EMSMP (La Encuesta Mundial de Salud Mental en el Peru); RMHS (Romania Mental Health Survey); SASH (South Africa Health Survey); CMDPSD (Comorbid Mental Disorders during Periods of Social Disruption); AMHES (Argentina Mental Health Epidemiologic Survey); NSMHWB (National Survey of Mental Health and Wellbeing); ESEMeD (The European Study Of The Epidemiology Of Mental Disorders); WMHJ2002-2006 (World Mental Health Japan Survey); NZMHS (New Zealand Mental Health Survey); NISHS (Northern Ireland Study of Health and Stress); EZOP (Epidemiology of Mental Disorders and Access to Care Survey); NMHS (Portugal National Mental Health Survey); WMHQ (World Mental Health Qatar Study); SNMHS (Saudi National Mental Health Survey); PEGASUS-Murcia (Psychiatric Enquiry to General Population in Southeast Spain-Murcia); NCS-R (The US National Comorbidity Survey Replication).

^c Most WMH surveys are based on stratified multistage clustered area probability samples of household in the countries under study. Areas equivalent to counties or municipalities in the US were selected in the first stage followed by one or more subsequent stages of geographic sampling (e.g., towns within counties, blocks within towns, households within blocks) to arrive at a nationally representative sample of households. In each household, an attempt was made to obtain a listing of all adult household members. And then one or, in the case of a few surveys, two people were selected from this listing at random to be interviewed. No substitution of households was made when the originally sampled household could not be reached or listed. No substitution was allowed when the originally sampled household resident could not be interviewed. These household samples were selected from Census area data in all countries other than France (where telephone directories were used to select households) and the Netherlands (where postal registries were used to select households). Several WMH surveys (Belgium, Germany, Italy, Poland, Spain-Murcia) used municipal, country resident or universal health-care registries to select respondents without listing households. The Japanese sample is the only totally un-clustered sample, with households randomly selected in each of the 11 metropolitan areas and one

random respondent selected in each sample household. 21 of the 32 surveys are based on nationally representative household samples, whereas the others are based on regional samples.

^d Argentina, Australia, Brazil, Bulgaria 2, Colombia-Medellin, Iraq, Israel, Japan, New Zealand, Northern Ireland, PRC - Shenzhen, Qatar, Romania, Saudi Arabia, South Africa and Spain-Murcia did not have an age restricted Part 2 sample. All other surveys, with the exception of Nigeria and Ukraine (which were age restricted to ≤ 39) were age restricted to ≤ 44 .

^e The response rate is calculated as the ratio of the number of households in which an interview was completed to the number of households originally sampled, excluding from the denominator households known not to be eligible either because of being vacant at the time of initial contact or because the residents were unable to speak the designated languages of the survey. The weighted average response rate is 63.6%.

^f People's Republic of China

^g This was one of the surveys included in the 2007 WMH report.¹ All other surveys were carried out subsequent to that report.

^h For the purposes of cross-national comparisons we limit the sample to those 18+.

ⁱ The survey began as a face-to-face household survey and had to switch to be phone-based due to the COVID-19 pandemic occurring shortly after the study started.

Table 2. Count and lifetime prevalence of disorders, by sex

Type of mental disorder	Male				Female				Test statistics χ^2 (p-value)
	Number of lifetime cases at time of interview	Number of people in the sample in which the disorder was assessed	Lifetime prevalence		Number of lifetime cases at time of interview	Number of people in the sample in which the disorder was assessed	Lifetime prevalence		
			%	(95% CI)			%	(95% CI)	
N ₁	N ₂			N ₁	N ₂				
I. Anxiety disorders									
Panic disorder and/or agoraphobia	1309	67808	1.9	(1.8-2.1)	3303	83328	3.7	(3.6-3.9)	289.6 (<0.0001)
Generalized anxiety disorder	1955	71023	2.7	(2.6-2.9)	4500	85308	5.0	(4.8-5.1)	396.8 (<0.0001)
Post-traumatic stress disorder	1456	35446	2.7	(2.5-2.9)	3721	47223	5.4	(5.2-5.7)	279.8 (<0.0001)
Social phobia	2254	65428	3.5	(3.3-3.7)	3770	80849	4.6	(4.4-4.8)	69.5 (<0.0001)
Specific phobia	2825	56355	5.0	(4.8-5.3)	6954	68781	10.0	(9.7-10.2)	744.6 (<0.0001)
Any anxiety disorder	6559	39060	11.3	(10.9-11.7)	13830	50741	18.8	(18.3-19.2)	669.8 (<0.0001)
II. Mood disorders									
Major depressive disorder	5324	71023	7.5	(7.2-7.7)	12144	85308	13.6	(13.3-13.9)	1160.5 (<0.0001)
Bipolar disorder	1398	57559	2.5	(2.4-2.7)	1593	68307	2.3	(2.1-2.4)	7.2 (0.0074)
Any mood disorder	6674	71023	9.5	(9.2-9.7)	13675	85308	15.4	(15.1-15.7)	880.6 (<0.0001)
III. Substance use disorders									
Alcohol abuse disorder	7629	52757	13.7	(13.3-14.1)	2602	67650	3.3	(3.1-3.4)	2226.0 (<0.0001)
Alcohol dependence	2056	52757	3.5	(3.3-3.7)	840	67650	0.9	(0.9-1.0)	516.5 (<0.0001)
Drug abuse disorder	2083	46180	4.1	(3.9-4.3)	1204	59642	1.7	(1.6-1.8)	337.4 (<0.0001)
Drug dependence	711	46180	1.4	(1.3-1.6)	490	59642	0.6	(0.6-0.7)	89.9 (<0.0001)
Any substance use disorder	7926	46939	15.6	(15.2-16.1)	3181	60943	4.5	(4.2-4.7)	1960.2 (<0.0001)
IV. Externalizing disorders									
Attention deficit/hyperactivity disorder	571	19402	2.4	(2.1-2.7)	575	25116	1.5	(1.3-1.7)	26.1 (<0.0001)
Intermittent explosive disorder	1326	40529	3.5	(3.2-3.7)	1267	49561	2.5	(2.4-2.7)	39.4 (<0.0001)
Any externalizing disorder	1524	30526	4.3	(3.9-4.6)	1563	39231	3.1	(2.9-3.3)	43.0 (<0.0001)
V. Any mental disorder	14662	36700	28.6	(27.9-29.2)	21485	48444	29.8	(29.2-30.3)	9.2 (0.0024)

