

Salma Mawfek Khaled (Orcid ID: 0000-0002-8844-3441)  
Ronald C Kessler (Orcid ID: 0000-0003-4831-2305)

## Title

Conducting a state-of-the-art mental health survey in a traditional setting: challenges and lessons from piloting the World Mental Health Survey in Qatar

## Authors

Salma M. Khaled, PhD, Associate Research Professor, Social and Economic Survey Research Institute, Qatar University, Doha, Qatar. Email: [skhaled@qu.edu.qa](mailto:skhaled@qu.edu.qa)

Catalina Petcu, MA, Research Assistant, Social and Economic Survey Research Institute, Qatar University, Doha, Qatar. Email: [cpetcu@qu.edu.qa](mailto:cpetcu@qu.edu.qa)

Lina Bader, BSc, Senior Research Assistant, SESRI, Qatar University, Doha, Qatar. Email: [lina.bader@qu.edu.qa](mailto:lina.bader@qu.edu.qa)

Iman Amro, MSc, Senior Research Assistant, Social and Economic Survey Research Institute, Qatar University, Doha, Qatar. Email: [iman.amro@qu.edu.qa](mailto:iman.amro@qu.edu.qa)

Marwa Al-Assi, BSc, Research Assistant, Social and Economic Survey Research Institute, Qatar University, Doha, Qatar. Email: [marwa.lassi@qu.edu.qa](mailto:marwa.lassi@qu.edu.qa)

Kien Le Trung, PhD, Associate Professor, Social and Economic Survey Research Institute, Qatar University, Doha, Qatar. Email: [kienle@qu.edu.qa](mailto:kienle@qu.edu.qa)

Zeina N. Mneimneh, PhD, Assistant Research Scientist, Director of the International Unit, Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, Michigan, USA. Email: [zeinam@umich.edu](mailto:zeinam@umich.edu)

Nancy A. Sampson, MSc, Project Directors, Department of Health Care Policy, Harvard Medical School, Boston, Massachusetts, USA. Email: [sampson@hcp.med.harvard.edu](mailto:sampson@hcp.med.harvard.edu)

Roland C. Kessler, PhD, Professor, McNeil Family Professor of Health Care Policy, Department of Health Care Policy, Harvard Medical School, Boston, Massachusetts, USA. Email: [kessler@hcp.med.harvard.edu](mailto:kessler@hcp.med.harvard.edu)

Peter W. Woodruff, MBBS., PhD., MRCP., FRCPsych., Professor of Psychiatry Weil Cornell Medical College in Qatar, Professor, University of Sheffield, UK. Email: [p.w.woodruff@sheffield.ac.uk](mailto:p.w.woodruff@sheffield.ac.uk)

**Corresponding author:** *Dr. Salma Mawfek Khaled, PhD, Associate Research Professor, Social and Economic Survey Research Institute, Qatar University, Doha, Qatar.*

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*Email: [skhaled@qu.edu.qa](mailto:skhaled@qu.edu.qa); P.O. Box: 2713, University Street, Doha Qatar; T+974 4403 5754 (direct), F+974 4403 3021.*

## **Abstract**

**Objectives:** A small country in the Arabian Peninsula, Qatar experienced rapid economic growth in the last three decades accompanied by major socio-demographic shifts towards a younger and more highly educated population. To date, no national epidemiological study has examined the prevalence, associated factors, or sequelae of mental disorders in Qatar's general population. **Methods:** The World Mental Health Qatar (WMHQ) is a national mental health needs assessment survey and is the first carried out in collaboration with the WMH Survey initiative to assess the prevalence and burden of psychiatric illnesses among the full Arabic speaking population (nationals and non-nationals) within the same country. **Results:** Standard translation and harmonization procedures were used to develop the WMHQ instrument. A survey quality control system with standard performance indicators was developed to ensure interviewer adherence to standard practices. A pilot study was then carried out just prior to the COVID-19 pandemic. Endorsement from public health authorities and sequential revision of the interview schedule led to full survey completion (as opposed to partial completion) and good overall response rate. **Conclusions:** The WMHQ survey will provide timely and actionable information based on quality enhancement procedures put in place during the development and piloting of the study.

## **Keywords**

WHO CIDI-5, Psychiatric Epidemiology, Arab, Qatar, Mental Health Survey

## Introduction

Mental disorders are a leading health concern globally (Vigo et al., 2016; Whiteford et al., 2016; Scott et al., 2018; Rehm & Shield, 2019) and of increasing interest within the Arab world (Karam & Itani, 2015; El Rassi et al., 2018; Maalouf et al., 2019; Zeinoun et al., 2020). Disability-adjusted life years (DALYs) attributable to mental disorders in Arab countries have been reported to be higher than the global average ( Mokdad et al., 2016; Charara et al., 2017; Maalouf et al., 2019). The Global Burden of Disease study estimates that mental and substance misuse disorders account for a higher proportion of global YLDs (years lived with disability) in Qatar (36.7%) than any other country (21% median, 15.4-36.7% range) (Vos et al., 2015). However, this estimate is a projection based on a simulation across many countries and have been criticized for yielding inaccurate estimates for individual countries (Vigo et al., 2016). Actual needs assessment survey data collected in the country are necessary to determine the true burden of mental disorders. To date, no national epidemiological study of this sort has been carried out in Qatar.

