



RESEARCH ARTICLE

Mental Health Literacy and Public Stigma: Examining the Link in 17 Countries

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ABSTRACT

Background. Literacy campaigns stand as the most common approach to raising awareness of mental health problems, increasing the use of services, and reducing stigma. However, research suggests that more informed public beliefs may have little effect or even trigger the stigma backlash. We aim to provide a wider, cross-national examination of how stigma varies globally and to examine whether the ability to recognize a mental health problem and see it as “a disease like any other” is the optimal roadmap for stigma reduction.

Methods. Data came from the Stigma in Global Context – Mental Health Study (SGC-MHS), which were collected from non-institutionalized adults 18 years of age or older through face-to-face interviews using vignettes meeting the Diagnostic and Statistical Manual of Mental Disorders, 4th edition clinical criteria for schizophrenia and major depression in 17 countries (N=18,342; response rate 65.9%). Analyses of association between the public’s endorsement of problem recognition, disease attributions, and severity on the desire for social distance were conducted using multivariate regression models in the structural equation modeling framework.

Results. For both depression and schizophrenia, countries fell into three groups of low, medium and high levels of public stigma. Consistently, Brazil and Germany anchored the lowest levels, Bangladesh and Hungary reported the highest levels, with Great Britain, USA, Belgium falling in midrange. Measures of mental health literacy did not have uniform effects, but, where significant, tended to align with expectations under labelling theory’s ideas about rejection rather than attribution theory’s claims for mental health literacy. Ironically, the most stable factor associated with lower stigma is the assessment that the situation will improve on its’ own, in direct contradiction to literacy theories.

Conclusion. Overall results suggest that anti-stigma efforts should move past a focus on mental health literacy or at least recognize its’ limitation and potential unintended consequences. Recognizing a situation as a mental illness can change the public’s support for mental health services to some extent. The association between seeing the problem resolving on its own and lower stigma levels suggests that newer approaches that focus on connectedness and mental health may hold greater purchase to decrease public stigma and increase recovery.

Introduction

Mental health literacy, the most common approach to reducing stigma and increasing service use, focuses on recognition, seeing mental illness as a real disease, and understanding what treatments are available. Introduced in 1997 by Jorm and colleagues, the focus on mental health literacy has been the foundation of many local and national efforts to increase awareness, tolerance, and resources¹⁻⁵. Research has documented that mental health literacy can be improved in the population and can in turn increase public support for help-seeking^{6,7}. Further, understanding the causes of mental illness and identifying behaviors associated with it have been linked to lower feelings of personal and/or family blame, as well as the threat of potential violence, which, in turn, reduces stigma⁸. For example, Swensson and Hansson⁹ demonstrated that greater awareness of mental illness was associated with more positive attitudes towards people with major depression, reducing the tendency to keep social distance from them. However, studies have also raised concerns, documenting that even with stable improvements in mental health literacy, stigma may not decrease at individual or societal levels^{10,11}. In Taiwan, respondents with higher, not lower, levels of mental health literacy were less willing to interact with people with schizophrenia¹². Overall, the hope that the public's understanding of the roles of biological, genetic, or brain imbalances would increase tolerance has received mixed support at best¹³.

Whether or not mental health literacy can stand as the blueprint for reducing stigma ties into existing medical versus social controversies about how the public takes in and understands mental illness, pitting attribution theory against labelling theory. On the one hand, the former more medical or psychological view suggests that individuals seek to understand the underlying causes of what happens to them and others, especially for outcomes that are negative or unexpected. They do so to cope with uncertainties in their surrounding environment and to increase control¹⁴.

In turn, these lead to assessments of individual responsibility, as well as practical and emotional judgments. Specifically, for mental illness, attribution theory posits that embracing scientific causes — biology, genes, chemical imbalance — decreases stigma by placing blame outside of individual volition or character. With this comes a shift away from stigma to support for seeking treatment, much like any other disease^{15,16}. On the other hand, labelling theory from sociology posits that when the medical system (official diagnosis) or the public (lay diagnosis) construct the individual's situation as a mental illness, that label shifts the view of an individual from "normal" to "less than fully human," triggering stereotypes and rejection¹⁷⁻¹⁹. In its most specific version of "genetic essentialist" thinking, individuals with mental illness may be seen as irrefutably and permanently different. While the public may, in fact, acknowledge that the fault lies beyond the individual's control and, as a result, treatment is legitimately sought, the effect on inclusion in social interactions, especially the family line, could be seriously impaired^{16,20}. For example, in the US National Stigma Studies, the public's endorsement of neurobiological attributions was high but had no effect on either individual or societal levels of mental illness stigma^{11,13}.

Further, the question of whether taking a mental health literacy approach is the blueprint for global stigma reduction is confronted by a lack of population-based, nationally representative studies in general, and an almost near-absence of research outside of the Global North. Given this consideration, a unique multi-national study in 17 countries, the Stigma in Global Context – Mental Health Study (SGC-MHS), deployed the same sampling approach to ensure generalizability to the country level and the same, but culturally-vetted, instrumentation, to examine the comparative levels of stigma for two mental health disorders – schizophrenia and depression. Because respondents were only provided with one of two case study vignettes that met DSM-IV criteria for two mental health diagnoses (but were not identified as such), the data allowed for examination

of the link between stigma and a number of disease attributions, problem recognition, and treatment issues. It remains as the only study providing nationally representative data from at least one country on each inhabited continent.

Methods

The SGC-MHS was designed to accomplish two aims – to provide a cross-national comparison of public stigma across 17 countries and to examine whether and to what extent different sociodemographic, medical and cultural factors were associated with prejudice and discrimination potential across these countries. The SGC-MHS is the first globally targeted, theoretically and methodologically coordinated empirical examination of the public stigma of mental illness that draws data from at least one country on all inhabited continents. All countries that participated in the International Social Survey Program (ISSP) at the time that met methodological criterion (i.e., face-to-face interviews) were invited to participate. Support to each country was provided by the U.S. National Institutes of Health (i.e., the Fogarty International Center, National Institute of Mental Health, Office of Behavioral and Social Science Research), the Icelandic Centre for Research, or the University of Ghent. Data reported here were collected from representative national samples of individuals in 17 countries with differing geographical location, political systems, and economic circumstances.

SAMPLING

Eligible respondents were non-institutionalized adults (i.e., age 18 or older). The selection of sample elements for all national cross-sections was based on multistage probability methods. Face-to-face interviews were conducted by trained interviewers who were closely monitored by survey center personnel. These collaborators also served as liaisons to the SGC-MHS team for translation, data coding, data preparation, and file delivery. The overall response rate for the combined SGC-MHS was 65.9%. Institutional review board approval

for the SGC-MHS during data collection was held at Indiana University (Study 04-9051).

SURVEY QUESTIONS

The 75-item interview included 3 vignettes (schizophrenia and major depression, used here; asthma, not used here), 57 stigma items and standard ISSP measures of socio-demographic characteristics. The challenges of cross-national comparability in the SGC-MHS were addressed by traditional back translation methods augmented by a cultural translation conducted with a non-mental health expert from that country. The countries were fielded in waves from 2004 to 2011. Respondents were randomly assigned one vignette describing a person meeting criteria for the DSM-IV or International Classification of Diseases and Related Health Problems, Tenth Revision²¹ diagnosis of either major depression or schizophrenia. No labels were offered to allow for investigation of problem recognition. Names and race/ethnic subgroups, selected by country-based survey teams, were altered for each country instrument. The US vignette versions, with random variation by gender and race, were:

Depression. John/Mary [White]/Tyrone/Shontell [Black] is a White/Black man/woman. For the last several weeks, John/Mary/Tyrone/Shontell has been feeling really down. He/she wakes up in the morning with a sad mood and a heavy feeling that sticks with him/her all day long. He/she isn't enjoying things the way he/she normally would. In fact, nothing gives him/her pleasure. Even when good things happen, they don't seem to make John/Mary/Tyrone/Shontell happy. The smallest tasks are difficult to accomplish. He/she finds it hard to concentrate on anything. He/she feels out of energy, out of steam, and cannot do things he/she usually does. And even though John/Mary/Tyrone/Shontell feels tired, when night comes, he/she can't go to sleep. John/Mary/Tyrone/Shontell feels pretty worthless, very discouraged, and guilty. John's/Mary's/Tyrone's/Shontell's family has noticed that he/she has lost appetite and weight. He/she has pulled away from them and just doesn't feel like talking.