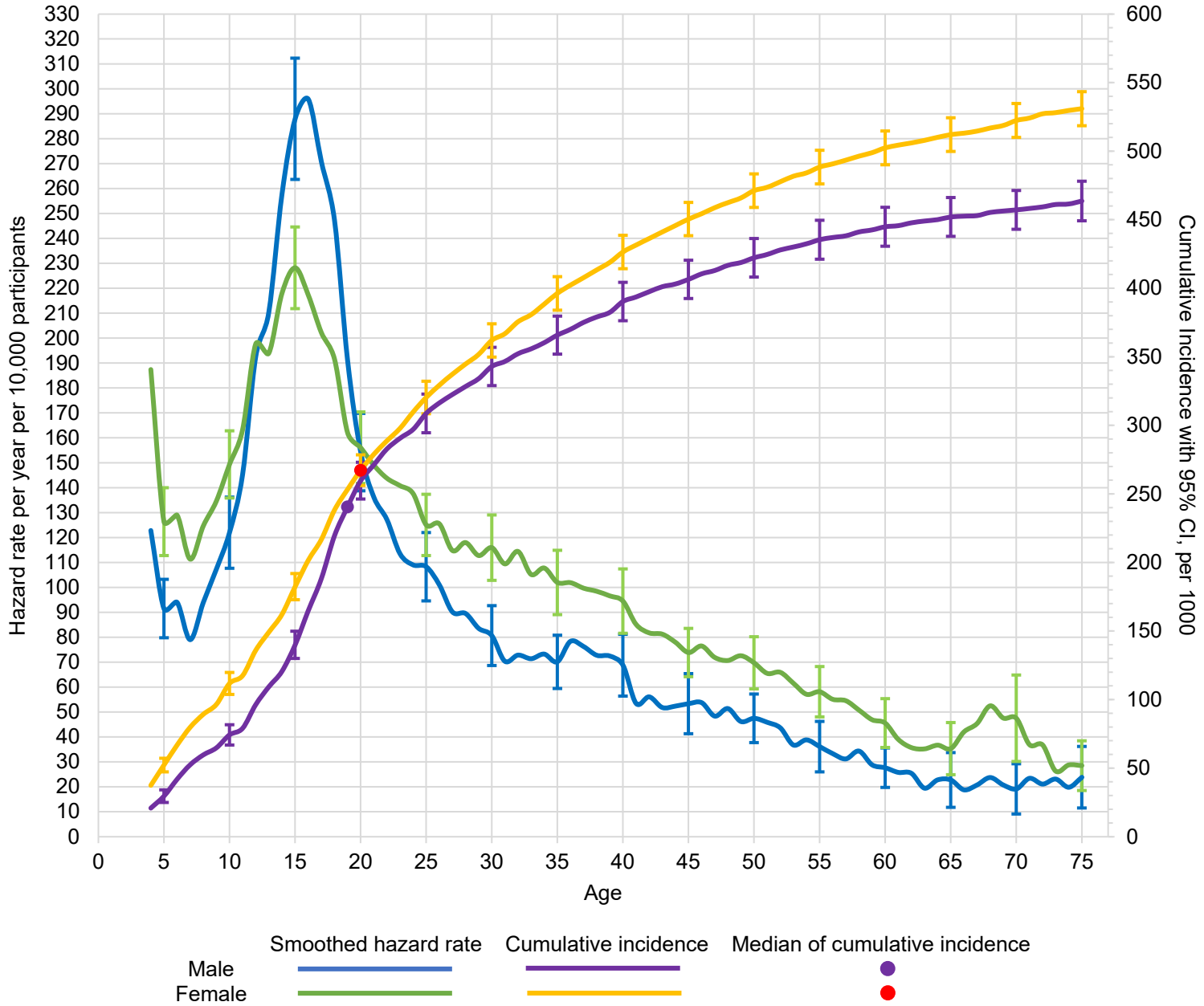
Abbreviations: N₁, observed (i.e., unweighted) number of respondents classified as meeting criteria for the disorder; N₂, observed (i.e., unweighted) number of respondents in the sample; %, the ratio of N₁ to N₂ in the weighted, not unweighted, data; 95% CI, 95% confidence interval of %; χ^2 , Wald test for significance of difference between male and female values of %; P, P value of χ^2 test.

Table 3. Morbid risk (per 100 participants) at 75 and ratio of morbid risk/lifetime prevalence by sex

Lifetime disorder	Morbid risk (per 100 participants at age 75)		Ratio of morbid risk to lifetime prevalence					
	MR	Male (95% CI)	MR	Female (95% CI)	MR/LP	Male (95% CI)	MR/LP	Female (95% CI)
I. Anxiety disorders								
Panic disorder and/or agoraphobia	3.6	(3.2-3.9)	7.3	(6.8-7.8)	1.8	(1.7-2.0)	2.0	(1.9-2.0)
Generalized anxiety disorder	6.5	(5.9-7.0)	12.5	(11.8-13.2)	2.4	(2.2-2.5)	2.5	(2.4-2.6)
Post-traumatic stress disorder	5.7	(5.1-6.3)	12.6	(11.7-13.5)	2.1	(1.9-2.2)	2.3	(2.2-2.4)
Social phobia	4.2	(3.8-4.6)	6.0	(5.5-6.4)	1.2	(1.1-1.3)	1.3	(1.2-1.4)
Specific phobia	5.9	(5.3-6.5)	11.6	(10.9-12.2)	1.2	(1.1-1.2)	1.2	(1.1-1.2)
Any anxiety disorder	18.3	(17.3-19.4)	31.0	(29.9-32.2)	1.6	(1.6-1.7)	1.7	(1.6-1.7)
II. Mood disorders								
Major depressive disorder	20.1	(19.2-20.9)	34.0	(33.2-34.9)	2.7	(2.6-2.8)	2.5	(2.4-2.5)
Bipolar disorder	6.3	(5.7-6.8)	6.2	(5.7-6.7)	2.5	(2.3-2.6)	2.8	(2.6-2.9)
Any mood disorder	24.5	(23.5-25.4)	37.9	(37.0-38.8)	2.6	(2.5-2.7)	2.5	(2.4-2.5)
III. Substance use disorder								
Alcohol abuse disorder	21.6	(20.6-22.7)	7.2	(6.7-7.7)	1.6	(1.5-1.6)	2.2	(2.1-2.3)
Alcohol dependence	6.1	(5.6-6.7)	2.3	(2.0-2.7)	1.8	(1.7-1.9)	2.4	(2.2-2.7)
Drug abuse disorder	7.9	(7.2-8.7)	4.2	(3.8-4.7)	1.9	(1.8-2.1)	2.5	(2.3-2.7)
Drug dependence	3.0	(2.4-3.5)	1.6	(1.4-1.9)	2.1	(1.8-2.3)	2.5	(2.3-2.8)
Any substance use disorder	24.4	(23.3-25.6)	9.9	(9.2-10.5)	1.6	(1.5-1.6)	2.2	(2.1-2.3)
IV. Externalizing disorders								
Attention deficit/hyperactivity disorder	3.0	(2.4-3.6)	1.8	(1.4-2.2)	1.3	(1.1-1.4)	1.2	(1.1-1.4)
Intermittent explosive disorder	5.9	(5.2-6.5)	5.2	(4.7-5.8)	1.7	(1.6-1.8)	2.1	(1.9-2.2)
Any externalizing disorder	6.8	(6.0-7.5)	5.6	(5.0-6.2)	1.6	(1.5-1.7)	1.8	(1.7-1.9)
V. Any mental disorder								
	46.4	(44.9-47.8)	53.1	(51.9-54.3)	1.6	(1.6-1.7)	1.8	(1.8-1.8)

Abbreviations: MR, morbid risk per 100 participants; 95% CI, 95% confidence interval of MR; MR/LP, ratio of MR to lifetime prevalence as of age 75.

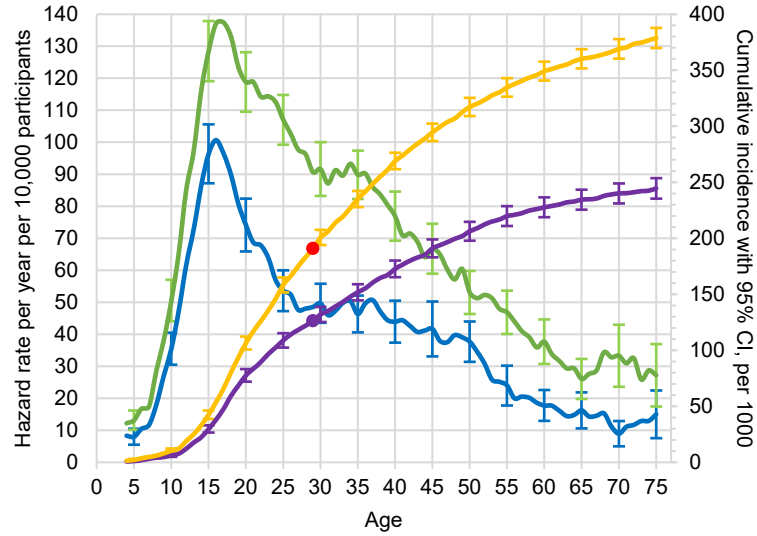
Figure 1. Smoothed hazard rate per year of age and cumulative incidence, with 95% confidence intervals by age and sex for any mental disorder^a