Qatar is a small country in the Arabian Peninsula that has witnessed a rapid pace of urbanization, modernization, and economic growth in the last three decades accompanied by major shifts in its socio-demographic profile towards a younger and more highly educated population. These demographic shifts include changes in birth rate and migration. From the beginning of 2000, newborns of foreign nationals increased in parallel with the growing population of foreign residents. Around 90% of Qatar's current population consists of expatriates. Two-thirds of newborns in the country are non-Qatari

(De Bel-Air, 2018). The need for high quality epidemiological baseline data has been recognized as necessary for purposes of benchmarking, planning, implementation, and evaluation of a national policy for providing the necessary community-based mental health programs detailed in Qatar's National Mental Health Strategy (Supreme Council of Health, 2013).

Methodology for doing this has been established by the World Health Organization (WHO) World Mental Health (WMH) Survey initiative. The methodology relies on the Composite International Diagnostic Interview [CIDI], a highly structured diagnostic interview, typically administered by trained lay interviewers (WHO, 1990; Kessler & Üstün, 2004). The CIDI has been shown to have good reliability and validity for estimating prevalence of common mental disorders across cultures (Robins, 1988; Wittchen, 1994; Peters & Andrews, 1995; Andrews & Peters, 1998; Haro et al., 2006, Kessler et al., 2020). To date, WMH surveys have been implemented in over 30 countries worldwide, building the necessary infrastructure to collect comprehensive comparative data in countries around the world, several of which are in the Arab world, including Lebanon, Iraq, and Saudi Arabia (Shahab et al., 2017; Aradati et al., 2019; Karam et al. 2019; Al-Habeeb et al., 2020; Altwaijri et al., 2020; Harris et al., 2020; [hcp.med.harvard.edu](http://hcp.med.harvard.edu), n.d.).

Qatar's national mental health study, the World Mental Health Qatar (WMHQ) is carried out by the Social and Economic Survey Research Institute (SESRI) at Qatar University in collaboration with strategic local stakeholders that include the Ministry of Public Health

and Hamad Medical Corporation. Technical support is being provided by the WMH Data Collection Coordination Center at the Institute for Social Research, University of Michigan, and the WMH Data Analysis Coordination Center at Harvard Medical School. The diagnostic interview in the WMHQ is based on the most recent international version of the CIDI, CIDI 5.0 Version 3.3, which comprises assessment of mental disorders using the definitions and criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition or DSM-5 (American Psychiatric Association, 2013).

The WMHQ study will be based on a representative sample of  $n=5,000$  Arabs, including both Qataris and non-Qataris, living in Qatar. The inclusion of non-Qataris is important because other Arab WMH surveys were either carried out in war-afflicted countries (Iraq and Lebanon) or focused solely on nationals (Saudi Arabia). Inclusion of non-nationals, which make up a large proportion of the population in many Arabic countries (e.g., about one-third of the populations of Lebanon and Saudi Arabia and 90% of the Qatari population) is essential to ensure complete coverage of the mental health care delivery needs within the country. Furthermore, the WMHQ fills in an important need for reliable, valid, and culturally appropriate assessment tools for DSM-5 disorders (Mokdad et al., 2016). Lastly, the study aims to support research training opportunities for investigators from the Arab region, which remain substantially underrepresented in the mental health research arena to date (Zeinoun et al., 2020).

This paper describes the original methodology of the WMHQ face-to-face pilot study conducted just prior to the COVID-19 pandemic. We also describe the survey processes

used in adapting, translating, testing, administering, and monitoring data quality in the context of the rapidly developing urban yet traditional setting of Qatar.

## **Methods**

### **Sample Design**

The state of Qatar is divided into eight administrative municipalities. The municipalities are further subdivided into 98 zones, which are in turn subdivided into districts and blocks. A sampling frame of all housing units in Qatar was used to draw a representative sample of Qatari nationals (Qataris) and Arab expatriates (non-Qataris), who were 18 years or older and lived in residential housing units in Qatar during the survey reference period. The sampling frame was developed by SESRI with the assistance from Qatar General Electricity and Water Corporation (Diop et al., 2017). In this frame, all housing units in Qatar were listed with information about the housing address and information to identify if residents in the housing units are Qataris (non-migrants) or non-Qataris (migrants).

To assure representation of all municipalities, stratified sampling was used whereby each municipality was treated as one stratum. Inside each municipality, housing units in the zones, subdivisions of municipalities, were ordered by geographic location to permit well distributed sampling of housing units from different areas or blocks. A systematic probability sample with probabilities of selection proportionate to size was constructed for Arab households (Qataris and non-Qataris). Inside each selected household, one

eligible adult was randomly selected using a computerized within-household selection method appropriate to Middle East culture (Le-Trung et al., 2013)

The collected data were weighted to account for variation in within-household probabilities of selection based on household size, non-response, and post-stratification calibration to known population targets to help reduce residual effects of non-response and under-coverage of the sampling frame. Our weighting variable ranged from 441 to 13279 with a variance of 1360 and mean of 1744.

