

# Pandemic Influenza H1N1 Vaccination Intention in the Post-Pandemic Phase: Psychosocial Determinants and Implications from a 2010 National Survey in Taiwan

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**Abstract. Background:** Vaccination has been recommended as one of the most effective ways to protect people from severe illness during influenza pandemics; however, little is known about the acceptability and psychosocial determinants of intention to receive vaccination against pandemic influenza A/H1N1 (pH1N1) in the post-pandemic phase. **Methods:** A national computer-assisted telephone interview survey, using random digit dialing and a validated questionnaire based on the Health Belief Model (HBM), was conducted during October 27-29, 2010 among residents of Taiwan aged 15 years or older. **Results:** Of the 1,067 participants interviewed, 54.4% reported intention to receive pH1N1 vaccination. Multivariate logistic regression analysis showed that, after controlling for age, gender, education, job, income, and region of residence, those who received pH1N1 vaccination in the previous year (adjusted odds ratio [AOR]=2.75; 95% confidence interval [CI]= 1.50-5.05), who perceived that vaccination was effective (AOR=1.97; 95% CI=1.21-3.21) or very effective (AOR=4.75; 95% CI=2.68-8.43) in preventing pH1N1, and who felt confident (AOR=10.44; 95% CI=7.10-15.35) or very confident (AOR=28.53; 95% CI=17.35-46.91) of receiving vaccination as recommended during the influenza season were more inclined toward getting vaccinated against pH1N1. By contrast, those who were concerned about the quality of the pH1N1 vaccine (AOR=0.59; 95% CI=0.41-0.84) were less likely to intend to be vaccinated. **Conclusion:** These findings indicate that prior experience of receiving pH1N1 vaccination was directly related to intention to be vaccinated in the future. As posited by the HBM, perceived self-efficacy to receive pH1N1 vaccination has been demonstrated to be the strongest correlate of pH1N1 vaccination intention among the health beliefs examined in this study. These results also underscore the importance of convincing the public of the effectiveness of pH1N1 vaccination, while reducing the public concerns about the quality of the pH1N1 vaccine when promoting vaccination programs. Findings about these specific and modifiable perceptions have practical implications for policy-making and prevention initiatives.

**Keywords:** pandemic influenza A/H1N1, vaccination intention, post-pandemic phase, Health Belief Model, psychosocial determinants, self-efficacy, barriers, Taiwan

## 1. Introduction

A new strand of influenza A/H1N1 virus was first reported to cause severe illness in April 2009 [1]. Based on its global surveillance data, World Health Organization (WHO) raised the level of influenza pandemic alert to Phase 5 on April 29, 2009 [2] and subsequently to Phase 6, the highest level of alert, on June 11, 2009 [3]. During the 2009 pandemic, pH1N1 vaccines were first made available in Taiwan in November 2009 and offered without charge to the public according to a vulnerability-based vaccination priority list predetermined by Taiwan CDC [4]. As a public health measure that can protect a large population against the influenza pandemic and its resulting impact on society, vaccination has long been regarded as one of the most effective ways to prevent severe illness during influenza pandemics [5,6]. However, little is known about the acceptability and psychosocial determinants of intention to receive vaccination against pandemic influenza A/H1N1 (pH1N1) in the post-pandemic phase. The purpose of this study was to identify psychosocial determinants of people's pH1N1 vaccination intention in the Taiwanese general population, using a large national sample. We employed the Health Belief Model (HBM) [7] as the overarching theoretical framework to guide both the development of the measures and the analyses.

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## **2. Methods**

### **2.1. Sampling and data collection**

Data were collected through a computer-assisted telephone interview (CATI), using random digit dialling and a validated questionnaire based on the Health Belief Model (HBM). The questionnaire used in this study was modified from survey questionnaires used in a previous avian influenza study [8] and H1N1 studies [9, 10]. This national survey was conducted in Taiwan between 27 and 29 October 2010 during the post-pandemic phase. Proportional stratified random digit dialling (RDD) by region was used to select a geographically representative national sample of the general population, which consisted of residents of Taiwan aged  $\geq 15$  years.

### **2.2. Statistical analysis**

Pearson's chi-square test was used to examine the associations between the independent variables (i.e. knowledge, HBM-based health beliefs and sociodemographic characteristics) and the outcome variable (i.e. pH1N1 vaccination intention). Next, multivariate stepwise logistic regression analysis was conducted to inform the selection of independent variables to be included in the final model; those remaining statistically significant ( $P < 0.05$ ) in the multivariate procedure were retained in the final model as covariates of the outcome variable. Hosmer–Lemeshow test was also performed to examine the goodness of fit of the final model. All statistical analyses were carried out with SPSS 17.0.

