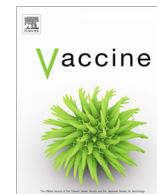




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Short communication

Interest in an Ebola vaccine among a U.S. national sample during the height of the 2014–2016 Ebola outbreak in West Africa

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ABSTRACT

To better understand the association between Ebola-related attitudes and interest in receiving an Ebola virus vaccine, a survey was administered to a U.S. national sample using GfK's KnowledgePanel[®]. Among participants (N = 1417), 34.1% expressed interest in an Ebola vaccine for themselves. In the subset of participants with children aged 0–17 (N = 410), 38.1% expressed interest in an Ebola vaccine for their child. In multivariable analyses, vaccine interest for oneself was associated with perceived susceptibility to Ebola (p = 0.009), beliefs that the U.S. government should spend money to control Ebola (p = 0.002), and beliefs Ebola posed a national threat (p = 0.007). Vaccine interest for one's child was associated with perceived severity of Ebola (p = 0.018) and beliefs that the U.S. government should spend money to control Ebola (p = 0.003). Findings highlight the influence of personal and national threat beliefs on vaccine interest. Understanding the impact of threat beliefs may benefit vaccine campaign development during future pandemic threats.

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1. Introduction

From 2014 to 2016, an unprecedented epidemic of Ebola virus disease (Ebola) spread through West Africa, leading to over 28,000 cases and over 11,000 deaths [1]. The scope, severity, and challenges with containing this epidemic spurred intensive Ebola vaccine research, development, and clinical trials [2,3]. Early results from vaccine trials hold promise, with two candidate vaccines proven safe and well-tolerated in humans [2–4]. As part of future control and response strategies, the licensure of an Ebola vaccine would be an invaluable asset—particularly for people living in West Africa and other regions where the disease is endemic.

Comparatively, the benefits an Ebola vaccine in the United States, where only four cases were reported during 2014–2016 [5,6], would be minimal. Although the risk of a U.S. Ebola outbreak was low, media hype and sensationalism led to a national contagion of fear, earning the moniker “Fearbola” [7,8]. While widespread adoption of an Ebola vaccine in the United States is unlikely, the recent outbreak provides a unique opportunity to explore how personal and national threat beliefs can influence

vaccine attitudes in the United States. Such an exploration could provide important information in the event of another epidemic of Ebola or similarly alarming emerging infectious disease threat in the United States. The purpose of this study was to examine the association between Ebola-related attitudes (personal and national threat beliefs) and participants' interest in receiving an Ebola vaccine for themselves or their child in a U.S. national sample.

2. Methods

From April 30–May 8, 2015, a survey was conducted using the GfK Group's KnowledgePanel[®], a probability-based web panel designed to be representative of the U.S. population. KnowledgePanel[®] uses an address-based sampling methodology for selecting panel members. This technique allows for sampling of almost all U.S. households and provides an effective method to recruit hard-to-reach individuals, with oversampling from minority communities. Data weights are assigned so that the weighted sample distribution matches that of the U.S. adult population. For this study, the sample comprised non-institutionalized, English-language survey-taking adults aged 18 and over in the United States.

Social Cognitive Theory (SCT) and the Health Belief Model (HBM) were used to guide survey development [9,10]. SCT posits that personal and environmental factors impact health behaviors.

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Personal factors were operationalized as HBM-driven personal threat beliefs (perceived susceptibility, perceived severity, and personal fear); environmental factors were operationalized as national threat beliefs. The main outcome measures were participants' interest in an Ebola vaccine for themselves and their child. Predictor variables included background factors (demographics and history of international travel in the past 12 months); Ebola-related

knowledge; Ebola-related behaviors (information seeking and hand hygiene); and Ebola-related attitudes (personal and national threat beliefs). Measurement details are presented in Table 1.

Analyses were conducted using SPSS version 23. Chi-square tests were used to assess differences in dichotomous variables; *T*-tests were used for continuous variables. Cronbach's alphas were calculated for scale variables to assess internal consistency.

Table 1
Knowledge and attitude scale survey items and measurement characteristics among a national sample—United States, 2015.

Construct	Items	Number of items, Range	Cronbach's Alpha	
			Full sample (N = 1471)	Sub-sample of households with children (N = 410)
Knowledge	Ebola is a contagious disease (<i>True</i>) A person infected with Ebola is not contagious until after the symptoms appear (<i>True</i>) Ebola can be spread through direct contact with bodily fluids (e.g. urine, sweat, saliva) of an infected individual (<i>True</i>) Ebola can be spread through sexual contact (<i>True</i>) Currently, there is no FDA approved drug for treating individuals who are infected with the Ebola virus (<i>True</i>) The Ebola virus can live on surfaces outside of the body for up to 6 days (<i>True</i>) There is no vaccine currently available to prevent infection with Ebola (<i>True</i>) If a person is infected with Ebola, symptoms may appear from 2 to 21 days after they are exposed to the virus (<i>True</i>)	8, 0–8	0.757	0.759
<i>Ebola-driven behaviors</i>				
Information Seeking	I search for new information related to the Ebola outbreak I follow the news stories related to the Ebola outbreak	2, 2–10	0.645	0.640
Hand hygiene	Because of the Ebola virus, I am more likely to use hand sanitizers Because of the Ebola virus, I wash my hands with soap more frequently	2, 2–10	0.944	0.935
<i>Personal beliefs</i>				
Perceived Susceptibility	My risk of getting infected with Ebola is high I am concerned about getting infected with Ebola There is a good possibility that I will get infected with Ebola Ebola poses a threat to me personally	4, 4–20	0.823	0.813
Perceived Severity	Ebola is a severe disease If a person becomes infected with Ebola, it is likely that they will die If a person becomes infected with Ebola, it is likely that they would have a hard time recovering Ebola is more deadly than HIV/AIDS Ebola is more deadly than the measles	5, 5–25	0.788	0.788
Personal fear	I would not want to be in the same classroom or work space with a person who had previously been diagnosed with Ebola If I sit next to someone on the airplane from countries where Ebola has been detected, there is a strong likelihood that I would get infected with Ebola I would not travel to Africa because of the Ebola epidemic I would not sit next to someone who is coughing because likelihood that I would get infected with Ebola	4, 4–20	0.762	0.787
<i>National beliefs</i>				
USG spending to control Ebola	It is important to support the US government spending money to fight Ebola in African countries It is important to support the US spending money to conduct Ebola research to develop treatments for people who are infected with Ebola It is important to support the US spending money to conduct Ebola research to develop a vaccine to protect against infection from Ebola	3, 3–15	0.874	0.885
US intervention support scale	I support the US policy to allocate billions of dollars to assist countries in confronting the Ebola crisis I support the US policy to send troops to Africa to fight the Ebola epidemic I support the US sending medical teams to countries affected by Ebola I support the US sending humanitarian aid in the form of food and health supplies to countries affected by Ebola	4, 4–20	0.842	0.800
National fear/isolationism	Ebola poses a threat to the national security of the United States People coming from countries where Ebola has been detected should be quarantined until tested for the virus The only way to stop Ebola spreading in the United States is to halt flights from going to and out of countries where cases of Ebola have been detected Bringing Ebola patients back to the US for treatment puts Americans at risk for infection Bringing Ebola patients back to the US for treatment may create a widespread Ebola infection in the US Students from African countries where Ebola has been detected should not be permitted to enroll in colleges or universities in the United States	6, 6–30	0.861	0.849

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