Feeling to Infectious Diseases in Flood-Affected Areas: A Cross-Sectional Survey in Central Vietnam

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1. Introduction

It has long been recognized that flooding can endanger lives and raise health risks of waterborne and foodborne diseases. However, in some areas of developing countries hit by flooding frequently, people seems to adapt their lives with the floodwater so well. Our question is if facing flooding frequently can reduce their psychological stress caused by flood-induced risk of infection. As an indicator of the stress, people's feeling to disease is important in estimation of its burden, especially for common diseases with low fatality. In this study, we tried to quantify the feeling of people living in a flood-affected area about infectious diseases and compare it to that of people in non-flooded area.

2. Methodology

In order to quantify the feeling of people about waterborne and foodborne diseases, we developed a questionnaire used in our interview survey. The interview survey was designed as a cross-sectional investigation, in which 306 household leader people aged between 18 and 60 were potentially involved. They were not admitted to the study if any of the following criteria were present: (1) Not willing to participate in the study (2) Living in the area less than 1 year. The setting of the study was Thua Thien Hue province in the central region of Vietnam. The annual precipitation in the province is 3200 mm and it comes mainly in rainy season from September to December, which always trigger flooding. The questionnaire was to ask general information about the household leader and his/her feeling about infectious diseases. All participants were interviewed by our research team on the face-to-face basis. To compare feeling about infectious diseases between people from the flood area and non-flood area, the data obtained in the survey was statistically analyzed using Chi-square test, Fisher's exact test, or t-test with a significance level of 0.05.

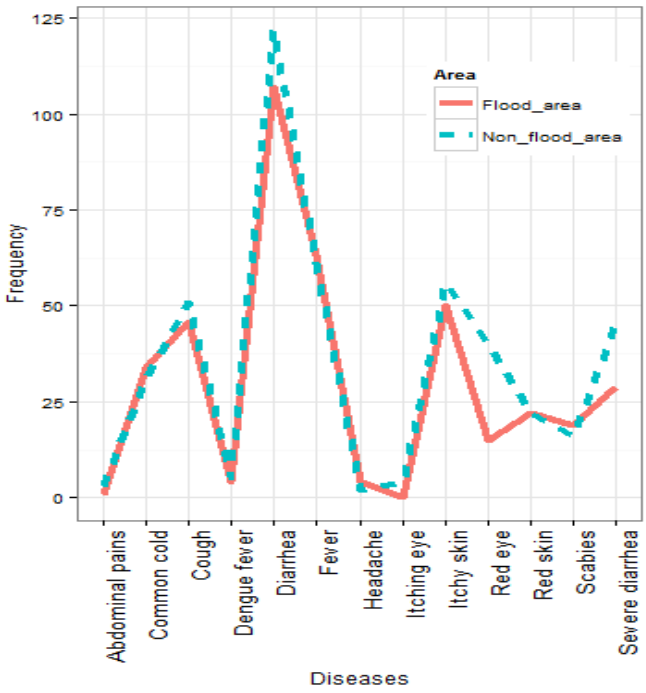

Figure 1. Number of participants thinking that each disease happens more frequently during/after flood.

3. Results

As the general information of participants, 75.5% were male with average age 45.7±9.7 years old. One haft of them (156/306) was from flood area. The majority of their education level was graduation from secondary school (39.9%). The average income of their family was 3.645.000±2.471.000 Vietnamese Dong per month. Most of their religious was Buddhist (56.9%).

Figure 1 illustrates the numbers of participants who answered that each disease happens more frequently during/after flood. Between participants from the flooding areas and non-flooding areas, there were significant differences in this number for diarrhea (χ^2=6.60, p=0.01), severe diarrhea (χ^2=5.43, p=0.02) and red eye (χ^2=15.08, p<0.001). People living in non-flood area tend to feel more stress to these infectious diseases.

We tried to quantify feeling to severe diarrhea by comparing its severity with other common diseases/symptoms (Figure 2). The participants answered that severe diarrhea was less, equally or more uncomfortable than each disease/symptom. We also conducted the same analysis about non-severe diarrhea (Figure 3). These figures indicates different feeling of participants from two areas about diarrheal diseases that often happen during/after flood.

Additionally we compared the feeling about the cost for medical treatment of diarrheal diseases in the two areas (Table 1), revealing a significant difference for non-severe diarrhea (χ^2= 6.01; p=0.014). In conclusion, as reported here, flood-related diseases can lower quality of life of affected people not only in physical ways but also in psychological ways. This kind of factors should be considered in future research.

Keywords: *Feeling; flood area; infectious diseases*
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Table 1. Feeling about the cost for medical treatment of non-severe diarrhea.

