

## Supplementary Online Content

Ruscio AM, Hallion LS, Lim CCW, et al. Cross-sectional comparison of the epidemiology of *DSM-5* generalized anxiety disorder across the globe. *JAMA Psychiatry*. Published online March 15, 2017.  
doi:10.1001/jamapsychiatry.2017.0056

**eTable 1.** World Mental Health Samples by Country Income Level

**eTable 2.** Bivariate Associations Between Sociodemographic Variables and *DSM-5* Generalized Anxiety Disorder Across Countries

**eTable 3.** Severity of Role Impairment Associated with Pure and Comorbid 12-Month Generalized Anxiety Disorder by Country Income Level

**eTable 4.** Treatment Seeking Associated with Pure and Comorbid 12-Month Generalized Anxiety Disorder by Country Income Level

**eAppendix.** Ethics Review and Informed Consent in the World Mental Health Surveys

**eFigure.** Age of Onset of Generalized Anxiety Disorder by Country Income Level

This supplementary material has been provided by the authors to give readers additional information about their work.

**eTable 1. World Mental Health Samples by Country Income Level<sup>a</sup>**

Country	Survey	Sample Characteristics	Field Dates	Age Range, y <sup>b</sup>	Sample Size, No.		Response Rate, %
					Part 1	Part 2	
<b>Low income</b>							
Colombia	NSMH	All urban areas of the country (approximately 73% of the total national population)	2003	18-65	4426	2381	87.7
Iraq	IMHS	Nationally representative	2006-2007	18+	4332	4332	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	2002-2004	18+	6752	2143	79.3
Peru	EMSMP	Five urban areas of the country (approximately 38% of the total national population)	2004-2005	18-65	3930	1801	90.2
PRC Beijing/Shanghai	B-WMH S-WMH	Beijing and Shanghai metropolitan areas	2001-2003	18+	5201	1628	74.7
PRC Shenzhen	Shenzhen	Shenzhen metropolitan area; included temporary residents as well as household residents	2005-2007	18+	7132	2475	80.0
Ukraine	CMDPSD	Nationally representative	2002	18+	4725	1719	78.3
<b>Middle income</b>							
Brazil	São Paulo Megacity	São Paulo metropolitan area	2005-2008	18+	5037	2942	81.3
Bulgaria	NSHS	Nationally representative	2002-2006	18+	5318	2233	72.0
Colombia (Medellín)	MMHHS	Medellín metropolitan area	2011-2012	18-65	3261	1673	97.2
Lebanon	LEBANON	Nationally representative	2002-2003	18+	2857	1031	70.0
Mexico	M-NCS	All urban areas of the country (approximately 75% of the total national population)	2001-2002	18-65	5782	2362	76.6
Romania	RMHS	Nationally representative	2005-2006	18+	2357	2357	70.9
South Africa	SASH	Nationally representative	2002-2004	18+	4315	4315	87.1
<b>High income</b>							
Australia	SMHWB	Nationally representative	2007	18+	8463	8463	60.0
Belgium	ESEMeD	Nationally representative	2001-2002	18+	2419	1043	50.6

**eTable 1. World Mental Health Samples by Country Income Level<sup>a</sup> (continued)**

Country	Survey	Sample Characteristics	Field Dates	Age Range, y <sup>b</sup>	Sample Size, No.		Response Rate, %
					Part 1	Part 2	
France	ESEMeD	Nationally representative	2001-2002	18+	2894	1436	45.9
Germany	ESEMeD	Nationally representative	2002-2003	18+	3555	1323	57.8
Israel	NHS	Nationally representative	2003-2004	21+	4859	4859	72.6
Italy	ESEMeD	Nationally representative	2001-2002	18+	4712	1779	71.3
Japan	WMHJ	Eleven metropolitan areas	2002-2006	20+	4129	1682	55.1
New Zealand	NZMHS	Nationally representative	2004-2005	18+	12,790	7312	73.3
Northern Ireland	NISHS	Nationally representative	2005-2008	18+	4340	1986	68.4
Poland	EZOP	Nationally representative	2010-2011	18-64	10,081	4000	50.4
Portugal	NMHS	Nationally representative	2008-2009	18+	3849	2060	57.3
Spain	ESEMeD	Nationally representative	2001-2002	18+	5473	2121	78.6
Spain (Murcia)	PEGASUS-Murcia	Murcia region; regionally representative	2010-2012	18+	2621	1459	67.4
The Netherlands	ESEMeD	Nationally representative	2002-2003	18+	2372	1094	56.4
United States	NCS-R	Nationally representative	2001-2003	18+	9282	5692	70.9
<b>All countries<sup>c</sup></b>					147,264	79,701	69.5

