Anticipated Negative Responses by Students to Possible Ebola Virus Outbreak, Guangzhou, China

Joseph T.F. Lau, Zixin Wang, Yoona Kim, Jing Gu, Anise M.S. Wu, Qianling Zhou, Chun Hao, Perry Cheng, Yuantao Hao

Author affiliations: Centre for Medical Anthropology and Behavioral Health, Sun Yat-sen University, Guangzhou, China (J.T.F. Lau); Shenzhen Research Institute, The Chinese University of Hong Kong, Shenzhen, China (J.T.F. Lau); Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong, Hong Kong, China (J.T.F. Lau, Z. Wang, Y. Kim, Q. Zhou, P. Cheng); Sun Yat-sen University School of Public Health, Guangzhou, China (J. Gu, C. Hao, Y. Hao); University of Macau, Macau, China (A.M.S. Wu)

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To the Editor: In 2014, a serious Ebola virus disease (EVD) outbreak occurred in West Africa (*1*). In a study on EVD-related perceptions, 85% of US respondents mistakenly believed that EVD could be transmitted through airborne droplets from patients' sneezes or coughs (*2*). EVD-related panic was reported in the United States (*3*) and the United Kingdom (*4*).

During November 15–December 20, 2014, we conducted a cross-sectional survey of 1,295 undergraduate students in Guangzhou, China, where the population of immigrants from Africa is high (online Technical Appendix, http://wwwnc.cdc.gov/EID/article/22/1/15-0898-Techapp1.pdf). Our aim was to measure students' anticipated negative emotional responses and avoidance activities (dependent variables) to a possible outbreak of EVD (*5*). We constructed scales for the dependent and independent variables to assess EVD-related perceptions: 1) misconceptions/knowledge about transmission modes, 2) scenarios of an EVD outbreak in Guangzhou (chances, severity, control), 3) efficacy of preventive measures and self-protection, and 4) public stigma toward EVD survivors. MLwiN 2.30 (Centre for Multilevel Modeling, University of Bristol, Bristol, UK) was used for multilevel regression analyses (online Technical Appendix).

We analyzed data from 1,155 (89.2%) students who had heard of EVD. To the example of 2–3 EVD cases detected in Guangzhou, 31.0% showed ≥4 types of anticipated negative emotions (e.g., fear, panic, worry); 59.5% showed ≥3 types of anticipated unnecessary avoidance. Most (80.0%) indicated ≥1 misconception regarding transmission mode (e.g., believed it was droplet or waterborne) but knew that direct contact with the corpse of an infected person (69.0%) and body fluids (81.4%) could lead to infection and perceived EVD as fatal (85.6%,) and highly infectious (81.6%). About half of respondents believed that effective treatment and a vaccine were unavailable (51.9% and 59.1%, respectively); 22.2% anticipated EVD outbreaks among Africans in Guangzhou (during the next 12 months). Many students perceived severe consequences if a small EVD outbreak occurred in Guangzhou and believed an outbreak would have a high fatality rate (70.5%), EVD is highly infectious (65.4%), an outbreak would be of long duration (47.5%), and the number of infected persons would be high (39.9%); 52.5%–79.2% of respondents lacked confidence in the government's ability to control an outbreak (e.g., ability to provide adequate vaccines, medication, protective gear). Half or more of respondents believed that restricting travel by Africans to and from Africa and avoiding visiting African-inhabited areas were effective means of prevention. About 40% were confident that they could protect themselves or family members from EVD (online Technical Appendix Tables 1, 2).

Older age, female sex, longer school years, and rural origin were associated with negative emotional responses, avoidance, or both (online Technical Appendix Table 3). In multivariate analyses that adjusted for significant background variables, we found positive associations between both dependent variables and the following independent variables: perceived fatality of EVD, perceived nonavailability of treatment, misconceptions regarding modes of transmission, perceived severity of a Guangzhou outbreak, perceived efficacy of restricting Africans' travel, perceived efficacy of avoiding African-inhabited areas, and public stigma toward EVD survivors. Confidence in governmental control was negatively associated with both dependent variables. Some variables were positively associated with emotional response but not avoidance (perceived irreversible harm, perceived chance of outbreak in Guangzhou and in other parts in China, perceived self-efficacy for protection); 2 variables (perceived nonavailability of vaccine and knowledge of transmission mode) were positively associated with avoidance measures but not with emotional responses (Table).