Schizophrenia. John/Mary [White]/Tyrone/Shontell [Black] is a White/Black man/woman. Up until a year ago, life was pretty okay for John/Mary/Tyrone/Shontell. But then, things started to change. He/She thought that people around him/her were making disapproving comments and talking behind his/her back. John/Mary/Tyrone/Shontell was convinced that people were spying on him/her and that they could hear what he/she was thinking. John/Mary/Tyrone/Shontell lost his/her drive to participate in his/her usual work and family activities and retreated to his/her home, eventually spending most of his/her time on his/her own. John/Mary/Tyrone/Shontell became so preoccupied with what he/she was thinking that he/she skipped meals and stopped bathing regularly. At night, when everyone else was sleeping, he/she was walking back and forth at home. John/Mary/Tyrone/Shontell was hearing voices even though no one else was around. These voices told him/her what to do and what to think. He/She has been living this way for 6 months.

MEASURES

Stigma was operationalized as responses to six items in traditional social distance scales. Respondents were asked whether they were: 'definitely unwilling, probably unwilling, probably willing, or definitely willing' to: (1) 'have [NAME] as a neighbor', (2) 'spend time socializing with [NAME]', (3) 'have [NAME] take care of your children or children you know', (4) 'to make friends with [NAME]', (5) 'to work closely with [NAME] on the job' and (6) 'to have [NAME] marry someone related to you'. Items ranging from 0 to 3 were binarized, such that 0-1 = 0 and 2-3=1 and added to create a social distance scale ranging from 0 to 6 ($\alpha = 0.88$).

Correlates of public stigma were selected to measure aspects of mental health literacy. Correct disease recognition asked respondents whether they thought the vignette situation was depression or schizophrenia, later coded to 1=correctly identified and 0=otherwise, respectively. Biological disease attribution asked respondents whether "Is it very likely, somewhat likely, not very

likely, not at all likely that [NAME'S] situation is caused by..." a brain disease", "genes" and other factors not considered here. These questions had four responses recoded to 1=likely; 0=not likely. Recognition of mental health problem asked respondents: "How likely do you think that [NAME] is experiencing a mental illness?" with four response options, recoded to 1 = likely; 0 = not likely. Improve on its own asked respondents: "How likely do you think that [NAME'S] situation will improve on its own?" with four response options, recoded to 1=likely; 0=not likely. Perceived problem severity asked: "How serious is [NAME'S] problem?" with four response options, recoded to 1=serious; 0=not serious.

All analyses controlled for standard sociodemographic characteristics considered in previous stigma research — gender, age, education, and having a contact with others or a personal history of mental illness. Gender was measured as a binary variable (1 = female, 0 = male). Age was measured as a continuous variable ranging between 18 and 97. Education was measured based on country-specific categories, and later binarized into those with university and higher degrees (1) and those with lower than university-level educational achievements (0). Prior contact asked respondents if they or someone they know has been diagnosed with a mental illness or has used treatment for mental illness. Positive responses to either of the items were recoded as 1 with 0 = otherwise. Descriptive frequencies on all measure are presented in Supplemental Appendix 1, Table S1. Effective sample sizes for each country by disorder types are presented in Tables 1 and 2.

ANALYSES

Graphical presentation of stigma levels across countries for schizophrenia and depression are presented with box and whisker plots using the median and interquartile range. To examine the association between mental health literacy measures and stigma, the five main predictor variables were entered into a linear regression model for each of the 17 countries and adjusted for

control variables. Analyses were run for depression and schizophrenia separately. Due to missing data present in the dependent and independent variables, full information maximum likelihood in structural equation models was used. All analyses were done using Stata 17 and checked for robustness by running different model specifications.

Results

STIGMA LEVELS

Figure 1 reports the median levels of social distance ordered from lower to higher levels. For depression (left), the lowest three countries with a median level of one on the social distance scale were Brazil, Spain, and Germany. The middle category is the largest with the median level of two and included most of the European countries (e.g., Bulgaria, Cyprus, Great Britain, Iceland, Belgium), the USA, one of the two South American countries (Argentina), and the only African country (South Africa). The groups with the highest stigma levels, registering mostly at the median of three, were Eastern countries (Philippines, China, South Korea). Within this group, the highest level, with a median of four, is Bangladesh.

The results for schizophrenia (right side, Figure 1), reveals that the levels of stigma are generally higher than for depression (see Supplementary Materials, Figure S1 for a direct comparison). While there is some correspondence in terms of grouping into the low, median, and highest categories, there are also some minor differences. The lowest group is larger and, as with depression, respondents in Brazil and Germany report the lowest stigma levels. However, here, the lowest median value is two with more countries included (Argentina, New Zealand, South Africa, Iceland). With a median level of three, Great Britain, USA and Belgium rank in the middle group here as they did for depression. Comparatively speaking, Spain changes from the lowest group to the middle grouping and is joined by some of the Eastern countries that were in the highest stigma group for depression (namely, Philippines, Korea, China). Bangladesh is the only country ranked among the most stigmatizing nations for both disorders and is included with two Eastern European nations (Hungary, Bulgaria) for schizophrenia. The highest level of stigma toward schizophrenia is found in Cyprus.

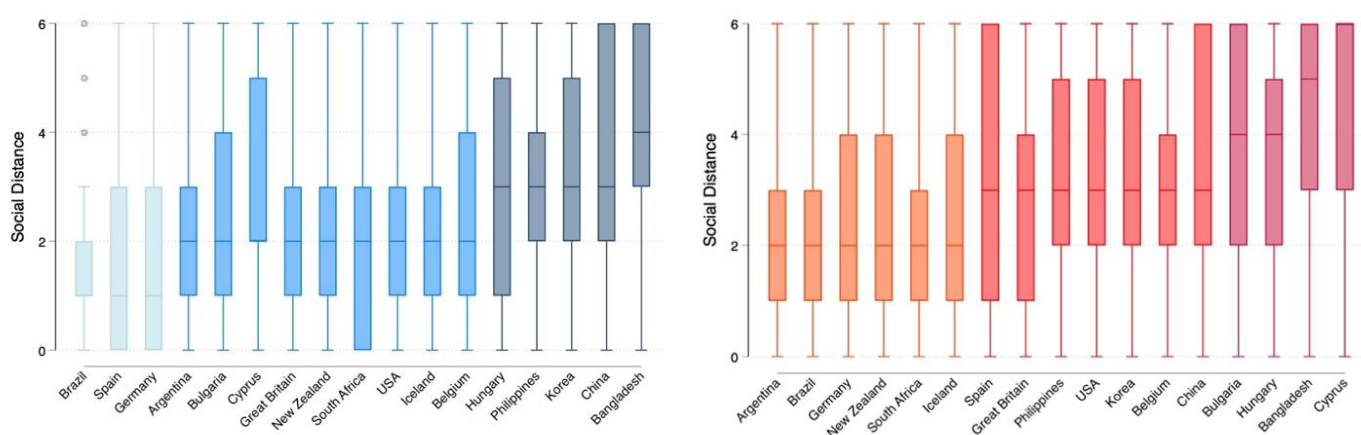


Figure 1. Median Distributions on Social Distance for Depression (Left, Blue) and Schizophrenia Vignettes (Right, Red), 17 Country Population-Based Samples, Stigma in Global Context-Mental Health Study (SGC-MHS).

MENTAL HEALTH LITERACY

While five different measures tapping mental health literacy are used in the multivariate analyses, Figure 2 provides a sense of how the key variables

of concern are distributed across countries. Three points are relevant. First, recognition of depression is consistently higher than for schizophrenia. Second, there are wide differences in recognition

of each disorder across the 17 countries. As indicated on the left-hand side of Figure 2, recognition of depression varies from a high of around 80% of the population recognizing depression in Spain to just over 20% in China. Third, for schizophrenia, the levels of recognition vary even more dramatically between the

countries, where the most respondents recognize schizophrenia (i.e., just over 90% in Bangladesh) to where only a small percentage of the population do (i.e., under 10% in Brazil). Full descriptive data on all variables used in this analysis are provided in Tables S2 and S3 in Supplemental Materials.

