



Published in final edited form as:

*Depress Anxiety*. 2018 March ; 35(3): 195–208. doi:10.1002/da.22711.

## Treatment Gap for Anxiety Disorders is Global: Results of the World Mental Health Surveys in 21 countries

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### Conflicts of Interest

In the past 3 years, Dr. Kessler received support for his epidemiological studies from Sanofi Aventis; was a consultant for Johnson & Johnson Wellness and Prevention, Shire, Takeda; and served on an advisory board for the Johnson & Johnson Services Inc. Lake Nona Life Project. Kessler is a co-owner of DataStat, Inc., a market research firm that carries out healthcare research.

Dr. Evans-Lacko received consulting fees from Lundbeck not connected to this research.

Dr. Haro received personal fees from Lundbeck.

Dr. Kawakami served as a consultant for Junpukai Foundation, SB At Work, Sekisui Co., Ltd., and received grant funding from Infosoft Technologies, Ministry of Health, Labour, and Welfare, and Japan Society for Promotion of Science.

The other authors report no biomedical financial interests or potential conflicts of interest.

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## Abstract

**Background**—Anxiety disorders are a major cause of burden of disease. Treatment gaps have been described, but a worldwide evaluation is lacking. We estimated, among individuals with a 12-month DSM-IV anxiety disorder in 21 countries, the proportion who: i) perceived a need for treatment; ii) received any treatment; and (iii) received possibly adequate treatment.

**Methods**—Data from 24 community surveys in 21 countries of the WMH surveys. DSM-IV mental disorders were assessed (WHO Composite International Diagnostic Interview, CIDI 3.0). DSM-IV included PTSD among anxiety disorders, while it is not considered so in the DSM-5. We asked if, in the previous 12 months, respondents felt they needed professional treatment and if they obtained professional treatment (specialized/general medical, complementary alternative medical, or non-medical professional) for “problems with emotions, nerves, mental health, or use of alcohol or drugs”. Possibly adequate treatment was defined as receiving pharmacotherapy (1+ months of medication and 4+ visits to a medical doctor) or psychotherapy, CAM or non-medical care (8+ visits).

**Results**—Of 51,547 respondents (response=71.3%), 9.8% had a 12-month DSM-IV anxiety disorder, 27.6% of whom received any treatment, and only 9.8% received possibly adequate treatment. 41.3% of those with 12-month anxiety perceived a need for care. Lower treatment levels were found for lower income countries.

**Conclusions**—Low levels of service use and a high proportion of those receiving services not meeting adequacy standards for anxiety disorders exist worldwide. Results suggest the need for improving recognition of anxiety disorders and the quality of treatment.

### Keywords

Anxiety Disorders; Perceived Need for Care; Adequate Treatment; Surveys; Health Services

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## INTRODUCTION

Anxiety disorders are frequent (lifetime prevalence ranging between 5 and 25 % of the population, and a 12-month prevalence ranging between 3.3 and 20.4%, worldwide)(Kessler et al., 2009). When adjusted for methodological differences, current (3-month) prevalence is estimated at 7.3% worldwide (4.8–10.9%), ranging from 5.3% (3.5–8.1%) in African settings to 10.4% (7.0–15.5%) in Euro/Anglo settings(Baxter, Scott, Vos, & Whiteford, 2013). Some anxiety disorders, in particular the phobias, social anxiety and separation anxiety, have very early age of onset (median ages in the range of 5–10 years of age(Kessler et al., 2009), while others (generalized anxiety disorder, panic disorder, and post-traumatic stress disorder) tend to have a later age-of-onset distributions (median 24–50), with much wider cross-national variation.

Because of their relatively high prevalence, their tendency towards chronicity and substantial comorbidity, anxiety disorders are associated with significant disability (Harter, Conway, & Merikangas, 2003; Saha, Stedman, Scott, & McGrath, 2013). Anxiety disorders cause 10.4% of the Disability Adjusted Life Years (DALYs) lost due to neurological, mental, substance use disorders and account for 1.1% of the global burden of disease worldwide, that is a total of 26,800,000 DALYs worldwide (Whiteford, Ferrari, Degenhardt, Feigin, & Vos, 2015). Anxiety disorders are also very costly. It has been estimated that the total costs of anxiety disorders were €74.4 billion for 30 European EU countries in 2010 (Gustavsson et al., 2011).

Cognitive-behavioral therapy (CBT) and selective serotonin reuptake inhibitors (SSRIs) are effective treatments for anxiety disorders (Hoffman & Smits, 2008; Koen & Stein, 2011). Therefore anxiety disorders are among the conditions that have been identified by the WHO for scaling up interventions for mental disorders (WHO, 2017; Chisholm et al., 2016). Yet a number of barriers limit the effective treatment of anxiety disorders. First, they are often unrecognized. Recognition rates in primary care may be lower than 50% (Culpepper, 2003). Using standardized case detection methods has been recommended to improve their recognition in primary settings (Culpepper, 2003; Olariu et al., 2015). Structural and health system weaknesses, including scarce mental health and human services (World Health Organization, 2010) as well as lack of awareness and costs of treatment (Ho, Hunt, & Li,

2008) and stigma perceived by the people who experience anxiety disorders, further limit their treatment (Clement et al., 2015).

All these factors result in a low use of health services for anxiety disorders. Even in high income countries, only about a third of individuals with anxiety disorders receive any treatment (Alonso et al., 2004; Hamalainen, Isometsa, Sihvo, & Pirkola, 2008), with the exception of the United States, where treatment rates are considerably higher (Olson, Marcus, Wan, & Geissler, 2004). Importantly, the proportion of patients with anxiety disorders who receive adequate treatment is still much lower (Roberge et al., 2015; Kasteenpohja et al., 2016), even in the US, with less than 15% of people with diagnosed anxiety receiving treatment which conforms with evidence-based recommendations (Roberge et al., 2015; Kasteenpohja et al., 2016). The treatment gap for anxiety seems to be even wider in low and middle income (LMIC) countries (Gureje et al., 2008), which is consistent with reports for major depressive disorders (MDD) (Thornicroft et al., 2017), and for overall mental disorders (Wang et al., 2007a). In addition, little is known about the access to treatment for anxiety disorders and its adequacy in Low and Middle Income countries (LMICs). Also different studies have used different definitions of adequate treatment. For minimally adequate pharmacotherapy, any or all of the following criteria have been considered: type, dosage, duration, plus the number of consultations. For minimally adequate psychotherapy, the number of sessions (either 8 or 12) and sometimes, the type of therapy (i.e., cognitive behavioral treatment by the same mental health professional) have been proposed (Roberge et al., 2015).

