



Research report

World survey of mental illness stigma

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ABSTRACT

Objective: To obtain rapid and reproducible opinions that address mental illness stigma around the world.**Method:** Random global Web users were exposed to brief questions, asking whether they interacted daily with someone with mental illness, whether they believed that mental illness was associated with violence, whether it was similar to physical illness, and whether it could be overcome.**Results:** Over a period of 1.7 years, 596,712 respondents from 229 countries completed the online survey. The response rate was 54.3%. China had the highest proportion of respondents in daily contact with a person with mental illness. In developed countries, 7% to 8% of respondents endorsed the statement that individuals with mental illness were more violent than others, in contrast to 15% or 16% in developing countries. While 45% to 51% of respondents from developed countries believed that mental illness was similar to physical illness, only 7% believed that mental illness could be overcome. To test for reproducibility, 21 repeats of the same questions were asked monthly in India for 21 months. Each time, $10.1 \pm 0.11\%$ s.e., of respondents endorsed the statement that persons who suffer from mental illness are more violent than others, indicating strong reproducibility of response.**Conclusion:** This study shows that surveys of constructs such as stigma towards mental illness can be carried out rapidly and repeatedly across the globe, so that the impact of policy interventions can be readily measured.**Limitations:** The method engages English speakers only, mainly young, educated males.

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1. Introduction

Culture, tradition, as well as access to education and to health services, all shape the perception of mental illness (Cheon and Chiao, 2012). Earlier studies have suggested that developing countries exhibit greater fear, shame, and stigma directed towards mental illness than do developed countries. Shame and fear lead to social distance, which, in turn, results in social isolation, self-stigma, lack of employment opportunity and self-determination, avoidance of help-seeking, poor adherence to treatment and overall poor health in the stigmatized (Cheon and Chiao, 2012; Linz and Sturm, 2013; Rüscher et al., 2014). For these reasons, the National Institute of Mental Health (1996) considers stigma to be the most debilitating aspect of a mental illness.

Stigma leads to mental distress, which then leads to more

stigma, and is, thus, a seemingly implacable force. Unpredictable behavior, social skill deficits, and unkempt appearance are often attributed to mental illness (Corrigan, 2000), whereas they could all be the result of stigmatizing attitudes (Hengartner et al., 2013). Such confounding and such consequences make it mandatory to assess mental health stigma not only in developing countries where surveys are habitually conducted, but across the world, in order to institute culturally appropriate interventions (Stuart, 2008).

Many methods have been used to assess stigma, including the use of stigma scales (Pawar et al., 2014), random sampling by postal questionnaire (Mirnezami et al., 2015), telephone surveys (Eurobarometer, 2014), and random questioning of conference attendees (World Health Organization, 2004). Such methods, however, yield relatively small sample sizes. Moreover, they are laborious and, therefore, are unlikely to be replicated by other researchers or repeated over time in order to examine changes in public attitudes in response to intervention or media exposure. In 2012, Schomerus et al. (Schomerus et al., 2012) conducted a

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systematic review of 16 studies on general population beliefs and attitudes about mental illness that included a minimum of two-year follow-ups. The authors hypothesized that increasing knowledge about the biological correlates of mental illnesses would result in greater social acceptance over time. They did find a trend toward greater mental health literacy, greater endorsement of a biological model of mental illness, and greater acceptance of professional help for mental health problems. Public attitudes towards people with mental illness, however, did not change; if anything, they worsened with time. The authors concluded that social rejection of persons with mental illness has remained disturbingly stable over the last 20 years. Pertinent to our study, they stressed that time-trend analyses of mental illness-related public attitudes have only been conducted in industrialized, first-world countries, and that developments in other parts of the world remain unknown. The 16 studies they reviewed were from the US, the UK, the Netherlands, Australia and New Zealand, Germany, Austria and Poland. No other countries had done stigma follow ups. The following year, Angermeyer et al. (2013) reported that, over twenty years, the German public's attitudes towards people with schizophrenia had worsened, whereas attitudes towards people with depression or alcohol dependence had remained essentially unchanged. That same year, Evans-Lacko et al. (2013) conducted a survey to determine whether an anti-stigma program instituted in England in 2009 had changed public knowledge, attitudes or behavior in relation to people suffering from mental health challenges. They found improvements over the 4 years in *intended* behavior but no significant improvement in knowledge or *reported* behavior of respondents. They were encouraged that there was no deterioration of attitudes over the interval.