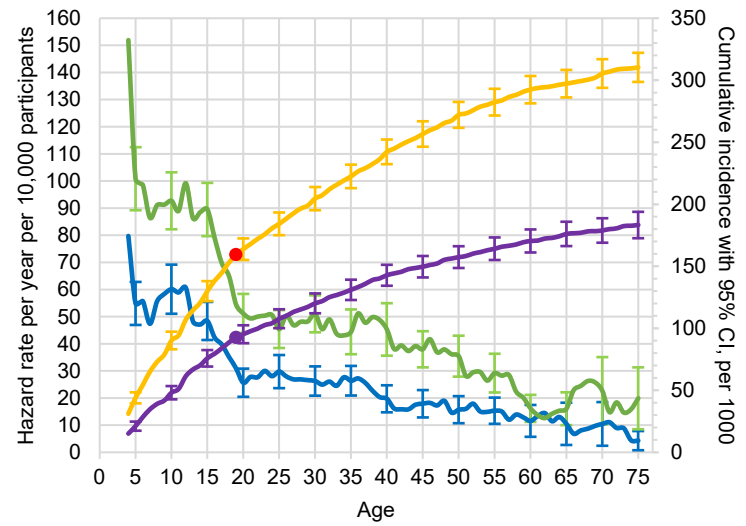
^a Left y-axis curves, with blue for males and green for females, are hazard rate (incidence rate) curves. These are calculated per year of age per 10,000 people, defined as a ratio of the number of disorder onsets at a given age among people who never had the disorder at any time up to that age and who lived through that age. For a given age t we used information only from respondents in the age range t to $t + 10$ to minimize the effects of recall bias. Right y-axis curves, with purple for males and yellow for females, are cumulative incidence (or morbid risk) curves. These are calculated based on the age-specific incidence rates at each year of life using the standard exponential formula.¹⁴

Figure 2: Smoothed hazard rates and cumulative incidence, with 95% confidence intervals by age and sex for any mood disorder, any anxiety disorder, any substance use disorder, and any externalizing disorder^a

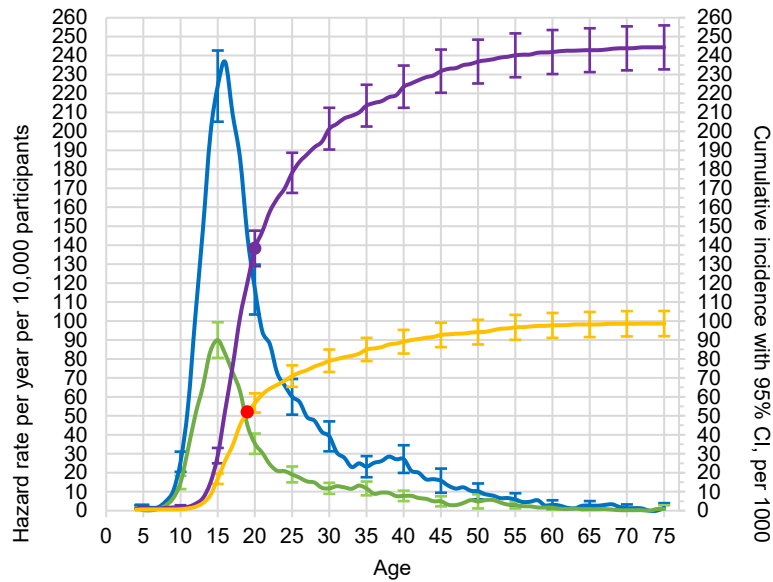
a. Any mood disorder



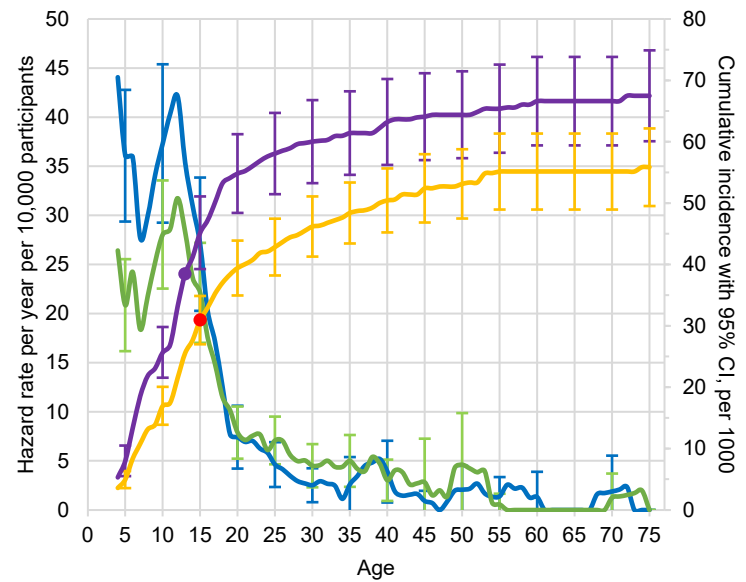
b. Any anxiety disorder



c. Any substance disorder



d. Any externalizing disorder



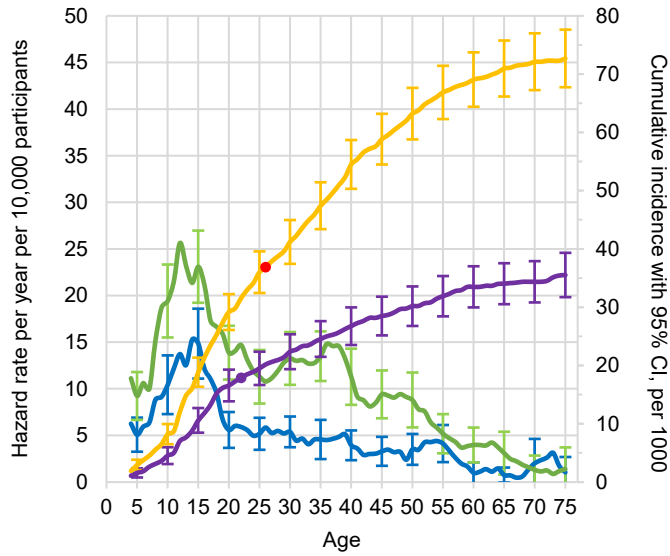
Smoothed hazard rate Cumulative incidence Median of cumulative incidence

Male ————— ————— ●
Female ————— ————— ●

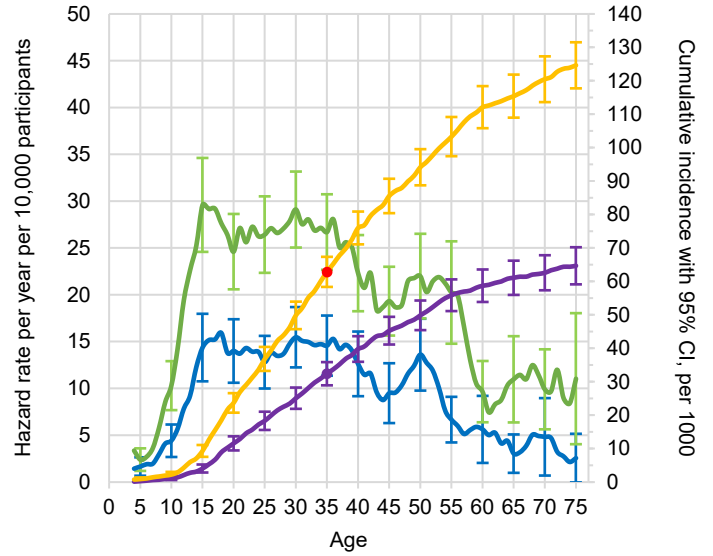
^a Left y-axis curves, with blue for males and green for females, are hazard rate (incidence rate) curves. These are calculated per year of age per 10,000 people, defined as a ratio of the number of disorder onsets at a given age among people who never had the disorder at any time up to that age and who lived through that age. For a given age t we used information only from respondents in the age range t to $t + 10$ to minimize the effects of recall bias. Right y-axis curves, with purple for males and yellow for females, are cumulative incidence (or morbid risk) curves. These are calculated based on the age-specific incidence rates at each year of life using the standard exponential formula.¹⁴

Figure 3. Smoothed Hazard Rate and cumulative incidence, with 95% confidence intervals by age and sex for thirteen specific disorders^a

