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JOURNAL OF PREVENTIVE MEDICINE AND CARE
ISSN NO: 2474-3585

Research Article

DOI : 10.14302/issn.2474-3585.jpmc-16-1112

Mental Health Promotion through Collection of Global Opinion Data

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Abstract

Background: Mental health promotion depends to a large extent on the gathering of accurate baseline opinion data from a targeted population.

Aim: The aim of this paper is to explore the potential applications of a new method of measuring true attitudes toward mental illness, and of monitoring and evaluating subsequent public health interventions.

Method: This paper reviews the strengths and limitations of a novel survey method, RIWI, its early findings, and its potential applications in the field of mental health promotion. Comparisons are made to other commonly used survey methods through entering pertinent search terms into the Google Scholar™ database.

Findings: The RIWI online survey method has several advantages over earlier survey methods: it is random, quick, anonymous, and reaches very large samples. Questionnaires are easily translatable and can be repeated, with excellent test-retest reliability. Anonymity reduces social desirability bias. The limitations are: a) variable completion rate, which carries the upside of allowing regional comparisons, and b) the reality that the respondent pool reflects regional Internet usage, often biased toward young literate males.

Conclusions: A survey method that is able to quickly and repeatedly sample large numbers of random individuals is an important advance for health promotion in that interventions can be timely and their efficacy can be rapidly evaluated.

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Citation: Neil Seeman, Sean G. Fogler, Mary V. Seeman (2016) Mental Health Promotion Through Collection of Global Opinion Data. Journal Of Preventive Medicine And Care - 1(1):23-36. https://doi.org/10.14302/issn.2474-3585.jpmc-16-1112

Keywords: Mental Health Promotion; Survey Methodology; Prevention of Stigma

Received May 19, 2016; **Accepted** Jul 17, 2016; **Published** Jul 26, 2016;

Academic Editor: Ying-Chu Lin, Kaohsiung Medical University, Taiwan

Introduction

Before launching initiatives in mental health promotion, it is important to accurately survey the views and beliefs of local stakeholders. Reliable surveys enable what is referred to as 'ground-truthing,' candid opinion provided by voluntary self-report as opposed to information gathered through indirect inference. The aim of this paper is to explore the potential applications of a new survey method to measure attitudes toward various aspects of mental illness and, thus, to enable subsequent testing of the adequacy of public health interventions.

Working Method of this Review

This paper first describes a novel Web survey method, Random Domain Intercept Technology (RDIT™), addresses its strengths and its limitations, and outlines early findings based on the method. Subsequently, the authors systematically entered the search terms defined in Table 1 (as well as their common synonyms) into the multidisciplinary database, Google Scholar™, and determined how standard survey methods that address mental health and public sentiment dealt with them. Each item was entered in the database in conjunction with the phrase, "mental health sentiment survey" and the Methods and Limitations sections of applicable studies were subsequently scanned. Since mental health sentiment surveys are a new phenomenon, there were relatively few comparators ('follow up' = 0; 'freshness', 'reproducibility' = 2; 'population breadth', 'voluntariness' = 3; 'question appropriateness', 'neutrality' = 4; 'sample size', 'randomness' = 5; 'representativeness', 'anonymity', 'questionnaire length' and 'questionnaire validity' = 6) from which to choose. The discussion section explores potential applications to health promotion and the prevention of mental illness.

Table 1 [insert approximately here]

Description of the RIWI Method

Taking advantage of the fact that all users of Web-enabled devices make occasional typographical errors on non-trademarked websites when navigating the Web, errors that lead them to unintended Internet destinations, the RIWI method places survey questions on such unintended Web destinations (1), using Random Domain Intercept Technology or RDIT™ (2). Web users mistyping a URL are, thus, automatically exposed to an opt-in anonymous survey that allows them to answer questions from one Internet Protocol (IP) address once only. A proprietary code ensures that the RIWI sample of exposed domains is randomized, 'bot'-free, geo-representative (that is, specific to a city, region or country), and quality controlled (ensuring no duplicate entries from the same IP address) (3). It enables real-time survey response data collection simultaneously in any and all geographic areas serviced by the Internet. Individual government restrictions, such as closure of social media sites, do not interfere with this method.