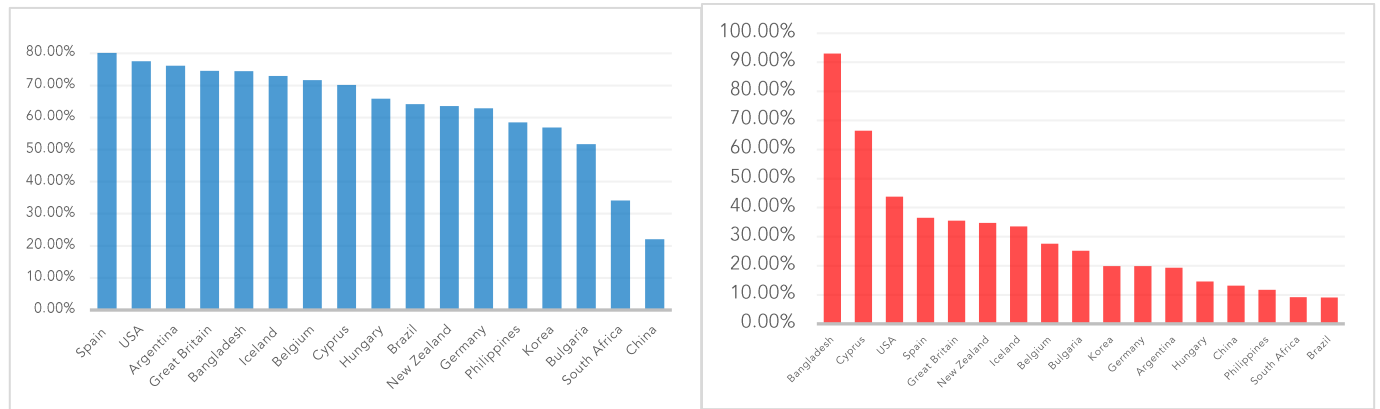


Figure 2. Percentage Distributions of Respondents’ Correct Recognition of the Mental Health Vignette Received for Depression (Left, Blue) and Schizophrenia (Right, Red), 17 Country Population-Based Samples, Stigma in Global Context-Mental Health Study (SGC-MHS).

CORRELATES OF MENTAL HEALTH STIGMA

Depression and Stigma. Table 1 presents findings on the link between stigma associated with depression and mental health literacy variables from the multivariate regression models. In only two countries, Cyprus and Bangladesh, individuals with greater mental health literacy, measured as the ability to correctly recognize depression, also report lower levels of stigma. In Cyprus, the effect is among the largest seen ($\beta = -.34$), however, it is much smaller in Bangladesh ($\beta = -.09$). In only two other cases, is there any support for attribution theory and the role of mental health literacy in stigma reduction. First, in Spain (where Figure 2

above indicates a very high level of correct identification of depression specifically) the respondents who say that the vignette is a mental illness also report lower levels of stigma ($\beta = -.15$). Second, in two cases, respondents agreeing that the vignette describes a serious condition also report lower levels of stigma (Germany, $\beta = -.19$; Belgium, $\beta = -.14$). Given the number of comparisons, it is possible that these significant results occurred by chance, but they also might indicate some unique differences in how individuals in those countries respond to mental health issues.

Table 1. Regressions of Social Distance on Mental Health Literacy and Controls, Depression by Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	Brazil (N = 556)	Spain (N = 459)	Germany (N = 409)	Argentina (N = 473)	Bulgaria (N = 391)	Cyprus (N = 268)	Gr. Britain (N = 354)
Correct recognition	-0.03 (0.14)	-0.02 (0.32)	-0.05 (0.22)	0.04 (0.21)	-0.12 (0.26)	-0.34*** (0.27)	0.00 (0.25)
Biological disease attribution	0.08 (0.15)	0.16** (0.25)	0.12* (0.20)	0.03 (0.18)	0.07 (0.30)	0.05 (0.28)	-0.08 (0.25)
Person has mental health issue	0.02 (0.14)	-0.15* (0.25)	0.06 (0.28)	-0.01 (0.18)	0.06 (0.29)	0.00 (0.34)	-0.01 (0.28)
Condition will improve on its own	-0.09* (0.15)	-0.04 (0.23)	-0.21*** (0.23)	-0.12* (0.18)	-0.09 (0.25)	0.01 (0.34)	-0.07 (0.23)
Problem is serious	-0.05 (0.18)	-0.04 (0.28)	-0.19*** (0.31)	-0.05 (0.24)	-0.11 (0.33)	0.07 (0.54)	-0.04 (0.40)

	N. Zealand (N = 340)	S. Africa (N = 518)	USA (N = 480)	Iceland (N = 259)	Belgium (N = 378)	Hungary (N = 422)	Philippines (N = 400)
Correct recognition	-0.01 (0.20)	0.08 (0.18)	0.02 (0.21)	0.05 (0.27)	0.05 (0.21)	-0.11 (0.24)	0.05 (0.19)
Biological disease attribution	-0.03 (0.22)	0.05 (0.19)	-0.06 (0.21)	-0.04 (0.29)	-0.05 (0.21)	0.06 (0.22)	-0.05 (0.20)
Person has mental health issue	-0.03 (0.24)	0.07 (0.18)	-0.01 (0.22)	0.17** (0.28)	0.12* (0.20)	-0.07 (0.28)	0.12* (0.20)
Condition will improve on its own	-0.05 (0.22)	-0.15*** (0.17)	-0.13* (0.18)	-0.03 (0.36)	-0.02 (0.23)	-0.15** (0.30)	-0.14** (0.20)
Problem is serious	0.06 (0.49)	0.02 (0.35)	0.03 (0.35)	-0.11 (0.73)	-0.14* (0.38)	-0.03 (0.36)	0.00 (0.25)

	Korea (N = 332)	China (N = 1,900)	Bangladesh (N = 500)
Correct recognition	0.04 (0.22)	0.03 (0.12)	-0.09* (0.17)
Biological disease attribution	0.15** (0.22)	0.00 (0.11)	0.18*** (0.19)
Person has mental health issue	0.19*** (0.25)	0.12*** (0.13)	0.14*** (0.29)
Condition will improve on its own	-0.26*** (0.22)	-0.17*** (0.10)	-0.15*** (0.17)
Problem is serious	0.03 (0.50)	0.05 (0.14)	-0.07 (0.53)

Notes: Standardized beta coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Overall, analyses for depression provide more support for labelling theory than for attribution theory. In four countries, there is evidence for the “blowback” effect of seeing the problem as a mental illness. That is, attributing the vignette condition to biological causes, either genetics or brain disease, is associated with a desire for *more* social distance (Spain, $\beta = .16$, Germany, $\beta = .12$, Korea, $\beta = .15$, Bangladesh, $\beta = .18$). The effect sizes are moderate with no consistent patterning to which countries (varying by political system, economic status, stigma or attribution levels in Figures 1 or 2) do or do not have this association. The most consistent correlate of lower levels of stigma is the belief that the condition will improve on its own, a finding again in opposition to mental health literacy expectations. Specifically, holding that view is associated with lower levels of desire for social distance in 10 of the 17 countries. The effect is small to moderate with the strongest effects observed in Germany ($\beta = -.21$) and South Korea ($\beta = -.26$). Complete regression results are presented in Tables S2 and S3 in Supplemental Materials.

Schizophrenia and Stigma. As reflected in Table 2, results regarding mental health literacy and stigma for schizophrenia reflect similar findings to those above. The most consistent correlate is the recognition of this vignette as schizophrenia. In 11 of 17 countries, correct recognition aligns with predictions that assigning the label increases the likelihood of being more unwilling to have social interaction with the person depicted. The effect sizes run from small to moderate with the strongest effects observed in Cyprus ($\beta = .33$), South Korea ($\beta = .21$) and Germany ($\beta = .22$). Similarly, respondents who believe that the problem described in the vignette scenario will improve on its own are less likely to endorse stigma, again in contradiction to the expectation of the mental health literacy and attribution theory.

