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Psychotic experiences in the general population: a cross-national analysis based on 31,261 respondents from 18 countries

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Potential Conflict of Interests

Over the past three years RK has been a consultant for Hoffman-La Roche Inc, Johnson & Johnson Wellness and Prevention, Sonofi-Aventis Group. RK has served on advisory boards for Mensante Corporation, Plus One Health Management, Lake Nona Institute and US Preventive Medicine. There are no other competing interests.

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Abstract

IMPORTANCE—Community-based surveys find that many otherwise healthy individuals report histories of hallucinations and delusions. To date, most studies have focused on the overall lifetime prevalence of ever having any of these psychotic experiences (PEs), possibly masking important features related to types and frequencies of PEs.

OBJECTIVE—To explore detailed epidemiological information of PEs in a large cross-national sample.

DESIGN, SETTING, AND PARTICIPANTS—Data came from the WHO World Mental Health (WMH) Surveys, a coordinated set of community epidemiological surveys of the prevalence and correlates of mental disorders in representative household samples in countries throughout the world. 31 261 adult (aged 18 and older) WMH respondents across 18 countries were asked about lifetime and 12-month prevalence and frequency of six types of PEs (two hallucinatory experiences [HEs] and four delusional experiences [DEs]).

MAIN OUTCOMES—Prevalence, frequency, and correlates of PEs.

RESULTS—Mean lifetime prevalence (standard error) of ever having a lifetime PE was 5.8% (0.2), with hallucinatory experiences (5.2% [0.2]) much more common than delusional experiences (1.3% [0.1]), More than two-thirds (72.0%) of respondents with lifetime PEs reported experiencing only one type. PEs were typically infrequent, with 32.2% of respondents with lifetime PEs reporting only one occurrence and an additional 31.8% only 2–5 occurrences. There was a significant relationship between having more than one type of PE and having more frequent PE episodes. Lifetime prevalence estimates were significantly higher among respondents in middle and high income countries than low income countries, women than men, the non-married than the married, not employed and those with low family income.

CONCLUSIONS AND RELEVANCE—The epidemiology of PEs is more nuanced than previously thought. Research is needed that focuses on similarities and differences in predictors of the onset, course, and consequences of distinct PEs.

There has been a growing interest in recent years in the epidemiology of hallucinations and delusions.[1] These psychotic experiences (PEs) are reported by a sizeable minority of the general population. A recent meta-analysis based on 61 studies reported that the median lifetime prevalence of PE was 7.2%.[2] Because this is substantially higher than the lifetime morbid risk (MR) of psychotic disorders such as schizophrenia (median MR 0.7%),[3] the field of psychiatric epidemiology has been forced to rethink how PEs ‘fit’ into the epidemiologic landscape of psychotic disorders. The terminology to describe these experiences has also evolved over time. Sometimes referred to as psychotic-like experiences, we will use the general term *psychotic experiences* to encompass both *hallucinatory experiences* (HEs) and *delusional experiences* (DEs).[2]

Early work on the epidemiology of PEs focused on these experiences as risk indicators for later conversion to full psychosis. There is an appealing logic to this type of research, as many of the risk factors associated with PEs are also associated with schizophrenia/psychosis.[4] More recently, evidence has accumulated that PEs are also associated with the subsequent onset of a wide array of common mental disorders including anxiety, mood, and substance use disorders,[5–7] as well as with an increased risk of suicidal ideation and intent.[8–10] Thus, there is a growing awareness that the presence of PEs may reflect a vulnerability to a wide range of adverse mental health outcomes (in addition to psychotic disorders).[11–16] These findings, and the concern that antipsychotic medications may be inappropriately used to treat individuals with isolated PEs, may have influenced the decision to exclude 'Attenuated Psychosis Syndrome' in recently revised diagnostic criteria.[17]

As the empirical data have accumulated, systematic reviews have pooled prevalence estimates and applied meta-regression techniques in order to explore the socio-demographic correlates of PEs.[2,15,18,19] These reviews provide valuable clues to the nature of PEs, but also highlight important gaps in the literature. Four of these gaps are of special importance for the current study.