Comparison with Other Methods

Socially Desirable Responses

There are several known methods of gathering opinion data about mental health and illness. Each one has its strengths and biases. Face-to-face or telephone interviews can collect in-depth information. A trained interviewer is often able to motivate respondents to respond fully and honestly by building a relationship of trust, which is absent in impersonal Web surveys. On the other hand, such interviews are not anonymous so that candid responses are constrained by social desirability bias and impression management, the tendency of survey respondents to answer questions in ways that interviewers would approve of (4). Anonymity, while not guaranteeing honesty (people can exhibit 'shirking behavior' in anonymous surveys, which means not expending sufficient mental effort to fully answer questions; or they can deliberately falsify their

Table. Factors Important to Mental Health Surveys

Population Breadth	The ability to reach as many diverse individuals as possible
Size of Sample	The ability to collect large population samples
Randomness	The equal chance of any individual being exposed to the survey questions
Representativeness	The degree to which respondents represent the general population of the region
Anonymity	The impossibility of associating respondents with their answers, thus guaranteeing confidentiality
Freshness	The likelihood of recruiting respondents with minimal previous exposure to surveys
Voluntariness	The certainty that potential respondents have the freedom to participate or not, as they wish
Appropriateness of Questions	The likelihood that the language, tone, and clarity of the questions enables respondents to answer accurately
Appropriate Length of Questionnaire	The likelihood that the questionnaire is long enough to cover the research question but short enough to prevent survey fatigue and that it thereby ensures sufficient numbers of reliable and complete responses
Validity of Questionnaire	The likelihood that the questions asked will yield quantitative or qualitative answers useful to the research purpose
Neutrality	The likelihood that respondents will not be swayed by what they consider to be socially desirable answers or by the offer of rewards for participation
Reproducibility	The likelihood that the same opinion questions, administered more than once to the same population parameter, will yield the same results (unless there is an intervening event that explains the discrepancy in results)
Follow-Up	The possibility of administering a questionnaire repeatedly, thus enabling longitudinal research and the measurement of efficacy of an intervention

answers), does provide the freedom to give honest answers, even when they are perceived as unpopular. The results of a comparison study comparing social desirability in face-to-face versus Web surveys while controlling for response rates showed that face-to-face surveys generated more socially desirable responses (5). This is especially important when collecting sensitive mental health data. When doing cross-country comparisons, it is also important to realize that there are cultural differences in both shirking and social desirability tendencies. Asian collectivist cultures, for instance, show more of both these tendencies when compared to individualistic North American cultures. Respondents from individualistic cultures are more inclined to inflate their own skills and to have greater confidence in their own judgments and, therefore, to be more definite about their opinions (6). Interviewers in face-to-face interviews are able to pick up on nonverbal cues that signal false reporting whereas anonymous Web respondents are hidden from view. Anonymous surveys, therefore, do not guarantee a truthful response but they increase its likelihood. Truthful response depends also on the wording and presentation of the questions (7), an important aspect of response data quality whatever the survey format.

Questionnaires, Incentives, Sample Size, Sample Diversity

Person-to-person interviews have the advantage of being able to use long, standardized, reliable, and valid questionnaires, which are able to yield, for instance, accurate point prevalences of mental health conditions (8). The RIWI method cannot do this. A survey of more than 14 questions has been found to lead to survey fatigue and survey abandonment. This may be because RIWI respondents are not 'incented' or rewarded for participation. Incentives increase participation but, at the same time, they make anonymity impossible (9). They also may be perceived as coercive (10).

In contrast to other methods, the RIWI process can reach vast numbers of individuals simultaneously throughout the world, and its brief questions can be easily translated into any number of languages, as needed.