Table 2. Regressions of Social Distance on Mental Health Literacy and Controls, Schizophrenia by Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	Argentina (N = 471)	Brazil (N = 505)	Germany (N = 438)	New Zealand (N = 340)	S. Africa (N = 515)	Iceland (N = 334)	Spain (N = 424)
Correct recognition	0.15** (0.22)	0.07 (0.27)	0.22*** (0.26)	0.08 (0.22)	0.19*** (0.30)	0.01 (0.23)	0.15** (0.27)
Biological disease attribution	0.04 (0.22)	0.08 (0.18)	0.14** (0.23)	0.00 (0.30)	0.03 (0.22)	0.07 (0.39)	0.09 (0.36)
Person has mental health issue	0.08 (0.20)	0.06 (0.17)	0.03 (0.32)	0.04 (0.33)	0.07 (0.20)	0.14* (0.37)	-0.00 (0.36)
Condition will improve on its own	0.04 (0.19)	-0.06 (0.19)	-0.19*** (0.26)	-0.14* (0.29)	-0.19*** (0.18)	0.01 (0.42)	-0.19*** (0.31)
Problem is serious	-0.02 (0.25)	0.06 (0.23)	-0.05 (0.44)	-0.10 (0.54)	-0.01 (0.34)	-0.14 (1.33)	0.12* (0.48)
	Gr. Britain (N = 349)	Philippines (N = 400)	USA (N = 473)	Korea (N = 337)	Belgium (N = 396)	China (N = 1,844)	Bulgaria (N = 373)
Correct recognition	0.07 (0.23)	0.14** (0.29)	0.11* (0.17)	0.21*** (0.27)	0.12* (0.20)	0.15*** (0.14)	0.06 (0.29)
Biological disease attribution	0.01 (0.37)	0.02 (0.32)	0.02 (0.33)	0.04 (0.23)	-0.09 (0.21)	0.02 (0.11)	0.20** (0.36)
Person has mental health issue	0.01 (0.44)	0.11 (0.27)	0.08 (0.38)	-0.03 (0.29)	0.14** (0.21)	0.15*** (0.13)	0.06 (0.37)
Condition will improve on its own	-0.11 (0.39)	-0.11* (0.21)	-0.19*** (0.25)	-0.17** (0.23)	-0.13** (0.27)	-0.19*** (0.10)	-0.08 (0.29)
Problem is serious	-0.10 (0.57)	0.04 (0.27)	-0.09* (0.60)	-0.02 (0.74)	-0.14** (0.33)	0.08** (0.15)	0.04 (0.45)
	Hungary (N = 418)	Bangladesh (N = 501)	Cyprus (N = 268)				
Correct recognition	0.15** (0.27)	-0.06 (0.31)	0.33*** (0.25)				
Biological disease attribution	0.07 (0.22)	0.00 (0.23)	0.06 (0.37)				
Person has mental health issue	0.05 (0.31)	0.06 (0.41)	0.09 (0.59)				
Condition will improve on its own	-0.17*** (0.30)	-0.23*** (0.17)	-0.13* (0.47)				
Problem is serious	-0.08 (0.33)	-0.08 (0.92)	-0.04 (0.89)				

With respect to control variables (presented in Tables S2 and S3 in Supplemental Materials) for both depression and schizophrenia, the most consistent correlate is having prior contact with six significant effects in the depression analyses and five significant effects in the schizophrenia analyses. Effect sizes are small to moderate, and the effect is apparent in fewer than half of the countries. The only other consistent effect is that of age, however, the association is significant only for depression and in seven of the 17 countries. The effects of both variables are in line with past research with prior contact associated with lower endorsement of stigma and older individuals endorsing higher levels of stigma²².

Discussion

Getting a global view of mental health stigma has been difficult, with pioneering studies focusing on Europe²³ and some cross-national collaborations currently in the field. Here, using the Stigma in Global Context – Mental Health Study (SGC-MHS), we extend the view to 17 countries, many in Europe, but also to countries spanning each inhabited continent. Focusing on representative population-based samples, we document variation in the public’s understanding of and response to two case descriptions of depression and schizophrenia.

Our findings reveal that cross-national variation in public stigma exists but escapes any simplistic

explanation of how geographic, political, economic or even mental health policy context shape that variation²⁴. Countries do tend to fall in somewhat similar, but not perfectly aligned, low, medium and high clusters across disorders. Within countries, the public response to schizophrenia is generally more negative than to depression, which has been documented elsewhere²⁵. China stands as one exception, which may reflect the history of their First Plan (2002-2020) in their Mental Health Program emphasizing psychosis management as a top government priority²⁶. Bangladesh displays equal levels of stigma which may reflect the lack of attention to mental health generally (see response to a recent refugee crisis well past the date of the SGC-MHS as an exception²⁷). Given the limitation of the current study to ISSP participants (which signals societies with a sufficient survey research infrastructure to meet our inclusion criteria) combined with the scant cross-national findings, our insights are somewhat speculative since our models leave a lot of variation in stigma unexplained. Even this conclusion indicates that theory, methods, and data collection need reconsideration. We also find it important to note that the data used in this study are more than a decade old, however, that should not raise questions about applicability of our findings to the current context. More recent research conducted in the Western countries have consistently demonstrated that public stigma levels have been slow to change over the past several decades, and some changes in public perceptions have been regressive, i.e. regarding dangerousness for schizophrenia and support for coercive treatment^{28,29,30}. As such, even though levels of mental health literacy may have increased since the end our data collection, we anticipate the associations between mental health literacy and public stigma to have remained quite stable.

The main goal of the present analyses aimed to provide an examination of whether one of the dominant approaches to anti-stigma efforts (mental health literacy) and the theory that underlies it (attribution theory) provide an effective

lever for stigma change. This biological, medical, and psychological approach maintains that knowledge about the biomedical and genetic roots of mental illness and help-seeking will shift the view of mental illness as emanating from innate character flaws to a “disease like any other”¹¹. By doing so, not only is treatment seen as critical, but the individual blame as well as prejudice and discrimination that goes with it, is lessened. In essence, the foundation of mental health literacy campaigns is that holding a scientific view of mental illness can erase the non-progressive attitudes, beliefs, and behaviors that underly stigma. We counterposed this with a classic sociological, social psychological, and cultural view that labelling a set of non-normative behavior as “mental illness” triggers stereotyping and stigma.

Here, we find some support for both views, but with an overwhelming balance of support for labelling theory’s expectation of the prejudicial power of “naming and framing.” That is, the effects of mental health literacy variables on the endorsement of stigma find only spotty support for a positive effect of knowledge and only in very few countries. Though not overwhelming, the most consistent effects of attributions and assessment of severity have the opposite effects on stigma measured as desire for social distance. When the public endorses the neurobiological origins of unidentified cases of depression and schizophrenia, this is linked to more, not fewer venues where they are unwilling to interact with the vignette characters. This “blowback” effect is relatively unaffected by respondents’ social characteristics. Thus, the approaches deployed by mental health literacy efforts and campaigns may not have the intended effect; indeed, they may be counterproductive unless combined with other strategies. Ironically, the most consistent factor associated with lower stigma is the assessment that the situation will improve on its own, in direct contradiction to literacy theories.

However, effect sizes are small to moderate, and the lack of consistent effect across SGC-MHS

countries may be surprising. The uneven significance of whether respondents have mental health issues or have prior contact with individuals with mental health issues is similarly curious. Taken as a whole, the findings here call for some serious rethinking of what shapes the attitudes, beliefs, and behaviors toward mental illness in contemporary society and how recent events, such as the COVID-19 pandemic, may have altered social and cultural systems.

As Rosenfield³¹ pointed out early on, a pivotal difference between competing perspectives lies in the judgement about stigma's role in mental illness. Labelling theory sees that naming a problem as "mental illness" rather than the behavior itself, casts a stubborn and persistent mark on an individual with consequences that extend far beyond any medical issues. Attribution theory is not a critic of that perspective and, in fact, recognizes the potential for these negative consequences. However, as more in sync with what Rosenfield calls the psychiatric perspective, attribution theory aligns with ideas about individual pathology where the consequences of mental illness diagnosis depend on disease severity and getting treatment. As a result, in labelling theory, stigma is the central problem; in attribution theory, it is transitory, inconsequential, and perhaps even necessary or beneficial to get individuals into treatment. Specifically, as disorders receive high quality care, symptoms, functioning and well-being improve, and with these, stigma decreases. Mental health literacy, then, is designed to hasten understanding of the psychiatric perspective, and resultingly, decrease stigma in individuals and society.