The WMH surveys, including information on anxiety disorders and related treatment across 21 diverse countries worldwide, provide an unprecedented opportunity to examine receipt of treatment for anxiety disorders. On one hand, countries from the whole spectrum of income and geographical variation have been included. On the other, common assessment methods and definitions have been used. The specific objectives of this study were to estimate, among individuals with a 12-month DSM-IV anxiety disorder: i) the proportion who perceived a need for treatment; ii) the proportion of those who received any treatment; and (iii) the proportion who received possibly adequate treatment. We also examined the influence of comorbidity on perceived need for treatment and whether the latter varied across countries.

It is important to note that in the current Diagnostic Statistical Manual (DSM5) post-traumatic stress disorder (PTSD) is no longer considered an anxiety disorder (as it was in the previous version, the DSM-IV). PTSD is currently considered a different type of disorder and it has been moved to a separate chapter (Trauma and Stress-Related Disorders, DSM-5.) (American Psychiatric Association, 2013). The reader should be aware that the WMH surveys used the DSM-IV classification and therefore we included PTSD among anxiety disorders.

## METHODS

### Sample

Data came from 24 community epidemiological surveys administered in 21 countries as part of the WMH surveys (Kessler & Ustun, 2004). These included 12 surveys carried out in

high-income countries, 6 surveys in upper-middle-income countries and 6 in low or lower-middle income countries (see table 1). The majority of surveys were based on nationally representative household samples. Three were representative of urban areas in their countries (Colombia, Mexico, and Peru). Three were representative of selected regions in their countries (Japan, Nigeria, and Murcia, Spain). Four were representative of selected Metropolitan Areas (Sao Paulo, Brazil; Medellin, Colombia; and Beijing-Shanghai and Shenzhen in the People's Republic of China (PRC)). Trained lay interviewers conducted face-to-face interviews with respondents, aged 18 years and over. The interviews took place within the households of the respondents. To reduce respondent burden, the interview was divided into two parts. Part I assessed core mental disorders and was administered to all respondents. Part II, which assessed additional disorders and correlates, was administered to all Part I respondents who met lifetime criteria for any disorder plus a probability subsample of other Part I respondents. Part II data, the focus of this report, were weighted by the inverse of their probabilities of selection into Part II and additionally weighted to adjust samples to match population distributions on the cross-classification of key socio-demographic and geographic variables. Further details about WMH sampling and weighting are available elsewhere (Heeringa et al., 2008). Response rates ranged between 45.9% and 97.2% and had a weighted average of 70.1% across all surveys.

## Measures

**Mental disorders**—Mental disorders were assessed using the WHO Composite International Diagnostic Interview (CIDI) Version 3.0, a fully-structured interview generating lifetime and 12-month prevalence estimates. Disorders considered in this paper are based on the DSM-IV and include: 12-month anxiety (agoraphobia; generalized anxiety disorder; panic disorder; post-traumatic stress disorder; social phobia; specific phobia; adult separation anxiety disorder).

The WMH CIDI interview translation, back-translation, and harmonization protocol required culturally competent bilingual clinicians to review, modify, and approve key phrases describing symptoms (Harkness et al., 2008). Blinded clinical reappraisal interviews with the Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 2002) were carried out in four countries. Good concordance was found with diagnoses based on the CIDI (Haro et al., 2006).

**12-Month Mental Health Service Use**—Within disorder-specific sections of the survey, respondents were asked whether or not they ever talked to a medical doctor or other professional (including psychologists, counselors, spiritual advisors, herbalists, acupuncturists, and other healing professionals), and if they ever have, they were asked if they received treatment in the last 12 months. Additionally, in the services section of the survey, respondents were asked if they ever in their lifetime went to see any professional on a provided list for problems with emotions, nerves, or use of alcohol or drugs. This list included psychiatrists, general practitioners or family doctors, any other medical doctors, psychologists, social workers, counselors, any other mental health professionals (such as psychotherapists or mental health nurses), nurses, occupational therapists, or other health professionals, religious or spiritual advisors, or any other healers (like herbalists,

chiropractors, or spiritualists). If the respondent reported ever seeing a given professional from the list, he or she was further probed if the given professional was seen in the past 12 months, and how many visits occurred in the past 12 months. In addition, respondents were asked about the number of self-help groups they attended in the past 12 months.

Those having responded “yes” to seeing a professional or attending a self-help group in the past 12 months in either the disorder-specific survey section or the services section were considered having received any 12-month treatment. Any treatment in the past 12 months was further classified as (1) specialist mental health treatment (psychiatrist, psychologist, other mental health professional in any setting, social worker or counselor in a mental health specialist treatment setting, used a mental health hotline); (2) general medical treatment (primary care doctor, or other medical doctor, or other healthcare professional seen in a general medical setting); (3) complementary alternative medicine (CAM) (any other type of healer such as chiropractors or participation in self-help groups); or (4) non-medical treatment provider (religious or spiritual advisor, social worker, or counsellor in any setting other than specialist mental health) for a mental health problem.

It is important to note that social workers or counselors in the non-medical treatment group only refer to those working outside of the health services settings. Those working in a specialized or a primary care setting were included in their respective categories (specialized or primary care).

We also asked participants to report whether they felt they needed professional treatment for their mental health problems. Those responding yes and those reporting using mental health services in the previous 12-month were considered to perceive a need for health care.

**Socio-economic characteristics**—To assess educational attainment, respondents were asked how many years of education they completed. As educational levels and systems varied across countries, responses were divided into four groups based on country-specific distributions. Annual family income was classified into quartiles as related to within-country median values of income per family member before taxes.

## Analysis

The analyses reported here focus on respondents who met DSM-IV criteria for any anxiety disorder at some time in the 12 months before interview. The definition used for possibly adequate treatment was that of Wang et al (Wang et al., 2007a), and Thornicroft et al (Thornicroft et al., 2017), and was based on evidence-based guidelines (Agency for Health Care Policy and Research (AHCPR), 1993; Lehman & Steinwachs, 1998; American Psychiatric Association, 2006) that consisted of receiving either pharmacotherapy (the respondent had to report having taken medication for at least 1 month as well as having visited a medical doctor at least 4 times, both in the previous 12 months for their mental health problems, as we assume that for pharmacotherapy treatment supervision and control of medication is required ) or psychotherapy or complementary alternative medicine (reporting 8+ visits with any professional including religious or spiritual advisor, social worker or counselor). Our decision to use four or more physician visits alongside pharmacotherapy was based on the fact that for medication assessment, initiation and

monitoring, four or more visits are generally recommended during the acute and continuation phases of treatment. We required at least eight sessions for psychotherapy based on the fact that clinical trials showing efficacy have generally included eight or more visits. Because adequacy definitions used in our study did not distinguish between CAM and non-medical sector, our analyses combine these two categories.

We considered visits to all sectors for the analysis of possibly adequate treatment, since small numbers preclude categorization by service sector.