Representativeness, Jadedness, Randomness

Delphi–type panels, structured communication methods that rely on the judgment of a panel of experts, have been used to gather a wide range of mental health data (11), but the opinions of hand-picked experts, while knowledgeable, do not represent the total population of mental health stakeholders, e.g. patients, family members, neighbors, employers. Widely distributed email invitations to visit survey websites are another commonly used method, but such invitations are increasingly blocked by email SPAM filters and, importantly, respondents to such mail-outs are not anonymous. The other problem with targeted survey methods is that they are known to recruit habitual respondents who, over time, become increasingly jaded (12) and, therefore, tend to respond hastily and haphazardly, to 'shirk' in other words. RIWI surveys, being random, reach different respondents on each occasion so that responses stay fresh while still representative of the targeted population.

Another way of extracting qualitative information about mental health is from applying linguistic algorithms to the text of postings on Twitter™ or other social media and blogs. The method has been applied to the analysis of public sentiment about autistic spectrum disorder (13) and dementia (14). The first reference harvested 11 million tweets about autism and showed that linguistic analysis could be applied to such texts. The second reference retrieved 9,200 tweets about dementia and developed a coding guide that could be used to analyze them. The findings were that a majority of the tweets were links to health information sites and that a large number discussed research relating to prediction of dementia risk. The personal opinions that can be gathered by this method have been found subject to significant interpretation error,

especially in unfamiliar cultural contexts because personal idioms of distress vary in ways that language cannot always capture (15). Another problem is that the texts that are analyzed through these methods are unlikely to be representative of general sentiment (16) and, as mentioned above, governments are able to control access to and censor social media sites.

A problem with all Web-based surveys is that the relative intensity of Web usage varies among regions. Offline surveys have similar limitations in that some populations are more accessible than others. The problem is partially mitigated by the RIWI process via respondent population re-weighting to local Census data and through the participation of large samples of all age categories.

Most factors important to consider when designing mental health surveys intended to cover as wide a swath of the world population as possible are summarized in Table 1.

Relative Advantages of the RIWI Survey Method

Response And Retention Rates

The meaning of "response rate" differs in different contexts, which makes survey methods difficult to compare on this measure. With respect to the RIWI method, the sample potentially exposed to the questionnaire is every person using the Internet in the targeted location during the time of the study. Whom the survey reaches depends on how frequently one uses the Internet, what access one has, whether one prefers to type or to copy and paste URL addresses, whether one tends to use bookmarks, and how careful one is to avoid mangled words or non-existent websites in the URL bar (everyone makes such errors on non-trademarked domains; some of us more frequently and some of us less so). It cannot be known how many persons are presented with the questionnaire and choose to ignore it. The main reason for ignoring the questionnaire is presumably the wish to return to the true, intended website destination. The number of such "non-responders" is unknown. There may also be "non-responders" who briefly scan the questionnaire and decide against it for lack of interest or other reasons, but this number is also unknown. An analogy is any member of the general public who sees a newspaper advertisement for a survey and ignores it. Such people are not included in the denominator when calculating response rates.

For RIWI and for online newspaper advertisements, non-response can be defined as beginning a survey and then abandoning it – i.e., abandonment rate. The post opt-in RIWI 'abandonment rate' varies depending on the topic and on the geographies targeted. Abandonment rates are generally lower in wealthier than in poorer countries; they depend on the salience of the topic to respondents (17,18). A related measure is completion rate – the rate at which, once opted in, respondents complete the survey. For RIWI, this always exceeds 40%. A 40% to 50% response rate (defined as the percentage of individuals to whom a questionnaire was sent who return it) is considered average for mail and Internet surveys. While response rate thus defined does not exactly correspond to RIWI's completion rate, it is probably the best comparison measure (19).