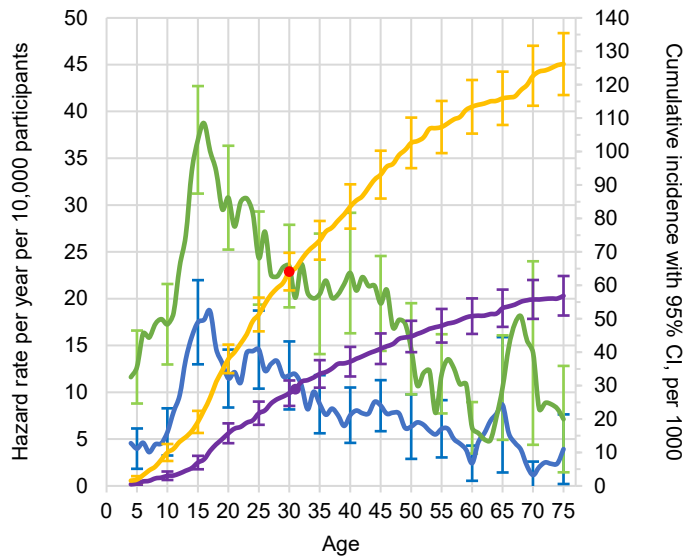
a. Panic disorder and/or agoraphobia



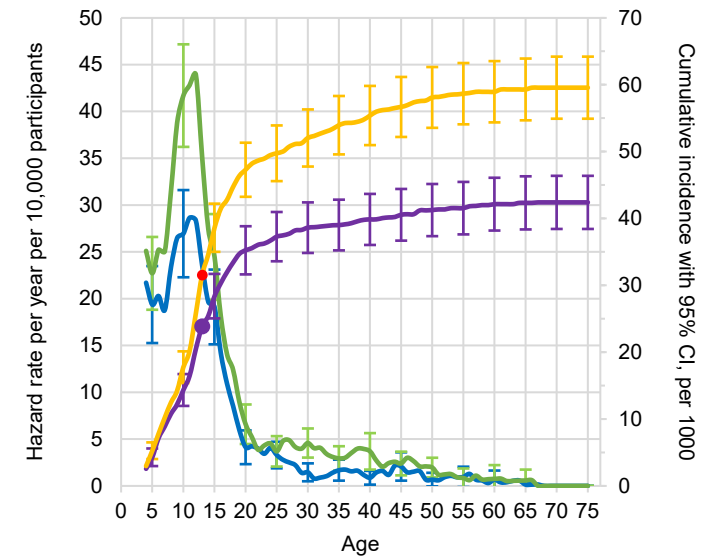
b. Generalized anxiety disorder



c. Post traumatic stress disorder

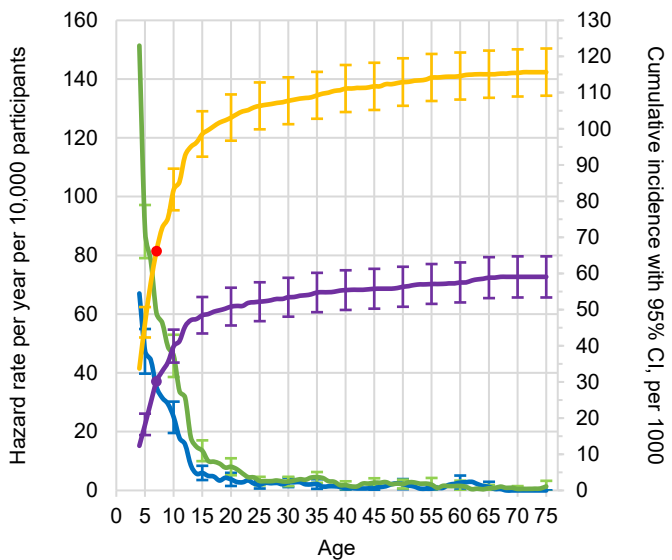


d. Social phobia

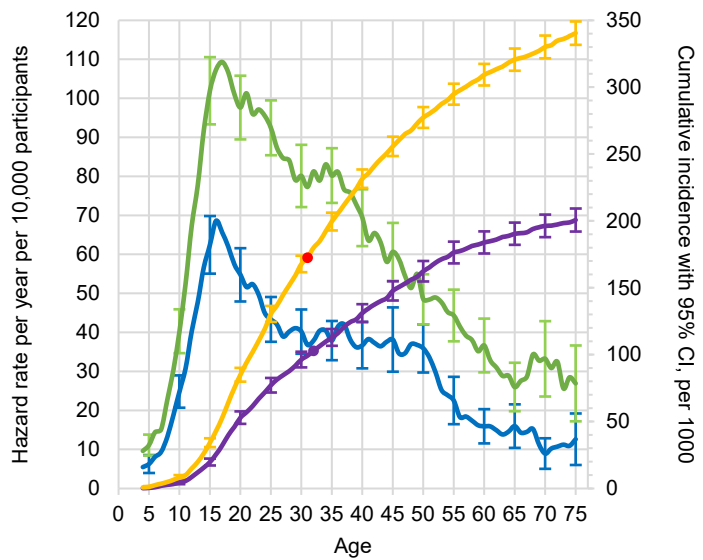


Smoothed hazard rate Cumulative incidence Median of cumulative incidence
 Male ————— ————— ●
 Female ————— ————— ●