Because EVD causes serious physical harm, negative emotional responses and unnecessary avoidance practices were anticipated. Such negative community responses might cause individual and societal harm, as witnessed during the epidemic of severe acute respiratory syndrome (*6*). Misconceptions concerning transmission modes were prevalent and significantly correlated with both dependent variables. More than 80% of respondents perceived that the virus was highly infectious, another significant factor.

About 20% of participants believed that an EVD outbreak would occur in Guangzhou in the next year. Among all participants, many anticipated severe outcomes but

Table. Factors associated with anticipated responses to EVD, adjusted for sociodemographic variables, Guangzhou, China, 2014*

Factor	Emotional Response to Ebola Scale†		Unnecessary Avoidance Scale‡	
	β (SE)	p value	β (SE)	p value
Perceived severity of EVD				
EVD is fatal	1.270 (0.928)	0.171	0.855 (0.388)	**0.027**
EVD causes irreversible harm to physical health	2.647 (0.637)	**<0.001**	0.504 (0.064)	0.064
Perceived fatality of EVD	2.545 (0.635)	**<0.001**	1.177 (0.269)	**<0.001**
Perceived high infectivity of EVD	1.568 (0.842)	0.063	1.273 (0.350)	**<0.001**
Treatment and vaccine availability				
Treatment not available	2.143 (0.639)	**<0.001**	1.108 (0.271)	**<0.001**
Vaccine not available	1.236 (0.654)	0.059	0.786 (0.276)	**0.005**
Misconceptions and knowledge about modes of transmission of EVD				
Misconceptions about Mode of Transmission Scale	0.406 (0.113)	**<0.001**	0.214 (0.048)	**<0.001**
Knowledge about Mode of Transmission Scale	0.285 (0.171)	0.095	0.369 (0.071)	**<0.001**
Perceptions related to EVD outbreak				
Chances of Outbreak Scale—Guangzhou	0.688 (0.091)	**<0.001**	0.064 (0.039)	0.100
Perceived Chances of Outbreak Scale—Other Parts of China	0.986 (0.189)	**<0.001**	0.151 (0.081)	0.062
Perceived Severity of Outbreak in Guangzhou Scale	0.825 (0.072)	**<0.001**	0.222 (0.031)	**<0.001**
Confidence in Governmental Control Scale	–1.024 (0.086)	**<0.001**	–0.192 (0.038)	**<0.001**
Perceived efficacy and self-efficacy				
Perceived Efficacy of Restricting Africans Travel Scale	1.003 (0.176)	**<0.001**	0.543 (0.073)	**<0.001**
Perceived Efficacy of Avoidance Scale	0.544 (0.138)	**<0.001**	0.595 (0.056)	**<0.001**
Perceived Self-Efficacy for Protection against EVD Scale	–0.571 (0.145)	**<0.001**	–0.112 (0.062)	0.070
Public stigma toward EVD survivors				
Public Stigma Scale	0.231 (0.032)	**<0.001**	0.125 (0.013)	**<0.001**

*Among participants who had heard of EVD (n = 1,155). Bold indicates significance. β, multilevel linear regression coefficient adjusted by significant background variables; EVD, Ebola virus disease.
†Anticipated Emotional Response to Ebola Scale items included the following: "If there are 2–3 EVD cases in Guangzhou, how likely would you 1) worry about getting infected with EVD, 2) worry about family members getting infected with EVD, 3) be scared, 4) be uneasy, 5) be in panic, 6) feel helpless, 7) be depressed, 8) have insomnia, 9) be distressed, 10) have fluctuating emotions, and 11) be emotionally disturbed." Response categories: 1 = very unlikely, 5 = very likely.
‡Unnecessary Avoidance Scale items included the following: "If there are 2–3 EVD cases in Guangzhou, how likely would you be to 1) avoid going to other cities, 2) avoid going to work, 3) avoid going out if unnecessary, 4) avoid going to crowded places, 5) avoid going to hospitals, and 6) avoid taking airplanes." Response categories: 1 = very unlikely, 5 = very likely.

were not confident that the government was prepared for and could control such an outbreak.

The concentration of immigrants from Africa in this region might have increased perceived chances of an EVD outbreak and thus lead to avoidance of this population. The high percentages of those who believed that restricting Africans' travel was effective also might result in discrimination.

