Ebola outbreak: A longitudinal survey of risk perception

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Abstract

Thomas Eric Duncan, age 42, died of the Ebola virus on October 8th, 2014, the first case on American soil. This sparked public concern about an outbreak in the United States. We conducted a 5-wave survey on a US web panel to follow risk perception of Ebola over 6 months. Using multilevel modeling, results showed that baseline (December 2014) perceived risk of Ebola for the U.S. was amplified among those who followed the news more closely, felt there was a high likelihood of a U.S. outbreak in the next five years, felt that the U.S. had had a near-miss with a large outbreak, or dreaded Ebola. However, there was a significant decline in U.S.-risk perception through May 2015. News following and feelings of a near-miss with a large outbreak were associated with greater decreases, and belief in a future outbreak with lesser decreases, in perceived U.S. risk.

Methods

The Decision Research web panel, a diverse sample of US citizens, was surveyed 5 times over the course of 6 months. Subjects were paid \$4-\$6 for each survey completion and a chance to win \$100 for completing all 5 surveys. Survey 1 had 815 respondents. The final survey had 625 respondents.



Measures:

- Perceived risk of Ebola (personal, U.S., global); dread
- Trust in Centers for Disease Control & Prevention (CDC)
- How closely they followed Ebola in the news
- Belief in near-miss disaster; likelihood of U.S. outbreak
- Exposure knowledge
- Individual difference measures: Worldviews (Kahan et al. 2007) & Need for closure (Roets & van Hiel, 2011)



How closely are you following news about the recent outbreak of **Ebola in the United States?**



Risk ratings were highest for global risk and lowest for personal risk. Risk ratings were linearly related to following the news of Ebola. Despite a high rate of news following, public knowledge of infection statistics and treatment was low.

Results – Change over time & Dread of Ebola

Risk declined
slightly over
time. Risk for
the US
showed the
most decline.

Very High	6
Hioh Risk	5
Moderate Risk	Z
	3
Slight Risk	
Little Risk	
	2
No Risk	1





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Quiz: How many people were being treated for Ebola in the US at the time?

30% of people correctly identified the answer (2)

Quiz: As of December 2014, how many people had died in the US from **Ebola**? 33% of people reported the correct

answer of 2 Quiz: Is there an effective medicine

to treat Ebola? 39.6% of people correctly reported that there is NOT an effective medicine

evaluated the acceptability ofa hypothetical Ebola vaccine.

Results - Multilevel Modeling

We used a split sample method, first developing a random coefficients multilevel model with perceived U.S. risk as the DV, then pseudoreplicated the final model on the second half of the sample.

	Model 1	Model 2	Final	Pseudoreplication
	β	β	β	β
Initial risk	3.647	3.789	3.477	3.508*
Linear Time (weeks)	-0.019	-0.033	-0.018*	-0.022*
News Following	0.146	0.228	0.218*	0.289*
Trust in the CDC	-0.031	-0.076		
Perceived Dread	0.07	0.087	0.074*	0.111*
"Near Miss"	0.13	0.162	0.133*	0.145*
Worldviews HE	0.007	0.012		
Worldviews IC	0.005	-0.001		
Need for Closure	-0.003	-0.054		
Likelihood of outbreak	0.54	0.347	0.433*	0.261*
Age	0	0.000		
Gender	-0.11	-0.111		
News*Time		-0.008	-0.009*	-0.01*
Trust*Time		0.005		
Dread*Time		-0.002		
Near Miss * Time		-0.003	-0.003*	-0.003*
WV HE*Time		0.000		
WV IC*Time		0.001		
NFC*Time		0.005		
Likely * Time		0.018	0.011*	0.023*
	Model 1 < Model 2		Mode	el 2 < Final model
Deviance Change tests (ML)	ChiSq	29.82		23.38
	df	8.00		11.00
	р	<.001		<i>p</i> = .016

Conclusions

- (Kasperson et al., 1988).



• U.S. risk perception one month after the last US death from Ebola (Nov. 2014) was predicted by news following (+), perceived dread of Ebola (+), "near miss" perceptions (+). • Perceived risk declined linearly over time but this decline was moderated by "near miss" perceptions (-), news following (-), and perceived likelihood of an outbreak (+). • Results support previous work on near-miss views of disasters (Dillon, Tinsley, & Burns 2014), dread as a predictor of risk (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978), and the social amplification of risk

Dillon, R. L., Tinsley, C. H., & Burns, W. J. (2014). Evolving risk perceptions about near-miss terrorist events. *Decision*

Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1978). How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits. *Policy sciences*, 9(2), 127-152. Kahan, D. M. (2012). Cultural cognition as a conception of the cultural theory of risk. In Handbook of risk theory (pp. 725-759).

Kasperson, R. E., Renn, O., Slovic, P., Brown, H. S., Emel, J., Goble, R., ... & Ratick, S. (1988). The social amplification of Roets, A., & Van Hiel, A. (2011). Item selection and validation of a brief, 15-item version of the Need for Closure