Firstly, the use of pooling in systematic reviews of PEs has encouraged the use of coarse dichotomous measures (e.g. lifetime prevalence present/absent) in order to harmonize the wide array of scales and diagnostic instruments used to assess PEs.[2] This has reduced the subtlety of the associations examined in these reviews. Secondly, the studies included in the systematic reviews have varied in many key design elements. As noted by Linscott and van Os [2] substantial heterogeneity in the data has hampered analyses related to the relationship between PEs and socio-demographic variables. Thirdly, the vast majority of community studies of PE prevalence and correlates have been carried out in high income countries. A major exception is the World Health Survey (WHS), which included four brief PE questions in surveys of 52 nations.[20] However, the WHS assessment of PEs had several limitations (e.g. it lacked information on frequency of PE occurrence; and questions about DEs were not asked in a fashion that excluded experiences related to alcohol, illicit drugs or sleep). Finally, in order to allow pooling of data from different studies, some reviews have collapsed different variables across orthogonal axes. For example, Kaymaz et al[15] compiled composite variables related to 'weak' and 'strong' PEs, which in theory could be built from data related to: (1) the count of different types of PEs, (2) the frequency of occurrence, (3) associated distress, (4) comorbidity, and/or (5) 'certainty' (e.g. confidence in the psychotic nature of the experience).

Leading commentators have repeatedly called for more fine-grained analyses of PE in order to guide the field.[1,21] The current report presents initial results of analyses designed to address the above limitations by examining data collected in the WHO World Mental Health (WMH) Surveys, a series of population-based surveys carried out in many countries using consistent instruments and field procedures designed to facilitate pooled cross-national analyses of the prevalence and correlates of mental disorders. These data provide an unprecedented opportunity to explore the epidemiologic landscape of PEs.

Methods

Participants

The WMH surveys are a coordinated set of community epidemiological surveys administered in probability samples of the household population in countries throughout the world (www.hcp.med.harvard.edu/WMH). Eighteen of the 26 WMH surveys completed up to now administered the CIDI Psychosis Module. These 18 countries are distributed across North and South America (Colombia, Mexico, Peru, Sao Paulo in Brazil, USA); Africa (Nigeria); the Middle East (Iraq, Lebanon); Asia (Shenzhen in the People's Republic of China [PRC]); the South Pacific (New Zealand); and Europe (Belgium, France, Germany, Italy, the Netherlands, Portugal, Romania, Spain). All 18 surveys were based on multi-stage, clustered area probability household sampling designs (Table 1). The weighted average response rate across all 18 countries was 72.1%. Most surveys were based on nationally representative sample frames, but a few excluded rural areas (Colombia, Mexico), or focused on particular regions (Nigeria, Shenzhen), or cities (Sao Paulo). Participating sites were grouped into 3 country-level income strata according to World Bank criteria[22] - '*low and lower-middle income*' countries (Colombia, Iraq, Nigeria, PRC-Shenzhen, Peru), *upper-middle income* (Sao Paulo, Lebanon, Mexico, Romania), and *high-income* countries (the European countries, New Zealand, USA). The age ranges reported here include 18 years and over except in three countries (Mexico, Colombia, Peru) where 65 years was the upper age limit.

In keeping with previous studies of PEs,[9,11,23–28] we made the *a priori* decision to exclude individuals who had PEs but who also screened positive for possible schizophrenia/psychosis, and manic-depression/mania (i.e. respondents who (a) reported (1) schizophrenia/psychosis or (2) manic-depression/mania" in response to the question "What did the doctor say was causing (this/these) experiences?"; and (b) those who ever took any antipsychotic medications for these symptoms). This resulted in the exclusion of 140 respondents (0.4% of all respondents), leaving 31,261 respondents for this study (see Table 1).

Measures and Assessments

All WMH surveys were conducted face-to-face in the homes of respondents by trained lay interviewers. Informed consent was obtained before beginning interviews in all countries. Procedures for obtaining informed consent and protecting individuals (ethical approval) were approved and monitored for compliance by the institutional review boards of the collaborating organisations in each country.[29] Full details of these procedures are described elsewhere.[30,31]

All WMH interviews had two parts. Part I, administered to all respondents, contained assessments related to core mental disorders. Part II included additional information relevant to a wide range of survey aims, including assessment of PEs. All Part I respondents who met criteria for any Part I DSM IV mental disorder as well as a probability sample of other respondents were administered Part II. Part II respondents were weighted by the inverse of their probability of selection for Part II to adjust for differential sampling. Within the different sites, questions related to PEs were either administered to all respondents or a

random sample of those administered Part II. Analyses in this article were based on the weighted Part II subsample of respondents administered the CIDI Psychosis Module. Additional weights were used to adjust for differential probabilities of selection within households, nonresponse, and to match the samples to population socio-demographic distributions.