### Statistical analyses

Survey sampling weights were applied in all analyses so that respondents reflected nationally representative samples in terms of sociodemographic characteristics within each country. Standard errors were estimated using the Taylor series linearization method implemented in the SAS software survey procedures to adjust weighting and clustering. To test for differences between high-income, upper-middle-income, and lower-middle- and low-income country groups, in relation to the key variables of interest related to the aims of the paper, chi-square tests were applied. Statistical significance was evaluated using two-sided 0.05-level tests.

## RESULTS

The characteristics of the study sample and survey response rates are presented in Table 1. In total, 17 nationally representative surveys and 6 large regionally representative samples were analyzed, with a total of 51,547 Part II respondents (12,285 from low, 12,598 from middle-upper, and 26,664 from high income countries). The overall weighted response rate was 71.3%.

As shown in Table 2 (first column), a total of 9.8% of respondents met criteria for at least one anxiety disorder in the 12 months prior to the interview. Prevalence figures were similar for high-income (10.3%) and upper-middle income (10.6%) countries, but lower for low-/lower-middle-income countries (7.9%). The United States (19.0%) and the metropolitan area of Sao Paulo (18.0%) were the sites with the highest 12-month prevalence, while Beijing/Shanghai (3.0%), Israel (3.6%), Nigeria (4.2%) and Japan (4.5%) had the lowest prevalence (Table 2, first column). A full account of the prevalence of anxiety disorders in the World Mental Health surveys may be found in previous publications (Demyttenaere et al., 2004; Kessler & Ustun, 2008).

Because our study was based on a community dwelling population, we could estimate the proportion of all the individuals meeting DSM-IV diagnostic criteria for any anxiety disorders in the overall population who received any treatment (Table 2, column 2). This was just over a quarter (27.6%, ranging from 36.3% in high income countries to 13.1% in low/middle-income countries). The proportion of respondents with an anxiety disorder who received possibly adequate treatment was 9.8% (ranging from 13.8% in high-income to 2.3% in low/middle income countries) (Table 2, column 3).

On average, less than half (41.3%) of the individuals with anxiety disorders reported a need for treatment (Table 2, column 4). Self-perception of need for treatment was higher in high-income countries (48%) with a clear gradient across country types, with a minimum of 28.5% in lower-middle income countries. Two thirds (66.8%) of individuals with an anxiety disorder who perceived a need for care received any treatment in the previous year (Table 2, column 5). This proportion showed a negative gradient by country income: 75.0% used services in high-income countries vs 46.1% in lower-middle-income countries. Perception of need for treatment was highest in Israel, the US and Peru, while participants in Nigeria, Iraq and Lebanon had the lowest perception of need. In Nigeria, the region of Murcia in Spain and Italy more than 90% of those who perceived a need for care received some treatment, while less than 38% of those living in Lebanon, Colombia, Peru and Mexico who perceived a need for care received any treatment.

Table 3 presents similar data to those in table 2, but stratified by two groups: (1) individuals with anxiety disorders without other comorbid mental disorders (Table 3, upper section) and (2) those with an anxiety disorder who also had a comorbid mental disorders (Table 3, lower section). Among those without comorbidity, perception of need for treatment was considerably lower than among those with comorbidity (overall, 26.3 vs 55.2%,  $p < .001$ ), Service use among those with a perception of need, however, was similar among those without and those with mental comorbidity (62.7% and 68.6%, respectively). Among individuals who perceived a need for help, the proportion receiving possibly adequate treatment varied among those without comorbidity and those with comorbidity (20.5% and 34.5%, respectively,  $p < .001$ ). These trends are present in all country income level groups.

For ease of presentation, statistical testing of results for Tables 2 and 3 are presented in Supplementary Tables s1 (test results for Table 2) and s2 (test results for Table 3). Table s1 shows that statistical tests of comparisons across all country surveys and comparisons across the income groups were all significant in both tables; differences within high income countries were all significant for all analyses; tests for within group comparisons of other country income groups were also significant, with the exception of within group comparisons of lower/lower-middle income countries for any treatment (column 2, table s1); and for the same comparison within upper-middle income countries for possibly adequate treatment among those perceiving need of treatment (column 3, table s1). Supplementary table s2 indicated that the vast majority of differences between comorbid and non-comorbid anxiety are statistically significant, with exceptions confined to four cells with low numbers of observations.

## DISCUSSION

A major finding of this study is that across 21 countries worldwide, only about a fourth (27.6%) of individuals meeting criteria of a DSM-IV anxiety disorder have received any treatment in the previous year. One important determinant of this treatment gap is that individuals do not perceive a need for treatment (less than half of individuals with a 12-month anxiety disorder reported a need for treatment). But other barriers may also exist, as only about two thirds of those who perceived a need for treatment actually received it. A second major finding is that the quality of treatment received by individuals with anxiety



disorders seems suboptimal, since only about a third of treated cases met the criteria for our definition of possibly adequate treatment. Thus, fewer than 1 in 10 individuals with anxiety disorders received possibly adequate treatment in a given year. The treatment gap was much wider for less wealthy countries. Individuals with comorbid mental disorders had a higher perception of need for care, and a higher likelihood of receiving possibly adequate treatment. Our results are consistent with previous studies in primary care settings, and with reports of undertreatment of depression disorders and common mental disorders in general (Thornicroft et al., 2017). The findings provide a global perspective on the treatment gap for anxiety disorders and indicate a need to improve access to care in all countries, in particular in low/middle income countries.

These results must be considered in the light of several study limitations. First, diagnoses of anxiety disorders were based on the CIDI 3.0. Although acceptable agreement between CIDI diagnoses and diagnoses made during blind clinical re-interviews (Haro et al., 2006) was achieved, these studies were conducted almost exclusively in high income countries. It remains possible that the accuracy of CIDI anxiety diagnoses could vary in lower income countries. Second we used the DSM-IV classification which considered post-traumatic stress disorder an anxiety disorder. There is a need to further evaluate the anxiety treatment gap using DSM-5 criteria. Third, we relied on self-reported data for use of services, and we were not able to corroborate responses with administrative records. Accuracy of self-reported use of services may differ across sociodemographic and cultural groups and this might affect the comparisons across countries (Luck, 1996; Mann et al., 1992). Nevertheless, a number of survey methods attempted to augment recall and accurate responses, including survey commitment probes and exclusion of individuals failing to endorse commitment. Fourth, we considered those reporting using services “for problems with emotions, nerves, mental health or use of alcohol or drugs” as receiving treatment. It may well be that the treatment received was not addressing their anxiety disorder. This might have led us to underestimate the treatment gap for anxiety disorders. On the other hand, patients might not recognize or consider themselves as having “problems with emotions, nerves, mental health, or use of alcohol or drugs” and yet they could still be treated with psychotropic medication for their somatic symptoms and/or sleep issues. This bias would lead us to overestimate the level of treatment gap for anxiety disorders.