Both, attribution theory and labelling theories, have found support in empirical research, but as Rosenfield pointed out, empirical examinations that can adjudicate the contributions of each were, and are still, rare. We follow on her conclusion that the insights need to be combined if we are to understand how to reduce stigma within communities, as well as improve the mental health treatment system. In fact, our findings do not, in

themselves, suggest that attribution theory is irrelevant. In combination with a review of the past research, including our own findings here and elsewhere, there is a potential rapprochement.

Research has documented that endorsing the neurobiological roots of mental health problem is linked with support for both medical and mental health care^{32,33}. Research has also documented that mental health literacy can be improved in the population and can increase individuals' use of services^{6,7}. This is not the case though with the effect of mental health literacy on attitudes or behavioral predispositions, such as increasing tolerance or aiding recovery¹³. In fact, a closer look at our own past research hints at a methodological issue that may underlie this set of discrepant findings.

Approaches that use a case-based strategy (e.g., vignettes) ask respondents what the described person should do, or in some cases, be forced to do (i.e., support for coerced or forced treatment²⁸). Endorsement of care tends to be high in such studies, and do not necessarily match the well-known rates of service use for mental health problems³⁴. In fact, in our own research where we examined individuals' attitudes toward the efficacy, potential side effects, and support for the use of psychiatric medications, the rates were overwhelmingly and surprisingly high. However, when this was followed by specific questions about *their own* willingness to use these medications for three increasingly serious situations, the rates were dismally low³⁵. In other words, the public voice spoke loudly: treatment is good for other people in the hypothetical case but not if they, themselves, face a mental health problem. As such, it is time to rethink our theories, measures, and methods.

Conclusions

Given our research results, we do not claim that large national studies nor national anti-stigma efforts are the only or even the best way to attack stigma, as much recent research has suggested. But it is unlikely that public or private agencies have the resources or the time to do the kind of in-

depth, heavily ethnographic work to tailor efforts to the myriad of special populations and places to decrease the burden of mental illness. As a result, having solid studies at and even across many levels is critical as governments and advocacy groups develop policies, build service systems, and launch efforts to reduce prejudice and discrimination surrounding mental health in their countries. This is especially salient in low-resourced countries such as Bangladesh, one of the countries in our study that revealed the highest rates of mental illness stigma. Finally, research targeting stigma or mental health literacy should recognize the desire for the public to know how to respond, how to access information, and to be given options to support others. In essence, flexibility, continuity, and the shift from emphasizing the recognition of signs and symptoms to evidence-based actions are key.

Conflict of Interest:

The authors have no conflicts of interest to declare.

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References:

1. Holman D. Exploring the relationship between social class, mental illness stigma and mental health literacy using British national survey data. *Health (London)*. 2015;19(4):413-429. doi:10.1177/1363459314554316
2. Jorm AF, Korten AE, Jacomb PA, Christensen H, Rodgers B, Pollitt P. "Mental health literacy": a survey of the public's ability to recognise mental disorders and their beliefs about the effectiveness of treatment. *Medical Journal of Australia*. 1997;166(4):182-186. doi:10.5694/j.1326-5377.1997.tb140071.x
3. Jorm AF. Mental health literacy: Empowering the community to take action for better mental health. *Am Psychol*. 2012;67(3):231-243. doi:10.1037/a0025957
4. Henderson C. Challenges in improving mental health literacy at population level. *World Psychiatry*. 2023;22(3):392-393. doi:10.1002/wps.21115
5. Sweileh WM. Global research activity on mental health literacy. *Middle East Curr Psychiatry*. 2021;28(1):43. doi:10.1186/s43045-021-00125-5
6. Jung H, von Sternberg K, Davis K. The impact of mental health literacy, stigma, and social support on attitudes toward mental health help-seeking. *Int J Ment Health Promot*. 2017;19(5):252-267. doi:10.1080/14623730.2017.1345687
7. Cheng HL, Wang C, McDermott RC, Kridel M, Rislin JL. Self-Stigma, Mental Health Literacy, and Attitudes Toward Seeking Psychological Help. *J Couns Dev*. 2018;96(1):64-74. doi:10.1002/jcad.12178
8. Corrigan PW. Mental health stigma as social attribution: Implications for research methods and attitude change. *Clin Psychol Sci Pract*. 2000;7(1):48-67. doi:10.1093/clipsy.7.1.48
9. Svensson B, Hansson L. How mental health literacy and experience of mental illness relate to stigmatizing attitudes and social distance towards people with depression or psychosis: A cross-sectional study. *Nord J Psychiatry*. 2016;70(4):309-313. doi:10.3109/08039488.2015.1109140
10. Freţian AM, Graf P, Kirchhoff S, et al. The Long-Term Effectiveness of Interventions Addressing Mental Health Literacy and Stigma of Mental Illness in Children and Adolescents: Systematic Review and Meta-Analysis. *Int J Public Health*. 2021;66:1604072. doi:10.3389/ijph.2021.1604072
11. Pescosolido BA, Martin JK, Long JS, Medina TR, Phelan JC, Link BG. "A Disease Like Any Other"? A Decade of Change in Public Reactions to Schizophrenia, Depression, and Alcohol Dependence. *Am J Psychiatry*. 2010;167(11):1321-1330. doi:10.1176/appi.ajp.2010.09121743
12. Zhuang XY, Wong DFK, Cheng CW, Pan SM. Mental health literacy, stigma and perception of causation of mental illness among Chinese people in Taiwan. *Int J Soc Psychiatry*. 2017;63(6):498-507.
13. Schnittker J. An uncertain revolution: Why the rise of a genetic model of mental illness has not increased tolerance. *Soc Sci Med*. 2008;67(9):1370-1381. doi:10.1016/j.socscimed.2008.07.007
14. Graham S. A review of attribution theory in achievement contexts. *Educ Psychol Rev*. 1991;3(1):5-39. doi:10.1007/BF01323661
15. Corrigan P, Markowitz FE, Watson A, Rowan D, Kubiak MA. An attribution model of public discrimination towards persons with mental illness. *J Health Soc Behav*. 2003;44(2):162-179.
16. Phelan JC, Cruz-rojas R, Reiff M. Genes and Stigma: The Connection Between Perceived Genetic Etiology and Attitudes and Beliefs About Mental Illness. *Psychiatr Rehabil Ski*. 2002;6(2):159-185. doi:10.1080/10973430208408431
17. Goffman E. *Stigma: Notes on the Management of Spoiled Identity*. Penguin; 1963.
18. Link BG, Cullen FT, Struening E, Shrout PE, Dohrenwend BP. A Modified Labeling Theory Approach to Mental Disorders: An Empirical Assessment. *Am Sociol Rev*. 1989;54(3):400-423. doi:10.2307/2095613
19. Scheff TJ. *Being Mentally Ill: A Sociological Theory*. Transaction Publishers
20. Phelan JC. Geneticization of Deviant Behavior and Consequences for Stigma: The Case of Mental Illness. *J Health Soc Behav*. 2005;46(4):307-322. doi:10.1177/0022146505