The instrument used in the WMH surveys was the WHO Composite International Diagnostic Interview (CIDI),[32] a validated fully-structured diagnostic interview designed to assess the prevalence and correlates of a wide range of mental disorders according to the definitions and criteria of both the DSM-IV and ICD-10 diagnostic systems.

The CIDI Psychosis Module included questions about 6 PE types – 2 related to HEs (visual hallucinations, auditory hallucinations) and 4 related to DEs (two 'bizarre' delusional items - thought insertion/withdrawal, mind control/passivity; two 'paranoid' delusional items - ideas of reference, plot to harm/follow) (See Appendices A1 & A2). For example, respondents were asked if they ever experienced PEs (e.g. "*Have you ever heard any voices that other people said did not exist?*"). This was followed by a probe question to determine if the reported PEs ever occurred when the person was '*not dreaming, not half-asleep, or not under the influence of alcohol or drugs*'. Only responses of the latter type are considered here. The sequence of these follow-up probe types differed slightly between the first 6 WMH surveys, which were carried out in Europe (Belgium, France, Germany, Italy, the Netherlands, Spain), and the remaining 12 countries (See eTables 1 and 2).

Respondents who reported PEs were then asked about: (a) presence of the PEs in the past 12 months; and (b) frequency/occurrences of the PEs in their lifetime. In this paper we present prevalence estimates for any PE, any HE (with or without associated DEs), any DE (with or without associated HEs), 'pure' HE (without DEs) and 'pure' DE (without HEs). In addition, we will present two key PE-related metrics: (a) count of types of PEs (henceforth referred to as *PE type metric);* and (b) frequency of occurrence of PE episodes (henceforth referred to as *PE frequency metric)*. Respondents may have had more than one hallucination and/or delusion type associated with a single episode of PEs. For the PE frequency metric, reported frequency of lifetime PE episodes was divided into 5 categories: only once, 2–5 times, 6–10 times, 11–100 times, and 101 and above. This five-category scheme was collapsed into 1–10 versus 11+ in analyses of socio-demographic correlates of PE frequency among respondents with lifetime PEs.

The socio-demographic factors considered here include: gender, age, number of years of education, employment history, marital status, family income, and nativity (i.e. born inside the country of assessment). For the bivariate and multivariate analyses, the socio-demographic variables were stratified into broad categories based on methodology described elsewhere.[29]

Statistical Analysis

Weighted prevalence estimates were calculated for the various PE types and related metrics. Odds ratios (ORs) and design-corrected 95% confidence intervals (CIs) are reported. Because the WMH survey data featured geographical clustering and weighting, standard

errors (se) of parameter estimates were generated using the design-based Taylor series linearization method implemented in a SAS macro (SAS Institute inc. version 9.4). Multivariate significance was evaluated using Wald χ^2 tests based on design-corrected coefficient variance–covariance matrices. The association between the PE type metric versus the PE frequency metric was evaluated using the Cochran-Armitage test. Statistical significance was evaluated consistently using two-tailed .05-level tests.

Results

Prevalence of PEs

Table 2 presents country-specific lifetime PE prevalence estimates. Lifetime prevalence (se) of at least 1 PE was reported by 5.8% (0.2) of the 31 261 respondents. Lifetime prevalence of any HE was 5.2% (0.2) and of any DE 1.3% (0.1). The median and interquartile range (IQR) of lifetime PEs, HEs and DEs were 5.5% (IQR: 2.8–7.5), 4.4% (IQR: 1.8–6.5), and 1.3% (IQR: 0.9–1.8), respectively (see eFigures 1–3 for cumulative distribution of PE, HE and DE estimates respectively). Twelve-month prevalence (se) of any PE was 2.0% (0.1), while the median (IQR) was 1.4% (1.0–2.8).

Lifetime PEs prevalence (se) was significantly higher among women than men (6.6% [0.2] vs. 5.0% [0.3]; χ^{21}=16.0, p< .001). Similar gender differences were found for prevalence of HEs (5.9% [0.2] vs. 4.3% [0.3]; χ^{21} =19.4, p<.001) but not DEs (1.4% [0.1] vs. 1.3% [0.1]; χ^{21}=0.3, p=.61). The significant gender difference was also found for respondents with ‘pure’ HEs (5.2% [0.2] vs. 3.7% [0.3]; χ^{21}=19.3, p < .001), but not ‘pure’ DEs (0.7% [0.1] vs. 0.7% [0.1]; χ^{21}=0.1, p = .80).