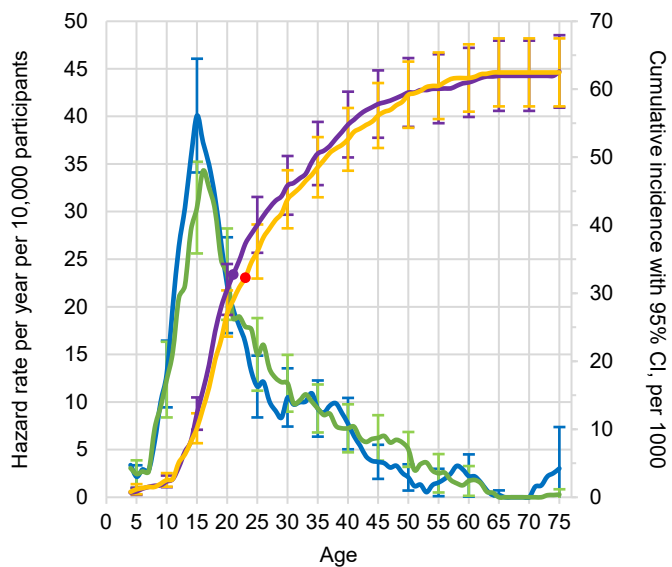
e. Specific phobia



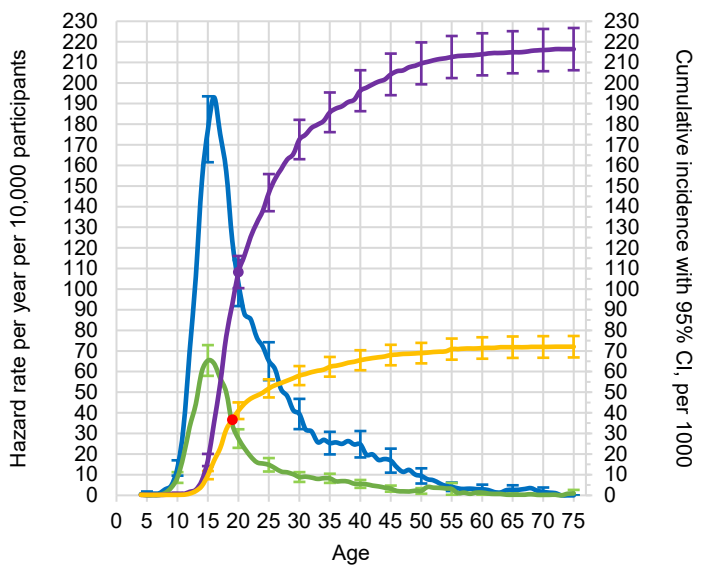
f. Major depressive disorder



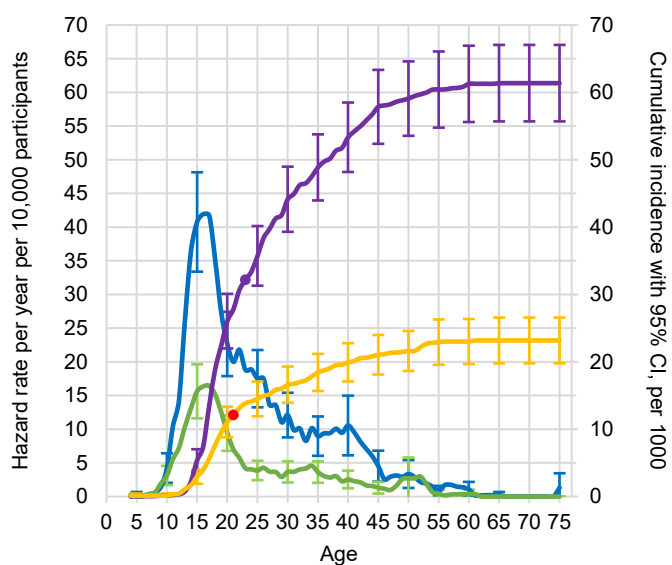
g. Bipolar disorder



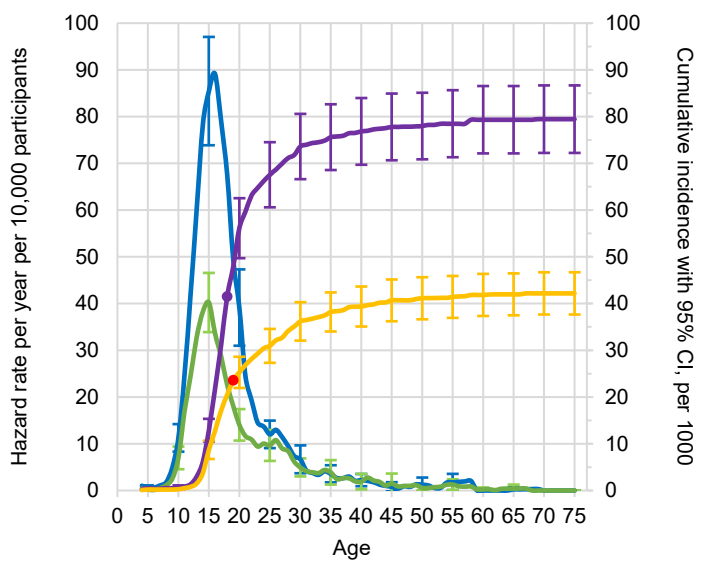
h. Alcohol abuse disorder



i. Alcohol dependence disorder

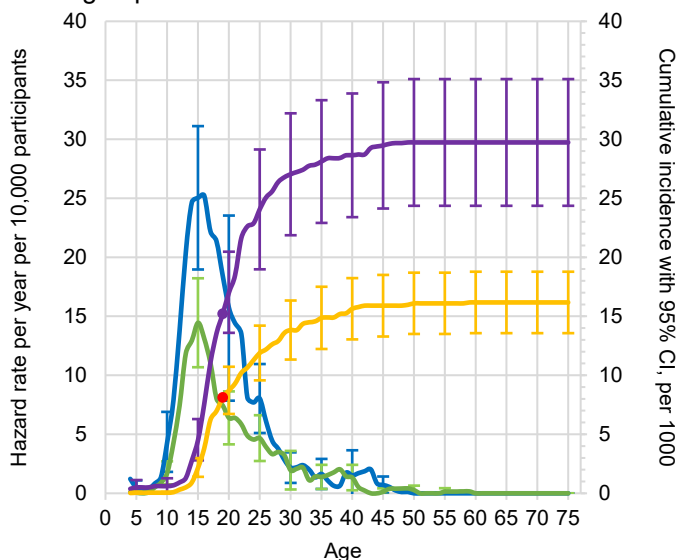


j. Drug abuse disorder

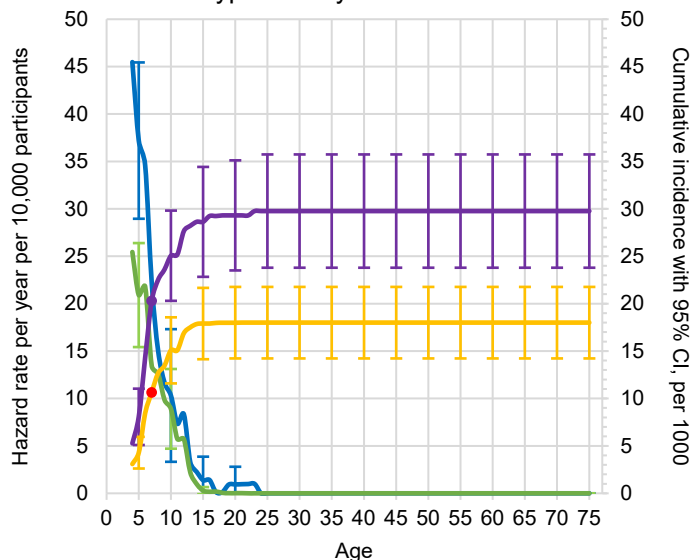


	Smoothed hazard rate	Cumulative incidence	Median of cumulative incidence
Male			
Female			

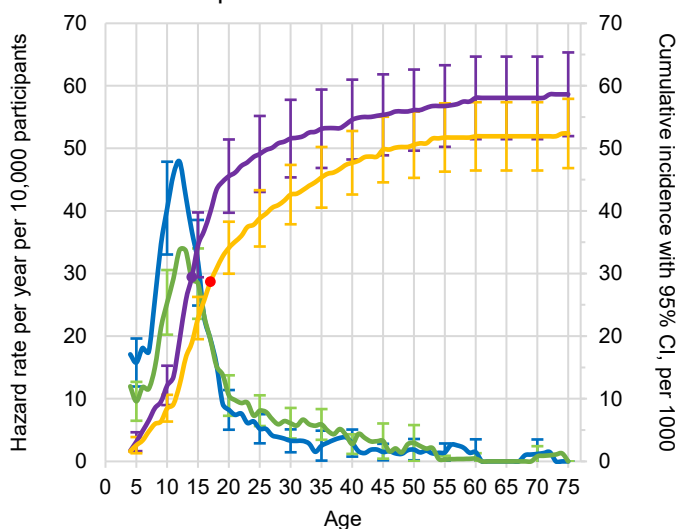
k. Drug dependence disorder



l. Attention deficit/hyperactivity disorder



m. Intermittent explosive disorder



Smoothed hazard rate Cumulative incidence Median of cumulative incidence
 Male ————— ————— ●
 Female ————— ————— ●

^a Left y-axis curves, with blue for males and green for females, are hazard rate (incidence rate) curves. These are calculated per year of age per 10,000 people, defined as a ratio of the number of disorder onsets at a given age among people who never had the disorder at any time up to that age and who lived through that age. For a given age t we used information only from respondents in the age range t to $t + 10$ to minimize the effects of recall bias. Right y-axis curves, with purple for males and yellow for females, are cumulative incidence (or morbid risk) curves. These are calculated based on the age-specific incidence rates at each year of life using the standard exponential formula.¹⁴

Supplementary Table 1. Minimum, maximum, median, and IQR values of smoothed hazard (per 10000) between ages 4 and 75 by gender

Lifetime disorder	Male					Female				
	Min	25 th	Median	75 th	Max	Min	25 th	Median	75 th	Max
I. Anxiety disorders										
Panic disorder and/or agoraphobia	0.5	2.6	4.3	5.7	15.3	0.9	4.3	9.7	13.7	25.6
Generalized anxiety disorders	1.4	4.9	9.8	13.9	15.9	2.4	11.0	20.5	26.4	29.6
Post-traumatic stress disorder	1.2	4.6	7.7	11.3	18.7	4.9	12.2	18.3	23.1	38.8
Social phobia	0.0	0.6	1.4	4.1	28.7	0.0	0.8	3.0	5.1	43.9
Specific phobia	0.0	0.8	2.1	3.2	67.1	0.4	1.4	2.8	6.5	151.4
Any anxiety disorder	4.4	14.2	20.1	28.9	79.8	12.6	26.4	43.4	51.1	151.9
II. Mood disorders										
Major depressive disorder	5.5	15.6	36.0	40.4	68.6	9.6	32.8	54.8	80.7	109.3
Bipolar disorder	0.0	2.1	4.1	10.7	40.1	0.0	1.8	6.2	12.5	34.3
Any mood disorder	8.0	17.0	39.4	49.8	100.6	12.2	33.6	62.3	91.5	137.4
III. Substance use disorders										
Alcohol abuse disorder	0.0	2.9	13.4	40.4	193.1	0.0	0.8	3.7	10.7	65.4
Alcohol dependence	0.0	0.5	3.8	11.6	41.9	0.0	0.3	2.2	4.0	16.4
Drug abuse disorder	0.0	0.5	1.8	10.4	89.1	0.0	0.5	1.4	7.7	40.2
Drug dependence	0.0	0.0	0.8	4.1	25.2	0.0	0.0	0.4	3.3	14.5
Any substance use disorder	0.0	3.0	14.5	44.5	236.6	0.0	1.3	5.6	14.9	90.0
IV. Externalizing disorders										
Attention deficit/hyperactivity disorder	0.0	0.0	0.0	0.5	45.5	0.0	0.0	0.0	0.0	25.4
Intermittent explosive disorder	0.0	1.3	2.6	7.5	47.9	0.0	0.9	4.3	9.5	33.8
Any externalizing disorder	0.0	1.4	2.5	7.0	44.1	0.0	1.3	4.3	7.6	31.8
V. Any mental disorder										
	18.8	32.3	69.5	104.2	295.9	26.3	53.5	95.6	127.7	228.2