Public stigmatization toward EVD survivors, another significant factor, was a prominent attitude (*7*,*8*). Fear, misconceptions, and perceived likelihood of EVD to cause death may lead to patient stigmatizing, which could hinder case detection and patients' service seeking. The relationship between stigmatization and EVD-related perceptions should be investigated.

The study's limitations included the inability to assess real responses, inability to generalize findings to all university students and the general public, and the use of scales that had not been validated. Also, some students might have given exaggerated responses.

In summary, misconceptions and perceptions regarding EVD may result in negative community responses in Guangzhou. Health education is needed to clarify that EVD is not airborne or waterborne or highly infectious and that avoidance is not an effective preventive measure. In addition, the government should start developing and publicizing its preparedness plans.

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Address for correspondence: Joseph T.F. Lau, 5F, School of Public Health, Prince of Wales Hospital, Shatin, NT, Hong Kong, China; email: jlau@cuhk.edu.hk

Multiple Fungicide-Driven Alterations in Azole-Resistant *Aspergillus fumigatus*, Colombia, 2015

Patrice Le Pape, Rose-Anne Lavergne, Florent Morio, Carlos Alvarez-Moreno

Author affiliations: Université de Nantes, Nantes, France (P. Le Pape, R.-A. Lavergne, F. Morio); Universidad Nacional de Colombia and Clinica Universitaria Columbia, Bogota, Colombia (C. Alvarez-Moreno)

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To the Editor: We read with interest the report by van der Linden et al. about the prevalence of azole-resistant *Aspergillus fumigatus* isolates from 19 countries, including 2 from the Americas (Brazil and the United States) (*1*). Recent reports have suggested a link between use of fungicides in agricultural practices and the presence of triazole-resistant *A. fumigatus* among azole-naive persons (*2*). These resistant strains harbored the TR34/L98H and TR46/Y121F/T289A mutations in the *CYP51A* gene and its promoter region. These novel mechanisms of resistance have been reported both in environmental and clinical samples in Europe, Asia, and Africa, suggesting a broad geographic spread. However, clinical isolates from 22 states in the United States (*3*) and a few isolates from Latin America (*1*,*4*) failed to show any fungicide-driven resistance in *A. fumigatus* in these continents, even though use of pesticides is a widespread practice in the Americas. Colombia was ranked fourth in the world in 2010 for the use of pesticides, reportedly using 14.5 tons/1,000 ha, 30% of which were fungicides (*5*). Among the fungicides approved by Colombia's regulatory agency, the Colombian Agricultural Institute (*6*), tebuconazole and difenoconazole are largely used in the flower industry, more specifically in Cundinamarca, where 60% of Colombia's flowers are produced.

In 2015, we conducted a study for which 60 soil samples from flower fields and greenhouses were collected in the outskirts of Bogota, Cundinamarca. Samples were inoculated on Sabouraud agar at 43°C, and positive samples were screened for azole-resistance on agar supplemented with either itraconazole (4 mg/L) or voriconazole (4 mg/L). Of the 38 resistant *Aspergillus* strains, 20 were selected (up to 5 colonies for each positive culture), identified as *A. fumigatus* by β-tubulin gene sequencing, and analyzed for *CYP51A* gene alterations (*7*). Results showed great diversity in molecular resistance with the presence of TR46/Y121F/T289A (n = 17), TR34/L98H (n = 1), and TR53 (n = 1) mutations; 1 isolate had a wild-type *CYP51* sequence (*8*).

Our study highlights the presence of *A. fumigatus* harboring fungicide-driven alterations in Colombia, South America. The results indicate the importance of initiating active agricultural surveillance along with close monitoring of drug resistance in clinical isolates from naive and azole-exposed patients in these countries. Clinical management of *Aspergillus* disease can be challenging because of unfavorable clinical outcomes after patients have acquired multi-azole–resistant strains from the environment (*9*). Additional studies are needed to evaluate the extent to which pesticide use in floriculture and agriculture (e.g., coffee and banana) contributes to azole resistance in Colombia.