Significant differences were found across the three country-level income strata in lifetime prevalence of any PE, any HE and any DE – in each comparison the prevalence estimates were significantly higher among respondents in middle and high income countries than low income countries (χ^{22} ranged from 7.1 to 58.2, each p < .001).

The prevalence of individual PEs and the distribution of the PE type metric

Table 3 shows the lifetime prevalence estimates of individual PE types and counts of different PE types. The most common PE type overall was visual hallucinations (3.8% [0.2]) followed by auditory hallucinations (2.5% [0.1]). Prevalence estimates of individual DE types were low (0.3– 0.7%). Among those with any lifetime PE, 72.0% (representing 4.2% of the total sample) reported only 1 PE type, 21.1% (representing 1.2% of the total sample) exactly 2 types, and 6.8% (representing 0.4% of the total sample) 3 or more types.

The distribution of the PE frequency metric, and the relationship between PE type and PE frequency metrics

PEs were typically infrequent, with 32.2% of the respondents with lifetime PEs reporting only one solitary episode (Table 4). An additional 31.8% of respondents with lifetime PEs experienced only 2–5 PE episodes. Thus, for nearly two-thirds of respondents (64.0%) with lifetime PEs, these experiences occurred only 1–5 times in their lives. An additional 10.0% of respondents with lifetime PEs reported 6–10 lifetime episodes, 20.0% 11–100 episodes,

and 6.0% 101 or more episodes. The relationship between the PE type metric and the PE frequency metric is best displayed in Table 5. Those with more PE types are disproportionately more likely to have more PE episodes (Cochran-Armitage z = −10.0, $p <$. 001).

Associations between socio-demographic factors with lifetime PEs, HEs and DEs

eTable 3 shows the association of socio-demographic variables with lifetime PEs, HEs and DEs in bivariate and multivariate models. Several socio-demographic variables were associated with increased Odds Ratios for PEs, HEs and DEs in both models: (a) being a homemaker or classified as 'other' employment (looking for work, disabled etc.) (versus employed); (b) being non-married (never married or separated/widowed/divorced) (versus married), and (c) lower household income (versus high income). In addition to these findings, several socio-demographic variables were associated with only one type of PE. Young respondents (18–29 years) were significantly more likely to have DEs (compared to those over 60 years), while age was unrelated to HEs (and overall PEs). While female sex was associated with an increased prevalence of PEs (in both models), this finding was driven by an increased risk of HEs (but not DEs). Low education, in comparison, was associated with an increased risk of DEs, but not HEs. Unexpectedly, those born outside the country (i.e. migrants) were significantly less likely than the native born to report HEs (but not DEs) in both bivariate and multivariate models.

Associations of socio-demographic factors with PE type and PE frequency metrics

Concerning factors that influence the PE type metric (in those who had experienced PEs), in the multivariate model, the three younger age strata (i.e. that spanned 18 to 59 years) were significantly more likely to have more than one PE type (compared to those aged 60+ years) (eTable 4). None of the other socio-demographic characteristics was associated with the PE type metric. Concerning the correlates of the PE frequency metric, student status was significantly associated with lower frequency of PE occurrence. None of the other socio-demographic variables was associated with PE frequency (eTable 5).

Discussion

Based on cross-national samples from 18 countries, we found that 5.8% of respondents reported having one or more PEs at least once in their lifetime and 2.0% in the previous year. These overall estimates are broadly consistent with the previous literature.[2] In addition, though, our study foregrounds important new information regarding the count of PE types and frequency of PEs that go beyond the issues considered in previous community-based studies of PEs.

Perhaps the most striking finding is that these experiences are infrequent for the majority of individuals who experience PEs, with 32.2% reporting only one PE episode in their life and 64% reporting no more than 5 lifetime occurrences.

In the general population, those with 2 or more types of PEs are also significantly more likely to have more PE episodes. For example, of those who reported 3 or more PE types, nearly a quarter (24.5%) reported more than 101 occurrences.