Cost for treatment	Factors	Feeling about the cost				Total		χ^2	p
		Expensive		Reasonable					
		n	%	n	%	n	%		
Using a medicine	Non flood area	7	7.4	87	92.6	94	100.0	6.007	0.014
	Flood area	23	19.2	97	80.8	120	100.0		
Doctor's diagnosis	Non flood area	5	33.3	10	66.7	15	100.0	0.410	0.522
	Flood area	6	24.0	19	76.0	25	100.0		

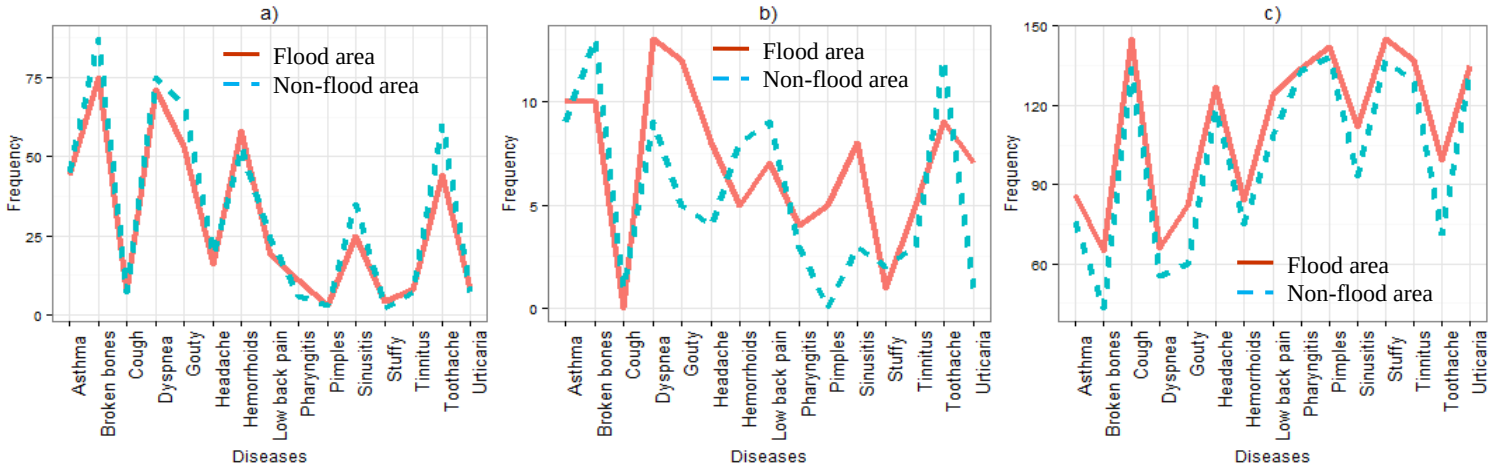

Figure 2. Numbers of participants who answered that "severe diarrhea" was less severe/uncomfortable than each of common disease/symptom (a), equally severe/uncomfortable as the diseases/symptom (b), and more severe/uncomfortable than the diseases/symptom (c).

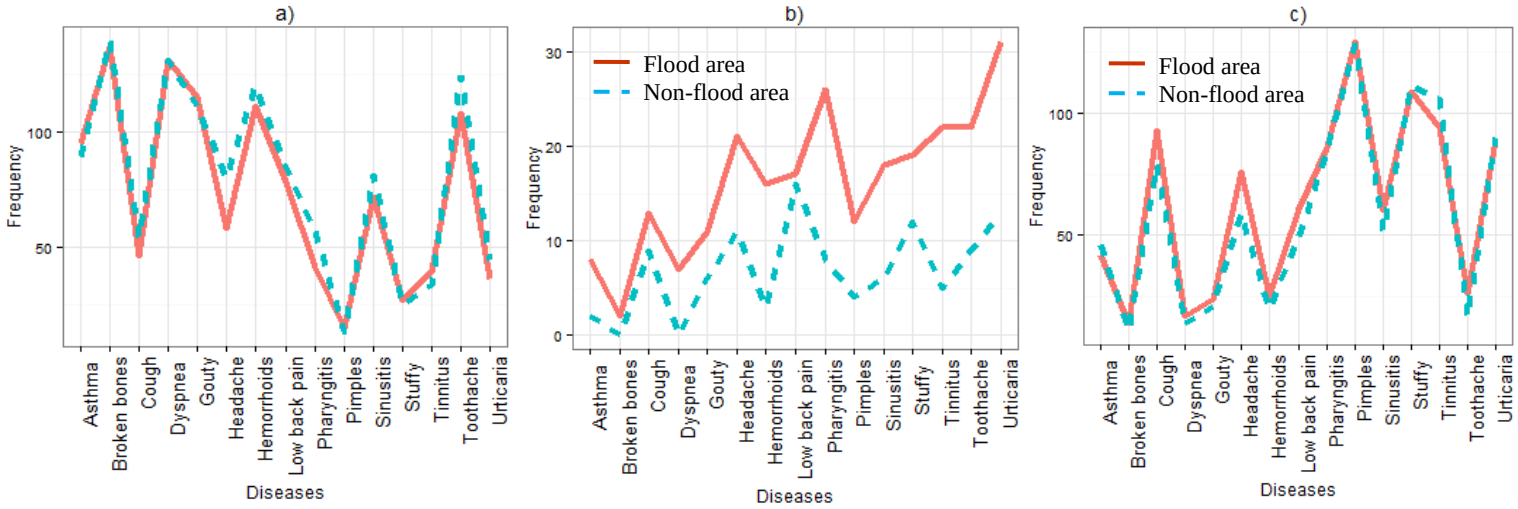

Figure 3. Numbers of participants who answered that "non-severe diarrhea" was less severe/uncomfortable than each of common disease/symptom (a), equally severe/uncomfortable as the diseases/symptom (b), and more severe/uncomfortable than the diseases/symptom (c).