## **3. Results**

Of the 1,067 participants interviewed, 54.4% reported intention to receive pH1N1 vaccination. Multivariate logistic regression analysis showed that, after controlling for age, gender, education, job, income, and region of residence, those who received pH1N1 vaccination in the previous year (adjusted odds ratio [AOR]=2.75; 95% confidence interval [CI]= 1.50-5.05), who perceived that vaccination was effective (AOR=1.97; 95% CI=1.21-3.21) or very effective (AOR=4.75; 95% CI=2.68-8.43) in preventing pH1N1, and who felt confident (AOR=10.44; 95% CI=7.10-15.35) or very confident (AOR=28.53; 95% CI=17.35-46.91) of receiving vaccination as recommended during the influenza season were more inclined toward getting vaccinated against pH1N1. By contrast, those who were concerned about the quality of the pH1N1 vaccine (AOR=0.59; 95% CI=0.41-0.84) were less likely to intend to be vaccinated.

## **4. Conclusion**

These findings indicate that prior experience of receiving pH1N1 vaccination was directly related to intention to be vaccinated in the future. As posited by the HBM, perceived self-efficacy to receive pH1N1 vaccination has been demonstrated to be the strongest correlate of pH1N1 vaccination intention among the health beliefs examined in this study. These results also underscore the importance of convincing the public of the effectiveness of pH1N1 vaccination, while reducing the public concerns about the quality of the pH1N1 vaccine when promoting vaccination programs. Findings about these specific and modifiable perceptions have practical implications for policy-making and prevention initiatives.

## **5. Acknowledgements**

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Table 1. Multivariate logistic regression model for covariates of intention to receive pH1N1 vaccination during the 2010 post-pandemic phase in Taiwan (n = 1,067)

Variable	AOR	95% CI
<b>Sociodemographic characteristics</b>		
Gender		
Male	1.14	0.78-1.68
Female (ref)	1.00	
Age		
15-29 (ref)	1.00	
30-44	1.61	0.96-2.70
45-59	1.40	0.86-2.28
≥ 60	0.87	0.20-3.74
Education		
Senior high or below (ref)	1.00	
Junior college	0.62	0.38-1.02
College or above	0.94	0.61-1.45
Employment status		
Student (ref)	1.00	
Employed	0.64	0.28-1.45
Retired	0.63	0.25-1.56
Homemaker/unemployed	<b>0.39</b>	<b>0.16-0.91*</b>
Household income (NT\$/month)		
<50,000 <sup>a</sup> (ref)	1.00	
50,000-99,999	1.03	0.68-1.58
≥100,000	<b>0.47</b>	<b>0.26-0.84†</b>
Not willing to tell	1.17	0.68-2.01
Region of residence		
North	0.54	0.22-1.31
Center	0.81	0.32-2.05
South	0.79	0.32-1.98
East (ref)	1.00	
Had received vaccination against pandemic influenza A/H1N1 last year		
No (ref)	1.00	
Yes	<b>2.75</b>	<b>1.50-5.05‡</b>
Had received vaccination against seasonal influenza last year		
No (ref)	1.00	
Yes	1.72	0.90-3.27
<b>Perceived benefit</b>		
Perceived effectiveness of vaccination in preventing pH1N1		
Not very effective/not at all effective (ref)	1.00	
Effective	<b>1.97</b>	<b>1.21-3.21†</b>
Very effective	<b>4.75</b>	<b>2.68-8.43§</b>
<b>Perceived self-efficacy</b>		
Perceived self-efficacy of receiving vaccination as suggested during the pandemic		
Disagree/strongly disagree (ref)	1.00	
Agree	<b>10.44</b>	<b>7.10-15.35§</b>
Strongly agree	<b>28.53</b>	<b>17.35-46.91§</b>
<b>Perceived barriers</b>		
Concerned about the quality of the pH1N1 vaccine		
No (ref)	1.00	
Yes	<b>0.59</b>	<b>0.41-0.84‡</b>

Ref=reference group; AOR=adjusted odds ratio; CI=confidence interval

\*P < .05; †P < .01; ‡P < .005; §P < .0001

a: NT\$50,000 is approximately US\$1,700; €1,200

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