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Anticipated Negative Responses by University Students to Possible Ebola Outbreak, Guangzhou, China

Technical Appendix

Methods

Sampling and Data Collection

This cross-sectional study was conducted during November 15–December 20, 2014, in 2 major universities in Guangzhou that had 41,000 and 50,000 students. Four undergraduate core classes were randomly selected from all related classes of each of 6 schools (public health, clinical medicine, chemical industry, mathematics and computer, sociology, politics and public affairs management) of the 2 universities. All students attending the selected classes were invited to self-administer an anonymous questionnaire in classrooms. They were reminded not to fill out the questionnaire twice. Research assistants read a statement indicating that participation is voluntary, refusal would have no effect on them, and data would only be used for research purposes. No names were entered in the questionnaire; written informed consent was recorded separately. No incentive was involved. Ethics approval was obtained from the ethics committee of The Chinese University of Hong Kong. Of the 1,888 students (30% of all 7 schools' students) invited to join the study, 1,295 (68.6%; range 45.5%–78.9% in the 7 schools) completed the questionnaire (refusal: 479 [25.3%]; incomplete: 114 [6.0%]).

Measures

Dependent Variables

The first dependent variable was the 11-item Anticipated Emotional Response Scale (AERES), constructed to assess anticipated emotional responses if 2–3 Ebola virus disease (EVD) cases were detected in Guangzhou. A sample item is the following: "If there are 2–3 EVD cases in Guangzhou, how likely would you be to panic?" (Cronbach $\alpha = 0.953$). The second dependent variable was the 6-item Unnecessary Avoidance Scale (UAS) (Cronbach α = 0.775). Ratings were made on Likert scales (1 = very unlikely to 5 = very likely).

Independent Variables

Four items were used to assess the perceived severity of EVD; 3 were rated on 3-point Likert scales and 1 asked about perceived fatality rate of EVD. Questions were also asked regarding the perceived availability of effective treatment and vaccine for EVD. The 6-item Misconceptions about Mode of Transmission Scale (MISTS) and the 4-item Knowledge on Modes of Transmission Scale (KTS) were constructed for this study.

Three scales were constructed to assess perceptions on anticipated scenarios of a potential EVD outbreak in Guangzhou, including the following: 1) the 4-item Perceived Chance of Outbreak in Guangzhou Scale (PCOS_GZ), 2); the 6-item Perceived Severity of Outbreak in Guangzhou Scale (PSO_GZ); and 3) the 5-item Confidence in Governmental Control Scale (CGCS). Another 2-item scale, the Perceived Chance of Outbreak in Other Parts of China Scale (PCOS_OC) was constructed to assess perceived chance of outbreak in other parts of China. Response categories of these scales ranged from 1 (very low or strongly disagree) to 5 (very high or strongly agree).

The 2-item Perceived Efficacy of Restricting Africans' Travel Scale (PERAT) and the 4-item Perceived Efficacy of Avoidance Scale (PEAS) rated perceived efficacy of such measures; response categories ranged from 1 (very ineffective) to 5 (very effective). The Perceived Self-efficacy for Protection against EVD Scale (PSEP) had 2 items, with responses ranging from 1 (not confident at all) to 5 (totally confident). The Public Stigma Scale, which has been used to assess stigma towards schizophrenia (*1*) and mental illness (*2*) in some Chinese populations, was modified and used in this study.

Exploratory factor analysis found single factors for all of the constructed scales, explaining 46.8% and 82.1% of the total variances. Cronbach α ranged from 0.642 to 0.953. (Details and items are shown in Technical Appendix Table 2.)

Statistical Analysis

Descriptive characteristics of the sample were analyzed by using SPSS 16.0 (IBM Corp., Armonk, NY, USA). A multilevel regression model was used to examine factors associated with the 2 dependent variables among the students. Individual students were selected by a stratified cluster sampling method at the class level. The random intercepts model was therefore used, in which intercepts of the regression model were allowed to vary across classes. Such a model can account for intracorrelated nested data. The 2-level linear regression model (level 1: classes; level 2: students) was performed by using MLwiN 2.30 (Centre for Multilevel Modeling, University of Bristol, Bristol, UK). First, univariate associations between independent variables and dependent variables (AERES and UAS) were tested. After adjusting for significant sociodemographic variables, regression coefficients (β) were obtained; p values <0.05 were considered statistically significant.