Additionally, we did not consider severity of anxiety disorder, which could have allowed to estimate whether international differences in use of services are influenced by variation in severity of anxiety disorders. We also used a broad definition of possibly adequate treatment. On one hand, this definition did not include specific effective psychotherapeutic techniques, such as mindfulness meditation (Vollestad, Nielsen, & Nielsen, 2012), which could have led to an underestimation of adequacy. In fact, it is difficult to determine the adequacy of complementary alternative medicine simply by the number of sessions. And, in relation to pharmacotherapy, we did not consider the type of medication. On the other hand, adequacy of benzodiazepines for treatment for anxiety disorders has been questioned (Baldwin et al., 2014). Not having excluded them might have led us to overestimate the adequacy of pharmacological treatment. However, even with this inclusion our estimated coverage rates are rather low. Another limitation is that we evaluated service use over a one-year period. This might underestimate utilization of services in the longer run, as there is some evidence

that individuals with persistent symptoms of common mental disorders tend to use services if followed for a longer period than one year (Baldwin et al., 2014). Also, even though the WMH surveys included a large number of respondents, for some specific sub-analyses, the number of respondents included for some countries was small, rendering results less stable and reliable. In addition, a more detailed analysis about use of psychopharmacology and psychotherapy treatments was not possible due to limitations in the way information was collected.

Finally, while results show that a significant proportion of individuals with anxiety disorders do not perceive a need for treatment, our analyses do not allow us to draw conclusions about the specific barriers that may be contributing to the treatment gap for anxiety disorders. A number of different barriers (i.e., stigma, logistical, among others) have been described (Gulliver, Griffiths, & Christensen, 2012) in the literature. We have not have analyzed them and we consider it very important to gather additional information to understand the role that different types of barriers to mental health treatment play in the anxiety treatment gap.

Notwithstanding these limitations, an important treatment gap for anxiety disorders has been identified. This finding is consistent with previous studies, and it suggests that the treatment gap for anxiety disorders is even higher than that described for MDD (Thornicroft et al., 2017). A lower proportion of individuals with anxiety disorders perceive a need for treatment (41.3% in our study) when compared to those with depression (56.7% in Thornicroft et al. study). Also, the proportion of those who receive treatment is lower among individuals with anxiety disorders than among those with depression. And the average delay between onset of the disorder and seeking treatment is much longer for anxiety disorders than for MDD (Wang et al., 2007b). Finally, the proportion receiving possibly adequate treatment is also lower for those with anxiety disorders (9.8%) and considerably lower than for those with MDD (16.5%) (Thornicroft et al., 2017). Differences in the severity of symptoms may contribute to differences in utilization rates. In our study, mental disorder comorbidity shows an important association with perception of need for care. This is likely due to a higher severity of symptoms among persons with comorbid anxiety (Saris, Aghajani, van der Werff, van der Wee, & Penninx, 2017). There is also the possibility that some symptoms are not recognized as a mental disorder, but rather are attributed to somatic illnesses. This might be an issue for the cross-cultural validity of some diagnoses, as has been pointed out for PTSD (Hinton & Lewis-Fernandez, 2011). There is a need to research the factors and mechanisms shaping perception of need for services.

In addition to lack of perceived need for treatment, other barriers may also play an important role. Low recognition rates for anxiety disorders have been described at the primary care level (Olariu et al., 2015). Also, the low level of perceived need for care among individuals with anxiety disorders may be due to low levels of mental health literacy (Wang et al., 2007b; Ho et al., 2008). Efforts in both areas (i.e., increasing detection rates in primary care and in awareness of the potential benefits of existing therapies among the public) are needed.

A worrying finding of our study is the low proportion of possibly adequate treatment for anxiety disorders. Our data indicate that this may result from a combination of the generally low levels of perception of need for care, together with varying level of access to care as

well as differences in the quality of care provided. In this respect, there are potentially important opportunities for improvement in several areas. Health literacy and awareness should be promoted in countries with low perception of need, mostly among the low/lower middle income countries. At the same time, the quality of treatment showed remarkable variation between and within country income levels. While the assessment of possibly adequate treatment in our study was based on self-report and these may differ from information gathered from administrative records in health services settings, our results suggest that it is important to encourage health providers to follow the clinical guidelines to improve treatment quality for anxiety disorders.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

### Funding resources

The World Health Organization World Mental Health (WMH) Survey Initiative is supported by the United States National Institute of Mental Health (NIMH; R01 MH070884), the John D. and Catherine T. MacArthur Foundation, the Pfizer Foundation, the United States Public Health Service (R13-MH066849, R01-MH069864, and R01 DA016558), the Fogarty International Center (FIRCA R03-TW006481), the Pan American Health Organization, Eli Lilly and Company, Ortho-McNeil Pharmaceutical Inc., GlaxoSmithKline, and Bristol-Myers Squibb. We thank the staff of the WMH Data Collection and Data Analysis Coordination Centres for assistance with instrumentation, fieldwork, and consultation on data analysis. 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 World Health Organization, other sponsoring organizations, agencies, or governments.

The Argentina survey -- Estudio Argentino de Epidemiología en Salud Mental (EASM) -- was supported by a grant from the Argentinian Ministry of Health (Ministerio de Salud de la Nación). The São Paulo Megacity Mental Health Survey is supported by the State of São Paulo Research Foundation (FAPESP) Thematic Project Grant 03/00204-3. The Brazilian National Council for Scientific and Technological Development supports Dr. Laura Andrade --(CNPq Grant #307623/2013-0).The Bulgarian Epidemiological Study of common mental disorders EPIBUL is supported by the Ministry of Health and the National Center for Public Health Protection. The Chinese World Mental Health Survey Initiative is supported by the Pfizer Foundation. The Colombian National Study of Mental Health (NSMH) is supported by the Ministry of Social Protection. The Mental Health Study Medellín – Colombia was carried out and supported jointly by the Center for Excellence on Research in Mental Health (CES University) and the Secretary of Health of Medellín. The ESEMeD project is funded by the European Commission (Contracts QLG5-1999-01042; SANCO 2004123, and EAHC 20081308), (the Piedmont Region, Italy), Fondo de Investigación Sanitaria, Instituto de Salud Carlos III, Spain (FIS 00/0028), Ministerio de Ciencia y Tecnología, Spain (SAF 2000-158-CE), Departament de Salut, Generalitat de Catalunya, Spain, Instituto de Salud Carlos III (CIBER CB06/02/0046, RETICS RD06/0011 REM-TAP), and other local agencies and by an unrestricted educational grant from GlaxoSmithKline. Implementation of the Iraq Mental Health Survey (IMHS) and data entry were carried out by the staff of the Iraqi MOH and MOP with direct support from the Iraqi IMHS team with funding from both the Japanese and European Funds through United Nations Development Group Iraq Trust Fund (UNDG ITF). The Israel National Health Survey is funded by the Ministry of Health with support from the Israel National Institute for Health Policy and Health Services Research and the National Insurance Institute of Israel. The World Mental Health Japan (WMHJ) Survey is supported by the Grant for Research on Psychiatric and Neurological Diseases and Mental Health (H13-SHOGAI-023, H14-TOKUBETSU-026, H16-KOKORO-013, H25-SEISHIN-IPPAN-006) from the Japan Ministry of Health, Labour and Welfare. The Lebanese Evaluation of the Burden of Ailments and Needs Of the Nation (L.E.B.A.N.O.N.) is supported by the Lebanese Ministry of Public Health, the WHO (Lebanon), National Institute of Health/Fogarty International Center (R03 TW006481-01), anonymous private donations to IDRAAC, Lebanon, and unrestricted grants from, Algorithm, AstraZeneca, Benta, Bella Pharma, Eli Lilly, Glaxo Smith Kline, Lundbeck, Novartis, Servier, OmniPharma, Phenicia, Pfizer, UPO. The Mexican National Comorbidity Survey (MNCS) is supported by The National Institute of Psychiatry Ramon de la Fuente (INPRFMDIES 4280) and by the National Council on Science and Technology (CONACyT-G30544- H), with supplemental support from the PanAmerican Health Organization (PAHO). The Nigerian Survey of Mental Health and Wellbeing (NSMHW) is supported by the WHO (Geneva), the WHO (Nigeria), and the Federal Ministry of Health, Abuja, Nigeria. The Peruvian World Mental Health Study was funded by the National Institute of Health