In 2015, Mirnezami et al. (Mirnezami et al., 2015) reported results of a survey of opinions about mental illness stigma in a single community in Sweden in 1976 and again in 2014. This group found that a quarter of the 500 adults studied still thought in 2014, as they had in 1976, that “people with mental illness commit violent acts more than others,” indicating that that, despite modern advances in education and treatment, the community continued to hold prejudicial views about persons diagnosed with a mental disorder.

Repeat surveys are few and limited to wealthier countries because such surveys are costly and time intensive. Two major international survey mechanisms are the Eurobarometer (2014) and the World Health Organization World Mental Health Survey Initiative (World Health Organization, 2004). However, they focus on the prevalence of mental illness and access to mental health resources. The respondents are sometimes rewarded for participating, depending on the country, and the survey takes on average two hours to complete. The Eurobarometer covers only 27 European Union countries. The WHO initiative only includes 26 countries; it excludes Canada, for example. There are more comprehensive databases of publicly available indicators, notably the global WHO Mental Health Atlas, yet this is comprised of governance, resource, process and management indicators (e.g., the timeliness of the collection of mental health data sets, the presence of stand-alone mental health laws, number of facilities, number of nurses) that are provided to the WHO by state member agencies. For the 2014 Report, only 171 out of the WHO's then-194 members completed even part of the questionnaire.

The present work uses a relatively new survey data collection method to gather global randomized opinion data on stigma from all countries in the world simultaneously, and permits frequent repeats of the survey, whether to confirm reproducibility or to measure change over time in public attitudes. Countries not covered in previous surveys but enjoying over 80% Internet penetration and, thus, exposed to our survey, include Bahrain, Qatar, South Korea, and India. The online survey method was used in this study

(a) to examine attitudes around the world towards persons with mental illness and (b) to ascertain the reproducibility of these determinations.

2. Methods

The survey method used in this study is based on Random Domain Intercept Technology or RDIT™ (RIWI Corp., 2015), a method invented and patented by RIWI Corp. (2015). To summarize the survey method: Web users often make mistakes when navigating the Web by incorrectly typing a non-trademarked Internet domain name, whether it is a generic top-level domain (TLD) (e.g. www.anyURLtyped.org), a TLD of any kind (e.g. www.anyURLtyped.xyz), a country code TLD (ccTLD) (e.g. www.anyURLtyped.co), or an internationalized domain name (“IDN”), into the URL (“address”) bar. Users searching for a website with a particular content may inadvertently navigate to a domain or sub-domain (e.g. www.anyURLtyped/example.com) that takes them to an unintended Internet Protocol (IP) destination whenever their intended IP destination is either nonexistent or inaccurate. When this happens, users will encounter an opt-in survey. RIWI uses proprietary algorithms allowing access to hundreds of thousands (or more) of exposures to (non-trademarked) websites rotating in real time through multiple geo-location software algorithms. Respondents are only able to answer a survey or question from a specific IP address once.

Proprietary code ensures that the RIWI sample of exposed domains is randomized, ‘bot’-free, geo-representative, and quality controlled. It enables real-time survey response data collection simultaneously in all geographic areas and dramatically reduces online coverage bias (Seeman et al., 2010). RIWI data are representative of the Web users in any country or region (re-weighted to the most recent official census figures) who are interested in responding. The method does not provide financial incentives to the users and collects no personally identifiable information about individual respondents. The technical specifications of the method, and select studies referencing the security and other safeguards relating to the survey technology platform, are discussed in previous publications (Seeman et al., 2010; Seeman and Seeman, 2010) and in (RIWI Corp., 2015).