Non-response propensity score weighting at the household level was applied to adjust the within-household inverse probability of selection to account for non-response by municipality and pre-specified gender sampling information (Trung Le et al., 2014), using the following formula:

$$W^{person} = \alpha W_{base}^{person}$$

where  $\alpha$ , the adjustment factor for non-response, was based on the propensity that a sampled unit was likely to respond to the survey (Ridgeway et al., 2015).

Post-stratification was then carried out with these weighted data using a raking method to align survey distributions with known population characteristics for age, gender, nationality (Qatari/non-Qatari), and marital status obtained from Census bureau (Ministry of Development Planning and Statistics, 2015).

## Response Rates

The final status of sampled households and two corresponding response rates (RR1 and RR2) were calculated using standards set by the American Association for Public Opinion Research (AAPOR, 2015). First, RR1 which is the ratio of the number of completed interviews to the total sample size after excluding those who were ineligible:

$RR1 = \frac{C}{C+E+UE}$  where C is the number of completes, E is the number of eligible

responses, and UE is the number of unknown eligibility. Second,  $RR2 = \frac{C}{C+E+eUE}$  which

adjusts the denominator after estimating the proportion of eligible participants from those of unknown eligibility where e is the estimated proportion of eligibilities given by  $e =$

$\frac{C+E}{C+E+IE}$  where IE is the number of ineligible.

## Instrument Translation and Adaptation

Arabic is a polyglossic language with dialects that differ across regions of the Arab world. As our target population consisted of Qatari and non-Qatari Arabs, the language of the instrument had to be understood by all Arabic speaking respondents alike. The conceptual equivalence of the Arabic CIDI has already been established in prior WMH surveys conducted in Arabic-speaking countries like Lebanon (Karam et al. 2006), Iraq, (Alhasnawi et al. 2009), and the latest in Saudi Arabia (Altwajjri et al., 2020). But to further ensure conceptual equivalence in our Arabic version of the CIDI 5.0, which was translated from English to a standard modern conversational form of Arabic, we used the process of translation and adaptation of instruments as outlined by the WHO guidelines



(WHO, n.d) and the TRAPD method of translation, review, adjudication, pretesting and documentation model (Kessler et al., 2008).

### *Forward-Back Translation*

The first team in charge of the forward-translation from English to Arabic consisted of five bilingual team members who are from different Arabic-speaking countries (Iraq/Kuwait, Syria, Palestine, Sudan, and Morocco) and different disciplines (Public Health, Anthropology, Linguistics, and Social Sciences). Different members of the translation team independently translated different assigned modules. The team met every week for 4 to 5 hours over three months to review and discuss the translation of each new module and reach consensus where there was any disagreement on terminology or phrasing of certain questions.

We relied on extensive back-translation process to assess conceptual equivalence to the original English version of the CIDI 5.0. The back-translation stage from Arabic to English lasted approximately two months and was conducted in parallel (as newly translated Arabic modules became available) by a second team of two other bilingual researchers who had not seen the original English version of the CIDI 5.0. The back-translation team lead by a senior researcher resolved any inconsistency in the back-translated English versions and produced a single unified back-translated English version.

In the last consolidation stage, the two leads from the two teams met and reviewed the entire Arabic and English versions of the instrument. For the most part, minor

discrepancies in translation arose and were resolved by consensus among the leads of the bilingual teams. There were only two instances where the leads resorted to the larger translation team for advice in reaching agreement on unresolved issues.

#### *Cultural Adaptation & Pre-testing*

We also used findings from the cognitive interviews conducted by the Saudi National Mental Health survey to make cultural adaptations to sensitive questions in the survey (Shahab et al., 2019). Qatar and Saudi Arabia– both Arab states that are part of the Gulf Cooperation Council - share the same traditional conservative Islamic culture and their people would have similar sensitivity concerns and misunderstandings of certain concepts. Furthermore, the pre-testing stage entailed this relatively large pilot study during which detailed feedback about our version of the instrument was received from the interviewers who administered the instrument in face-to-face interviews leading to subsequent modification to certain problematic (comprehension) or potentially insensitive or offensive wordings

#### **Instrument Programming and Administration**

A team of programmers from SESRI and the Harvard-Michigan WMH coordinating centers programmed the questionnaire in Blaise 5.2 (Blaise, 2017). Trained interviewers used Computer-assisted personal interviewing (CAPI) to administer the instrument during face-to-face interviews conducted in households of Arabic speaking residents and nationals of Qatar. These respondents were recruited from January 2020 through February 2020.

In order to customize our version of the questionnaire to Qatar's context, we adapted culturally sensitive questions, entire optional sections, and added non-CIDI sections using a CAPI modularization program. The final survey instrument consisted of 25 sections including 20 sections from the CIDI 5.0. For more details about the content of the WMHQ survey, please refer to Table 1.

In addition to the CAPI mode, SESRI IT team used the audio computer-assisted self-interviewing (ACASI) Blaise feature to program an ACASI version for two modules of CIDI 5.0 that were particularly sensitive in the cultural context of Qatar: the Self Harm and Tobacco, Alcohol and Drugs modules.

ACASI enabled respondents to listen to the questions through headphones and to enter responses using a touch-screen. The questions of the sensitive CIDI modules were presented as recorded audio voice-overs. As mispronunciation and unfamiliar accents could influence the participants' responses, two recorders (one female and one male) fluent in the Arabic language clearly enunciated the questions without any heavy accent to ensure the audios were understandable to the study population.