of the Ministry of Health of Peru. The Portuguese Mental Health Study was carried out by the Department of Mental Health, Faculty of Medical Sciences, NOVA University of Lisbon, with collaboration of the Portuguese Catholic University, and was funded by Champalimaud Foundation, Gulbenkian Foundation, Foundation for Science and Technology (FCT) and Ministry of Health. The Romania WMH study projects “Policies in Mental Health Area” and “National Study regarding Mental Health and Services Use” were carried out by National School of Public Health & Health Services Management (former National Institute for Research & Development in Health), with technical support of Metro Media Transilvania, the National Institute of Statistics-National Centre for Training in Statistics, SC. Cheyenne Services SRL, Statistics Netherlands and were funded by Ministry of Public Health (former Ministry of Health) with supplemental support of Eli Lilly Romania SRL. The Psychiatric Enquiry to General Population in Southeast Spain – Murcia (PEGASUS-Murcia) Project has been financed by the Regional Health Authorities of Murcia (Servicio Murciano de Salud and Consejería de Sanidad y Política Social) and Fundación para la Formación e Investigación Sanitarias (FFIS) of Murcia. The US National Comorbidity Survey Replication (NCS-R) is supported by the National Institute of Mental Health (NIMH; U01-MH60220) with supplemental support from the National Institute of Drug Abuse (NIDA), the Substance Abuse and Mental Health Services Administration (SAMHSA), the Robert Wood Johnson Foundation (RWJF; Grant 044708), and the John W. Alden Trust.

Dr. Thornicroft is supported by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care South London at King’s College London Foundation Trust. GT acknowledges financial support from the Department of Health via the National Institute for Health Research (NIHR) Biomedical Research Centre and Dementia Unit awarded to South London and Maudsley NHS Foundation Trust in partnership with King’s College London and King’s College Hospital NHS Foundation Trust. The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health GT is supported by the European Union Seventh Framework Programme (FP7/2007-2013) Emerald project.

SEL (Sara Evans-Lacko) currently holds a Starting Grant from the European Research Council (337673).

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

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Table 1

WMH sample characteristics by World Bank income categories<sup>a</sup>

Country by income category	Survey <sup>b</sup>	Sample characteristics <sup>c</sup>	Field dates	Age range	Sample size			Response rate <sup>e</sup>
					Part I	Part II	Part II and age 44 <sup>d</sup>	
<b>I. High-income countries</b>								
Argentina	AMHES	Nationally representative.	2015	18–98	3,927	2,116	--	77.3
Belgium	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	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	ESEMeD	Nationally representative.	2002–3	19–95	3,555	1,323	621	57.8
Israel	NHS	Nationally representative.	2003–4	21–98	4,859	4,859	--	72.6
Italy	ESEMeD	Nationally representative. The sample was selected from municipality resident registries.	2001–2	18–100	4,712	1,779	853	71.3
Japan	WMHJ 2002–2006	Eleven metropolitan areas.	2002–6	20–98	4,129	1,682	--	55.1
Netherlands	ESEMeD	Nationally representative. The sample was selected from municipal postal registries.	2002–3	18–95	2,372	1,094	516	56.4
Portugal	NMHS	Nationally representative.	2008–9	18–81	3,849	2,060	1,070	57.3
Spain	ESEMeD	Nationally representative.	2001–2	18–98	5,473	2,121	960	78.6
Spain - Murcia	PEGASUS- Murcia	Murcia region.	2010–12	18–96	2,621	1,459	--	67.4
United States	NCS-R	Nationally representative.	2001–3	18–99	9,282	5,692	3,197	70.9
<b>TOTAL</b>					(50,092)	(26,664)	(8,430)	64.2
<b>II. Upper-middle income countries</b>								

Country by income category	Survey <sup>b</sup>	Sample characteristics <sup>c</sup>	Field dates	Age range	Sample size			Response rate <sup>e</sup>
					Part I	Part II	Part II and age 44 <sup>d</sup>	
Brazil - São Paulo	São Paulo Megacity	São Paulo metropolitan area.	2005-8	18-93	5,037	2,942	--	81.3
Bulgaria	NSHS	Nationally representative.	2002-6	18-98	5,318	2,233	741	72.0
Colombia - Medellín <sup>f</sup>	MMHHS	Medellin metropolitan area.	2011-12	19-65	3,261	1,673		97.2
Lebanon	LEBANON	Nationally representative.	2002-3	18-94	2,857	1,031	595	70.0
Mexico	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
Romania	RMHS	Nationally representative.	2005-6	18-96	2,357	2,357	--	70.9
<b>TOTAL</b>					(24,612)	(12,598)	(3,072)	77.2
<b>III. Low and lower middle income countries</b>								
Colombia	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
Iraq	IMHS	Nationally representative.	2006-7	18-96	4,332	4,332	--	95.2
Nigeria	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
PRC <sup>f</sup> - Beijing/Shanghai	B-WMH/S-WMH	Beijing and Shanghai metropolitan areas.	2001-3	18-70	5,201	1,628	570	74.7
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
<b>TOTAL</b>					(24,641)	(12,285)	(4,791)	83.7
<b>IV. TOTAL</b>					99,345	51,547	16,293	71.3

<sup>a</sup>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.