There may be some sensitive items on a questionnaire that are less likely to be responded to than others. This is the "item response rate" and it will vary with the sensitivity of the question and how it is framed. RIWI's ability to reach non-habitual responders who can be expected to be relatively interested in answering survey questions and RIWI's receipt of approximately the same number of responses from any given region at different points of time both suggest fairly robust responsiveness, although exact comparisons with other methods are not possible to make.

Wide Population Breadth

RIWI respondents currently come from 231 countries and territories and from all walks of life, but the respondent pool is limited to those with access to

the Internet (43% of the world's population) – and, generally, therefore, this means more males (65%). The male/female ratio varies, depending on geography. The male bias is narrower in North America and Western European countries than it is in the rest of the world. For example, the population with access to the Internet is 52% male in the U.S., in contrast to 77% male in Pakistan (18). It is a relatively young population, 54% being 34 years old or younger, relatively more educated, more likely to be employed, and thus in a higher socioeconomic bracket than their peers (17). If the survey is in English (as most current global surveys tend to be), non-English speakers are automatically excluded. RIWI questions, however, being short, can easily be translated into local languages. RIWI respondents have been shown to be representative of the Web users in any country or region (re-weighted to the most recent official Census figures). The RIWI method has been described as yielding a "truly random sample" (17,18).

Absence Of Social Desirability Bias

The RIWI method does not provide financial incentives to participants and collects no personally identifiable information about individual respondents. The anonymity and lack of incentives dramatically reduce social desirability bias (20).

Freshness

Because of the randomness of recruitment, RIWI respondents tend to be unjaded, relatively 'fresh' with respect to participating in surveys. The GRIT Consumer Participation in Research Report (17) states that 7 out of 10 RIWI respondents had not answered a survey of any kind in at least one month. 'Fresh' responders have been shown to provide more reliable replies to surveys than habitual responders (21,22).

Reproducibility Of Results

To check test retest reliability, RIWI has conducted monthly repeats of the same questions in a well-populated country (India) over 21 months (23). Each time, 10.1±0.11% s.e. of (different) respondents endorsed the statement that persons who suffer from mental illness are more violent than others, indicating strong reproducibility of response in the population. The RIWI method can thus be used repeatedly to monitor changes in attitude or opinion. The same individuals will not answer (so there will be no 'practice effect') but, the sample size being large, comparable groups of individuals will respond on each occasion.

Large Sample Size

The large sample sizes that can be obtained through the use of this method ensure the statistical power required to obtain significant results for questions posed in a brief survey. In a study for the World Bank, over 16,000 complete responses were captured in a month using RDIT™ methodology, and as many as 60,000 responses to individual questions in 14 countries (24).

Limitations

RIWI surveys are cross-sectional and cannot follow the same individuals over time. However, large samples of comparable individuals can be recruited and the survey repeated as often as needed. This enables longitudinal research.

All Web surveys, especially if no incentives are provided, tend to have large drop off rates, questionnaires being abandoned before completion. The 40% RIWI completion rate may sound low but there has been a lack of consensus on how best to calculate and report response rates on surveys, understandably, because dissemination methods vary. Surveys traditionally aim at a somewhat arbitrary 60% response rate, but what counts most is sample representativeness and response rates may not be as strongly associated with representativeness as was once believed (25). Because RIWI questions are very brief, however, there is relatively less risk for abandonment. Contrasting RIWI drop-off rates in different regions can, in fact, be useful because contrasts can be used to assess differential regional interest in specific topics at a snapshot in time, or over extended periods of time.

It is to be expected that a fairly large proportion of people exposed to RIWI questions will choose not to answer them, but this does not bias the survey results because of the large potential pool of responders and the random nature of the exposure.

All Web surveys select for respondents with Internet access. As time passes, Internet access will be available to more and more of the world's population and, as smartphone and tablet usage increases and the number of Web domains in each country increases, manual type-in errors on all browsers will become more likely, thus increasing the potential reach of RIWI surveys (18).