Our findings provide an empirical foundation upon which to investigate factors that influence the *persistence* of PEs.[1] When viewed within the context of the gap between 12-month and lifetime PE estimates from the current study (i.e. 2.0% versus 5.8%), we can infer that most individuals do not have persistent PEs. Mindful that lifetime prevalence estimates for mental health disorders are often downward-biased due to under-reporting.[33] Linscott and van Os[2] estimated that of those who report any PEs, approximately 80% would have had transient experiences. This estimate is consistent with our empirical finding that about 64% of individuals with PEs report only 1–5 lifetime occurrences.

Based on the set of PEs examined, our study confirms that hallucinations were more common than delusions (5.2% versus 1.3%), and this general pattern was consistent across the 3 country-level income strata. We note that the lifetime prevalence of PEs was lower in the low-lower middle income countries (3.2%) compared to the upper-middle and high income countries (7.2%, 6.8% respectively). While we cannot directly compare our results with the one previous cross-national study of PEs [20] due to differences in how PEs were assessed, we note that both studies (optimized for consistent design and PE assessment) provided insights in variation between sites.

One of the strengths of cross-national studies such as the WMH Survey is that they are able to identify risk factors that exist consistently across countries despite site-specific cultural factors. We found an increased prevalence of both HEs and DEs associated with being unmarried, not employed, and having low household income. However, certain demographic features were differentially associated with HEs but not DEs, and vice versa. For example, women had a significantly higher prevalence of HEs but not DEs. We found a significant relationship between younger age and DEs, but not HEs. Unexpectedly, migrants in our study were significantly less likely to report lifetime HEs (compared to native born respondents). These novel findings provide important points of distinction between the epidemiology of psychotic disorders and PEs.[4,34]

It is of interest to note that while several socio-demographic variables were significantly associated with the lifetime prevalence of PEs, these features were not associated with the PE type or PE frequency metrics. We speculate that comorbid psychiatric illness (e.g. depression, anxiety disorders) and other risk factors known to be associated with PEs and mental disorders (e.g. family history, substance use, trauma exposure) may contribute to these PE-related metrics. The comprehensive nature of the WMH survey will allow us to explore these hypotheses in future analyses.

While the study has many strengths (e.g. large sample size, range of countries, uniform methodology for data collection, innovative analysis of PE-related metrics), there are several limitations. In keeping with other population-based surveys, we relied on trained lay interviewers to administer the questionnaire. While we excluded those who were screen-positive for possible psychotic disorders, we did not have access to valid measures of clinical psychotic disorders. Lifetime prevalence estimates are prone to under-reporting.[33] We only assessed four types of DEs, and these probes may have been insensitive to culture-specific delusional beliefs.[16]

Conclusions

We have provided the most comprehensive description of the epidemiology of PEs published to date. While the lifetime prevalence of PEs is 5.8%, these are mostly rare events. For nearly a third of those who have PEs (i.e. 32.2%), these were solitary (i.e. one-off) events. In the general population there is a small subgroup of individuals who have multiple types of PEs and who experiences these PEs more frequently. The research community needs to leverage this fine-grained information in order to better determine how PEs reflect risk status. Our study highlights the subtle and variegated nature of the epidemiology of PEs, and provides a solid foundation upon which to explore the bi-directional relationship between PEs and mental health disorders.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

World Mental Health (WMH) sample characteristics by World Bank income categories[a], and sample for psychotic experiences (PEs) after exclusion of 140 respondents who were screen-positive for possible schizophrenia/psychosis[b]