Abbreviations: B-WMH, The Beijing World Mental Health Survey; CMDPSD, Comorbid Mental Disorders During Periods of Social Disruption; EMSMP, La Encuesta Mundial de Salud Mental en el Peru; ESEMeD, The European Study of the Epidemiology of Mental Disorders; EZOP, Epidemiology of Mental Health and Access to Care Survey; IMHS, Iraq Mental Health Survey; LEBANON, Lebanese Evaluation of the Burden of Ailments and Needs of the Nation; MMHHS, Medellín Mental Health Household Study; M-NCS, Mexico National Comorbidity Survey; NCS-R, National Comorbidity Survey Replication; NHS, Israel National Health Survey; NISHS, Northern Ireland Study of Health and Stress; NMHS, Portugal National Mental Health Survey; NSHS, Bulgaria National Survey of Health and Stress; NSMH, Columbian National Study of Mental Health; NSMHW, Nigerian Survey of Mental Health and Well-being; NZMHS, New Zealand Mental Health Survey; PEGASUS, Psychiatric Enquiry to General Population in Southeast Spain; PRC, People's Republic of China; RMHS, Romania Mental Health Survey; SASH, South Africa Health and Stress Study; SMHWP, National Survey of Mental Health and Wellbeing; S-WHM; The Shanghai World Mental Health Survey; WMHJ, The World Mental Health Japan.

<sup>a</sup>Based on World Bank Data and Statistics classification at the time each survey was fielded. “Low income” refers to the World Bank categories of low- and lower-middle-income countries; “middle income” refers to the World Bank category of upper-middle-income countries; “high income” refers to the World Bank category of high-income countries.

<sup>b</sup>For purposes of cross-national comparisons the sample was limited to respondents ages 18 or older.

<sup>c</sup>Three respondents were missing age of onset (AOO) data for generalized anxiety disorder and were excluded from the analyses.

eTable 2. Bivariate Associations Between Sociodemographic Variables and *DSM-5* Generalized Anxiety Disorder Across Countries

Variables	Lifetime GAD, OR (95% CI) [P value] <sup>a</sup>	12-month GAD among lifetime cases, OR (95% CI) [P value] <sup>b</sup>
<b>Age-cohort</b>		
18-29	6.0 (5.1-7.0) [ $<.001$ ]	-
30-44	4.8 (4.3-5.4) [ $<.001$ ]	-
45-59	3.0 (2.7-3.3) [ $<.001$ ]	-
60+	1.0	-
$\chi^2$ (P Value) <sup>c</sup>	743.8 ( $<.001$ )	
<b>Age of onset of GAD</b>		
Early	-	1.8 (1.5-2.3) [ $<.001$ ]
Early-average	-	1.2 (1.0-1.5) [.03]
Late-average	-	1.0 (0.8-1.2) [.66]
Late	-	1.0
$\chi^2$ (P Value) <sup>c</sup>		45.9 ( $<.001$ )
<b>Sex</b>		
Female	1.8 (1.7-2.0) [ $<.001$ ]	1.1 (0.9-1.3) [.25]
Male	1.0	1.0
$\chi^2$ (P Value) <sup>c</sup>	313.2 ( $<.001$ )	1.3 (.25)
<b>Marital status</b>		
Never married	1.2 (1.1-1.3) [ $<.001$ ]	1.1 (0.9-1.3) [.57]
Divorced/ separated/widowed	1.6 (1.5-1.8) [ $<.001$ ]	1.1 (0.9-1.3) [.36]
Currently married	1.0	1.0
$\chi^2$ (P Value) <sup>c</sup>	131.4 ( $<.001$ )	1.0 (.60)
<b>Education level</b>		
No education	1.8 (1.4-2.3) [ $<.001$ ]	1.4 (0.8-2.3) [.22]
Some primary	1.4 (1.2-1.6) [ $<.001$ ]	1.9 (1.4-2.5) [ $<.001$ ]
Finished primary	1.6 (1.3-1.8) [ $<.001$ ]	1.7 (1.2-2.3) [.003]
Some secondary	1.4 (1.3-1.6) [ $<.001$ ]	1.5 (1.2-1.8) [ $<.001$ ]
Finished secondary	1.2 (1.1-1.4) [ $<.001$ ]	1.3 (1.0-1.6) [.02]
Some college	1.3 (1.1-1.4) [ $<.001$ ]	1.1 (0.9-1.4) [.39]
Finished college	1.0	1.0
$\chi^2$ (P Value) <sup>c</sup>	54.1 ( $<.001$ )	24.2 (.001)
<b>Household income</b>		
Low	1.3 (1.1-1.4) [ $<.001$ ]	1.6 (1.3-2.0) [ $<.001$ ]
Low-average	1.2 (1.0-1.3) [.009]	1.4 (1.1-1.7) [.001]
High-average	1.1 (1.0-1.3) [.01]	1.3 (1.1-1.6) [.004]
High	1.0	1.0
$\chi^2$ (P Value) <sup>c</sup>	20.8 ( $<.001$ )	22.1 ( $<.001$ )
<b>Employment status</b>		
Student	1.2 (0.9-1.5) [.15]	1.5 (1.0-2.4) [.07]
Homemaker	1.1 (1.0-1.2) [.18]	1.2 (1.0-1.5) [.03]
Retired	0.9 (0.8-1.0) [.07]	1.2 (1.0-1.5) [.10]
Other	1.7 (1.5-1.9) [.001]	1.6 (1.3-2.0) [ $<.001$ ]
Employed	1.0	1.0
$\chi^2$ (P Value) <sup>c</sup>	113.3 ( $<.001$ )	22.7 ( $<.001$ )