### **Study-related Training**

#### *Train-the-Trainer sessions*

The study team, including the principal investigator of the study, three research assistants, field operation team, and two experienced interviewers, attended two days of webinar-based training on the administration of the CIDI 5.0 instrument conducted by the

CIDI training center at University of Michigan Institute for Social Research. Participants were provided with password-protected access to online training modules for the CIDI and were required to participate in live interaction webinars. Upon completion of the CIDI training, participants received their certificates, which enabled them to train the local field interviewers.

#### *Field Interviewers Selection and Training Process*

Initially, 31 field interviewers were nominated for training based on their extensive experience and performance in previous surveys conducted by SESRI. Upon further screening, 29 interviewers (20 females and 9 males) were invited to attend the WMH survey-training workshop.

Culturally, it is more acceptable for female interviewers to visit households and interview male respondents. As such, more females were trained than males.

Prior to the workshop, potential interviewers received the study material, which included a hard copy of the questionnaire, the training slides, and the respondent package, as presented in details in Appendix A.

The training workshop spanned over five days, starting at 8 am and finishing at 4 pm.

The training was conducted at SESRI's headquarters at Qatar University. Specific topics covered during the training and other training-related details are summarized in Figure 1.

Role-playing using scripted interviews prepared in advance were used in the last three days of the training. By the end of the training course, each interviewer completed at least three scripted interviews.

Out of the 29 interviewers, 27 passed the evaluation and successfully completed the study training. The evaluation was based on performance during the training, which included assessment for IT skills and degree of understanding of the CIDI administration (question reading and probing techniques) and rounding rules.

## **Field Operation**

### *Team structure*

The final survey fielding team consisted of 27 interviewers (20 females plus 7 males), 8 head of groups (HoGs), and 4 supervisors. Each interviewing group consisted of two female interviewers and one male HoG except for male interviewers who worked alone i.e. one male interviewer only. The main role of HoGs is to transport and accompany each pair of female interviewers to their respective sampled households for conducting the interviews. Two out of the four supervisors directly oversaw the male interviewers, while the two remaining supervisors oversaw female interviewers and their HoGs.

### *Sample Allocation*

As the sampled households were spread geographically all over Qatar and across zones; the supervisors were responsible for allocating to each male interviewer or HoG a detailed list of sampled households, their location, and a timeline for completing these potential interviews within each zone. Each HoG then allocated a specific number of sampled households within the same zone to each group of interviewers based on sample location, which was often close to the interviewers' home locations, starting with sampled households that are closest to each other.

### *Fielding Operations Team Roles*

As described earlier, the HoG role fulfilled the cultural expectations of a male chaperone of female interviewers and ensured their safety in case of altercations or other issues upon reaching or contacting the sampled households for the first time i.e. without arranging appointments a head of household visit.

Upon reaching the first destination, the HoG and the first female interviewer would contact the sampled household. If the contact was successfully established, the HOG would proceed along with the second female interviewer to the next sampled household, while the first female interviewer would conduct the interview with the selected respondent in the first household. At the end of each working day in the field, the HoGs and interviewers would complete a detailed report about the status of the sampled households that were visited. This reporting to the supervisor was done on daily basis.

In turn, supervisors monitored fielding progress in terms of achieving target completed interviews by teams and ensured smooth survey fielding experience for participants and survey fielding team alike. In particular, supervisors monitored and evaluated interviewers as they collected data to ensure data integrity by conducting face-to-face verification of visited households and by conducting random checks to verify adherence to fielding protocol and practices including wearing appropriate uniform and carrying valid ID, study permit, and consent forms.

Interviewers worked from 4 pm to 8 pm Sunday to Friday, but also worked to accommodate scheduled appointments with potential respondents. Interviewers were paid per working day rather than per completed interview, which has been shown previously to yield better data quality (Kessler & Üstün, 2004).

### *Fielding Procedures*

Field procedures and strategies utilized by interviewers in handling most scenarios commonly encountered in the field are shown in Figure 2.

### *Safety Protocol*

As part of the study's safety procedures, interviewers provided all participants with contact sheets that included information about: 1) the Mental Health Service hotline; 2) the emergency department contact number; and 3) contact details for local primary healthcare centers.

### *Quality Control Indicators*

We aimed to ensure that the interviewers' performance adhered to preset quality criteria. To this end, SESRI IT team, in collaboration with University of Michigan, developed and implemented a Quality Control (QC) system to monitor interviewer activity in the field.

### *CIDI-Specific Quality Metrics*

The QC indicator database, with visualizations of flagged activities based on preset criteria in a workbook called Power BI (Powerbi, n.d.), served as a primary source in the

investigation of data quality in relation to the CIDI. Values of flags were updated once per day, at 23:00 (UTC +3). SESRI QC monitoring team investigated daily output (tables and charts) from the QC system and reported to the principal investigator and the Field Operations manager the issues found. The Field Operations team compared the results with their field reports and reported back to the principal investigator and research team. These indicators included the following flags: low response rate; too many completed interviews per day; short question field time; short interview length; low prevalence rate; and long interview pause. For more information on these indicators, please see Appendix B.