<sup>b</sup>NSMH (The Colombian National Study of Mental Health); IMHS (Iraq Mental Health Survey); NSMHW (The Nigerian Survey of Mental Health and Wellbeing); B-WMH (The Beijing World Mental Health Survey); S-WMH (The Shanghai World Mental Health Survey); EMSMP (La Encuesta Mundial de Salud Mental en el Peru); NSHS (Bulgaria National Survey of Health and Stress); MMHHS



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(Medellin Mental Health Household Study); LEBANON (Lebanese Evaluation of the Burden of Ailments and Needs of the Nation); M-NCS (The Mexico National Comorbidity Survey); RMHS (Romania Mental Health Survey); AMHES (Argentina Mental Health Epidemiologic Survey); ESEMeD (The European Study Of The Epidemiology Of Mental Disorders); NHS (Israel National Health Survey); WMH2002–2006 (World Mental Health Japan Survey); NMHS (Portugal National Mental Health Survey); PEGASUS-Murcia (Psychiatric Enquiry to General Population in Southeast Spain-Murcia);NCS-R (The US National Comorbidity Survey Replication).

Most WMH surveys are based on stratified multistage clustered area probability household samples in which samples of 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 sample of households, in each of which a listing of household members was created and one or two people were selected from this listing to be interviewed. 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).

**Table 2**

12-month prevalence of DSM-IV anxiety disorder, perceived need for treatment, receipt of any 12-month treatment, and receipt of possibly adequate treatment (Total N=51,547)

12-month diagnosis of Anxiety Disorder	2*		3*		4*		5*		6*	
	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)
<b>I. High income</b>										
Belgium	8.3 (1.4)	35.7 (3.8)	11.2 (2.9)	40.6 (4.2)	87.9 (3.8)	31.5 (6.9)	140			
France	13.7 (1.1)	29.4 (4.3)	13.7 (2.9)	42.4 (3.7)	69.3 (8.2)	46.4 (5.5)	277			
Germany	8.3 (1.1)	24.0 (3.7)	13.0 (2.8)	27.6 (3.8)	86.8 (4.4)	54.1 (6.3)	195			
Israel	3.6 (0.3)	41.2 (3.9)	15.8 (3.0)	59.3 (3.7)	69.5 (4.4)	38.4 (6.0)	171			
Italy	6.5 (0.6)	29.7 (3.3)	9.1 (2.3)	32.9 (3.6)	90.3 (2.3)	30.8 (4.4)	190			
Japan	4.5 (0.5)	22.3 (3.2)	11.6 (3.2)	31.8 (4.1)	70.1 (3.0)	51.8 (8.3)	149			
Murcia, Spain	9.6 (1.0)	45.1 (3.1)	10.5 (1.8)	48.9 (2.9)	92.3 (2.2)	23.2 (4.1)	225			
Netherland	9.0 (1.0)	31.6 (5.5)	16.1 (3.5)	41.1 (5.6)	76.9 (7.8)	51.0 (7.8)	172			
Portugal	16.2 (1.0)	32.0 (2.4)	10.9 (1.5)	42.2 (3.0)	75.8 (3.2)	33.9 (3.7)	520			
Spain	6.6 (0.9)	29.5 (2.6)	11.9 (2.0)	34.3 (3.1)	86.0 (4.4)	40.2 (4.7)	232			
US	19.0 (0.7)	42.3 (1.1)	16.1 (1.0)	57.6 (1.5)	73.4 (2.0)	38.1 (2.3)	1721			
Argentina	8.9 (0.5)	30.0 (3.4)	12.0 (2.4)	48.0 (3.0)	62.6 (5.2)	39.8 (5.3)	354			
<b>Total</b>	<b>10.3 (0.3)</b>	<b>36.3 (0.8)</b>	<b>13.8 (0.6)</b>	<b>48.4 (0.9)</b>	<b>75.0 (1.3)</b>	<b>38.0 (1.4)</b>	<b>4346</b>			
<b>II. Upper-middle income</b>										
Sao Paulo, Brazil	18.0(0.7)	23.2(1.6)	10.7(1.3)	39.1(2.0)	59.2(3.0)	46.2(4.2)	776			
Bulgaria	7.6 (0.7)	21.6 (3.7)	7.3 (1.9)	29.6 (3.9)	72.8 (4.4)	33.8 (8.3)	260			
Lebanon	12.1 (1.2)	8.2 (1.5)	1.3 (0.7)	25.9 (3.4)	31.7 (4.6)	15.7 (9.1)	198			
Medellin, Colombia	12.1 (1.0)	18.8 (2.5)	3.8 (1.2)	36.3 (3.1)	51.7 (5.1)	20.5 (6.1)	374			
Mexico	8.4 (0.6)	16.1 (2.5)	3.3 (1.0)	42.9 (3.5)	37.6 (4.5)	20.3 (3.8)	440			
Romania	4.8 (0.5)	29.2 (4.1)	8.7 (2.4)	33.1 (4.3)	88.2 (3.5)	29.9 (5.2)	121			
<b>Total</b>	<b>10.6 (0.3)</b>	<b>20.4 (1.0)</b>	<b>7.1 (10.7)</b>	<b>36.3 (1.3)</b>	<b>56.1 (1.9)</b>	<b>34.8 (2.6)</b>	<b>2169</b>			

	<b>1*</b>	<b>2*</b>	<b>3*</b>	<b>4*</b>	<b>5*</b>	<b>6*</b>
<b>12-month diagnosis of Anxiety Disorder</b>	<b>Any treatment (among those w disorder)</b>	<b>Possibly adequate treatment (among those w disorder)</b>	<b>Perceived need for treatment (among those w disorder)</b>	<b>Any treatment (among those w perceived need)</b>	<b>Possibly adequate treatment (among those w perceived need &amp; any treatment)</b>	<b>N</b>
	<b>%(SE)</b>	<b>%(SE)</b>	<b>%(SE)</b>	<b>%(SE)</b>	<b>%(SE)</b>	<b>%(SE)</b>
<b>III. Lower-middle income</b>						
Colombia	14.4 (1.0)	13.2 (1.9)	3.2 (1.1)	37.9 (3.0)	34.8 (4.8)	580
Iraq	8.0 (0.6)	11.0 (2.7)	1.7 (1.3)	14.1 (2.6)	77.8 (9.2)	357
Nigeria <sup>^</sup>	4.2 (0.5)	11.4 (2.7)	0.0 (.)	12.4 (2.7)	92.2 (6.9)	113
Peru	7.9 (0.5)	17.9 (3.6)	1.1 (0.7)	51.2 (2.6)	35.0 (6.0)	245
Beijing/Shanghai, PRC	3.0 (0.5)	17.3 (8.5)	8.8 (7.6)	27.4 (8.8)	63.0 (3.4)	100
<b>Total</b>	<b>7.9 (0.3)</b>	<b>13.1 (1.4)</b>	<b>2.3 (0.7)</b>	<b>28.5 (1.6)</b>	<b>46.1 (3.5)</b>	<b>1395</b>
<b>IV. Total</b>						
<b>Total</b>	<b>9.8 (0.2)</b>	<b>27.6 (0.6)</b>	<b>9.8 (0.4)</b>	<b>41.3 (0.7)</b>	<b>66.8 (1.1)</b>	<b>7910</b>