Abbreviations: OR, odds ratio; CI, confidence interval. Endashed lines indicate that associations were not estimated.

<sup>a</sup>Based on survival models adjusted for age-cohorts, sex, person-years, and country. The denominator used for these estimates is the number of person-years in the survival models (N = 6,360,664).

<sup>b</sup>Based on logistic regression models adjusted for time since GAD onset, age of GAD onset, sex, and country. The denominator used for these estimates is the number of lifetime GAD cases (N = 5,888).

<sup>c</sup>Chi-square test for differences between blocks of sociodemographic variables.

eTable 3. Severity of Role Impairment Associated with Pure and Comorbid 12-Month Generalized Anxiety Disorder by Country Income Level

SDS domain	Proportion with severe role impairment (SDS score: 7-10), No. (%) [SE]	
	Pure GAD <sup>a</sup>	Comorbid GAD <sup>b</sup>
<b>Home</b>		
Low income	18 (18.2) [4.5]	61 (25.2) [3.6]
Middle income	20 (13.6) [3.5]	100 (30.3) [2.5]
High income	96 (20.2) [2.2]	469 (32.6) [1.6]
All countries	134 (18.9) [1.7]	630 (31.3) [1.3]
Comparison between countries, $\chi^2$ (P Value) <sup>c</sup>	1.9 (.14)	1.8 (.16)
<b>Work</b>		
Low income	18 (20.0) [5.3]	56 (25.4) [4.2]
Middle income	24 (18.1) [4.1]	93 (32.8) [3.6]
High income	101 (21.1) [2.2]	525 (39.0) [1.8]
All countries	143 (20.4) [1.8]	674 (36.5) [1.5]
Comparison between countries, $\chi^2$ (P Value) <sup>c</sup>	0.5 (.59)	5.1 (.006)
<b>Relationship</b>		
Low income	19 (19.5) [5.4]	60 (28.8) [4.2]
Middle income	20 (14.7) [3.7]	103 (31.7) [2.8]
High income	84 (16.0) [2.1]	545 (39.0) [1.7]
All countries	123 (16.2) [1.8]	708 (36.6) [1.4]
Comparison between countries, $\chi^2$ (P Value) <sup>c</sup>	2.3 (.10)	4.3 (.01)
<b>Social</b>		
Low income	19 (23.8) [6.6]	48 (25.0) [4.4]
Middle income	16 (12.1) [3.4]	112 (35.0) [3.3]
High income	95 (19.4) [2.2]	619 (44.8) [1.6]
All countries	130 (18.7) [1.9]	779 (41.0) [1.4]
Comparison between countries, $\chi^2$ (P Value) <sup>c</sup>	1.9 (.15)	10.6 (<.001)
<b>Any<sup>d</sup></b>		
Low income	32 (34.1) [6.5]	94 (41.2) [4.4]
Middle income	42 (30.1) [4.8]	150 (47.6) [3.7]
High income	185 (36.9) [2.5]	866 (60.8) [1.6]
All countries	259 (35.3) [2.1]	1110 (56.3) [1.4]
Comparison between countries, $\chi^2$ (P Value) <sup>c</sup>	1.9 (.16)	12.1 (<.001)

Abbreviations: SDS, Sheehan Disability Scale.