21. American Psychiatric Association. DSM-IV Sourcebook. Volumes 1-4. Washington, DC: American Psychiatric Press; 1994-1997.
22. Couture S, Penn D. Interpersonal contact and the stigma of mental illness: A review of the literature. *J Ment Health*. 2003;12(3):291-305. doi:10.1080/09638231000118276
23. Evans-Lacko S, Knapp M, McCrone P, Thornicroft G, Mojtabai R. The Mental Health Consequences of the Recession: Economic Hardship and Employment of People with Mental Health Problems in 27 European Countries. *PLOS ONE*. 2013;8(7):e69792. doi:10.1371/journal.pone.0069792
24. Pescosolido BA, Martin JK, Olafsdottir S, Long JS, Kafadar K, Medina TR. The Theory of Industrial Society and Cultural Schemata: Does the "Cultural Myth of Stigma" Underlie the WHO Schizophrenia Paradox? *Am J Sociol*. 2015;121(3):783-825. doi:10.1086/683225
25. Pescosolido BA, Medina TR, Martin JK, Long JS. The "backbone" of stigma: Identifying the global core of public prejudice associated with mental illness. *Am J Public Health*. 2013;103(5):853-860. doi:10.2105/AJPH.2012.301147
26. Huang D, Yang LH, Pescosolido BA. Understanding the public's profile of mental health literacy in China: a nationwide study. *BMC Psychiatry*. 2019;19(1):20. doi:10.1186/s12888-018-1980-8
27. Hasan MT, Anwar T, Christopher E, et al. The current state of mental healthcare in Bangladesh: part 1 – an updated country profile. *BJPsych Int*. 2021;18(4):78-82. doi:10.1192/bji.2021.41
28. Pescosolido BA, Manago B, Monahan J. Evolving Public Views On The Likelihood Of Violence From People With Mental Illness: Stigma And Its Consequences. *Health Aff (Millwood)*. 2019;38(10):1735-1743. doi:10.1377/hlthaff.2019.00702
29. Pescosolido BA, Halpern-Manners A, Luo L, Perry B. Trends in Public Stigma of Mental Illness in the US, 1996-2018. *JAMA Netw Open*. 2021;4(12):e2140202. doi:10.1001/jamanetworkopen.2021.40202
30. Schomerus G, Schwahn C, Holzinger A, et al. Evolution of public attitudes about mental illness: a systematic review and meta-analysis. *Acta Psychiatr Scand*. 2012;125(6):440-452. doi:10.1111/j.1600-0447.2012.01826.x
31. Rosenfield S. Labeling Mental Illness: The Effects of Received Services and Perceived Stigma on Life Satisfaction. *Am Sociol Rev*. 1997;62(4):660. doi:10.2307/2657432
32. Baek CH, Kim HJ, Park HY, Seo HY, Yoo H, Park JE. Influence of Biogenetic Explanations of Mental Disorders on Stigma and Help-Seeking Behavior: A Systematic Review and Meta-Analysis. *J Korean Med Sci*. 2022;38(3):e25. doi:10.3346/jkms.2023.38.e25
33. Schnyder N, Panczak R, Groth N, Schultze-Lutter F. Association between mental health-related stigma and active help-seeking: Systematic review and meta-analysis. *Br J Psychiatry*. 2017;210(4):261-268. doi:10.1192/bjp.bp.116.189464
34. Pescosolido BA, Olafsdottir S. The Cultural Turn in Sociology: Can It Help Us Resolve an Age-Old Problem in Understanding Decision Making for Health Care? In: *Sociological Forum*. Vol 25. Blackwell Publishing Ltd.; 210AD:655-676.
35. Croghan TW, Tomlin M, Pescosolido BA, et al. American attitudes toward and willingness to use psychiatric medications. *J Nerv Ment Dis*. 2003;191(3):166-174. doi:10.1097/01.NMD.0000054933.52571.CA

Supplemental Materials:

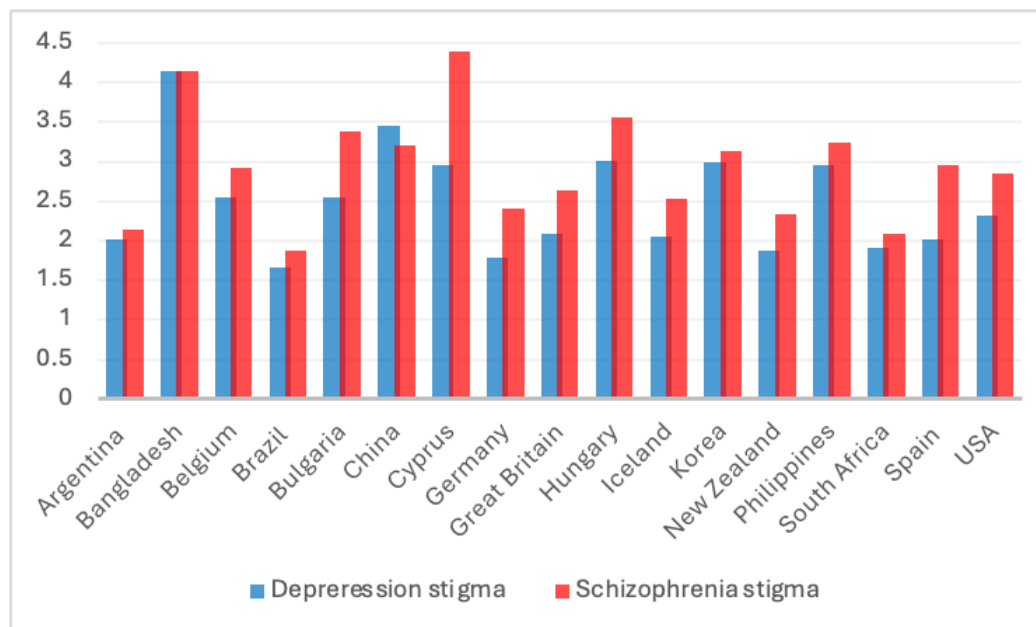


Figure S1. Comparison of Levels of Stigma as Measured by Social Distance for Depression And Schizophrenia (red) Compared and Ordered Alphabetically by Country, Stigma in Global Context – Mental Health Study

Table S1. Descriptive Statistics by Country (sorted alphabetically) for Depression-Specific, Schizophrenia-Specific, and Controls, Stigma in Global Context – Mental Health Study

	Argentina (N = 944)	Bangladesh (N = 1,001)	Brazil (N = 1,061)	Belgium (N = 774)	Bulgaria (N = 764)	China (N = 3,746)	Cyprus (N = 536)
	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%
DEPRESSION							
Stigma (social distance)	2.01 (1.68)	4.14 (1.75)	1.67 (1.48)	2.55 (1.80)	2.55 (1.98)	3.45 (1.97)	2.95 (1.88)
Correct recognition	76.11%	74.40%	64.21%	71.69%	51.66%	22.08%	70.15%
Biological disease attribution	15.86%	30.80%	18.88%	34.07%	19.18%	17.67%	25.37%
Person has mental health issue	40.59%	92.60%	46.04%	58.99%	54.73%	78.08%	83.58%
Condition will improve on its own	33.83%	26.60%	21.04%	19.84%	46.55%	61.72%	15.30%
Problem is serious	86.26%	97.80%	82.55%	93.12%	77.75%	83.70%	93.66%

	Argentina (N = 944)	Bangladesh (N = 1,001)	Brazil (N = 1,061)	Belgium (N = 774)	Bulgaria (N = 764)	China (N = 3,746)	Cyprus (N = 536)
	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%
SCHIZOPHRENIA							
Stigma (social distance)	2.32 (1.76)	4.25 (1.67)	2.15 (1.71)	3.00 (1.78)	3.65 (2.08)	3.37 (2.02)	4.68 (1.69)
Correct recognition	19.32%	93.01%	9.11%	27.53%	25.20%	13.18%	66.42%
Biological disease attribution	24.84%	28.14%	22.18%	35.35%	41.29%	17.52%	60.07%
Person has mental health issue	59.02%	96.21%	58.61%	75.00%	80.97%	76.14%	95.90%
Condition will improve on its own	31.21%	24.55%	22.18%	11.36%	23.59%	59.71%	5.97%
Problem is serious	85.56%	99.40%	83.96%	92.68%	87.13%	82.81%	97.01%
CONTROL VARIABLES							
Gender (% female)	53.92%	49.95%	58.15%	53.23%	58.51%	54.83%	50.19%
Age	42.85%	36.40 (12.77)	41.72 (16.76)	49.07 (18.29)	50.09 (17.59)	47.83(6.12)	43.61 (15.37)
Education (% with university degree)	9.00%	8.49%	8.01%	13.05%	24.21%	28.50%	14.18%
Has contact with mental illness history	55.40%	30.87%	51.18%	70.28%	34.29%	12.28%	18.47%

Note. Percent may not add up to a 100 due to missing data.