#### *Verification Indicators & Random Visits*

In addition to the QC indicators with flags, performance indicators were also calculated and monitored regularly. Furthermore, a random sample of interviews were selected for face-to-face or phone verification.

Phone verification was conducted by interviewers from the computer-assisted telephone interviewing (CATI) lab at SESRI. Two demographic questions and three general health variables (height, weight, and presence of one or more life-threatening or seriously impairing chronic physical health problem) were re-asked during the phone verification, as the mental health variables were considered too sensitive to verify over the phone.

We also developed and monitored indicator for discrepancy between the frame (expected) location and the actual location of interviews or geolocation. Two methods



allowed the interviewers to capture their geolocations: mobile application developed for the purpose of capturing interviewers' visit points and the CAPI system installed on their laptops. Field Operations Manager reviewed discrepancies daily and discrepancy representing a distance of greater than 30 meters was flagged for verification.

Supervisors also conducted in-person random visits of interviewers in the field and evaluated the status of each visit as good, warning, or suspended from field based on preset scored criteria (such as adherence to consenting protocol, carrying an identifying badge, and physical appearance).

## **Results**

### *Sample Distribution & Response Rates*

The total pilot sample consisted of  $n = 1,076$  households selected proportional to size of municipalities in Qatar. Response rates ranged from 41.2 to 54.9% across municipalities based on 395 completed survey interviews (see Table 2).

The overall response rates and final status of sampled households in the survey are shown in Table 3. RR1 and RR2 were 46.1% and 56.9%, respectively. Eligible households that did not complete the interview included housing units of Arab residents who refused to participate in the study. Approximately, 3.5% of the total sample refused to participate in the study. Ineligible households included mostly non-Arab households, as well as housing units under maintenance, vacant housing units, and non-residential buildings. Households with no one at residence (closed) or falling under the sample error sub-category were also not eligible for the survey. Households with unknown eligibility

included housing units that were initially contacted but without success in reaching the participant even after three attempts or where a contact was faced with obstructive or uncooperative household keepers (servants, drivers, and security personnel) so eligibility status of potential participants could not be determined.

### *Sample Characteristics*

Weighted descriptive statistics of the overall sample of respondents who completed the interview are presented in Table 4. The mean age was 37.6 years ( $SD=12.1$ ). Overall, three-quarters of respondents were married and 39.7% reported receiving an undergraduate degree. Approximately, 51.4% of respondents were male and 48.6% were female, which is representative of Qatari population (Planning and Statistics Authority, 2018). Also as observed in our sample, but not officially made available by Qatar's Planning and Statistics Authority, Qataris are minority in the population of Qatar (Winckler, 2015). Most of the respondents in our sample (82.0%) were non-Qataris (Snoj, 2019), while 18.0% of respondents were Qataris, with almost equal gender distribution in both groups. As the census bureau in Qatar (*Qatar Census*, n.d.) does not publish a lot of official demographic data by nationality (Qataris versus non-Qataris) or ethnicity (Arab versus non-Arab), it was not possible to directly compare the distribution of our sample broken down by these variables with official population distributions.

### *Performance Metrics*

On average 66 contacts attempts were made per day. These contact attempts lead to an average of 66 completed interviews per day, with a mean of one completed interview per interviewer. The average length of time per interview was 97 minutes.

#### *Verification Indicators & Random Visits*

Out of the total 1076 households that were visited, 129 visited households were randomly selected for one of the following types of verification: 61 households selected for face-to-face verification and 68 for phone verification.

For face-to-face verification, 85% of the selected cases were completely verified, and 15% showed some inconsistent information related to the household visit or address.

Approximately, 80% of all calls were verified either partially (some of the questions, but not all) or fully, while only 2% of all calls failed verification.

Approximately, 14% of the completed cases showed discrepancy in location (meaning that the interviewer did not capture a valid location within the expected household frame of 30m) and an additional 8.6% had no information on the actual geolocation points. All 173 random visits were reported as “good” during the fielding of this pilot, verifying good adherence to field practice by all interviewers.

#### **Discussion**

This paper highlighted the methodology used in adapting, translating, testing, training, administering, and monitoring data quality of the CIDI 5.0 for the WMHQ pilot, which

was based on a large and representative sample of Qatar's population prior to the COVID-19 pandemic. The overall response rates based on our pilot study ranged between 46.1% and 56.9%, which is comparable to 60.0% obtained in Saudi National Mental Health Survey (Mneimneh et al., 2020), but on the lower end, for other WMH surveys where a response rate as low as 45.9% was reported in France and as high as 97.2% reported in Colombia – Medellín (Hcp.Med.Harvard.Eu. n.d.). However, most of these surveys were conducted in the early 2000s and response rates for all surveys have been on the decline worldwide (Leeper, 2019). Our pilot response rates are still considered relatively high compared to typical response rates (20% - 30%) for face-to-face surveys in developed countries like Germany and the US (Massey & Tourangeau, 2013; Wittwer & Hubrich, 2015; Schröder, 2016).

We summarize below some of the main methodological challenges and lessons learned during the course of the pilot.