The method, as used in the previous studies, does not allow for exposure of respondents to a standardized, well-validated questionnaire but, nevertheless, permits brief questions to be answered on a voluntary, non-incented basis by large numbers of anonymous, random, and diverse individuals worldwide.

The stigma survey was conducted from September 23, 2013 to May 23, 2015. Question repeats continued in India until July 23, 2015. Depending on the question, the number of people replying to each question varied from 596,712 to 1,099,333.

The questions in the survey, organized to be answered individually – and in a manner where it is possible for any exposed potential respondent to answer each question once-included:

1. What is your age? (See example of computer screen in Fig. 1).
2. What is your gender?
3. Is there someone you interact with every day who suffers from mental illness?
(This may include psychosis, depression, addiction, or autism).
4. People WHO suffer from mental illness are
 - More lazy.
 - More violent.
 - Suffering from a condition as serious as physical illness.
 - Victims of bad parenting.
 - Can overcome their challenges through tough love.

What is your age and gender?



Female

< 18					18	19	20	21
22	23	24	25	26	27	28	29	
30	31	32	33	34	35	36	37	
38	39	40	41	42	43	44	45	
46	47	48	49	50	51	52	53	
54	55	56	57	58	59	60	61	
62	63	64	65 +					

Male

< 18					18	19	20	21
22	23	24	25	26	27	28	29	
30	31	32	33	34	35	36	37	
38	39	40	41	42	43	44	45	
46	47	48	49	50	51	52	53	
54	55	56	57	58	59	60	61	
62	63	64	65 +					

This is a voluntary opinion survey that is being asked randomly to Internet users around the world for the purpose of academic research on attitudes toward aspects of mental health. Your answers will be calculated statistically, without identifying any individuals. It will take you less than one minute to complete. Our privacy statement can be accessed below. Thank you for your cooperation.

Fig. 1. Screen-shot example of the internet user's computer screen after the user inadvertently makes a mistake when navigating the Web by mistyping an internet domain name, as provided by Random Domain Intercept Technology or RDIT™.

- Do not know/do not care.

(Options to the prompt responses in question 4 are rotated randomly).

3. Results

3.1. Sample size and response rate

Responses were obtained from 229 countries and protectorates around the globe from September 23, 2013 to May 23, 2015. While the smaller countries only provided between 300 (Mauritania) to 500 (Angola) responses, the larger countries provided between 10,000 and 267,005 (India) replies each. A sample of the total number of replies for 22 major countries is given in Fig. 2, where the total number of replies ranged from 9785 (Germany) to 267,005 (India). 596,712 respondents completed the full suite of questions, resulting in a total response rate of 54.3%.

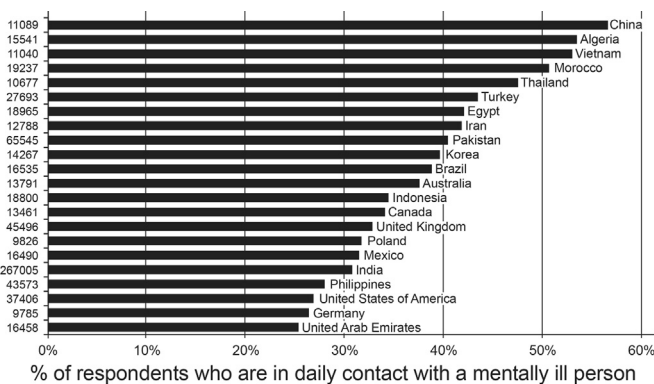


Fig. 2. Replies from 22 countries showing the percent of respondents who stated that they were in daily contact with a person with mental illness. The total number of replies from each country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are represented here.