\* Key:

1. People with 12-month anxiety disorder
2. Percentage of those in 1 (12-month anxiety) who received any treatment over 12 months
3. Percentage of those in 1 (12-month anxiety) who received possibly adequate treatment
4. Percentage of those people in 1 (12-month anxiety) who had a "perceived need"
5. Percent of those in 4 (with a "perceived need") who received any treatment over 12 months
6. Percentage of those in 5 (with a perceived need and treated) who received possibly adequate treatment

<sup>^</sup> There are no participants who reported having possibly adequate treatment in Nigeria

\*\* Unable to estimate SE due to sparse sampling

**Table 3**

12-month prevalence of ANX, perceived need for treatment, receipt of any treatment, and receipt of possibly adequate treatment by mental comorbidity status

	1*	2*	3*	4*	5*	6*
12-month diagnosis of Anxiety Disorder	Any treatment (among those w anxiety disorder)	Possibly adequate treatment (among those w anxiety disorder)	Perceived need for treatment (among those w anxiety disorder)	Any 12-Month Treatment (among those w anxiety disorder & perceived need)	Possibly adequate treatment (among those w perceived need & any treatment)	N
	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)
<b>WITHOUT COMORBIDITY (Total N = 34,979)</b>						
<b>I. High Income</b>						
Belgium	4.6 (1.1)	21.0 (3.8)	2.9 (2.1)	21.9 (3.8)	96.1 (.)	14.0 (.)
France	7.6 (1.2)	10.9 (4.2)	4.9 (3.0)	23.4 (3.2)	46.6 (17.6)	44.7 (0.5)
Germany	5.1 (0.8)	16.5 (3.8)	5.4 (2.5)	19.1 (3.6)	86.5 (3.3)	32.8 (4.4)
Israel	2.2 (0.2)	29.2 (4.6)	5.1 (2.2)	50.5 (4.9)	57.9 (5.8)	17.4 (5.5)
Italy	4.2 (0.6)	16.3 (3.4)	4.5 (2.2)	16.3 (3.4)	100.0 (0.0)	27.3 (2.1)
Japan	3.2 (0.4)	15.8 (2.8)	5.8 (2.7)	26.7 (4.3)	59.4 (3.8)	36.7 (0.8)
Murcia, Spain	7.1 (0.6)	38.4 (5.9)	1.9 (1.2)	41.3 (6.0)	92.9 (3.1)	4.9 (2.6)
Netherlands	5.2 (1.0)	14.8 (5.0)	4.3 (1.9)	20.5 (4.9)	72.1 (12.2)	28.8 (7.9)
Portugal	11.0 (1.0)	18.5 (3.3)	3.3 (1.2)	28.1 (4.3)	65.8 (5.3)	17.9 (5.2)
Spain	4.2 (0.9)	9.3 (1.4)	3.8 (0.5)	13.0 (2.0)	71.3 (2.0)	41.1 (5.0)
US	9.4 (0.6)	28.9 (2.1)	8.1 (1.1)	37.7 (2.8)	76.6 (3.0)	27.9 (3.0)
Argentina	5.2 (0.6)	20.4 (3.2)	4.6 (1.2)	35.4 (4.0)	57.5 (3.8)	22.6 (6.0)

	1*	2*	3*	4*	5*	6*	N
	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	
12-month diagnosis of Anxiety Disorder	Any treatment (among those w anxiety disorder)	Possibly adequate treatment (among those w anxiety disorder)	Perceived need for treatment (among those w anxiety disorder)	Any 12-Month Treatment (among those w anxiety disorder & perceived need)	Possibly adequate treatment (among those w perceived need & any treatment)		
<b>Total</b>	<b>5.7 (0.2)</b>	<b>22.4 (1.1)</b>	<b>5.3 (0.5)</b>	<b>31.3 (1.3)</b>	<b>71.7 (1.9)</b>	<b>23.6 (1.6)</b>	<b>1505</b>
<b>II. Upper-middle income</b>							
Sao Paulo, Brazil	11.2 (0.9)	10.3 (1.8)	1.6 (1.0)	16.4 (2.2)	62.9 (6.4)	16.0 (2.0)	288
Bulgaria	6.2 (0.8)	15.9 (4.1)	4.4 (2.2)	21.1 (4.1)	75.4 (7.1)	28.0 (11.2)	158
Lebanon	9.0 (1.3)	6.0 (1.6)	0.0 (0.0)	23.5 (5.1)	25.4 (6.3)	0.0 (0.0)	80
Medellin, Colombia	7.4 (0.9)	16.3 (3.9)	2.7 (1.8)	27.2 (4.5)	59.8 (9.6)	16.6 (9.7)	163
Mexico	4.9 (0.6)	10.7 (1.3)	2.5 (0.8)	30.8 (2.5)	34.7 (3.2)	23.5 (4.6)	205
Romania	3.4 (0.5)	24.8 (5.7)	5.1 (3.4)	30.3 (6.2)	82.0 (2.7)	20.4 (.)	79
<b>Total</b>	<b>6.7 (0.3)</b>	<b>13.2 (1.3)</b>	<b>2.6 (0.7)</b>	<b>23.0 (1.6)</b>	<b>57.5 (3.2)</b>	<b>19.6 (3.2)</b>	<b>973</b>
<b>III. Lower-middle income</b>							
Colombia	9.5 (0.9)	6.2 (1.3)	1.2 (0.7)	28.3 (4.8)	21.9 (6.4)	19.0 (6.6)	265
Iraq	5.6 (0.5)	8.1 (3.0)	0.0 (0.0)	11.2 (2.7)	72.2 (17.2)	0.6 (0.1)	218
Nigeria <sup>A</sup>	3.8 (0.5)	7.8 (2.7)	0.0 (0.0)	9.0 (2.8)	86.9 (1.4)	0.0 (0.0)	80
Peru	5.6 (0.5)	16.7 (3.9)	0.7 (0.7)	43.0 (3.8)	38.8 (7.9)	4.3 (4.3)	122
Beijing/Shanghai, PRC	2.3 (0.5)	5.4 (3.5)	0.5 (0.1)	13.4 (4.9)	40.1 (5.2)	8.4 (.)	60
<b>Total</b>	<b>5.5 (0.3)</b>	<b>8.5 (1.4)</b>	<b>0.5 (0.2)</b>	<b>20.5 (2.0)</b>	<b>41.8 (6.1)</b>	<b>5.7 (1.9)</b>	<b>745</b>
<b>IV. Total</b>							
<b>Total</b>	<b>5.9 (0.1)</b>	<b>16.5 (0.7)</b>	<b>3.4 (0.3)</b>	<b>26.3 (0.9)</b>	<b>62.7 (1.9)</b>	<b>20.5 (1.3)</b>	<b>3223</b>