Country by income category[a]	Sample characteristics[c, d]	Field dates	Age range	Sample size		Response rate[e]
				Part I	PEs sample	
I. Low and lower middle income countries						
Colombia	All urban areas of the country	2003	18–65	4,426	722	87.7
Iraq	Nationally representative	2006–7	18–96	4,332	4,329	95.2
Nigeria	21 of the 36 states in the country	2002–3	18–100	6,752	1,417	79.3
PRC[f] – Shenzhen[g]	Shenzhen metropolitan area	2006–7	18–88	7,132	2,468	80.0
Peru	Nationally representative	2004–5	18–65	3,930	530	90.2
TOTAL				*26,572*	*9,466*	*84.7*
II. Upper-middle income countries						
Brazil - São Paulo	São Paulo metropolitan area	2005–7	18–93	5,037	2,922	81.3
Lebanon	Nationally representative	2002–3	18–94	2,857	1,029	70.0
Mexico	All urban areas of the country	2001–2	18–65	5,782	715	76.6
Romania	Nationally representative	2005–6	18–96	2,357	2,357	70.9
TOTAL				*16,033*	*7,023*	*75.8*
III. High-income countries						
Belgium	Nationally representative	2001–2	18–95	2,419	319	50.6
France	Nationally representative	2001–2	18–97	2,894	301	45.9
Germany	Nationally representative	2002–3	18–95	3,555	408	57.8
Italy	Nationally representative	2001–2	18–100	4,712	617	71.3
Netherlands	Nationally representative	2002–3	18–95	2,372	348	56.4
New Zealand[g]	Nationally representative	2003–4	18–98	12,790	7,263	73.3
Portugal	Nationally representative	2008–9	18–81	3,849	2,053	57.3
Spain	Nationally representative	2001–2	18–98	5,473	1,159	78.6
United States	Nationally representative	2002–3	18–99	9,282	2,304	70.9
TOTAL				*47,346*	*14,772*	*65.5*

Country by income category[a]	Sample characteristics[c, d]	Field dates	Age range	Sample size		Response rate[e]
				Part I	PEs sample	
IV. Total				***89,951***	***31,261***	***72.1***

[a]Based on World Bank country level of economic development (The World Bank. (2008). Data and Statistics. Accessed May 12, 2009 at: http://go.worldbank.org/D7SN0B8YU0)

[b]Respondents were excluded if they endorsed any PE but also (a) reported *(1) schizophrenia/psychosis* or *(2) manic-depression/mania*" in response to the question "*What did the doctor say was causing (this/these) experiences?*"; and (b) those who ever took any antipsychotic medications for these symptoms. This resulted in the exclusion of 140 respondents (0.4% of all respondents), leaving 31,261 respondents for this study.

[c]NSMH (The Colombian National Study of Mental Health); IMHS (Iraq Mental Health Survey); NSMHW (The Nigerian Survey of Mental Health and Wellbeing); EMSMP (La Encuesta Mundial de Salud Mental en el Peru); 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); ESEMeD (The European Study Of The Epidemiology Of Mental Disorders); NZMHS (New Zealand Mental Health Survey); NMHS (Portugal National Mental Health Survey); NCS-R (The US National Comorbidity Survey Replication).

[d]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). Several WMH surveys (Belgium, Germany, and Italy) used municipal resident registries to select respondents without listing households. 13 of the 18 surveys are based on nationally representative household samples.

[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 72.1%.

[f]People's Republic of China

[g]For the purposes of cross-national comparisons we limit the sample to those 18+.

Table 2

Lifetime and 12-month prevalence of psychotic experiences in the World Mental Health surveys