Supplementary Table 2. Lifetime prevalence by gender and timing of surveys^a

Type of mental disorder	Male				Female				Test statistics χ^2 (p-value)
	Number of lifetime cases at time of interview	Number of people in the sample in which the disorder was assessed	Lifetime prevalence		Number of lifetime cases at time of interview	Number of people in the sample in which the disorder was assessed	Lifetime prevalence		
			%	(95% CI)			%	(95% CI)	
N ₁	N ₂			N ₁	N ₂				
I. Earlier surveys									
Any anxiety disorder	3587	17665	12.8	(12.2-13.4)	7723	24628	20.3	(19.6-20.9)	345.9 (<0.0001)
Any mood disorder	3626	35985	10.0	(9.6-10.5)	7863	45357	16.5	(16.1-17.0)	563.2 (<0.0001)
Any substance use disorder	4430	28755	14.3	(13.7-14.8)	1799	37110	4.0	(3.8-4.3)	1099.2 (<0.0001)
Any externalizing disorder	800	13346	4.7	(4.2-5.1)	807	17997	3.2	(2.9-3.5)	31.7 (<0.0001)
Any mental disorder	7649	17665	29.1	(28.1-30.0)	12072	24628	30.8	(30.0-31.6)	10.5 (0.00121)
II. More recent surveys									
Any anxiety disorder	2972	21395	10.1	(9.6-10.6)	6107	26113	17.4	(16.8-18.0)	316.9 (<0.0001)
Any mood disorder	3048	35038	8.8	(8.5-9.2)	5812	39951	14.1	(13.6-14.5)	318.7 (<0.0001)
Any substance use disorder	3496	18184	17.7	(17.0-18.4)	1382	23833	5.1	(4.7-5.5)	856.8 (<0.0001)
Any externalizing disorder	724	17180	3.9	(3.5-4.3)	756	21234	2.9	(2.6-3.2)	15.2 (0.00011)
Any mental disorder	7013	19035	28.1	(27.2-29.0)	9413	23816	28.7	(27.9-29.4)	1.0 (0.32580)

Abbreviations: N₁, observed (i.e., unweighted) number of respondents classified as meeting criteria for the disorder; N₂, observed (i.e., unweighted) number of respondents in the sample; %, the ratio of N₁ to N₂ in the weighted, not unweighted, data; 95% CI, 95% confidence interval of %; χ^2 , Wald test for significance of difference between male and female values of %; P, P value of χ^2 test

^a The results for “earlier” surveys are based on the surveys included in the 2007 WMH report.¹ The results for “more recent” surveys are for the WMH surveys carried out subsequent to the 2007 report. See Table 1 footnote g for a separate listing of the two groups of surveys.

Supplementary Table 3. Morbid risk (per 100 participants) at 75 and ratio by sex from earlier and more recent surveys^a

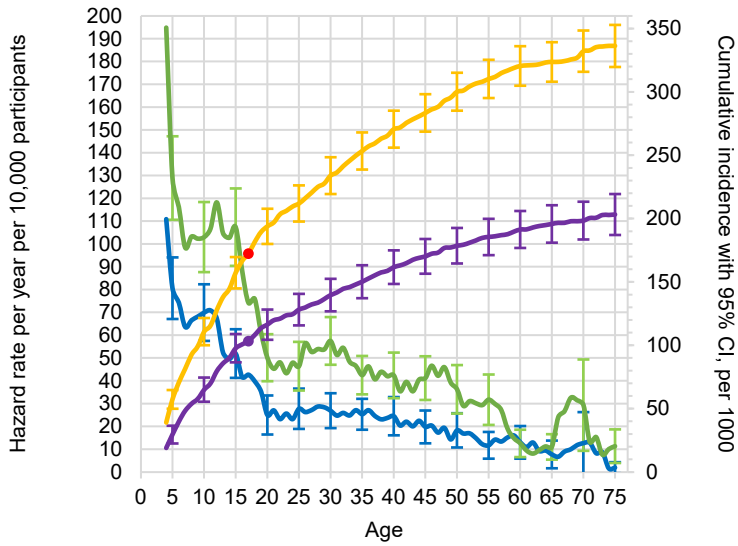
Lifetime disorder	Morbid risk (per 100 participants at age 75)				Ratio of morbid risk to lifetime prevalence			
	Male		Female		Male		Female	
	MR	(95% CI)	MR	(95% CI)	MR/LP	(95% CI)	MR/LP	(95% CI)
I. Earlier surveys								
Any anxiety disorder	20.3	(18.7-21.9)	33.6	(32.0-35.3)	1.6	(1.5-1.7)	1.7	(1.6-1.7)
Any mood disorder	26.2	(24.9-27.5)	40.3	(39.2-41.5)	2.6	(2.5-2.7)	2.4	(2.4-2.5)
Any substance use disorder	23.8	(22.3-25.2)	9.4	(8.5-10.2)	1.7	(1.6-1.7)	2.3	(2.2-2.5)
Any externalizing disorder	6.9	(5.7-8.0)	6.0	(5.1-6.9)	1.5	(1.3-1.6)	1.9	(1.7-2.0)
Any mental disorder	48.8	(46.8-50.8)	55.3	(53.7-56.9)	1.7	(1.6-1.7)	1.8	(1.7-1.8)
II. More recent surveys								
Any anxiety disorder	16.8	(15.4-18.2)	29.2	(27.5-30.9)	1.7	(1.6-1.7)	1.7	(1.6-1.7)
Any mood disorder	22.6	(21.3-23.9)	35.2	(33.8-36.6)	2.6	(2.5-2.7)	2.5	(2.4-2.6)
Any substance use disorder	25.5	(23.6-27.4)	10.7	(9.6-11.7)	1.4	(1.4-1.5)	2.1	(1.9-2.2)
Any externalizing disorder	6.7	(5.7-7.6)	5.2	(4.4-6.1)	1.7	(1.5-1.9)	1.8	(1.6-2.0)
Any mental disorder	44.2	(42.1-46.2)	50.9	(49.0-52.8)	1.6	(1.5-1.6)	1.8	(1.7-1.8)

Abbreviations: MR, morbid risk per 100 participants; 95% CI, 95% confidence interval of MR; MR/LP, ratio of MR to lifetime prevalence as of age 75

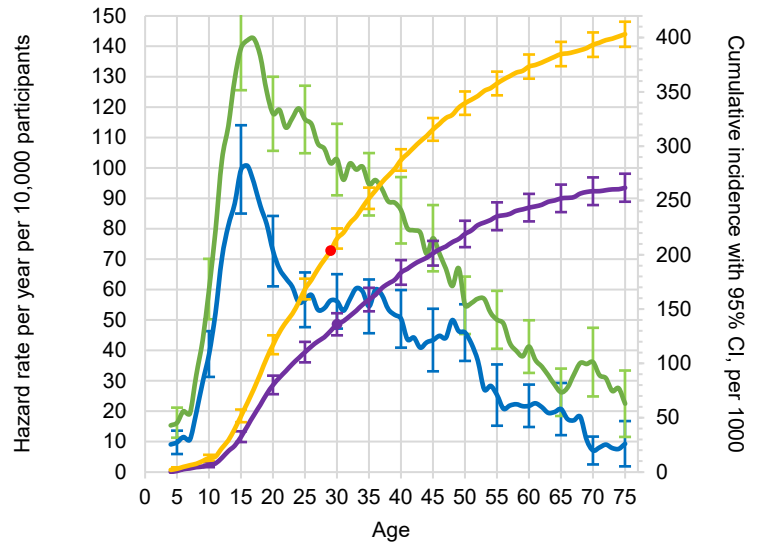
^a The results for “earlier” surveys are based on the surveys included in the 2007 WMH report. ¹ The results for “more recent” surveys are for the WMH surveys carried out subsequent to the 2007 report. See Table 1 footnote g for a separate listing of the two groups of surveys.