Table S1 cont. Descriptive Statistics by Country (sorted alphabetically) for Depression-Specific, Schizophrenia-Specific, and Controls, Stigma in Global Context – Mental Health Study

	Germany (N = 847)	Great Britain (N = 703)	Hungary (N = 840)	Iceland (N = 1,033)	Korea (N = 669)	New Zealand (N = 680)	Philippines (N = 800)
	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%
DEPRESSION							
Stigma (social distance)	1.79 (1.74)	2.08 (1.74)	3.00 (1.92)	2.05 (1.81)	2.99 (1.94)	1.87 (1.48)	2.96 (1.78)
Correct recognition	62.84%	74.58%	65.88%	72.97%	56.93%	63.53%	58.50%
Biological disease attribution	16.14%	30.23%	13.03%	35.14%	12.35%	31.47%	25.75%
Person has mental health issue	80.68%	77.40%	79.15%	72.59%	75.30%	74.41%	65.75%
Condition will improve on its own	24.21%	25.71%	12.09%	11.58%	47.29%	23.82%	73.50%
Problem is serious	87.78%	92.09%	87.20%	97.30%	92.77%	96.47%	85.00%
SCHIZOPHRENIA							
Stigma (social distance)	2.57 (2.01)	2.95 (1.86)	3.55 (1.89)	2.62 (1.78)	3.33 (1.92)	2.57 (1.71)	3.44 (1.91)
Correct recognition	19.86%	35.53%	14.59%	33.53%	19.88%	34.71%	11.75%
Biological disease attribution	30.37%	48.14%	25.84%	55.39%	16.02%	44.41%	36.50%
Person has mental health issue	86.99%	92.84%	84.45%	87.43%	77.74%	84.41%	81.50%
Condition will improve on its own	17.58%	8.60%	12.20%	7.49%	37.39%	17.35%	70.00%
Problem is serious	94.52%	95.99%	87.32%	99.10%	97.03%	96.47%	85.00%

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	Germany (N = 847)	Great Britain (N = 703)	Hungary (N = 840)	Iceland (N = 1,033)	Korea (N = 669)	New Zealand (N = 680)	Philippines (N = 800)
	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%
CONTROL VARIABLES							
Gender (% female)	53.36%	56.05%	57.26%	50.93%	57.25%	51.18%	50.00%
Age	48.20 (17.24)	50.37 (18.58)	49.61 (18.01)	43.59 (16.77)	46.09 (14.98)	46.19 (17.64)	40.63 (14.67)
Education (% with university degree)	19.48%	28.31%	5.83%	22.77%	24.81%	21.47%	13.75%
Has contact with mental illness history	50.65%	64.01%	45.36%	74.37%	27.50%	70.44%	20.88%

Note. Percent may not add up to a 100 due to missing data.

Table S1 cont. Descriptive Statistics by Country (sorted alphabetically) for Depression-Specific, Schizophrenia-Specific, and Controls, Stigma in Global Context – Mental Health Study

	South Africa (N = 1,033)	Spain (N = 883)	USA (N = 953)
	Mean (SD)/%	Mean (SD)/%	Mean (SD)/%
DEPRESSION			
Stigma (social distance)	1.92 (1.84)	2.01 (2.04)	2.32 (1.60)
Correct recognition	34.17%	80.17%	77.50%
Biological disease attribution	20.27%	15.47%	41.25%
Person has mental health issue	51.93%	56.86%	78.96%
Condition will improve on its own	35.52%	29.19%	29.17%
Problem is serious	93.44%	79.08%	93.96%
SCHIZOPHRENIA			
Stigma (social distance)	2.25 (1.90)	3.25 (2.39)	3.18 (1.72)
Correct recognition	9.13%	36.56%	43.76%
Biological disease attribution	26.02%	31.37%	68.08%
Person has mental health issue	66.80%	76.89%	93.23%
Condition will improve on its own	30.68%	19.81%	12.68%
Problem is serious	93.01%	90.33%	98.31%
CONTROL VARIABLES			
Gender (% female)	49.95%	51.30%	53.10%
Age	38.84 (15.61)	45.72 (18.03)	47.35 (16.51)
Education (years or /% with higher ed.)	13.94%	8.49%	34.73%
Has contact with mental illness history	39.21%	35.56%	73.14%

Note. Percent may not add up to a 100 due to missing data.

Table S2. Regressions of Social Distance on Mental Health Literacy and Controls, Depression by Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	Brazil (N = 556)	Spain (N = 459)	Germany (N = 409)	Argentina (N = 473)	Bulgaria (N = 391)	Cyprus (N = 268)	Gr. Britain (N = 354)
Correct recognition	-0.03 (0.14)	-0.02 (0.32)	-0.05 (0.22)	0.04 (0.21)	-0.12 (0.26)	-0.34*** (0.27)	0.00 (0.25)
Biological disease attribution	0.08 (0.15)	0.16** (0.25)	0.12* (0.20)	0.03 (0.18)	0.07 (0.30)	0.05 (0.28)	-0.08 (0.25)
Person has mental health issue	0.02 (0.14)	-0.15* (0.25)	0.06 (0.28)	-0.01 (0.18)	0.06 (0.29)	0.00 (0.34)	-0.01 (0.28)
Condition will improve on its own	-0.09* (0.15)	-0.04 (0.23)	-0.21*** (0.23)	-0.12* (0.18)	-0.09 (0.25)	0.01 (0.34)	-0.07 (0.23)
Problem is serious	-0.05 (0.18)	-0.04 (0.28)	-0.19*** (0.31)	-0.05 (0.24)	-0.11 (0.33)	0.07 (0.54)	-0.04 (0.40)
Gender (1 = female)	-0.02 (0.13)	0.03 (0.221)	-0.00 (0.18)	0.07 (0.16)	0.04 (0.25)	-0.06 (0.25)	-0.07 (0.20)
Age	0.19*** (0.00)	0.16** (0.01)	0.07 (0.01)	0.05 (0.01)	0.10 (0.01)	0.06 (0.01)	0.11* (0.01)
Education (% with higher ed.)	-0.07 (0.22)	-0.01 (0.42)	0.02 (0.23)	0.12* (0.29)	0.06 (0.28)	-0.11 (0.37)	-0.03 (0.22)
Contact with mental illness history	-0.01 (0.13)	-0.04 (0.22)	-0.18*** (0.18)	-0.04 (0.17)	-0.16** (0.25)	-0.18** (0.30)	-0.11 (0.21)
AIC	11508.601	9258.184	8307.401	9826.649	8119.744	4892.000	7225.618
BIC	11789.451	9526.573	8568.292	10096.990	8377.710	5125.415	7477.123

Notes: Standardized beta coefficients; Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table S2. cont. Regressions of Social Distance on Mental Health Literacy and Controls, Depression By Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	New Zealand (N = 340)	S. Africa (N = 518)	USA (N = 480)	Iceland (N = 259)	Belgium (N = 378)	Hungary (N = 422)	Philippines (N = 400)
Correct recognition	-0.01 (0.20)	0.08 (0.18)	0.02 (0.21)	0.05 (0.27)	0.05 (0.21)	-0.11 (0.24)	0.05 (0.19)
Biological disease attribution	-0.03 (0.22)	0.05 (0.19)	-0.06 (0.21)	-0.04 (0.29)	-0.05 (0.21)	0.06 (0.22)	-0.05 (0.20)
Person has mental health issue	-0.03 (0.24)	0.07 (0.18)	-0.01 (0.22)	0.17** (0.28)	0.12* (0.20)	-0.07 (0.28)	0.12* (0.20)
Condition will improve on its own	-0.05 (0.22)	-0.15*** (0.17)	-0.13* (0.18)	-0.03 (0.36)	-0.02 (0.23)	-0.15** (0.30)	-0.14** (0.20)
Problem is serious	0.06 (0.49)	0.02 (0.35)	0.03 (0.35)	-0.11 (0.73)	-0.14* (0.38)	-0.03 (0.36)	0.00 (0.25)
Gender (1 = female)	-0.08 (0.18)	0.08 (0.17)	-0.10* (0.15)	-0.01 (0.23)	0.09 (0.18)	-0.04 (0.20)	0.13** (0.17)
Age	0.02 (0.00)	0.08 (0.01)	0.19*** (0.00)	0.20** (0.01)	0.28*** (0.00)	0.12* (0.01)	-0.00 (0.01)
Education (% with higher ed.)	-0.05 (0.23)	0.07 (0.25)	-0.01 (0.16)	-0.10 (0.28)	-0.07 (0.25)	0.10 (0.43)	-0.11* (0.25)
Contact with mental illness history	-0.15* (0.19)	-0.02 (0.17)	-0.07 (0.18)	-0.20** (0.28)	-0.01 (0.20)	-0.04 (0.21)	-0.04 (0.22)
AIC	6552.209	10788.585	9191.893	4876.847	7890.499	8172.501	8396.371
BIC	6801.091	11064.834	9463.189	5108.041	8146.268	8435.427	8655.817