### ***Instrument Challenges***

#### *Translation*

To facilitate agreement on terminology and the type of Arabic language used in the initial stages of the forward-translation process, all team members translated the same first four modules and met in person several times over three-to-four weeks to discuss and agree on consistent terminology to use throughout the survey. This initial step in the forward-translation stage in addition to regular weekly meetings to review as a group all translated modules by the different team members was important to ensure that the final Arabic

translated instrument was consistent and less susceptible to idiosyncratic and dialectical influences by different members of the forward-translation team. The whole process was extremely time consuming and required a lot of resources. In our study, two independent teams undertook forward- and back- translations of the instrument. The entire process including the final consolidation stage took approximately 6 months to complete.

### *Instrument Length*

The average length of completed interviews was approximately 97 minutes. The shortest interview was 43 minutes, while the longest interview was 277 minutes. Although the length of the CIDI interview was expected to be the main challenge of the study, we were surprised that it was not the main issue for recruitment purposes as “hard” refusals accounted for only 3.5% of the total sample. Interviewers were often able to circumvent concerns about length by explaining well the importance of the study to potential participants. In this regard, we learned that having an informative study brochure and an endorsement letter by a figurehead from public health authorities as part of the distributed study package were crucially important in gaining cooperation from the head of the visited households. As we had a relatively low proportion of partially completed interviews (3.7%), we learned that it was very important for interviewers to show flexibility. Here, it was important to allow respondents to take multiple breaks, including time for prayer and to attend to their family's needs.

### *Sensitivity of Survey Questions*

Some of the CIDI questions were sensitive in a way that may make respondents inclined to refuse to answer them or respond to them in socially desirable manner in line with conservative Qatari/Arab culture. For example, suicide attempts, drinking alcohol, using drugs, and sexual harassment/rape are taboo topics in this region of the world. We found that the process of adaption of the questionnaire was very important in our context.

Particularly, it was very important to phrase questions in a culturally acceptable way, such as using terms like “putting an end to your life” as opposed to “kill yourself” for suicidality and “prohibited substances” instead of “drugs”. As ACASI is better method for collecting information about culturally sensitive behaviors and thoughts than face-to-face interviews (Brown et al., 2013), we used ACASI for sensitive survey modules including suicidality and Tobacco, Alcohol & Drugs (99% of completed interviews used ACASI for these sections), which ensured that we did not have unusually high item-refusal or missing rates for sensitive questions or offend respondents and risk losing interviews that would otherwise be complete.

Similar challenges related to the adaptation of the questionnaire to the cultural context and instrument validation were found in a population-based mental health survey among Lebanese adolescents (Ghandour et al., 2018). Furthermore, the translation process, sensitive questions and interview length were presented as challenging in another WMH survey conducted in Saudi Arabia (Shahab et al. 2017).

### ***Programming and Debugging Challenges***

The length of the instrument also presented the team with challenges related to programming and testing. Adequate resources in terms of staff and time were necessary for implementation and verification of changes to the instrument. The programmed Arabic version of the questionnaire was subjected to countless changes. In this regard, we learnt that the translated version of the questionnaire would require multiple rounds of thorough examination for grammar and spelling before submitting it to the programmers. This strategy of thorough debugging ensured that fewer textual changes were reported upon testing. Similarly, the ACASI version was subjected to multiple changes and multiple rounds of recording. An effective method to minimize the changes implemented in Blaise was to record each question separately, so when changes occurred, only a particular question recording was revised.

### ***Training Challenges***

An important challenge that was pronounced in the CIDI 5.0 was training the interviewers on a dynamic survey text due to the large number of dynamic fills in the instrument. The customized question wording that changed depending on responses to previous questions often presented challenges for training interviewers. This meant that all possible versions of every dynamic fill question had to be presented and variations were explained, which made practicing and mastering survey questions harder for interviewers and trainers alike. In this regard, we learned that role-playing with scripted interviews was very helpful not only in familiarizing the interviewers with the entire CIDI, but in also allowing the interviewers to practice with different variations of the text.

Additionally, IT literacy skills for some of our interviewers were basic. This necessitated devoting time and resources for IT-related training because of the high-tech requirement for administering the CIDI 5.0 and some non-CIDI sections to ensure interview administration within a reasonable target time. Good IT literacy skills were also important for troubleshooting Blaise and for using apps that were developed for measuring performance and for quality monitoring purposes in the field. In general, we learned that hiring interviewers with good IT literacy from the start would mean less time needed for IT-related training and less problems in the field not only for administering the CIDI, but also for the fulfillment of the entire study protocol including quality requirements of the data.

### ***Field Challenges***

Debriefing sessions with interviewers revealed that it was specially challenging to persuade members of working families to complete these lengthy interviews during regular fielding working hours - from 4 pm to 8 pm, Sunday to Thursday. Often, interviewers approached households whose members have just returned home from work, who may be taking a nap or taking care of their children or preparing meals for tomorrow, or getting ready for the next workday. Often, working families preferred weekend appointments. Therefore, flexibility in scheduling appointments outside of fielding operations' working hours and on weekends was important to accommodate this segment of the population. One additional challenge faced by interviewers was late arrival for appointments - often due to unpredictably long interview beforehand, which



could lead to losing potential interviews. Because of these issues, productivity was largely impacted; most interviewers were only able to complete one interview per day.

Compared to other studies, we did not encounter difficulties in terms of household access, political instability, funding constraints (Ghandour et al., 2018), respondent attitudes and household location (Shahab et al., 2017).