Supplementary Figure 1. Smoothed hazard rates and cumulative incidence, with 95% confidence intervals by age and sex for any anxiety disorder, any mood disorder, any substance use disorder, any externalizing disorder, and any mental disorder^a for the earlier surveys^b

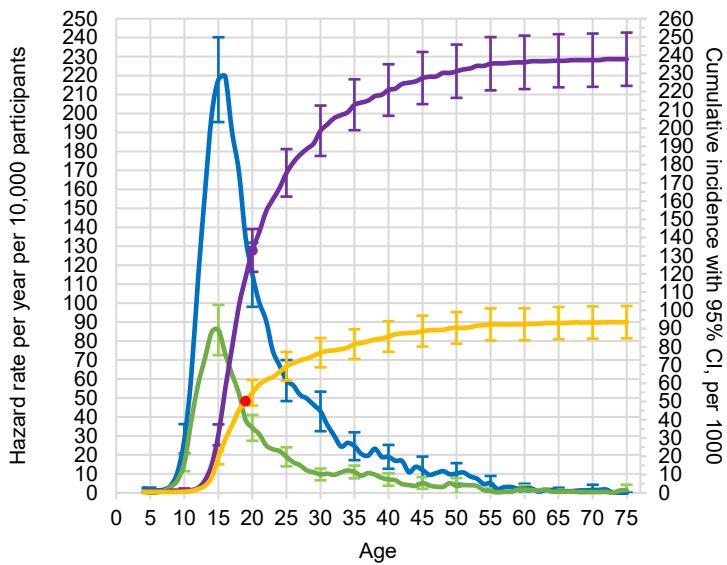
a. Any anxiety disorder



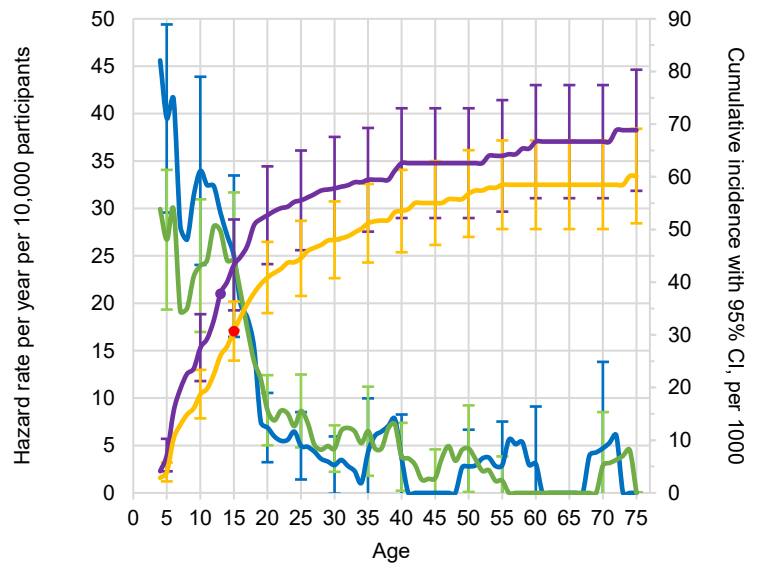
b. Any mood disorder



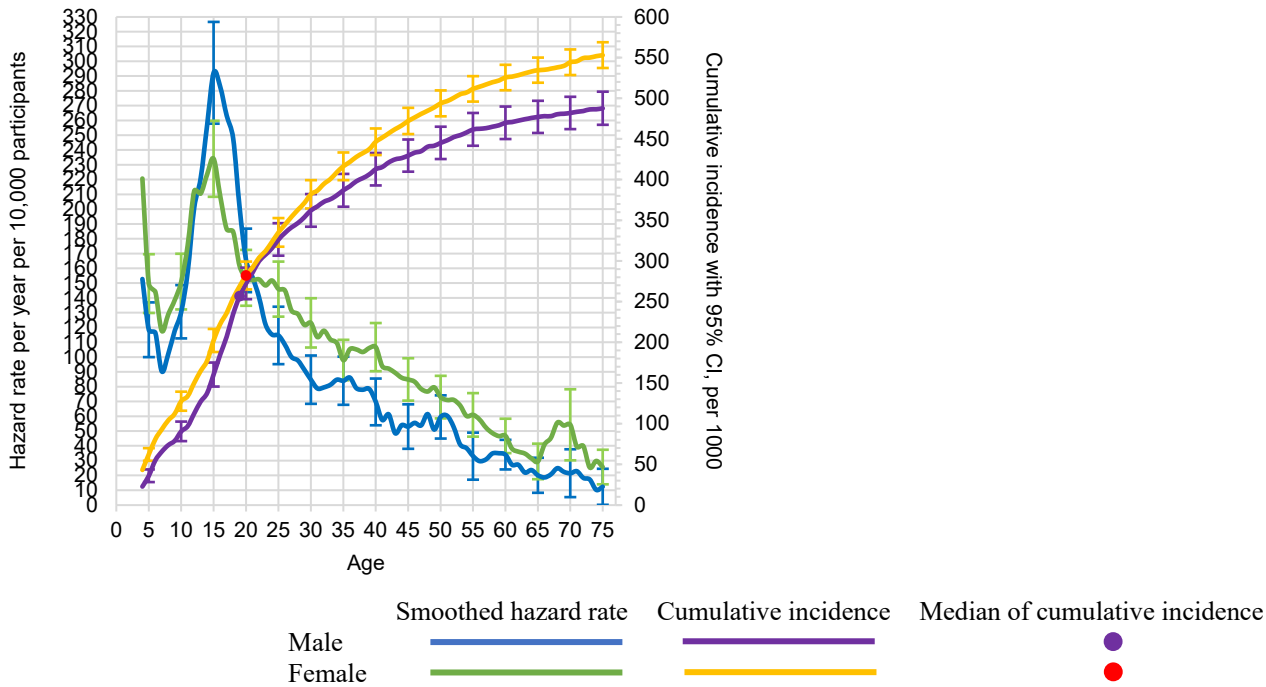
c. Any substance use disorder



d. Any externalizing disorder



e. Any mental disorder

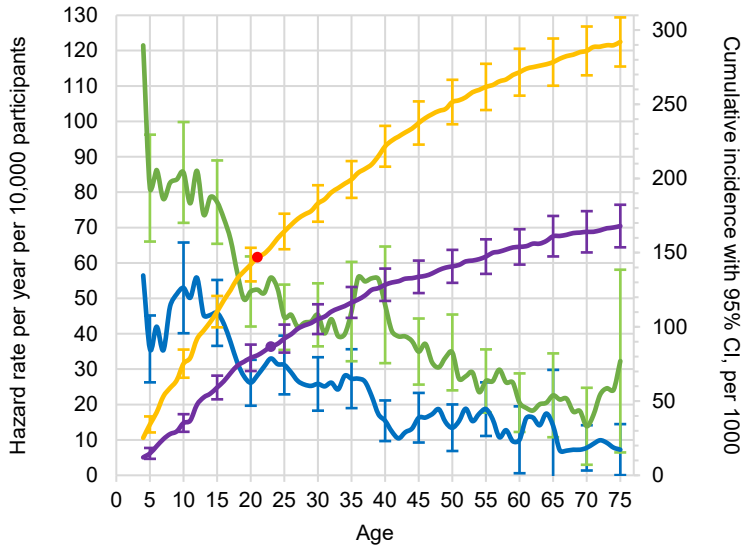


^a Left y-axis curves, with blue for males and green for females, are hazard rate (incidence rate) curves. These are calculated per year of age per 10,000 people, defined as a ratio of the number of disorder onsets at a given age among people who never had the disorder at any time up to that age and who lived through that age. For a given age t we used information only from respondents in the age range t to $t + 10$ to minimize the effects of recall bias. Right y-axis curves, with purple for males and yellow for females, are cumulative incidence (or morbid risk) curves. These are calculated based on the age-specific incidence rates at each year of life using the standard exponential formula.