The method works best with very brief sets of questions so that lengthy mental health questionnaires are not used. This makes the method challenging for lengthy epidemiological surveys of the prevalence of mental health conditions that require well-validated gold standard instruments. Long RIWI surveys can, however, be modularized, or 'chunked up', as has been done in one Canadian study on social values that consisted of a 150-question survey instrument. The results showed good reproducibility of long-established norms (26)

Prior Uses of the RIWI Method

The RIWI method was first used to probe anti-vaccine sentiment during the 2009 HINI flu pandemic (27). The objectives of that study were to evaluate Canadian opinion on the safety of the H1N1 vaccine in real time and to investigate the possibility that public health communications over the Internet could counteract anti-vaccine sentiment. A random sample of 175,257 Canadian web users was asked about perceptions of the safety of the HINI vaccine. A total of 27,382 unique online participants answered the survey. Of the respondents, 23.4% considered the vaccine safe, 41.4% thought it was unsafe and 35.2% were ambivalent. Many websites and blog posts during the course of the pandemic were found to be expressing intense anti-vaccine sentiment, which helped to explain the survey findings, and to suggest that appropriate public health messaging could in fact be used to counteract public mistrust and seeming suspicion of the medical establishment.

More recently, RIWI conducted a global survey of mental health stigma, probing attitudes toward persons suffering from mental illness (23). 596,712 respondents completed this survey over a period of 1.7 years. These were the key findings: Of 229 countries, daily contact with a person with mental illness was most prevalent in China. This was a surprise finding given the reported degree of stigma that attaches to mental illness in Asian countries (28). The ease of disclosure was undoubtedly facilitated by the anonymous nature of the survey and the finding can be interpreted to mean that, in China, persons with mental illness reside in the family home (hence daily contact) rather than in institutions or boarding homes. The fact that daily contact was true in China more than anywhere else in the world may also be due to the cohesiveness of family structure in China, to the pervasive shame of mental illness, and to a relative lack of treatment facilities.

In developing countries, 15% of respondents (twice as many as in developed countries) were of the opinion that individuals with mental illness were violence -prone. The developing/developed country difference in this form of stigma can be attributed to the fact that mental illness is often left untreated in developing countries because of poor access to mental health services and perhaps also to the available treatment being relatively ineffective. According to the World Health Organization, more than 75% of persons with serious mental illness in less-developed countries never receive treatment and for those who do, treatment effectiveness has not been evaluated (29). There is an established link between untreated or undertreated mental illnesses and violence (30), which helps to explain the findings.

While 45% to 51% of respondents from developed countries believed mental illness to be similar

in kind to physical illness, only 7% agreed that mental illness could be overcome. This was a large discrepancy, suggesting that biophysiological perspectives on mental illness do not necessarily lead to trust in the effectiveness of treatment.

The findings of this study and its methodology captured significant academic attention (31) because the quality and extent of stigma can be measured before and after a directed public health intervention and can, thus, evaluate the effectiveness of interventions.

Discussion

The RIWI method lends itself to health promotion because it can provide: a) quick accurate responses from very large, random, and widespread populations b) anonymous answers to questions that are sensitive in nature c) answers to brief, validated survey instruments. This method can probe regional differences and questions can be asked before and after public health interventions so that intervention efficacy can be measured. Repeating the survey can also test the duration of impact of a public health campaign. Furthermore, the participant abandonment rate can, in the proper context where, for example, an anti-stigma campaign is active, be a good measure of the resonance of the message of that campaign. The lower the percentage of respondents who fail to respond or complete, the higher the evident interest. This intensity measurement is more transparent and objective than sentiment analysis based, for instance, on the application of language algorithms to social media postings that need to be interpreted (16).

The rest of the discussion outlines mental health conditions to which the RIWI survey method can be applied. The examples were chosen by the authors to reflect public health need, requirement for anonymity, availability of appropriate validated survey instruments, presence of regional differences, and the possibility of using survey results to evaluate an intervention.