### *Quality Control Challenges*

As several CIDI-specific flags were not showing accurate data during the pilot study, further examination and reconstruction of computations were carried out during and after the pilot. This was expected since the pilot was used to test the QC system. As such, we also monitored raw data from the interviewers' laptops, to allow for precise reporting of interviewer performance to the Field Operations Team. Moreover, as the verification indicators were not finalized in the Power BI workbook, SESRI IT team worked after the pilot to generate the remaining indicator tables and to add new flags based on the pilot experience.

From the verification process of the pilot, we have learnt that it is essential to develop a good system of logging and documenting all the investigations and actions taken by supervisors. Moreover, it was important to have clear definitions of operational and verification features as this would simplify the reporting process and aid in the development of new strategies for the main survey production phase.

The pilot study also revealed that interviewers had trouble in capturing the visit location on the mobile application and the Blaise system installed on their laptops. In fact, several interviewers failed altogether to log in their locations in both Blaise and mobile app leading to no geolocation flags. After investigation, no technical issues were found in the mobile application, nor in Blaise. On the other hand, after investigating another location-related flag called “discrepant location”, most of the cases showed technical issues (e.g. difficulty to capture the location inside the household or in certain areas of the city, GPS satellite error, connectivity due to poor weather). Some of the investigated cases suggested that interviewers added the location after the actual household visits.

Altogether, these results showed that more training focusing on technological aspects of fielding is required for future training sessions in preparation for main survey production phase.

### **Current & Future Directions**

At the time of writing (May 2021), the main survey production is well underway after extensive COVID-related modification to the WMHQ survey methodology. We are also planning to conduct a follow-up study to estimate incidence of main CIDI-5 diagnoses in relation to COVID-related variables.

### **Conclusions**

In the past year since the start of the study, many challenges were faced in preparation for, leading to, and during the course of conducting the WMHQ survey pilot, which was successfully completed just before the start of the COVID-19 pandemic outbreak in this

part of the world. At the time of writing this paper, the peak of Qatar's outbreak is not yet over. Uncertainty about the outcome of this pandemic raises doubt on the feasibility of conducting face-to-face household-based community surveys in the immediate future. Despite this uncertainty, there were many valuable lessons learned in the course of this pilot that can prepare researchers planning for future mental health field surveys and in adapting the design to address the new challenges of carrying out the survey during the pandemic.

Of the main lessons learnt, there are three worthy of special consideration: first, the need to adapt questions to the local cultural context; second, having adequate technological infrastructure and IT literate personnel to conduct state-of-the-art large-scale mental health research in the community; and, third, the importance of fostering international collaborations that facilitate transfer of methodological advances in mental health research to local contexts and allow comparability of high quality data across countries globally.

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#### CONFLICT OF INTEREST

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#### DATA AVAILABILITY STATEMENT

Data are available from corresponding author upon reasonable request

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Table 1: CIDI and Non-CIDI Modules used in Qatar’s WMH Study Pilot

<b>Module Name</b>
Respondent Contact
Your Background
Your Health
MoCA – Montreal Cognitive Assessment*
Depression
Persistent Depression
High Mood
Worry And Anxiety
Anger Attacks
Panic Attacks
Social Anxiety
Stressful Experiences
Self-Harm
Tobacco, Alcohol, And Drugs
Unusual Experiences
Treatment Of Emotional Problems
Employment
Finances
Personal Relationships
Social Networks
Childhood Experiences
Schizotypal Personality Questionnaire*
Family history of psychological, emotional or behavioral problems*
Resilience*

\*Non-CIDI modules.

Table 2. Distribution of Total Pilot Sample and Response Rate by Municipality

Municipality	Number of Sampled Units	Percentage of Total Sample (%)	Response Rate (%)
Ad Dawhah	437	40.6	43.8
Al Rayyan	399	37.0	51.1
Al Wakrah	77	7.2	54.9
Umm Salal	62	5.8	43.5
Other	101	9.4	41.2

Note: Small municipalities were grouped into “Other” including Al Shamal, Al Khor, Al-Shahaniya, and Al Daayen.

Table 3: Final Interview Status of Sampled households and Response Rates

<i>Interview Status</i>	<i>Households Frequency</i>
Total Sample	1076
Completed	349
Not completed	727
Eligible household <sup>1</sup>	73
Ineligible household <sup>2</sup>	319
Unknown eligibility <sup>3</sup>	335
Response rate ( <i>RR1</i> ) <sup>4</sup>	46.1
Response rate ( <i>RR2</i> ) <sup>5</sup>	56.9+

Note: Response rates (RR1 and RR2) were calculated using standardized coding and interpretation procedure for different dialing outcomes as set by the American Association for Public Opinion Research (AAPOR, 2015).<sup>1</sup>Eligible households that did not complete the interview included housing units of Arab residents who refused to participate in the study and those who agreed to an appointment, but the appointment was not fulfilled upon follow-up. <sup>2</sup>Ineligible households included mostly non-Arab households, as well as housing units under maintenance, vacant housing units, and non-residential buildings. Households with no one at residence (closed) or falling under sample error sub-category were also not eligible for the survey. <sup>3</sup>Households with unknown eligibility included housing units that were initially contacted but without success in reaching the participant even after three attempts or where a contact was faced with obstructive or uncooperative household keepers (servants, drivers, and security personnel) so eligibility status of potential participants could not be determined. <sup>4</sup>RR1 is the ratio of the number of completed interviews to the total sample size after excluding those who were ineligible:  $RR1 = C / (C + E + UE)$  where C is the number of completes, E is the number of eligible responses, and UE is the number of unknown eligibility. <sup>5</sup>RR2= $C / (C + E + eUE)$  adjusts the denominator after estimating the proportion of eligible participants from those of unknown eligibility where e is the estimated proportion of eligibilities given by  $e = (C + E) / (C + E + IE)$  where IE is the number of ineligibles.