3.2. Questions

1. Is there someone you interact with every day WHO suffers from mental illness?

The data in Fig. 2 show the percent of “yes” replies from respondents who stated that they were in daily contact with a person suffering from mental illness. The highest proportion of “yes” replies was from China, where 57% or 6288 individuals replied “yes”. The lowest percent positive response to this question was 25%, or 4164 responses, from the United Arab Emirates.

Replies from 22 countries showing the percent of respondents who stated that they were in daily contact with a person with mental illness. The total number of replies from each country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are represented here.

2. Option choice: “People WHO suffer from mental illness more violent.”

In the more developed countries (e.g., United States, Canada, and Australia) only 7% or 8% of the respondents stated that *people suffering from mental illness* were more violent than others. In contrast, 15% or 16% of the replies from developing countries (e.g. Algeria, Mexico, Morocco, and China) indicated that *people suffering from mental illness* were more violent, as summarized in Fig. 3 for 21 countries.

Replies from 21 countries showing the percent of respondents who stated that they thought that persons with mental illness were more violent. The total number of replies from each country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are represented here.

3. Option choice: “People with mental illness are suffering from a condition similar to physical illness.”

The data in Fig. 4 show that 45% to 51% of respondents from developed countries (e.g., Australia, United Kingdom, Canada and the USA) stated that mental illness was similar to physical illness. In contrast, only 12% to 15% of respondents from

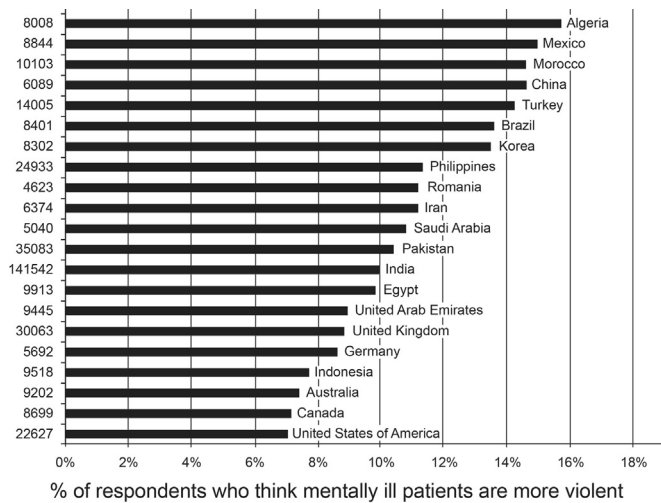


Fig. 3. Replies from 21 countries showing the percent of respondents who stated that they thought that individuals with mental illness are more violent. The total number of replies from each country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are represented here.

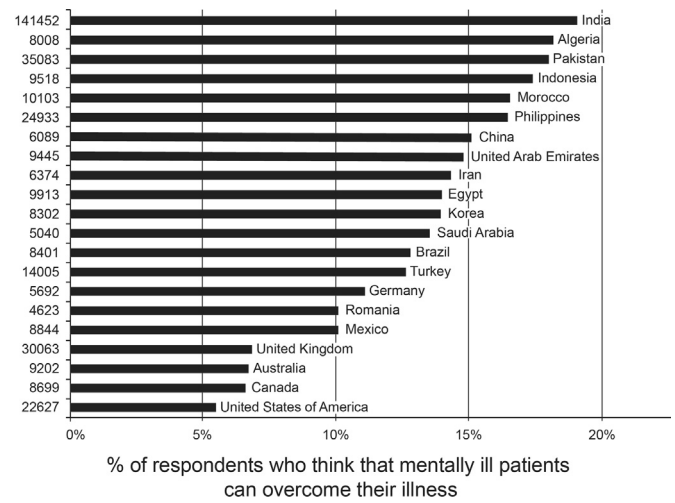


Fig. 5. Replies from 21 countries showing the percent of respondents who stated that they thought that individuals with mental illness can overcome their illness. The total number of replies from each country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are represented here.