Posttraumatic Stress Syndrome

Prevention of posttraumatic stress syndrome (PTSD) is a particularly good example of a condition to which this kind of survey can be profitably applied because PTSD is a reaction to an event. It is an important syndrome to study because it inflicts substantial burden on individuals and on societies across the globe (32). PTSD symptoms can be monitored in a community in the aftermath of natural disasters, wars, or epidemics. Short, reliable and validated PTSD questionnaires appropriate for such surveys are available (33). Global surveys that address this condition are important because PTSD symptoms are expressed as culture-specific idioms of distress and specific treatments may prove to be more effective in one culture than in another (34,35). The natural course of PTSD – how long effects linger after trauma exposure – is best measured by repeat surveys. This has been done locally following the September 11, 2001 terrorist attack in New York City (36), but can now also be done in less well-resourced regions of the world.

Comorbidity of PTSD and substance abuse (37) is perhaps especially important to study because of its association with domestic abuse and violent crime (38). It is often this association that determines stigma, or the public's attitudes towards PTSD sufferers. Change in public attitudes can be monitored after a programmatic intervention as can, after a period of time has elapsed, the possibility of posttraumatic growth, positive psychological change in the aftermath of trauma (39), in some segments of the population.

Substance Abuse And Addiction

Substance abuse on its own brings associated problems that pose an increasing challenge throughout the world although the actual substances of abuse vary from region to region. Alcohol and opiate use is escalating in Europe, Africa and Asia, while amphetamine and cannabis use is rising in Asia, North America and Europe. Cocaine use is on the rise in North America and Europe, whereas khat is a problem in parts

of Africa and the Middle East, as are coca leaves in South America (40). The results of RIWI surveys can help to differentiate the effects of different substances on public perceptions of health and of safety (41).

Professional education is important as physicians who prescribe analgesics, hypnotics, anxiolytics, or stimulants can inadvertently contribute to the addiction problem. Medical prescription often starts people on the road to addiction. Surveying jurisdictions before and after continuing medical education campaigns can help to design more effective educational interventions.

There are forms of non-drug dependency (e.g., gambling, sex, shopping, hoarding) that are widely considered to be Western phenomena – their presence or relative absence in the developing world can be determined by surveys. Answers to such questions are important for global disease prevention and health maintenance.

Shame and Guilt Syndromes

Much psychopathology will be preventable when more is known about negative emotions such as shame and guilt (42,43). The RIWI method is ideal for this area of study because there are validated brief questionnaires that can differentiate between shame and guilt (44). Reliable global surveys are needed because there are well-recognized differences among countries and cultures with respect to these two emotions (45). It is thought that individuals from collectivist cultures react with shame when they judge themselves to have violated cultural expectations while individuals from individualistic cultures react with guilt. Shame is a reaction to what others think and say whereas guilt is a reaction to one's own conscience, to perceiving that one has violated an internalized moral or traditionally valued standard. Such distinctions are, in fact, controversial and need to be probed further.

New Events And Special Populations

The RIWI method can respond quickly to new events. For instance, because of events in Iraq and Syria, the world is currently on high alert to the effects inherent in large-scale migrations of refugees. RIWI surveys can elucidate the relationship between refugee status, trauma, shame, and guilt, and determine whether the emotional needs of migrants are addressed more effectively by specific resettlement strategies (46).

Particular segments of the population may require special focus. The elderly, for instance, are more vulnerable than other groups to some mental illnesses. The growth in the prevalence of dementia has been identified as a priority at a recent G-7 Dementia Research Meeting (47). Surveys can be conducted on priorities in elder care. The efficacy of risk reduction strategies can also be tracked.

Related to the prevalence of old age and dementia in the community is the issue of prevention of elder abuse. Though the victims may not have access to the Internet, questions pertaining to elder abuse can be asked of the general population who have observed acts of physical, emotional, sexual, and financial abuse directed toward the frail elderly. Here again, the effects of population educational campaigns and changes in the licensure of care providers can be assessed by repeat surveys.