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Technical Appendix Table 1. Background characteristics of study participants, Guangzhou, China, 2014*

Characteristic	No. (%) all participants, N = 1,295	No. (%) participants who had heard of EVD, n = 1,155	No. (%) participants who had not heard of EVD, n = 140	p value†
Age, y, mean ± SD	19.94 ± 1.55	19.90 ± 1.52	20.26 ± 1.77	**0.009**
Sex				0.057
M	698 (54.3)	613 (53.4)	85 (62.0)	
F	587 (45.7)	535 (46.6)	52 (38.0)	
School affiliations				**<0.001**
Public Health	123 (9.5)	119 (10.3)	4 (2.9)	
Clinical Medicine	314 (24.2)	295 (25.5)	19 (13.6)	
Chemical Industry	475 (36.7)	424 (36.7)	51 (36.4)	
Sociology	97 (7.5)	91 (7.9)	6 (4.3)	
Politics and Public Affairs Management	84 (6.5)	46 (4.0)	38 (27.1)	
Mathematics and Computer	202 (15.6)	180 (15.6)	22 (15.7)	
School year				0.099
1	308 (23.8)	275 (23.8)	33 (23.6)	
2	400 (30.9)	345 (29.9)	55 (39.3)	
3	288 (22.3)	260 (22.5)	28 (20.0)	
4	295 (22.8)	274 (23.7)	24 (17.1)	
Place of origin				0.454
Guangzhou	139 (10.6)	121 (10.5)	18 (12.9)	
Other places in Guangdong	531 (41.1)	470 (40.8)	61 (43.6)	
Outside Guangdong	623 (48.2)	562 (48.7)	61 (43.6)	
Rural/urban origin				0.766
Large city	379 (29.3)	341 (29.6)	38 (27.3)	
Medium-sized or small city	434 (33.6)	385 (33.4)	49 (35.3)	
Town	230 (17.8)	202 (17.5)	28 (20.1)	
Village	249 (19.3)	225 (19.5)	24 (17.3)	
Length of stay in Guangzhou, y, mean ± SD	3.51 ± 5.31	3.51 ± 5.28	3.46 ± 5.56	0.905

*EVD, Ebola virus disease; n = 1,155.
†Independent sample *t* test for continuous variables and $\chi 2$ test for categorical variables.

Technical Appendix Table 2. Frequency distribution of items related to EVD among participants who had heard of EVD, Guangzhou, China, 2014*†

Response	No. patients or mean score	% Patients or SD
Anticipated emotional response if 2–3 EVD cases in Guangzhou (% Likely/Very likely)		
Worry about getting infected with EVD	648	56.1
Worry about family members getting infected with EVD	535	46.3
Scared	388	33.6
Uneasy	389	33.7
Panic	326	28.2
Helpless	252	21.8
Depressed	220	19.0
Insomnia	131	11.3
Distressed	194	16.8
Emotional fluctuation	162	14.0
Emotional disturbance	160	13.9
Scale score		
Anticipated Emotional Response Scale (AERES, 11 items)†	27.9	11.1
Unnecessary avoidance if 2–3 EVD cases in Guangzhou (% Likely/Very likely)		
Avoid going to other cities	792	68.6
Avoid going to work	155	13.4
Avoid going out unless necessary	609	52.7
Avoid going to crowded places	853	73.9
Avoid going to hospitals	562	48.7
Avoid taking airplanes	381	33.0
Scale score		
Unnecessary Avoidance Scale (UAS, 6 items)‡	19.1	4.7
Perceived severity of EVD		
EVD is fatal		
Disagree/uncertain	166	14.4
Agree	989	85.6
EVD causes irreversible harm of physical health		
Disagree/uncertain	594	51.4
Agree	561	48.6