		Lifetime Any PE[b]	Lifetime Any HE[c]	Lifetime Any DE[d]	12-month PE	Total Sample
Income category[a]	**Country**	**n_1[e] (%[f], SE)**	**n_1[e] (%[f], SE)**	**n_1[e] (%[f], SE)**	**n_1[e] (%[f], SE)**	**N[g]**
Low and Lower-Middle	Colombia	73 (7.5,1.2)	68 (7.1,1.2)	11 (0.9,0.3)	25 (2.1,0.5)	722
	Iraq	51 (1.2,0.2)	46 (1.1,0.2)	13 (0.4,0.2)	25 (0.7,0.2)	4329
	Nigeria	39 (2.2,0.5)	32 (1.7,0.4)	16 (1.0,0.4)	15 (1.0,0.4)	1417
	PRC-Shenzhen	151 (5.3,0.8)	116 (3.8,0.6)	54 (1.8,0.4)	45 (1.4,0.3)	2468
	Peru	36 (6.4,1.4)	33 (6.1,1.4)	7 (1.1,0.4)	18 (3.3,0.9)	530
Total Low and Lower-Middle		*350 (3.2,0.3)*	*295 (2.6,0.2)*	*101 (0.9,0.1)*	*128 (1.2,0.2)*	*9466*
Upper-Middle	Brazil-Sao Paulo	548 (14.9,0.9)	471 (13.3,0.9)	183 (3.6,0.3)	230 (5.6,0.4)	2922
	Lebanon	37 (1.9,0.4)	30 (1.6,0.4)	14 (0.6,0.3)	15 (0.9,0.4)	1029
	Mexico	53 (4.1,1.0)	49 (3.6,0.9)	12 (0.8,0.4)	22 (1.4,0.4)	715
	Romania	24 (1.0,0.4)	21 (0.9,0.4)	5 (0.1,0.1)	9 (0.3,0.1)	2357
Total Upper-Middle		*662 (7.2,0.4)*	*571 (6.4,0.4)*	*214 (1.7,0.1)*	*276 (2.7,0.2)*	*7023*
High	Belgium	32 (8.3,2.5)	19 (5.0,1.6)	20 (5.7,2.3)	11 (4.1,2.4)	319
	France	27 (5.7,1.4)	23 (4.9,1.3)	7 (1.6,0.6)	6 (1.3,0.7)	301
	Germany	25 (2.8,0.5)	16 (1.8,0.4)	13 (1.3,0.3)	6 (1.0,0.2)	408
	Italy	38 (4.5,0.8)	31 (3.5,1.0)	16 (1.9,0.6)	12 (1.3,0.5)	617
	Netherlands	47 (10.8,2.5)	41 (10.1,2.5)	11 (1.6,0.5)	13 (3.0,1.2)	348
	New Zealand	724 (6.9,0.4)	667 (6.5,0.4)	134 (0.9,0.1)	271 (2.4,0.2)	7263
	Portugal	140 (5.2,0.7)	106 (3.9,0.5)	66 (2.6,0.5)	43 (1.7,0.3)	2053
	Spain	91 (6.7,1.5)	77 (5.8,1.5)	35 (1.4,0.4)	19 (0.9,0.2)	1159
	United States	249 (8.6,0.9)	232 (8.2,0.9)	41 (1.3,0.2)	79 (2.8,0.4)	2304
Total High		*1373 (6.8,0.3)*	*1212 (6.2,0.3)*	*343 (1.4,0.1)*	*460 (2.2,0.2)*	*14772*
All Countries		2385 (5.8,0.2)	2078 (5.2,0.2)	658 (1.3,0.1)	864 (2.0,0.1)	31261

[a]Income = Based on World Bank country level of economic development (The World Bank. (2008). Data and Statistics. Accessed May 12, 2009 at: http://go.worldbank.org/D7SN0B8YU0);

[b]PE = Psychotic experience (any of the six types);

[c] HE = Hallucinatory experience (either of the two types);

[d] DE = Delusional experience (any of the four types);

[e] n1 = Unweighted number of respondents who reported the PEs;

[f] Prevalence estimates are based on weighted data;

[g] N = The total unweighted number of respondents who were asked about PEs.

Table 3

Lifetime prevalence of individual psychotic experiences in the World Mental Health surveys

Type	Lifetime prevalence n[a] (%[b], SE)
HE - visual	1545 (3.8,0.2)
HE - auditory (verbal)	1051 (2.5,0.1)
Any HE[c]	2078 (5.2,0.2)
DE - thought insertion/withdrawal	193 (0.4,0.0)
DE - mind control/passivity	148 (0.3,0.0)
DE - ideas of reference	209 (0.4,0.0)
DE - plot to harm/follow	328 (0.7,0.1)
Any DE[d]	658 (1.3,0.1)
Any PE[e]	2385 (5.8,0.2)
Exactly 1 PE type	1631 (4.2,0.2)
Exactly 2 PE types	544 (1.2,0.1)
3 or more PE types	210 (0.4,0.0)
Total Sample (N[f])	***31261 (100,0.0)***

[a] n = Unweighted number of respondents who reported the PEs;

[b] Prevalence estimates are based on weighted data;

[c] HE = Hallucinatory experience (either of the two items);

[d] DE = Delusional experience (any of the four items);

[e] PE = Psychotic experience (any of the six items);

[f] N = The total unweighted number of respondents who were asked about PEs.

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Table 4

Frequency of lifetime occurrence of psychotic experiences (PEs) among respondents who reported ever having one or more PE in the World Mental Health surveys