Sensitive Issues

Survey respondents can be forthright about sensitive topics when the surveys are anonymous. As an example, a recent study found that heterosexual respondents were less likely to support equal access to employment, military service, adoption, and marriage for homosexual people in Web surveys (where they perceived themselves to be anonymous) than when being asked the same questions face-to-face (48).

Social desirability plays a large part in the accuracy of survey responses. The issue of induced abortion, for instance, is one that divides people across the world. Many consider taking a life to be an indefensible crime. Others believe abortion is a woman's choice since she is the one carrying the fetus. A question that has troubled even the staunchest abortion advocates is sex-dependent abortion, the preferential

killing in utero of female fetuses. Only an anonymous, entirely confidential survey can garner people's true opinions on such sensitive issues, and this is vital to the passage of public health legislation that reflects majority opinion.

Obesity

A good example of a condition for which many quasi solutions are implemented without prior evaluation is obesity (49-51). Some jurisdictions have introduced school lunches, some have invested in public health messaging, some have banned sugar-sweetened beverages, and some have mandated physical activity in schools. Most of these interventions enjoy limited empirical evidence of efficacy (52). The RIWI method was used to assess the self-reported efficacy of a new tax on soft drinks in Mexico. The data were first segmented by income group and other pertinent variables. The results indicated that Mexicans did not reduce the number of sugary drinks they consumed post tax introduction, nor did they support higher taxes as a way to reduce obesity (53). This is a good example of the usefulness of before and after opinion surveys.

Attention Deficit Hyperactivity Disorder

Attention deficit hyperactivity disorder (ADHD) is an example of a contested diagnosis, given to a child who is inattentive, impulsive, and overly active at home or at school. It has a worldwide prevalence of about 5% (54). The perception of impulsivity, activity and attentiveness remains, however, largely subjective and, for this reason, it is important to ascertain whether ADHD constitutes true pathology or whether it is better conceptualized as a social construct peculiar to Western cultures that place high premium on quiet classroom sitting (55-58).

Regional variations can help. While there is a global interest in attention deficit hyperactivity disorder (59), different geographic areas focus on different aspects of the disorder. Europe has been reported to be most interested in the association of ADHD with antisocial behavior, the US with the addictive potential of anti-ADHD drugs, East Asia with issues of self-esteem secondary to stigmatizing attitudes toward ADHD whereas Israel, Turkey, Australia and South America focus most on the academic sequelae of ADHD (60). There is a lack of studies from Africa. Pursuing regional differences will help to clarify the underlying pathology of ADHD and help to shape culture-specific interventions.

Concussion

Concussion associated with sports trauma, especially with respect to late effects, has become a major preoccupation (61). Significant information about contact sports injuries around the globe can be quickly probed and the effects of new equipment and new regulations and return-to-play policies monitored with the RIWI method. Concussions are said to occur on average 1.75 million times a year in North America (62). The Centers for Disease Control and Prevention in the US has declared that sport-related concussions are reaching epidemic levels and urgently require further research (63). There is significant concern about the potential long-term cognitive and behavioral consequences of concussion for young athletes and the burden of injury is said to disproportionately affect low and middle-income countries (64-66). These are important and provocative findings that, if confirmed, will make preventive measures possible.

Conclusion

The RIWI survey method is able to obtain simultaneous answers to brief focused questions on sensitive issues from very large numbers of random respondents. Comparable incentive-based surveys take longer to complete and may be less representative and more vulnerable to bias. Repeat surveys are needed to answer many important health questions and have, until now, been particularly difficult to conduct, especially in developing countries, because of cost and lack of available resources.

A recent paper predicts that the burden of mental health and substance-use disorders will increase

worldwide in the near future and that the greatest rise will be seen in low and middle-income countries because of rising life expectancy in those regions, population growth and under-resourced health care systems (67). An important goal of mental health promotion is to identify and address unmet needs for mental health care in these very countries. Critically needed are accurate identification, preventive measures, and assessment of the efficacy of interventions.

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