Response	No. patients or mean score	% Patients or SD
Fatality rate of EVD		
< 70%/uncertain	593	51.3
≥70%	562	48.7
EVD has high infectivity		
Disagree/Uncertain	212	18.4
Agree	943	81.6
Availability of treatment and vaccines		
Effective treatment not available		
Disagree/uncertain	556	48.1
Agree	599	51.9
Effective vaccine not available		
Disagree/Uncertain	472	40.9
Agree	683	59.1
Misconceptions and knowledge about modes of transmission of EVD		
Misconceptions		
Whether EVD can spread by the following routes? (% agree)		
Airborne	213	18.4
Droplets	725	62.8
Mosquitoborne	394	34.1
Direct contact with bird	317	27.4
Foodborne	343	29.7
Waterborne	533	46.1
Scale score		
Misconceptions about Mode of Transmission Scale (MISTS, 6 items)§	12.3	2.8
Knowledge		
Whether EVD can spread by the following routes? (% Agree)		
Direct contact with infected people	557	48.2
Direct contact with body fluid of infected persons	940	81.4
Direct contact with body of animal that died of Ebola	659	57.1
Direct contact with body of deceased infected persons	797	69.0
Scale score		
Knowledge about Mode of Transmission Scale (KTS, 4 items)¶	10.1	1.9
Perceptions related to EVD outbreak		
Perceived chances of EVD outbreak in Guangzhou in next year (PCOS_GZ) (% High/Very high)		
Perceived chance of EVD outbreak among Africans living in GZ	256	22.2
Perceived chance of EVD outbreak among Chinese living in GZ	177	15.3
Perceived chance of large scale EVD outbreak in GZ	90	7.8
Perceived chance of EVD outbreak among healthcare workers in GZ	188	16.3
Scale score		
Perceived Chances of Outbreak Scale–Guangzhou (PCOS_GZ, 4 items)#	10.0	3.5
Perceived chances of EVD outbreak in other places in China in next year (% High/Very high)		
Perceived chance of EVD outbreak among Africans living in other places in China	129	11.2
Perceived chance of EVD outbreak among Chinese living in other places in China	106	9.2
Scale score		
Perceived Chances of Outbreak Scale–Other Places in China (PCOS_OC, 2 items)**	4.9	1.7
Perceived severity of EVD outbreak in Guangzhou		
Perceived consequences of EVD outbreak in Guangzhou (% Agree/Strongly agree)		
High mortality rate of infected persons	814	70.5
Long duration of the outbreak	549	47.5
... Highly infectious	755	65.4
Huge number of infected persons	461	39.9
Ineffectiveness of treatment	453	39.2
Ineffectiveness of prevention measures	312	27.0
Scale score		
Perceived Severity of Outbreak in Guangzhou Scale (PSO_GZ, 6 items)††	20.0	4.3
Confidence in governmental control of EVD outbreak (% Agree/Strongly agree)		
Guangzhou government would be able to control outbreak	515	44.6
Guangzhou government would have vaccines to control outbreak	240	20.8
Guangzhou government would have enough medication to control outbreak	473	40.9
Healthcare workers in Guangzhou would have enough protective equipment for themselves	549	47.5
Hospitals in Guangzhou would have enough quarantine measures to control outbreak	602	52.2
Scale score		
Confidence in Governmental Control Scale (CGCS, 5 items)‡‡	16.1	3.6
Perceived efficacy and self-efficacy		
Perceived efficacy of restricting Africans' travel in preventing EVD(% Effective/Very effective)		
Restricting Africans coming to Guangzhou	549	47.5
Restricting Africans living in Guangzhou coming back and forth to Africa	695	60.2
Scale score		

Response	No. patients or mean score	% Patients or SD
Perceived Efficacy of Restricting Africans' Travel Scale (PERAT, 2 items)§§	6.9	1.8
Perceived efficacy of avoidance in preventing EVD (% Effective/Very effective)		
Avoid going to African-inhabited areas in Guangzhou	689	59.7
Avoid going to countries having an EVD outbreak	964	83.5
Avoid going to crowded places	834	72.2
Avoid taking airplanes	193	16.7
Scale score		
Perceived Efficacy of Avoidance Scale (PEAS, 4 items)¶¶	13.9	2.4
Perceived self-efficacy for protection against EVD (% Confident/Very confident)		
Confident in protecting oneself from EVD	403	34.9
Confident in protecting family members from EVD	441	38.2
Scale score		
Perceived Self-Efficacy for Protection against EVD Scale (PSEP, 2 items)##	6.3	2.2
Public stigma toward EVD survivors		
Public Stigma Scale (20 items)***	64.5	10.2

*EVD, Ebola virus disease; n = 1,155.
†Cronbach α = 0.953, 1 factor was identified by exploratory factor analysis (EFA), which explained 82.1% of total variance.
‡Cronbach α = 0.775, 1 factor was identified by EFA, which explained 46.8% of total variance.
§Cronbach α = 0.650, 1 factor was identified by EFA, which explained 55.8% of total variance.
¶Cronbach α = 0.642, 1 factor was identified by EFA, which explained 53.8% of total variance.
#Cronbach α = 0.884, 1 factor was identified by EFA, which explained 74.2% of total variance.
**Cronbach α = 0.822.
††Cronbach α = 0.807, 1 factor was identified by EFA, which explained 70.8% of total variance.
‡‡Cronbach α = 0.793, 1 factor was identified by EFA, explained 57.3% of total variance.
§§Cronbach α = 0.811.
¶¶Cronbach α = 0.769, 1 factor was identified by EFA, which explained 47.2% of total variance.
##Cronbach α = 0.885.
***Cronbach α = 0.749, 1 factor was identified by EFA, which explained 67.2% of total variance.