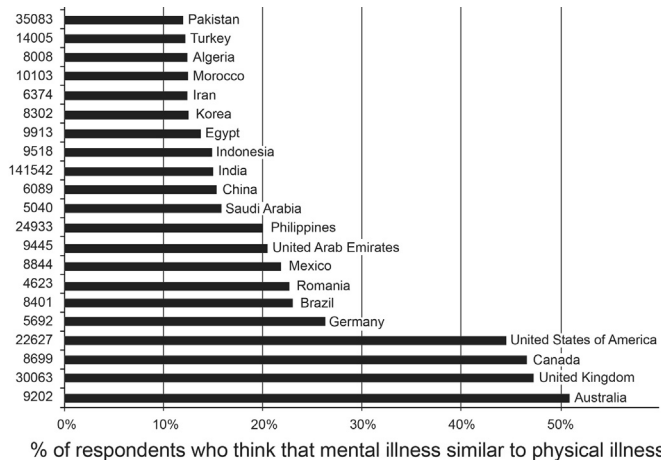


Fig. 4. Replies from 21 countries showing the percent of respondents who stated that they considered mental illness to be similar to physical illness. The total number of replies from each country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are here.

country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are represented here.

4. Reproducibility

It was important to test whether the data were reproducible over time. Table 1 indicates that this is the case. India was selected for the reproducibility test because of its strong English language proficiency (English being the mode of the survey language), its very large population, its high Web usage across different sub-geographies and social classes and among urban and rural regions across India, and, most importantly, its status as the country with the highest rates of major depression in the WHO World Mental Health Survey Initiative (World Health Organization, 2004). We re-surveyed India every month for 1.8 years (21 surveys in all). We found an average of $31.1 \pm 0.18\%$ s.e. (s.d.=0.84%) “yes” replies to the question about daily interaction with a person suffering from mental illness. As for the prompt about those suffering from mental illness being more violent, an average of $10.1 \pm 0.11\%$ s.e. (s.d.=0.49%) respondents made this choice. By any objective standard, these variations over 21 months were insignificant, indicating a surprisingly high consistency in response over time.

In a separate, one-year comparability analysis, we compared global results from the months of June and July 2014 ($N=42,236$ without India), to June and July 2015 ($N=41,017$ without India), finding statistically identical results between the two waves of data. Notably, when comparing the proportion of respondents, both (a) globally, without India-based respondents, and (b) exclusively among those respondents over the two years answering from within India, there was no statistical difference seen across any of the option choices within any of the three questions. Comparing the two arrays of percentage values in the 38 paired answer sets (2014 answers versus 2015 answers) in the above test, we found a correlation coefficient of 0.994, thus showing no statistical difference over time.

5. Discussion

The data indicate that a high proportion (up to 57%) of individuals in many countries around the world are in daily contact

developing countries (e.g., Pakistan, Turkey, Algeria, Morocco, Iran, Korea, Egypt, and Indonesia) endorsed this statement. Replies from 21 countries showing the percent of respondents who stated that they considered mental illness to be similar to a physical illness. The total number of replies from each country is given on the left side. Although 229 countries and protectorates were surveyed, only those that had more than 5000 total replies are represented here.

4. Option choice: “Individuals suffering from mental illness can overcome their illness.”

A surprisingly low proportion (7%) of respondents from developed countries endorsed the statement that persons suffering from mental illness can overcome their illness, as shown in Fig. 5.

In contrast, respondents from developing countries agreed more frequently that patients with mental illness can overcome their illness, specifically, 16% in Algeria and 12% in India (Fig. 5).