		PE frequency metric					
		Row Sample Size	1	2–5	6–10	11–100	101 or more
Sample	**Type**	**n[a]**	**%[b] (SE)**	**%[b] (SE)**	**%[b](SE)**	**%[b](SE)**	**%[b](SE)**
All countries (except for ESEMed[#])	HE - visual	1379	31.9 (1.7)	32.0 (1.7)	10.5 (1.0)	18.7 (1.4)	6.7 (0.9)
	HE - auditory (verbal)	965	20.8 (1.9)	31.7 (2.2)	11.1 (1.3)	26.5 (1.9)	9.9 (1.3)
	Any HE[c]	***1871***	***30.4 (1.4)***	***32.4 (1.4)***	***10.0 (0.8)***	***20.6 (1.3)***	***6.6 (0.8)***
	DE - thought insertion/withdrawal	162	28.9 (4.1)	27.1 (3.9)	9.7 (2.0)	15.6 (2.9)	18.8 (3.3)
	DE - mind control/passivity	136	27.1 (5.0)	18.2 (3.5)	11.8 (2.5)	24.2 (4.5)	18.8 (4.6)
	DE - ideas of reference	169	15.5 (2.6)	24.5 (4.5)	13.2 (2.8)	23.7 (4.0)	23.1 (5.2)
	DE - plot to harm/follow	278	36.4 (3.5)	26.2 (2.8)	12.6 (2.2)	18.7 (2.4)	6.0 (1.8)
	Any DE[d]	***556***	***29.1 (2.5)***	***27.6 (2.1)***	***12.6 (1.5)***	***18.2 (1.8)***	***12.5 (2.0)***
	Any PE[e]	***2125***	***31.7 (1.4)***	***31.9 (1.3)***	***10.1 (0.7)***	***20.0 (1.2)***	***6.4 (0.7)***
	Exactly 1 PE type	1452	37.5 (1.7)	32.3 (1.5)	8.9 (0.8)	18.0 (1.4)	3.3 (0.7)
	Exactly 2 PE types	491	16.7 (3.3)	35.3 (3.6)	12.8 (2.5)	24.9 (2.5)	10.3 (1.9)
	3 or more PE types	182	17.2 (2.8)	17.6 (3.5)	13.8 (3.4)	25.6 (3.9)	25.8 (4.3)
ESEMed[#] only	***Any PE[e]***	***260***	***36.4 (3.3)***	***30.7 (2.9)***	***9.5 (1.5)***	***20.3 (2.3)***	***3.2 (0.9)***
	Exactly 1 PE type	179	43.0 (3.9)	29.6 (3.7)	4.3 (1.4)	21.0 (2.1)	2.1 (0.9)
	Exactly 2 PE types	53	23.6 (8.6)	33.7 (4.7)	32.3 (5.7)	6.8 (1.3)	3.6 (1.4)
	3 or more PE types	28	2.1 (0.6)	34.0 (12.1)	2.5 (1.0)	48.2 (12.5)	13.2 (5.6)
All countries	***Any PE[e]***	***2385***	***32.2 (1.3)***	***31.8 (1.2)***	***10.0 (0.7)***	***20.0 (1.1)***	***6.0 (0.6)***
	Exactly 1 PE type	1631	38.1 (1.5)	32.0 (1.4)	8.4 (0.7)	18.3 (1.2)	3.2 (0.6)
	Exactly 2 PE types	544	17.4 (3.1)	35.1 (3.3)	14.6 (2.3)	23.2 (2.2)	9.7 (1.8)
	3 or more PE types	210	15.6 (2.5)	19.3 (3.3)	12.7 (3.1)	27.9 (3.9)	24.5 (3.9)

[a] n = Unweighted number of respondents who reported the PEs;

[b] Prevalence estimates are based on weighted data;

[c] HE = Hallucinatory experience (either of the two types);

[d] DE = Delusional experience (any of the four types);

[e] PE = Psychotic experience (any of the six types);

[#] ESEMeD = European Study of the Epidemiology of Mental Disorders.

Table 5

Cross table of psychotic experiences (PE) frequency metric and PE type metric in the World Mental Health surveys

		PE frequency metric					
		Row Sample Size	1	2–5	6 or more	Cochran- Armitage test	Chi-Square test
Sample	Type	n[a]	%[b] (SE)	%[b] (SE)	%[b] (SE)	z (*p*-value)	χ^2_2 (*p*-value)
All countries	Exactly 1 PE type	1631	38.1 (1.5)	32.0 (1.4)	29.9 (1.5)	−10.0[*] (<.001)	32.1[*] (<.001)
	2 or more PE types	754	16.9 (2.4)	31.2 (2.6)	51.8 (2.9)		

[a] n = Unweighted number of respondents who reported the PEs;

[b] Prevalence estimates are based on weighted data;

[*] Significant at 0.05 level, two-sided test (p value shown in table).