Technical Appendix Table 3. Associations between sociodemographic factors and anticipated responses to EBV outbreak among participants who had heard of EVD, Guangzhou, China, 2014*

Factor	AERES		UAS	
	β (SE)	p	β (SE)	p
Age, y	0.588 (0.236)	**0.013**	0.125 (0.108)	0.246
Sex	2.543 (0.662)	**<0.001**	0.740 (0.286)	**0.010**
School affiliations	–0.254 (0.260)	0.327	–0.159 (0.121)	0.190
School year	1.187 (0.338)	**<0.001**	0.591 (0.145)	**<0.001**
Place of origin	–1.244 (1.050)	0.238	–0.045 (0.445)	0.920
Rural/urban origin	0.198 (0.298)	0.509	0.291 (0.127)	**0.022**
Length of stay in Guangzhou, y	–0.058 (0.061)	0.342	0.000 (0.026)	1.000

*n = 1,155.
*EVD, Ebola virus disease; AERES, Anticipated Emotional Response to Ebola Scale; UAS, Unnecessary Avoidance Scale; β, multilevel univariate linear regression coefficient; bold, p<0.05.

Technical Appendix Table 4. Univariate associations between independent variables and anticipated responses to EVD, among participants who had heard of EVD, Guangzhou, China, 2014*†

	AERES		UAS	
Variable	β (SE)	p	β (SE)	p
Perceived severity of EVD				
Fatal	1.183 (0.924)	0.200	0.793 (0.393)	**0.044**
Causes irreversible harm to physical health	2.689 (0.638)	**<0.001**	0.502 (0.272)	0.064
Perceived fatality of EVD	2.570 (0.639)	**<0.001**	1.176 (0.270)	**<0.001**
Perceived high infectivity of EVD	1.869 (0.833)	**0.025**	1.393 (0.352)	**<0.001**
Treatment and vaccine				
Nonavailability of treatment	2.403 (0.642)	**<0.001**	1.162 (0.272)	**<0.001**
Nonavailability of vaccine	1.461 (0.654)	**0.026**	0.813 (0.277)	**0.003**
Misconceptions and knowledge about modes of transmission of EVD				
Misconceptions about Mode of Transmission Scale (MISTS)	0.390 (0.113)	**<0.001**	0.207 (0.048)	**<0.001**
Knowledge about Mode of Transmission Scale (KTS)	0.321 (0.171)	0.061	0.385 (0.072)	**<0.001**
Perceptions related to EVD outbreak				
Perceived Chances of Outbreak Scale-Guangzhou (PCOS-GZ)	0.739 (0.090)	**<0.001**	0.076 (0.039)	0.052
Perceived Chances of Outbreak Scale-Other parts in China (PCOS-OC)	1.084 (0.188)	**<0.001**	0.180 (0.081)	**0.026**
Perceived Severity of Outbreak in Guangzhou Scale (PSO-GZ)	0.846 (0.072)	**<0.001**	0.232 (0.031)	**<0.001**
Confidence in Governmental Control Scale (CGCS)	--1.067 (0.085)	**<0.001**	-0.208 (0.038)	**<0.001**
Perceived efficacy and self-efficacy				
Perceived Efficacy of Restricting Africans' Travel Scale (PERAT)	1.122 (0.174)	**<0.001**	0.568 (0.072)	**<0.001**
Perceived Efficacy of Avoidance Scale (PEAS)	0.619 (0.136)	**<0.001**	0.610 (0.055)	**<0.001**
Perceived Self-Efficacy for Protection against EVD Scale (PSEP)	–0.564 (0.146)	**<0.001**	–0.107 (0.062)	0.085
Public Stigma towards EVD survivors				
Public Stigma Scale	0.234 (0.032)	**<0.001**	0.126 (0.013)	**<0.001**

*n = 1,155.

†EVD, Ebola virus disease; AERES, Anticipated Emotional Response to Ebola Scale; UAS, Unnecessary Avoidance Scale; β, multilevel univariate linear regression coefficient; bold, p<0.05.