<sup>a</sup>Among respondents with 12-month GAD and no comorbid *DSM-IV/CIDI* disorders in low-income (n = 107), middle-income (n = 164), and high-income (n = 533) countries, proportion reporting severe impairment due to GAD in the past 12 months. The ratio of numerator to denominator numbers does not equal the reported percentages because the percentages are weighted.

<sup>b</sup>Among respondents with 12-month GAD and one or more comorbid *DSM-IV/CIDI* disorders in low-income (n = 238), middle-income (n = 343), and high-income (n = 1500) countries,

proportion reporting severe impairment due to GAD in the past 12 months. The ratio of numerator to denominator numbers does not equal the reported percentages because the percentages are weighted.

<sup>c</sup>Chi-square test of homogeneity for variation in impairment severity across low-, middle-, and high-income countries (df = 2).

<sup>d</sup>Proportion with severe role impairment in at least one of the four SDS role domains.



eTable 4. Treatment Seeking Associated with Pure and Comorbid 12-Month Generalized Anxiety Disorder by Country Income Level

Treatment sector	Proportion who received mental health treatment in the past 12 months, No. (%) [SE]	
	Pure GAD <sup>a</sup>	Comorbid GAD <sup>b</sup>
<b>Specialty mental health<sup>c</sup></b>		
Low income	-	10 (4.4) [1.9]
Middle income	11 (6.5) [2.3]	69 (21.2) [3.1]
High income	84 (18.7) [2.5]	550 (37.4) [1.5]
All countries	99 (14.1) [1.8]	629 (30.7) [1.3]
Comparison between countries, $\chi^2$ (P Value) <sup>d</sup>	13.0 (<.001)	52.7 (<.001)
<b>General medical<sup>e</sup></b>		
Low income	7 (6.8) [2.8]	33 (13.4) [2.8]
Middle income	19 (12.0) [3.2]	60 (16.0) [2.5]
High income	136 (27.5) [2.6]	707 (45.7) [1.6]
All countries	162 (21.7) [2.0]	800 (36.9) [1.3]
Comparison between countries, $\chi^2$ (P Value) <sup>d</sup>	12.8 (<.001)	61.7 (<.001)
<b>Human services<sup>f</sup></b>		
Low income	-	14 (7.1) [2.6]
Middle income	5 (3.7) [1.9]	14 (3.8) [1.3]
High income	28 (5.5) [1.6]	126 (8.4) [0.9]
All countries	36 (5.1) [1.3]	154 (7.5) [0.7]
Comparison between countries, $\chi^2$ (P Value) <sup>d</sup>	0.3 (.77)	4.3 (.01)
<b>Complementary-alternative medicine<sup>g</sup></b>		
Low income	-	7 (3.2) [1.3]
Middle income	-	21 (5.9) [2.1]
High income	25(4.7) [1.1]	139 (9.5) [1.0]
All countries	26 (3.2) [0.7]	167 (8.2) [0.8]
Comparison between countries, $\chi^2$ (P Value) <sup>d</sup>	-	7.1 (<.001)
<b>Any treatment<sup>h</sup></b>		
Low income	15 (14.1) [4.7]	56 (24.8) [4.0]
Middle income	31 (18.2) [3.7]	125 (34.2) [3.7]
High income	204 (40.1) [2.5]	1001 (66.0) [1.5]
All countries	250 (32.4) [2.1]	1182 (55.8) [1.4]
Comparison between countries, $\chi^2$ (P Value) <sup>d</sup>	16.4 (<.001)	55.9 (<.001)

Endashed lines indicate low cell counts (n < 5). The ratio of numerator to denominator numbers does not equal the reported percentages because the percentages are weighted.

<sup>a</sup>Among respondents with 12-month GAD and no comorbid DSM-IV/CIDI disorders, proportion who received mental health treatment in the past 12 months.

<sup>b</sup>Among respondents with 12-month GAD and one or more comorbid DSM-IV/CIDI disorders, proportion who received mental health treatment in the past 12 months.

<sup>c</sup>Includes psychiatrist, psychologist, or other mental health professional; social worker or counselor in a mental health specialty setting; use of a mental health helpline; or overnight

admission for a mental health, drug, or alcohol problem, with a presumption of daily contact with a psychiatrist.

<sup>d</sup>Chi-square test of homogeneity testing for variation in treatment estimates across low-, middle-, and high-income countries ( $df = 2$ ). The test was performed when more than one stable cell ( $n \geq 5$ ) was available for comparison.