	12-month diagnosis of Anxiety Disorder	Any treatment (among those w anxiety disorder)	Possibly adequate treatment (among those w anxiety disorder)	Perceived need for treatment (among those w anxiety disorder)	Any 12-Month Treatment (among those w anxiety disorder & perceived need)	Possibly adequate treatment (among those w perceived need & any treatment)	N
	1*	2*	3*	4*	5*	6*	
	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	
<b>WITH COMORBIDITY (Total N = 16,568)</b>							
<b>I. High Income</b>							
Belgium	20.1 (2.8)	46.1 (7.3)	17.1 (4.2)	53.9 (8.7)	85.6 (3.3)	37.1 (4.5)	101
France	27.7 (2.7)	41.3 (4.1)	19.3 (3.7)	54.7 (3.8)	75.5 (7.9)	46.7 (6.1)	218
Germany	23.0 (3.0)	31.6 (4.3)	20.6 (3.7)	36.3 (4.4)	86.9 (3.9)	65.4 (6.5)	125
Israel	11.5 (1.2)	54.9 (5.6)	19.0 (4.7)	69.5 (4.8)	79.1 (5.1)	34.6 (7.0)	78
Italy	22.4 (1.8)	47.1 (3.6)	15.2 (3.3)	54.4 (3.3)	86.6 (3.0)	32.3 (6.1)	121
Japan	11.4 (2.0)	31.9 (3.9)	18.4 (3.4)	39.5 (3.9)	80.7 (1.0)	57.6 (7.3)	61
Murcia, Spain	16.8 (2.4)	53.6 (3.7)	3.2 (1.7)	58.4 (3.2)	91.8 (3.8)	5.9 (3.2)	112
Netherlands	19.8 (2.1)	44.4 (6.2)	25.1 (4.8)	56.7 (5.2)	78.3 (8.6)	56.6 (8.0)	121
Portugal	27.9 (1.9)	44.3 (3.0)	9.0 (2.0)	55.1 (3.9)	80.4 (2.8)	20.4 (3.7)	333
Spain	19.2 (1.9)	53.3 (4.6)	21.3 (3.8)	59.5 (4.9)	89.7 (4.0)	40.0 (5.2)	163
US	35.9 (1.0)	48.5 (1.4)	19.9 (1.4)	66.8 (1.8)	72.5 (2.2)	41.0 (2.7)	1206
Argentina	23.0 (1.7)	38.5 (4.2)	15.8 (3.8)	59.1 (4.0)	65.2 (5.9)	41.1 (8.1)	202
<b>Total</b>	<b>25.4 (0.6)</b>	<b>46.4 (1.0)</b>	<b>17.7 (0.9)</b>	<b>60.9 (1.2)</b>	<b>76.2 (1.5)</b>	<b>38.1 (1.6)</b>	<b>2841</b>
<b>II. Upper-middle income</b>							
Sao Paulo, Brazil	32.1 (1.5)	32.6 (2.1)	10.8 (1.9)	55.7 (2.7)	58.5 (3.5)	33.1 (5.2)	488

	1*	2*	3*	4*	5*	6*
	12-month diagnosis of Anxiety Disorder	Any treatment (among those w anxiety disorder)	Possibly adequate treatment (among those w anxiety disorder)	Perceived need for treatment (among those w anxiety disorder)	Any 12-Month Treatment (among those w anxiety disorder & perceived need)	Possibly adequate treatment (among those w perceived need & any treatment)
	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)
Bulgaria	19.2 (1.8)	36.5 (3.8)	9.4 (4.3)	52.1 (3.2)	70.1 (4.0)	25.6 (8.2)
Lebanon	28.6 (2.5)	11.9 (2.0)	1.6 (1.3)	29.8 (3.0)	40.1 (5.1)	13.8 (10.7)
Medellin, Colombia	26.4 (2.4)	20.9 (3.3)	1.9 (0.8)	44.1 (4.1)	47.4 (6.3)	8.9 (4.2)
Mexico	23.7 (2.0)	21.1 (4.1)	1.9 (0.5)	54.0 (5.0)	39.1 (5.0)	9.1 (1.5)
Romania	19.6 (2.6)	36.8 (2.9)	13.5 (3.5)	37.9 (3.1)	97.0 (0.3)	36.6 (4.4)
<b>Total</b>	<b>27.0 (0.9)</b>	<b>27.9 (1.4)</b>	<b>7.3 (1.0)</b>	<b>50.2 (1.7)</b>	<b>55.5 (2.3)</b>	<b>26.2 (3.1)</b>
<b>III. Lower-middle income</b>						
Colombia	28.5 (2.2)	19.9 (3.0)	3.5 (1.6)	47.1 (3.5)	42.3 (5.3)	17.3 (7.1)
Iraq	30.4 (2.5)	16.1 (3.7)	3.3 (0.3)	19.2 (3.9)	83.7 (2.6)	20.7 (1.1)
Nigeria <sup>A</sup>	11.0 (1.7)	28.7 (5.5)	0.0 (0.0)	28.7 (5.5)	100.0 (0.0)	0.0 (0.0)
Peru	17.2 (1.4)	19.5 (4.6)	1.6 (1.1)	61.9 (3.1)	31.5 (7.0)	8.3 (4.4)
Beijing/Shanghai, PRC	9.4 (2.3)	43.3 (15.9)	27.2 (19.5)	58.0 (12.7)	74.6 (1.0)	62.8 (.)
<b>Total</b>	<b>23.2 (1.1)</b>	<b>19.9 (2.1)</b>	<b>3.9 (1.2)</b>	<b>40.3 (2.3)</b>	<b>49.4 (3.3)</b>	<b>19.7 (3.3)</b>
<b>IV. Total</b>						
<b>Total</b>	<b>25.4 (0.5)</b>	<b>37.8 (0.8)</b>	<b>13.0 (0.6)</b>	<b>55.2 (0.9)</b>	<b>68.6 (1.1)</b>	<b>34.5 (1.4)</b>

\* Key:

1. People with 12-month anxiety disorder

2. Percentage of those in 1 (12-month anxiety) who received any treatment over 12 months

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3. Percentage of those in 1 (12-month anxiety) who received possibly adequate treatment
4. Percentage of those people in 1 (12-month anxiety) who had a “perceived need”
5. Percent of those in 4 (with a “perceived need”) who received any treatment over 12 months
6. Percentage of those in 5 (with a perceived need and treated) who received possibly adequate treatment

^ There are no participants who reported having possibly adequate treatment in Nigeria

\*\* Unable to estimate SE due to sparse sampling