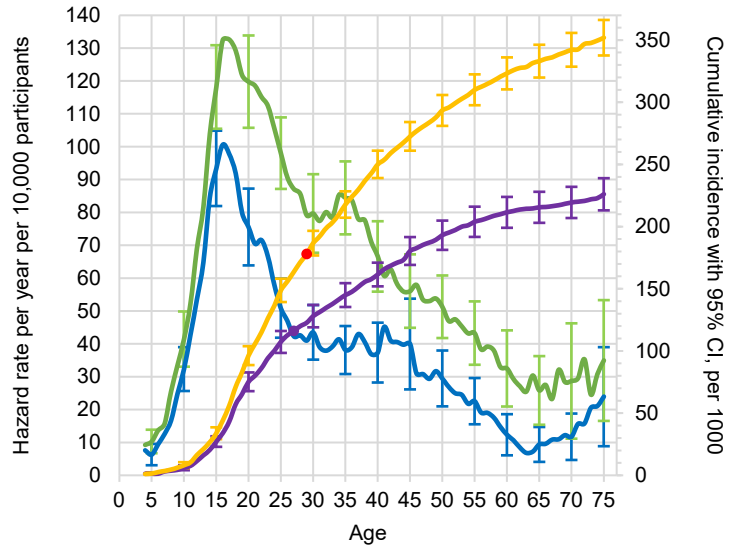
^b The “earlier” surveys are the surveys included in the 2007 WMH report. ¹ See Table 1 footnote g for a separate listing of these surveys.

Supplementary Figure 2. Smoothed hazard rates and cumulative incidence, with 95% confidence intervals by age and sex for any anxiety disorder, any mood disorder, any substance use disorder, any externalizing disorder, and any mental disorder^a for the more recent surveys^b

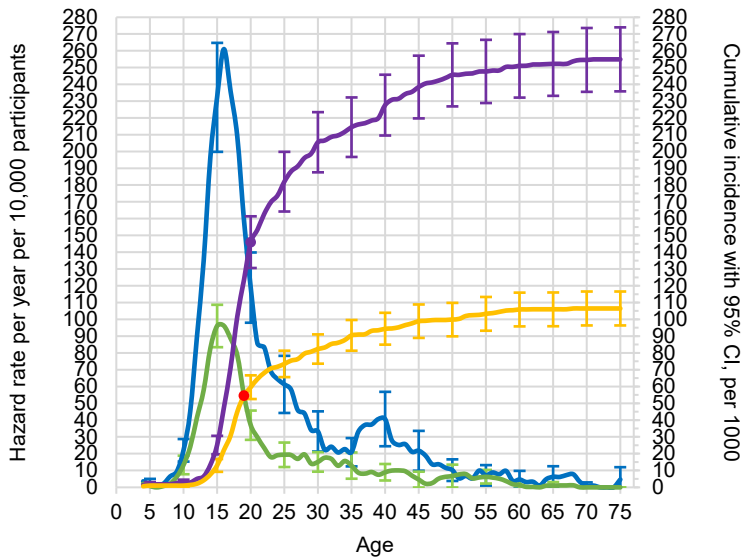
a. Any anxiety disorder



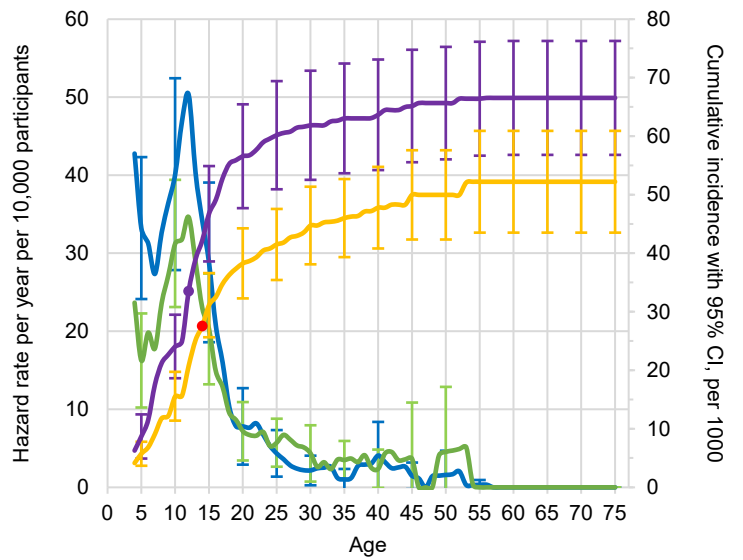
b. Any mood disorder



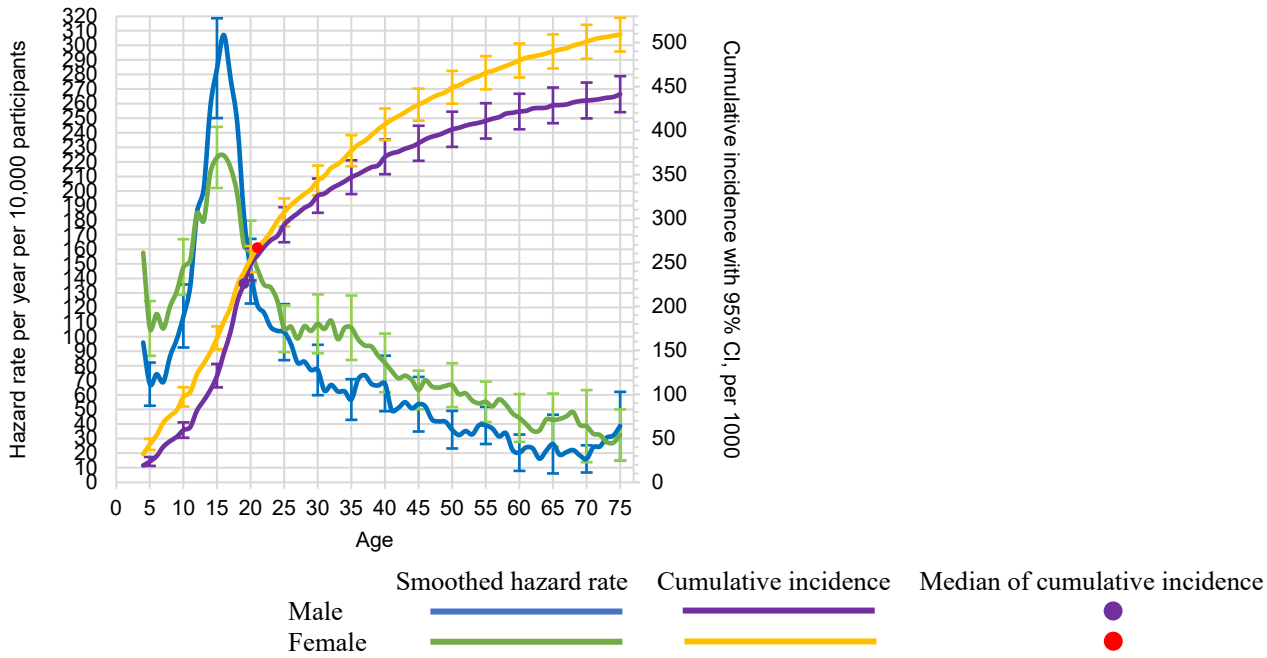
c. Any substance use disorder



d. Any externalizing disorder



e. Any mental disorder



^a Left y-axis curves, with blue for males and green for females, are hazard rate (incidence rate) curves. These are calculated per year of age per 10,000 people, defined as a ratio of the number of disorder onsets at a given age among people who never had the disorder at any time up to that age and who lived through that age. For a given age t we used information only from respondents in the age range t to $t + 10$ to minimize the effects of recall bias. Right y-axis curves, with purple for males and yellow for females, are cumulative incidence (or morbid risk) curves. These are calculated based on the age-specific incidence rates at each year of life using the standard exponential formula.

^b The “earlier” surveys are the surveys included in the 2007 WMH report. ¹ See Table 1 footnote g for a separate listing of these surveys.

Supplemental References

1. Kessler RC, Angermeyer M, Anthony JC, et al. Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey initiative. *World Psychiatry* 2007; **6**: 168-76.