<sup>e</sup>Includes general practitioner, other medical doctor, nurse, occupational therapist, or other healthcare professional not previously mentioned.

<sup>f</sup>Includes religious or spiritual advisor, or social worker or counselor in any setting other than a specialty mental health setting.

<sup>g</sup>Includes any other type of healer such as herbalist or homeopath, participation in an internet support group, or participation in a self-help group.

<sup>h</sup>Respondents who sought any form of treatment listed above.

eAppendix. Ethics Review and Informed Consent in the World Mental Health Surveys

<b>Country</b>	<b>Type of Organization</b>	<b>IRB/Ethics approval</b>	<b>Type of consent obtained</b>
Australia	Government Agency	Interviews were carried out by trained interviewers from the Australian Bureau of Statistics, a statutory body responsible for conducting such surveys using ethical protocols that include written consent	Written
Belgium	Government Agency	Ethics Committee of the Institute of Public Health (Federal Public Service Health, Food Chain Safety, and Environment)	Verbal
Brazil	Academic Center/Institute; Private For-Profit Company	Research and Ethics Committee of the School of Medicine, University of São Paulo	Written
Bulgaria	Academic Center/Institute	Ethics approval from the Deputy Minister and Head of the Executive Committee of the National Psychiatric Program	Verbal
Colombia	Non-Profit Organization	Ethics Committee for the FES Social Foundation	Verbal
Colombia (Medellín)	Academic Center/Institute	Comité Institucional de Ética Universidad CES	Written
France	Academic Center/Institute	Acta No. 39	Written
Germany	Academic Center/Institute	Ethics Committee of the University of Leipzig	Verbal
Iraq	Government Agencies; World Health Organization	Ethics Scientific Committee of the Ministry of Health of Iraq	Verbal
Israel	Government Agency	Human Subjects Committee for survey and field procedures in Eitanim-Kfar Shaul Hospital	Verbal
Italy	Private For-Profit Company	Italian National Institute of Health	Written
Japan	Government Agency; Academic Center/Institute	National Center of Neurology and Psychiatry; Okayama University School of Medicine; Nagasaki University School of Medicine; Keio University School of Medicine; Jichi University School of Medicine; Juntendo University School of Medicine; Yamagata University School of Medicine	Written
Lebanon	Non-Profit Research Institute; Non-Governmental Organization	University of Balamand Faculty of Medicine Institutional Review Board	Verbal
Mexico	Academic Center/Institute	Ethics Committee in Research of the National Institute of Psychiatry Ramon de la Fuente Muñiz	Verbal

New Zealand	Ministry of Health	New Zealand Health Ethics Committees (approval from 14 separate committees)	Written
Nigeria	Government Agency; Academic Center/Institute	University of Ibadan/University College Hospital Joint Ethics Committee	Verbal
Northern Ireland	Academic Center/Institute	University of Ulster Ethics Committee	Written
Peru	Institute of Health	National Institute of Health Peru	Verbal
PRC Beijing/Shanghai	Academic Center/Institute	Ethics Committee of Peking University	Verbal
PRC Shenzhen	Academic Center/Institute	Ethics Committee of Shenzhen Kangning Hospital	Verbal
Poland	Public Research and Treatment Institute	Komisja Bioetyczna (Bioethical Committee) of Instytut Psychiatrii i Neurologi	Written
Portugal	Academic Center/Institute	Ethics Committee, Faculdade de Ciências Médicas, Universidade Nova	Verbal
Romania	Academic Center/Institute; Public Organization	Ethic Commission, Scientific Board of National Institute for Research and Development in Health	Verbal
South Africa	Academic Center/Institute	Human Subjects Committees of the University of Michigan, Harvard Medical School, and the Medical University of South Africa	Written
Spain	Academic Center/Institute	Ethical Committees of Sant Joan de Deu Serveis de Salut Menta and of IMIM-Hospital del Mar Medical Research Institute	Written
Spain (Murcia)	Public Health Authority	The Clinical Research Ethics Committee of the University Hospital Virgen de la Arrixaca of Murcia	Written
The Netherlands	Private For-Profit Company; Academic Center/Institute	Ethics Committee of the Netherlands Institute of Mental Health and Addiction	Written
Ukraine	Academic Center/Institute	Kiev International Institute of Sociology; Ukrainian Psychiatric Association	Written
United States	Academic Center/Institute	Human Subjects Committees of the Institute for Social Research at the University of Michigan and of Harvard Medical School	Verbal

Abbreviation: PRC, People's Republic of China.

eFigure 1. Age of Onset of Generalized Anxiety Disorder by Country Income Level