Notes: Standardized beta coefficients; Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table S2. cont. Regressions of Social Distance on Mental Health Literacy and Controls, Depression by Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	Korea (N = 332)	China (N = 1,900)	Bangladesh (N = 500)
Correct recognition	0.04 (0.22)	0.03 (0.12)	-0.09* (0.17)
Biological disease attribution	0.15** (0.22)	0.00 (0.11)	0.18*** (0.19)
Person has mental health issue	0.19*** (0.25)	0.12*** (0.13)	0.14*** (0.29)
Condition will improve on its own	-0.26*** (0.22)	-0.17*** (0.10)	-0.15*** (0.17)
Problem is serious	0.03 (0.50)	0.05 (0.14)	-0.07 (0.53)
Gender (1 = female)	-0.06 (0.23)	-0.01 (0.10)	0.05 (0.15)
Age	-0.05 (0.01)	0.04 (0.00)	0.08 (0.01)
Education (% with higher ed.)	0.03 (0.26)	-0.00 (0.11)	-0.10* (0.28)
Contact with mental illness history	0.06 (0.25)	-0.05* (0.14)	0.04 (0.16)
AIC	6920.579	38743.726	8558.514
BIC	7167.913	39104.451	8832.463

Notes: Standardized beta coefficients; Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table S3. Regressions of Social Distance on Mental Health Literacy and Controls, Schizophrenia by Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	Argentina (N = 471)	Brazil (N = 505)	Germany (N = 438)	New Zealand (N = 340)	S. Africa (N = 515)	Iceland (N = 334)	Spain (N = 424)
Correct recognition	0.15** (0.22)	0.07 (0.27)	0.22*** (0.26)	0.08 (0.22)	0.19*** (0.30)	0.01 (0.23)	0.15** (0.27)
Biological disease attribution	0.04 (0.22)	0.08 (0.18)	0.14** (0.23)	0.00 (0.30)	0.03 (0.22)	0.07 (0.39)	0.09 (0.36)
Person has mental health issue	0.08 (0.20)	0.06 (0.17)	0.03 (0.32)	0.04 (0.33)	0.07 (0.20)	0.14* (0.37)	-0.00 (0.36)
Condition will improve on its own	0.04 (0.19)	-0.06 (0.19)	-0.19*** (0.26)	-0.14* (0.29)	-0.19*** (0.18)	0.01 (0.42)	-0.19*** (0.31)
Problem is serious	-0.02 (0.25)	0.06 (0.23)	-0.05 (0.44)	-0.10 (0.54)	-0.01 (0.34)	-0.14 (1.33)	0.12* (0.48)
Gender (1 = female)	0.02 (0.17)	-0.05 (0.16)	-0.19*** (0.19)	-0.06 (0.19)	0.01 (0.17)	-0.09 (0.21)	-0.01 (0.25)
Age	0.07 (0.01)	0.11* (0.00)	0.06 (0.01)	0.12* (0.01)	0.06 (0.01)	0.02 (0.01)	0.14** (0.01)
Education (years or % with higher ed.)	0.05 (0.30)	-0.04 (0.30)	-0.00 (0.25)	0.08 (0.23)	-0.02 (0.25)	0.04 (0.24)	-0.03 (0.42)
Contact with mental illness history	-0.05 (0.17)	-0.06 (0.16)	-0.17*** (0.20)	-0.12 (0.23)	-0.02 (0.18)	-0.08 (0.24)	-0.03 (0.26)
AIC	9614.986	10048.263	8305.787	6313.595	10099.932	5277.890	8229.617
BIC	9885.051	10322.859	8571.131	6562.477	10375.803	5525.614	8492.850

Notes: Standardized beta coefficients; Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table S3 cont. Regressions of Social Distance on Mental Health Literacy and Controls, Schizophrenia by Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	Gr. Britain (N = 349)	Philippines (N = 400)	USA (N = 473)	Korea (N = 337)	Belgium (N = 396)	China (N = 1,844)	Bulgaria (N = 373)
Correct recognition	0.07 (0.23)	0.14** (0.29)	0.11* (0.17)	0.21*** (0.27)	0.12* (0.20)	0.15*** (0.14)	0.06 (0.29)
Biological disease attribution	0.01 (0.37)	0.02 (0.32)	0.02 (0.33)	0.04 (0.23)	-0.09 (0.21)	0.02 (0.11)	0.20** (0.36)
Person has mental health issue	0.01 (0.44)	0.11 (0.27)	0.08 (0.38)	-0.03 (0.29)	0.14** (0.21)	0.15*** (0.13)	0.06 (0.37)
Condition will improve on its own	-0.11 (0.39)	-0.11* (0.21)	-0.19*** (0.25)	-0.17** (0.23)	-0.13** (0.27)	-0.19*** (0.10)	-0.08 (0.29)
Problem is serious	-0.10 (0.57)	0.04 (0.27)	-0.09* (0.60)	-0.02 (0.74)	-0.14** (0.33)	0.08** (0.15)	0.04 (0.45)
Gender (1 = female)	-0.10 (0.21)	0.05 (0.19)	-0.03 (0.16)	0.05 (0.22)	-0.05 (0.17)	-0.03 (0.10)	-0.02 (0.23)
Age	-0.00 (0.01)	-0.01 (0.01)	0.06 (0.00)	0.00 (0.01)	0.27*** (0.00)	0.03 (0.00)	0.03 (0.01)
Education (years or % with higher ed.)	0.03 (0.24)	0.04 (0.28)	0.12* (0.17)	0.04 (0.28)	0.03 (0.27)	-0.01 (0.11)	0.03 (0.01)
Contact with mental illness history	-0.16** (0.23)	-0.07 (0.23)	-0.13** (0.18)	-0.07 (0.24)	-0.09 (0.19)	-0.04 (0.14)	-0.29*** (0.24)
AIC	6255.198	7828.713	7929.238	6544.136	7767.940	37155.403	7185.515
BIC	6505.778	8088.158	8199.580	6792.442	8026.732	37514.183	7440.418

Notes: Standardized beta coefficients; Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table S3 cont. Regressions of Social Distance on Mental Health Literacy and Controls, Schizophrenia by Country (Only MHL Variables Displayed), Stigma in Global Context – Mental Health Study

	Hungary (N = 418)	Bangladesh (N = 501)	Cyprus (N = 268)
Correct recognition	0.15** (0.27)	-0.06 (0.31)	0.33*** (0.25)
Biological disease attribution	0.07 (0.22)	0.00 (0.23)	0.06 (0.37)
Person has mental health issue	0.05 (0.31)	0.06 (0.41)	0.09 (0.59)
Condition will improve on its own	-0.17*** (0.30)	-0.23*** (0.17)	-0.13* (0.47)
Problem is serious	-0.08 (0.33)	-0.08 (0.92)	-0.04 (0.89)
Gender (1 = female)	-0.00 (0.19)	0.02 (0.15)	0.05 (0.22)
Age	0.20*** (0.01)	0.10* (0.01)	0.03 (0.01)
Education (years or % with higher ed.)	-0.03 (0.47)	-0.13** (0.26)	-0.06 (0.30)
Contact with mental illness history	-0.15** (0.19)	0.03 (0.16)	-0.06 (0.30)
AIC	7577.035	6791.167	3782.120
BIC	7839.341	7065.246	4015.535

Notes: Standardized beta coefficients; Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001