Replies from 21 countries showing the percent of respondents who stated that they thought that patients with mental illness can overcome their illness. The total number of replies from each

Table 1
 Reproducibility data for India, as surveyed every 23rd day of each month

Survey date	Q. Do you have daily interaction with a mentally ill person?			Q. Mentally ill people are more violent		
	Total replies	"Yes" responses	% replying "yes"	Total replies	"Yes" responses	% replying "yes"
September 2013	16,288	5282	32.4	8903	899	10.1
October 2013	19,353	6049	31.3	10,487	1071	10.2
November 2013	12,533	3952	31.5	6857	681	9.9
December 2013	13,766	4123	29.9	7361	732	9.9
January 2014	11,123	3573	32.1	5907	547	9.3
February 2014	6749	2094	31.0	3586	366	10.2
March 2014	7745	2406	31.1	4082	430	10.5
May 2014	2280	700	30.7	1227	144	11.7
June 2014	21,572	6736	31.2	11,395	1182	10.4
July 2014	16,899	5393	31.9	8881	919	10.3
August 2014	21,850	6917	31.7	11,403	1127	9.9
September 2014	19,553	6053	31.0	10,380	1008	9.7
October 2014	19,387	5978	30.8	10,124	1010	10.0
November 2014	15,726	4846	30.8	7877	755	9.6
December 2014	17,402	5331	30.6	8612	881	10.2
January 2015	17,879	5401	30.2	9053	930	10.2
February 2015	14,650	4588	31.3	7768	746	9.6
March 2015	15,387	4737	32.9	8342	887	10.6
April 2015	5035	1547	30.7	2778	266	9.6
May 2015	14,903	4481	30.0	8016	834	10.4
June 2015	15,334	4503	29.4	8166	821	10.1
		av = 31.1%			av = 10.1%	
		s.e. 0.18%			s.e. = 0.11%	
		s.d. = 0.84%			s.d. = 0.49%	

with a person who they think suffers from mental illness, defined for them as including psychosis, depression, addiction, and autism (Fig. 2). Though different respondents may give different meaning to these terms, the replication analyses indicate that there is apparent stability over time in the understanding of the terms.

Despite reports that mental illness is kept secret in Asian countries such as China (Yang, 2007), the anonymity of the survey allowed consistent answers (no personally identifiable information was collected). The relatively large numbers of individuals in daily contact with a person suffering from mental illness in developing countries in general suggests that persons thought to suffer from mental disorder are kept at home, either because of a relative lack of psychiatric services outside the home or because of the family's shame and fear of losing 'face.' In China, for instance, those with mental illness are reportedly heavily socially sanctioned because their unpredictable behavior threatens to violate Confucian principles governing social order and harmony (Yang, 2007). It is, therefore, in the family's interest to keep relatives suffering from mental illness out of the way of prying eyes. The 'loss of face' associated with mental illness in China (and in many developing countries) attaches not only to the ill person, but also to family members. There is a strong motive for the family 'disgrace' to remain concealed (Ng, 1997; Lauber and Rossler, 2007). Traditional societies ascribe a moral 'defect' to sufferers of mental illnesses and to their families, perhaps awarded as punishment for an ancestor's misconduct (Lin et al., 1980). Buddhist beliefs in reincarnation suggest that those who suffer from mental disorders in this life are reaping the penalties of a prior life of sin (Lin et al., 1980; Lam et al., 2010; Lin et al., 2008; Wynaden et al., 2005)

Approximately 7% to 16% of responders thought that persons with mental illness "were more violent" than the general population (Fig. 3). The developing countries had a higher percentage endorsing this opinion than did the developed countries. This comparison may be accurate in that there is a relative lack of treatment and hospital facilities in developing countries to prevent and contain potential violence. Or it may be false, an example of biased attitudes that automatically equate 'mental illness' with violence (Jorm et al., 2012; Torrey, 2011). Fear of violence, while

hard to measure accurately, is important to try to ascertain because this fear is a core component of stigma directed at those with mental illness.

Respondents in the developed world are known to also subscribe to the 'mental illness equals violence' belief, but usually allow for additional causal attributions such as substance use, access to guns, gender, history of child abuse, personality, adherence to medication, making the direct association weaker (Nestor, 2002; Robbins et al., 2003; Swanson et al., 2015; Swartz et al., 1998; Monahan et al., 2001).