Table 4: Characteristics of Final Sample of Respondents who Completed CIDI Interview.

	Frequency (n)	(%)*	%
Gender			
Male	162	51.4	46.0
Female	187	48.6	54.0
Nationality			
Qatari	63	29.0	18.0
Non- Qatari	286	71.0	82.0
Marital status			
Married	286	74.9	82.0
Divorced /Separated	12	2.5	3.0
/Widowed	6	1.7	2.0
Never married	44	20.8	13.0
Education level			
None	7	2.9	2.0
Primary school			
(1- 6th grade)	31	12.3	9.0
Secondary school			
(6 - 12th grade)	71	20.6	20.0
Post-Secondary school			
/ diploma	45	15.2	13.0
Undergraduate degree	158	39.7	46.0
Graduate (MA/PhD)	34	9.2	10.0

\*Percentages based on weighted proportions

## Appendix A

### Study Materials for Training of Interviewers

The study package was designed to train interviewers in a standardized manner by establishing guidelines and norms for all interviewers to follow. The study package was provided in the Arabic language and it contained the following documents:

*Training slides.* In October 2019, SESRI team was trained by the Michigan team. The PowerPoint slides used during the webinar session were translated and adapted for SESRI interviewer training. The slides included standardized interviewing and general interviewing techniques (reading questions, clarification and probing, feedback to respondent, recording data), CIDI diagnostic questions, Blaise presentation and navigation, and interviewer responsibilities.

*Questionnaire.* The Arabic questionnaire prepared for the training included CIDI and non-CIDI sections. It was adapted for the training by removing the programmer's instructions.

*WMH Brochure.* The purpose of the brochure is to concisely present the study in a visually appealing manner. It contains information regarding the main principal investigators, collaborators, alignment with Qatar National Vision 2030, target population, outcome of the study (comprehensive descriptive data on the prevalence of mental disorders), objectives (improve mental health services in Qatar, educate the community, create awareness and reduce stigma) and contact information.

*Consent form.* The interviewers are familiar with the procedure of obtaining consent from the respondent before conducting the interview. The consent form is integrated in the interviewers' study material as it provides detailed information on the ethical considerations of the research. The consent form includes the title, purpose and nature of the study, key investigators, sponsor, introduction of the interviewer, the duration of the interview, clear explanation of the possible risks, harms and benefits to the respondent, voluntary participation in the study, withdrawal policy, description of any devices to be used, disposition and storage of data and its future use, confidentiality statements, contact information of researcher.

*Letter of support.* Aiming at increasing the response rate and gaining credibility in a society where mental health issues are still considered taboos, the letter of support endorses the importance of this research on a regional and global level. Having Sheikh Dr. Mohammed Bin Hamad Bin J. Al-Thani as an advocate of the mental health study maximizes the opportunities of creating awareness at both public and decision-making levels. Dr. Mohammed Bin Hamad Bin J. Al-Thani is the Director of Public Health Department at the Ministry of Public Health in the State of Qatar. Dr. Al-Thani has led the development of Qatar's first Preventive Health Strategy and headed a number of national committees including chairing the National Preventive Health Committee.

*Respondent booklet.* It was designed to assist in answering complex questions and in dating symptom onset and recency (Wittchen et al, 2001). It serves as a visual recall aid, multiple

questions in the CIDI being addressed by directing the respondent to a specific page in the respondent booklet. The booklet has been translated to Arabic and adapted to the local context with prior permission from Harvard University. Changes included developing new categories for capturing assets (the assets were categorized in monthly income in Qatari Riyals), a list of prescribed medications common in Qatar, a new list of stressful experiences and a list of response choices for the MoCA section.

## Appendix B

### Indicators Developed in Power BI by University of Michigan and Qatar University

The Michigan team created tables and developed the following seven indicators:

1. Low Response Rate - Ranked interviewers from high to low on response rates among finalized non-interviews and flagged the interviewers with the lowest response rates.
2. Too many completed interviews per day - Flagged interviewers who completed three or more main interviews in one day.
3. Short question field time – Flagged questions read in less than 3 seconds. All fields were included.
4. Short interview length – Flagged interviews that were conducted in less than 60 minutes.
5. Short average interview length - Ranked interviewers from shortest to longest average interview length for screening interviews and flagged the interviewers with the three lowest average interview length.
6. Low prevalence rate – Ranked interviewers from low to high on prevalence of mental health disorders and flagged the interviewers with the lowest prevalence rates.
7. Long pause - Flagged interviews who had at least one pause of more than 30 minutes in the main interview. It displayed a percent of occurrences across all interviewer's completed main interviews.

Figure 1: WMH Study- Interviewer's selection and training process.