Respondents from developed countries were more likely than those in developing countries to indicate that mental illnesses were 'diseases as any other,' (Pescosolido et al., 2010), similar, in other words, to physical illness (Fig. 4). Attributions of mental illness causation in developing countries include the supernatural and mystical, punishment for a person's sins or those of ancestors (Lauber and Rossler, 2007; Saravanan et al., 2007; Ciftci et al., 2013), concepts that differentiate such disorders from physical illness. Perhaps surprisingly, where illnesses were believed to be 'not like physical illness,' they were also considered more amenable to prevention and recovery. Respondents from developed countries, despite believing that mental illness was similar to physical illness (and, as a consequence, one would think, treatable and curable) had less hope for a person being able to overcome mental illness than did respondents from developing countries (Fig. 5). As previously reported in Germany (Angermeyer et al., 2013) and the United States (Pescosolido et al., 2010), a biogenetic understanding of mental illness appears to make the public more, rather than less, pessimistic about outcome.

Importantly, this relatively new high-speed, random survey response method provides rapid and reproducible data, indicating that the method can be applied to measuring changing sentiment or prevalence rates of psychiatric and sociological conditions in all regions of the world.

6. Limitations

A drawback of this study is that it is limited to English speakers

and that Web-based technology generally engages respondents who are relatively young, with a preponderance of males of higher income and educational attainment than the population at large (Norris, 2001). This explains the reason for selecting India to examine the reproducibility of our data, since India has a relatively young population who all speak English. It means, however, that the opinions of the older generation and of individuals who are poorly educated and who have little access to the Internet may be underrepresented.

Secondly, the total response rate of 54.3% suggests the possibility of a non-response bias. There could be important differences between those who chose to respond to a question and those who chose not to, but the very large sample sizes reduce concerns about non-response bias. A response rate of 54.3% is high for surveys on the Web, response rate being a challenge for online surveys, even when pre-recruited, self-selected incentivized panels are used (Couper and Miller, 2009). The study corrected for concerns about response rate by using large, geographically diverse, daily, random sampling (Couper and Miller, 2009). The reproducibility in the results over time as found in this study further reduces concerns about potential non-response bias.

Another constraint is that the study did not use an established stigma measure. The relative simplicity of the questions does not do justice to the complex nature of mental illness stigma. Nor did we ask about specific diagnoses even though stigma is attached more to some psychiatric diagnoses than to others (Hengartner et al., 2013; Angermeyer et al., 2013). Instead, we combined several diagnoses under the term, 'mental illness'. The relative simplicity of the questions achieved their purpose, however – first, by allowing us to attain a high response rate (54.3%) in a non-incented (nothing to lose or gain by responding), random global population, and, second, by resulting in strong reproducibility. We were particularly interested in reviewing the reproducibility of the findings from the early summer months of 2014 to the same time frame 12 months later (both globally, and in India) to assess the degree to which the data varied over time. The lack of fluctuation supported the hypothesis that attitudes at a population level towards issues of mental health are very slow to change.

While the questions posed may not have explored the complexities of the stigma construct, they have, nevertheless, uncovered interesting results.

7. Conclusion

In the last 15 years, there has been increasing recognition of the importance of mental illness stigma, in its prevalence, its measures, its consequences, and its eradication. Despite much work, many challenges remain (Pescosolido, 2013). The literature indicates that there are important differences among various geographic and cultural groups with respect to who is stigmatized and why (Abdullah and Brown, 2011). The global survey method reported here is able to sample a large and diverse population, thus increasing our understanding of where and when this phenomenon occurs. It enables longitudinal data gathering that can easily and rapidly assess whether policy change or regulatory or other initiatives are able to effect attitudinal change.

Conflict of interest

The authors state that they have no conflicts of interest.

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